The Distributional Impacts of Fiscal Policy in Middle Income Countries

By

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Declaration I

I hereby declare that I authored Chapters 1 and 2 in collaboration with my supervisors. While I served as the first author of both Chapters, my supervisors acted as my co-authors. Also, I confirm that I am the sole author of Chapter 3. Finally, I certify that all materials from other sources have been appropriately acknowledged.

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Declaration II

- A version of Chapter 1 was presented at the Economics Seminar of the Department of Economics, University of Reading, in June 2020.

- A version of Chapter 1 has been published in the Economics Discussion Papers of the Department of Economics, University of Reading, UK, and can be accessed through the link: https://ideas.repec.org/p/rdg/emxxdp/em-dp2022-08.html.

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Prologue

This PhD thesis comprises three main chapters, with a unifying theme connecting them. Specifically, the common thread across these chapters is the focus on the redistributive effects of fiscal policy in middle-income countries, with each chapter exploring distinct aspects of this subject matter. Apart from the fact that the study of distributional and fiscal policy matters within middle-income countries is a rather scarce domain of research, the relevance of this subject matter can be elucidated by two crucial points: First, the global trend towards a widening divide between the "rich" and the "poor" is especially acute within these countries. Indeed, middle-income countries stand out as the most unequal among all groups of countries (United Nations, 2015). Second, within middle income countries, key fiscal policy tools, such as taxes and public spending, tend not to be robust, particularly when compared to high income countries. For example, while the tax ratio for advanced economies exceeds 30% of GDP, middle-income countries have a much lower share, typically between 15% and 18% over the past three decades. Meanwhile, the composition and combination of fiscal policy tools matter vis-à-vis their potential distributional effects. In light of the comparatively constrained scale and visibility of key fiscal policy tools within middle income countries, it is therefore reasonable to be interested in discerning how effective fiscal policies would be in recording distributional gains, within this group of countries.

This broad discussion about the distributional impacts of fiscal policy within middle income countries has been examined through specific research objectives that are expounded upon in the three chapters of this thesis. In its first chapter, the thesis investigates whether government expenditure reallocations between sectors are equalizing. Specifically, the chapter examines the inequality effects of funding social spending sectors through cuts in other sectoral expenditures, within a panel of 50 middle-income countries over the period 2005–2015, effectively maintaining the same level of overall government expenditure. The chapter identifies the social spending sectors as: social protection sector, health sector, education sector, and the agriculture sector. Meanwhile, the defense sector, transport and communication sector, and "other" sectors are considered for funding the social spending sectors. Further, the chapter evaluates the effect of public spending reallocations on a summary measure of inequality (the Atkinson index) and on three segments of the income distribution (the 10th percentile, the 50th percentile, and the 90th percentile) that reflect three "ideal" income groups. Additionally, sensitivity analyses are conducted by using two other summary measures of inequality (the Gini coefficient and the Theil index), and three other percentiles of the income distribution (the 20th, 40th and 80th percentiles). Further tests are carried out to ascertain if the findings alter when the sample is divided into upper and lower middle-income countries.

The second chapter investigates the response of inequality to public expenditure shocks across various time horizons. Specifically, the chapter employs the GMM Panel VAR method in studying a sample of 56 middle-income countries, over the period, 2004-2014. Orthogonalized impulse response functions (IRFs) and forecast error variance decompositions (FEVDs) are used to identify the shocks, which are defined as unanticipated changes in government expenditure. Additionally, the chapter explores the distributional effects of shocks imposed on taxes as well as three social expenditure variables, which are identified as social protection, health care, and education. Further, the chapter assesses how the tax and spending shocks affect those at the bottom (10th percentile), middle (50th percentile), and top of the income distribution (the 90th percentile). The research presented in this chapter represents the first to employ the GMM Panel VAR method towards examining the effects of tax and public spending shocks on the distribution of income within middle-income countries.

The third chapter of this thesis employs a Bayesian DSGE model in evaluating the effect of negative commodity shocks on household consumption within Brazil, Russia, India and South Africa (BRIS), on one hand, and Mexico, Indonesia, Nigeria and Turkey (MINT) on the other. Amidst the negative commodity shocks, the effects of fiscal policy shocks on consumption are also considered. In theory, the fiscal policy shocks examined are expansionary, and are accounted for, through transfers, tax and debt shocks. While the shock imposed on tax is negative, that of transfers and debt is positive. Specifically, the chapter evaluates how such fiscal policy shocks affect household spending in the aftermath of negative commodity shocks. It is noteworthy that two distributionally diverse households are considered: those with complete access to financial markets (i.e., Ricardian households) and those without such access (i.e., non-Ricardian households). As a corollary, the chapter examines how both households compare in the aftermath of the shocks, across BRIS and MINT. Further, the chapter compares the changes in domestic and foreign goods consumption following the shocks, thus allowing for the determination of the category of goods that are more impacted by the commodity and fiscal policy shocks. The research presented in this chapter is the first to compare the effects of commodity and fiscal policy shocks on household spending in both BRIS and MINT. As demonstrated thus far, a common thread across all three chapters is that each addresses issues related to fiscal policy, income distribution and middle-income countries.

As regards the findings obtained, the first chapter shows that income inequality can be reduced, with all percentiles benefiting, if the education sector is funded by cuts in public expenditure on the transport and communication sector, the defence sector, and "other" sectors. After splitting the data by national income levels, the chapter reveals the equalising role of government spending reallocations in favour of the agricultural sector within the subsample of upper middle-income countries. Similar inequality-reducing roles are also revealed, following reallocations in favour of the social protection and health sectors, within the subsample of the lower middle-income countries. While uncovering the kinds of spending reallocations that are equalizing within middle-income countries, the chapter recommends that, when reallocating away from the relevant financing sectors (i.e., the sectors from which expenditure is being reallocated towards the social spending sectors), policymakers should place greater priority on imprudent expenditures (within the financing sectors), particularly as such inefficient expenditures have remained a major issue to contend with in many emerging countries.

Meanwhile, the second chapter of the thesis finds that government and education spending shocks positively impact the low- and middle-income groups, with high-income groups also benefiting from education spending shocks. Meanwhile, social protection shocks often exhibit brief equalising effects; and health spending and tax shocks generally have no detectable effects on income inequality.

Further, the third chapter of the thesis shows that households, both Ricardian and non-Ricardian, reduce consumption following negative shocks to commodity output and prices. Among BRIS, Russia witnesses the biggest drop in aggregate consumption, meanwhile, the decline obtained for Nigeria is greater than that of Russia as well as the rest of MINT. Nonetheless, positive shocks on public transfers raise aggregate consumption across BRIS and MINT and play a crucial role in facilitating a redistribution pattern that is associated with a fall in the consumption ratio between Ricardian and non-Ricardian households. Meanwhile, such reductions in the consumption ratio are not observed in the aftermath of negative tax shocks and positive debt shocks.

Chapter 1

Who Benefits from Changes in the Composition of Government Expenditure? Panel Data Evidence from a Sample of Middle-Income Countries

Abstract

We examine the redistributive effects of government spending reallocations towards four social spending sectors: social protection, health, education and agriculture. More specifically, we ask whether it is possible to identify some social spending sectors that can be associated with a relatively more pronounced income-equalizing effect. Employing panel data analysis based on a disaggregated dataset of 51 middle-income countries covering 11 years (2005-2015), we find that: (i) the income gap can be reduced, with all percentiles benefiting, if the education sector is financed by cuts in public spending on the transport and communication sector, the defence sector, and other sectors. We also split the sample by national income levels, and reveal that: (ii) the equalizing role of government spending reallocations in favour of the agricultural sector becomes manifest in the subsample of upper middle-income countries; (iii) the inequality-reducing impact of spending reallocations towards the social protection and health sectors becomes clearer in the subsample of lower middle-income countries. In the long run (and more importantly for policymakers), (iv) the spending reallocations towards the social spending sectors tend to reduce inequality within both the upper and lower middle-income countries. While we reveal, in this paper, the kinds of spending reallocations that are equalizing within middle-income countries, we equally recommend that, when reallocating away from the relevant financing sectors (i.e., the sectors from which expenditure is being reallocated towards the social spending sectors), policymakers should place greater priority on imprudent expenditures (within the financing sectors), particularly, as inefficient spending on "white elephant" projects has remained a challenge in emerging countries. We conclude that greater consideration should be given to the redistributive effects of government budget reallocations than is typically the case.

Keywords: middle-income countries, income inequality, composition of government expenditure, education sector, health sector, social protection sector

JEL codes: E62, H53, O15

1.1 Introduction

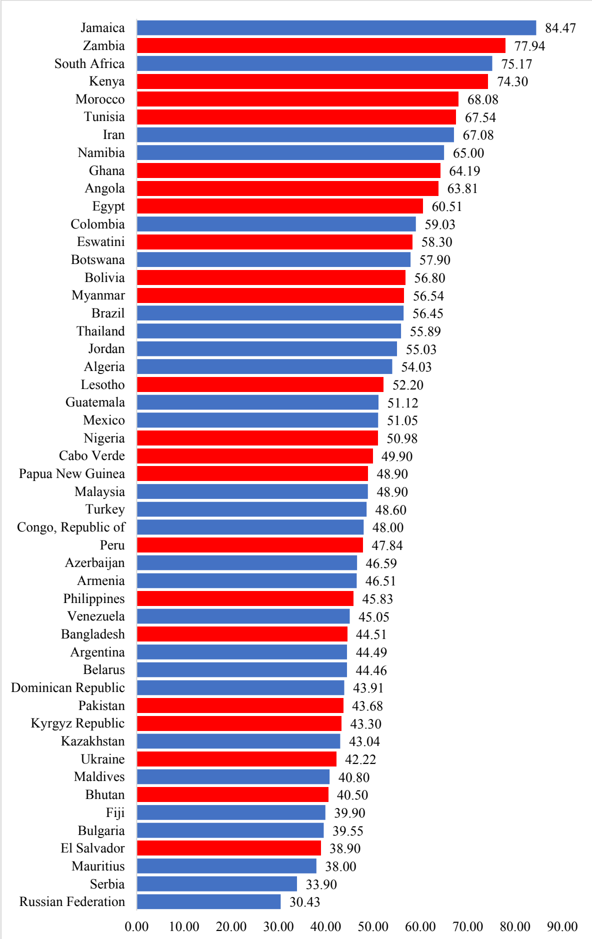
The persistent and increasing divide between the "rich" and the "poor", although never completely out of the academic debate,[1] has resurged to the highlight in the economic literature in the recent years (Piketty, 2013; Atkinson, 2015; Alvaredo et al., 2017). While being a global trend, this divide has been particularly acute within middle-income countries, the most unequal among all groups of countries. Moreover, inequality is significantly higher within middle-income countries in sub-Saharan Africa compared to middle-income countries in Europe and Central Asia (United Nations, 2015). Figure 1.1, depicting the 50 middle-income countries in our sample in 2015, shows that in Russia the level of inequality, measured by the Atkinson inequality index (Atkinson, 1970), was 30.43, while in South Africa it was, 75.17, i.e., two and half times higher. The reduction of inequality has, therefore, become an increasingly important focus of policymakers at different levels. For instance, while in the past the International Monetary Fund (IMF) was criticised for its strong focus on the so-called "Washington consensus", according to which distributional considerations were of secondary relevance, more recently it has placed substantial effort to outline the negative consequences of inequality on both economic growth and macroeconomic stability (Clements et al., 2015). In those middle-income countries where poverty rates have decreased substantially with economic growth in the past three decades, there is an increased emphasis that further growth should be more inclusive and should benefit much larger sections of society.[2] Public support for redistribution has also increased since 2010, as shown by increasing numbers of people in both advanced and developing countries agreeing with the statement that "incomes should be made more equal" than with the statement that "we need larger income differences as incentives for individual effort" (Clements et al., 2015).

One way to achieve this objective is to fund inequality-reducing social spending sectors through public debts (see, e.g., Furceri et al., 2016; Salotti and Trecroci, 2018). However, this kind of funding is not always available nor particularly desirable. Indeed, while not yet fully recovered from the 2007–2009 Global Financial Crisis (GFC), many countries in the world were unexpectedly hit by the COVID–19 pandemic in 2020, which sparked a severe global economic contraction (see, e.g., O'Brien and Gilligan, 2013; Gurría, 2020), and then by the war in Ukraine since March 2022, which created huge uncertainty all over the world, with sky-rocketing prices of energy and food and a return to high inflation rates. Consequently, opportunities for loans are increasingly becoming unavailable as foreign lenders and investors reduce lending during periods of economic downturn (see, e.g., Love, 2013).

[1]See, e.g., the famous Presidential address of Anthony Atkinson to the Royal Economic Society in 1996, titled: "Bringing Income Distribution in from the Cold" (Atkinson, 1997).

[2]See also the extensive material and collection of research in the IMF website section on "The IMF and Income Inequality": `https://www.imf.org/en/Topics/Inequality`.

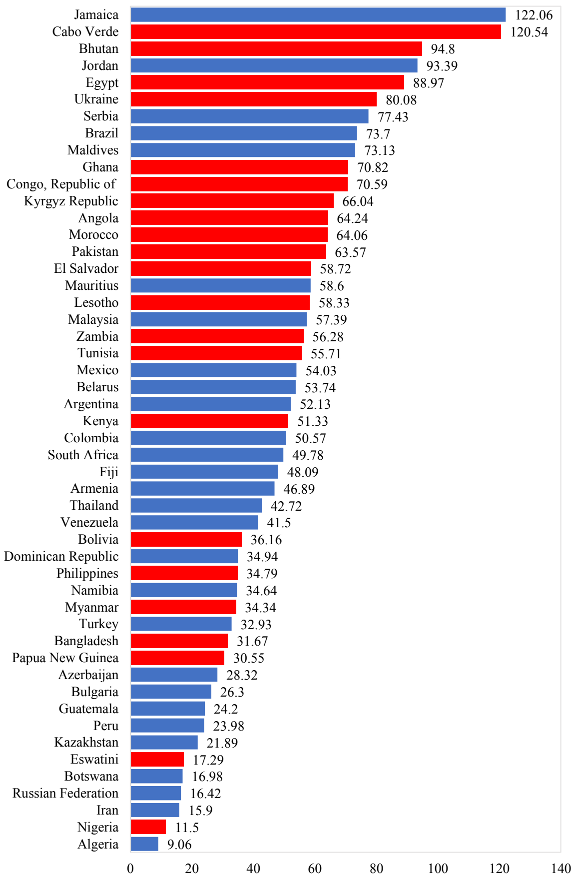
Figure (1.1) Atkinson Measure of Inequality for Middle-Income Countries, 2015



Note: Figure 1.1 is created using data from the Global Consumption and Income Project Database. The Atkinson inequality measure ranges on a scale from 0 (perfect equality) to 100 (perfect inequality). The blue bars represent upper middle-income countries while the red bars represent lower middle-income countries.

Funding income inequality reductions through public debt is also undesirable, for at least two reasons. First, when loans are available, multilateral lending agencies and countries often award them along with unfavourable conditions. For example, the loan agreement may permit the lender to exhibit a huge influence on the policies of the borrowing country. It is not uncommon for loan contracts to be accompanied by clauses requiring the borrowing country to implement policies that turn out to be detrimental to its economy in the long run. For instance, the adverse economic implications associated with the structural adjustment programs, which the IMF and the World Bank stipulated as a condition for granting loans to low- and middle-income countries, are well documented (see, e.g., Cavanagh and Mander, 2003; Oberdabernig, 2010). Second, many middle-income countries are currently faced with limited fiscal space. For most middle-income countries, the sustainability of a high debt-to-GDP ratio (shown in Figure 1.2) is additionally threatened by a high share of short-term debt, currency depreciation pressures, fall in the price of primary commodities in international markets and the possible rise in interest rate in the United States (US), which could heighten the cost of debt-servicing (United Nations, 2015).

Figure (1.2) Public Debt as a Percentage of GDP in Middle-Income Countries, 2015



Note: Figure 1.2 is created using the IMF Historical Public Debt Database. The blue bars represent upper middle-income countries while the red bars represent lower middle-income countries.

Moreover, the IMF (2017) observes that further delays in reducing the debt-to-GDP ratio could prevent growth-enhancing spending, crowd out investment by private firms and impact negatively on the foreign sector. Accordingly, policymakers in middle-income countries are faced with the task of adequately funding inequality-reducing social spending sectors while simultaneously ensuring debt sustainability.

Therefore, in this paper, we ask whether government spending reallocations across sectors are equality enhancing or not and, more specifically, whether it is possible to identify some spending sectors that can be associated with a relatively more pronounced income-equalizing effect than other sectors. To address this question, we use a panel of 50 middle-income countries to evaluate the inequality impact of financing social spending sectors through cuts in the remaining sectoral expenditures in the period between 2005 and 2015, in effect, leaving the level of total government expenditure unchanged. We employ the recently released Statistics on Public Expenditure for Economic Development (SPEED) Database and define the social spending sectors following Oxfam/DFI (2017) as: social protection sector, health sector, education sector, and the agriculture sector.[3] Three other sectors are considered for financing the social spending sectors: defense sector, transport and communication sector, and "other" sectors.

We assess the impact of the spending reallocations on both a summary index of inequality (the Atkinson index) as well as on three different parts of the distribution, representing three "ideal" income groups: the relatively poor (represented by the 10th percentile), the middle-income group (the 50th percentile) and the relatively rich (the 90th percentile). Moreover, we carry out sensitivity analysis by using two other summary measures of inequality (the Gini coefficient and the Theil index) and three other percentiles of the income distribution (the 20th, 40th and 80th percentiles). We also look at whether the results change when we split the whole sample of middle-income countries into upper and lower middle-income countries.

For the sample of middle-income countries as a whole, we find that reallocation to the education sector is associated with a reduction in income inequality. Interestingly, all the three income groups, including the middle and the relatively rich groups, benefit from such reallocation. We further find that the equalizing impact of spending reallocations differ depending on the income level of the country. In the case of upper middle-income countries, spending reallocations towards the agricultural sector improve equality while, for lower middle-income countries, it is spending reallocations towards the social protection and health sectors that is associated with increasing equality. In the long run (and most importantly for policymakers), reallocations towards the social spending sectors tend to reduce inequality within both the upper and lower middle-income countries. Finally, we recommend that when reallocating away from the relevant financing sectors (i.e., the sectors from which expenditure is being reallocated towards the social spending sectors), policymakers should place greater priority on imprudent expenditures within these sectors, particularly as such inefficient expenditures often exist within emerging countries (see, for example Robinson and Torvik, 2005; Schiavo-Campo, 2007; Ronsholt, 2013) [4].

The rest of the paper is organized as follows. Section 1.2 examines the related literature. Section 1.3 outlines the methodology and data. Section 1.4 discusses the results. Section 1.5 provides extensive robustness checks. Section 1.6 summarizes and concludes. An appendix, finally, contains more detail on our methodology, data and findings.

[3]While Oxfam/DFI (2017) notes that the social protection, health and education sectors traditionally provide the pillars for inequality-reducing spending, it also adds that spending on the agricultural sector is equally essential for reducing the income gap within developing countries, since a considerable percentage of the less privileged in these countries are employed by this sector. Accordingly, our work also considers the inequality impact of spending reallocations in favour of the agricultural sector.

[4]Robinson and Torvik (2005) reveal that emerging economies (to which middle income countries belong), are faced with budget misallocation challenges, with a reasonable share of government budgets often going towards white elephant infrastructural projects. Likewise, Wnorowski (2011) in a study on China; a leading middle income country, provides discussions regarding what the paper describes as "extravagant" spending on some sports infrastructure, which have the tendency to be of little or no use after the ceremonies for which they were originally constructed.

1.2 Related Literature

In this section, for the four social spending sectors, we summarize both the theoretical and empirical literature on the relationship between the specific social sector spending and inequality. The empirical studies are reported in the respective Tables 1.1-1.4, which distinguish between those that find an equalizing effect (in the upper panel A of the tables) and those that do not find an equalizing effect (in the lower panel B) from the reallocation of spending to the relevant social spending sector. The tables also summarize the methodology employed by the studies and some of their key limitations. Largely, our literature review builds out of empirical papers focusing on developing countries.

1.2.1 Social Protection Sector

Some studies predict that expenditures on the social protection sector reduce inequality because they are customarily targeted at the poor (Whiteford, 2008; Anderson et al., 2017). Correspondingly, they argue that achieving a significant reduction in inequality requires that spending on this sector be targeted towards the poorest of the poor, therefore reflecting a Rawlsian social welfare function (Rawls, 2009). Some other studies predict that expenditures on the social protection sector may be accompanied by some inequality-increasing effects, by encouraging the low-income recipients to be entirely dependent on the transfers and decrease their work-hours relative to those of high-income earners (Niehues, 2010). In addition, Benabou (2000) and Kerr (2014) theorize that when public spending on the social protection sector is low and there exist capital market imperfections, investment opportunities would be grossly unequal, thereby increasing inequality. In sum, the ultimate impact of social contributions is theoretically ambiguous, and remains an empirical question. Table 1.1 reports the findings of 5 empirical studies specifically on the social protection sector, covering a period of time that goes from 1970 to 2016 overall. Two of these studies do not find a significant equalizing effect from the social protection sector.

1.2.2 Health Sector

On one hand, some theories predict that expenditures on the health sector reduce inequality because they enable the low-income groups to save or gainfully invest expenditures they would have incurred on healthcare. Over time, this would result in higher earnings of the low-income groups, which may, ultimately, have an equalizing impact on the income distribution (Verbist et al., 2012). On the other hand, other theories suggest that corrupt public officials may embezzle the expenditures allocated to this sector, thereby preventing the low-income groups from benefiting adequately from such expenditures, and inequality may in fact increase (Alesina, 1998). Accordingly, the ultimate impact of the health sector may be difficult to predict in theory, so again, an empirical investigation is worthwhile. Table 1.2 reports the findings of 4 empirical studies related to the equalizing effect of the health sector, covering a period of time from 1980 to 2014 overall. Here as well, the overall results are ambiguous. Leaving aside the analysis for specific countries, those that study a range of low-income countries found both a positive impact of health spending on equality, as is the case of Ospina (2010) for 19 Latin America countries over two decades, and a negative one, as in Lustig (2016) for 28 low and middle-income countries but only in 2010.

Table (1.1) Studies on the Social Protection Sector

(a) Studies that Find an Equalizing Effect of the Social Protection Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
Hoy and Sumner (2016)	Uses data for 2015 and 2016 to determine how long it would take for global poverty to be eradicated.	IMF World Economic Outlook projections.	Inequality can be reduced if policymakers ensure an efficient redistribution of social expenditures.	Does not rigorously consider the impact of government spending on different percentile income shares.
Odusola (2017)	Investigates the role of fiscal policy in inequality reduction within African countries over the period 1990-2012.	OLS	Well targeted social contributions have been instrumental to reducing inequality within the African continent.	Heterogeneity across time and space is not rigorously addressed.
Doumbia and Kinda (2019)	Analyses the inequality effects of redistributing public expenditure within a sample of 83 developed and developing countries over the period 1970-2010	Fixed Effects	Positive redistributive gains are recorded through social expenditures.	Effects of public expenditure on varying income percentiles is not examined.

(b) Studies that Do Not Find an Equalizing Effect of the Social Protection Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
López et al. (2010)	Researches the redistributive impact of funding public social spending within a sample of 40 low-income countries over the period 1980-2004.	IV-SUR	Social spending has an ambiguous impact on income inequality.	The use of IV-SUR is more applicable to long panels.
Cornia and Martorano (2012)	Examines inequality trends in developing regions over the period 1980-2010.	Least Squares Dummy Variables technique as well as the 3SLS technique.	Social protection as a percentage of government expenditure has an unclear impact on inequality.	Does not give adequate consideration to key determinants of inequality such as population density.

Table (1.2) Studies on the Health Sector

(a) Studies that Find an Equalizing Effect of the Health Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
Ospina (2010)	Investigates the redistributive impact of public spending within 19 Latin American countries over the period 1980-2000.	2SLS and GMM techniques.	Public expenditure on healthcare has an equalizing impact on income distribution.	The use of the GMM technique is more applicable to short panels (i.e. a panel data analysis wherein the number of countries is greater than the number of time periods).
Hounsa et al. (2019)	Examines the redistributive effects of government spending in Mali and Niger for the year 2014.	The Commitment to Equity (CEQ) methodology.	Government expenditure on healthcare reduces income inequality.	Does not rigorously consider the inequality impact of the health sector on different percentile income shares.

(b) Studies that Do Not Find an Equalizing Effect of the Health Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
De La Fuente et al. (2017)	Analyses the impact of fiscal policy on inequality and poverty in Zambia in 2015.	Commitment to Equity (CEQ) methodology.	Highly valued public health services are more accessible to the rich relative to the poor and hence, spending on such services tends to be regressive.	Does not rigorously examine the avenues through which fiscal space can be expanded to allow for adequate expenditure on social spending sectors.
Lustig (2016)	Investigates the impact of fiscal policy on inequality and poverty in 28 low and middle-income countries for 2010.	Commitment to Equity (CEQ) methodology.	Inequality may not decline if the quality of healthcare provided by the government is low or benefits the high-income groups more than the low-income groups.	Does not adequately consider the possible long-term impact of the public health services on inequality.

1.2.3 Education Sector

The link between expenditure on the education sector and the income distribution has often emphasised the positive theoretical impact on the acquisition of human capital and higher degrees and its associated likelihood to be gainfully employed. Ultimately, this would reduce the income gap between the high- and low-income groups (Becker, 1964). Other theories, however, show that expenditures on the education sector may be hijacked by the high-income groups or not properly targeted towards the low-income groups, and this may eventually increase inequality (see, e.g., Tanzi, 1974; Hausmann and Rigobón, 1993; Schwartz and Ter-Minassian, 2000). The extent to which expenditures on education might be equalizing or not would depend on the amount of this expenditure. On one hand, if low, it would enable only a few individuals to possess relevant educational qualifications, and as such the premium on them would be very high as would be their earnings. On the other hand, these expenditures may reduce inequality if they increase over time, and consequently result in a high supply of highly educated individuals. As a corollary, the premium placed on them may reduce and ultimately result in a reduction in their earnings, and thus a decline in inequality (Knight and Sabot, 1983). In sum, the ultimate impact of the education sector may not be straightforward theoretically either. Table 1.3 summarizes 6 empirical studies, four of which find no significant equalizing effect. Interestingly, the overall time period covered by these studies is quite long, beginning from 1950, and the set of countries covered is generally wider than for other sectors.

1.2.4 Agricultural Sector

A key objective of public spending on the agricultural sector is to create jobs and enhance income growth within the sector. Usually, an increase in spending on the agricultural sector within a developing country is expected to reduce income inequality (Oxfam/DFI, 2017). This is because a considerable percentage of those engaged in the agricultural sector within developing countries often belong to the low-income group. As this group benefits from the expenditures on the agricultural sector, the income gap between the rich and the poor shrinks. Nonetheless, government spending on the agricultural sector may have disequalizing impacts if they get appropriated by the politically connected. For example, Beegle and Christiaensen (2019) show how social contributions aimed at subsidizing farm inputs are often captured by the wealthy. Table 1.4 reports the findings of four relevant empirical studies, which are, unfortunately, about four specific countries and a rather limited time period.

The literature review which we undertook in the present section reveals that the empirical work on the avenues for funding social spending sectors is rather scanty, and only a handful of such papers exist (see, e.g., López et al., 2010). Moreover, to the best of our knowledge, existing econometric studies on middle-income countries do not focus on identifying sectoral expenditures that can be associated with an income-equalizing effect when reallocated towards social spending sectors, leaving the total spending unchanged and therefore within a neutral fiscal policy stance.

Perhaps, the paper that is closest to ours is that of Doumbia and Kinda (2019). However, our paper differs from Doumbia and Kinda (2019) in three vital areas, namely: First, Doumbia and Kinda (2019)

Table (1.3) Studies on the Education Sector

(a) Studies that Find an Equalizing Effect of the Education Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
Odedokun and Round (2004)	Examines the determinants of economic disparity in 35 developing countries over the period 1960–2000.	OLS with robust standard errors proposed by White (1980).	Government spending towards increasing school enrolment contributes meaningfully towards bridging the income gap between the rich and the poor.	Due to the use of the OLS technique, it fails to rigorously address potential heterogeneity across time and space.
Coady and Dizioli (2018)	Investigates the redistributive impact of a rise in school enrolment within a sample of advanced economies and emerging countries in Asia, Africa, Latin America and Europe over the period 1980-2010.	OLS, SURE, Fixed Effects and GMM.	Inequality reduces in developing countries with an increase in the mean years of school attendance for individuals aged 25.	Fails to examine the avenues through which fiscal space can be expanded to allow for adequate funding of social spending sectors.

(b) Studies that Do Not Find an Equalizing Effect of the Education Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
Castelló and Doménech (2014)	Investigates the trends of income and education inequality over the period 1950–2010, within a sample of 146 countries drawn from several continents.	OLS, Fixed Effects and some Instrumental Variables techniques.	Spending towards increasing the average years of school attendance increases inequality if the prospects of earning higher income rises as higher levels of education is pursued.	Does not give adequate consideration to key determinants of inequality such as taxation revenue.
Battistón et al. (2014)	Examines the impact of the education sector on inequality within a sample of eighteen Latin American countries over the period 1990-2009.	Microsimulation using individual earnings equations.	Spending towards increasing school enrolment widens the income gap. This disequalizing effect would remain persistent unless the funding of education sector is well targeted.	Fails to rigorously examine the impact of public education spending on the percentile income shares of different income groups.
Coyne (2015)	Examines the redistributive impact of the lecture hours devoted to learning the official language of a country's previous colonizer using 33 African countries	OLS	Secondary school enrolment has no significant impact in bridging the income gap.	Due to the use of the OLS technique, this study does not rigorously address potential heterogeneity across time and space.
Sturm and De Haan (2015)	Investigates the impact of economic freedom on income distribution over the period 1971–2010, within a large sample of countries drawn from Asia, Europe, Latin-America, Africa, North America and Oceania.	OLS and Fixed Effects	Income inequality does not respond to increases in the proportion of the population possessing high school qualifications.	The main results are obtained using the market Gini index as a measure of inequality, yet the market Gini index only provides information about the income distribution prior to transfers and taxes.

Table (1.4) Studies on the Agricultural Sector

(a) Studies that Find an Equalizing Effect of the Agricultural Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
Rocchi et al. (2013)	Investigates the redistributive impact of the liberalization of the agricultural sector in Syria using the National Agricultural Policy Centre of Damascus for 2004.	Social Accounting Matrix (SAM) modelling.	Inequality and poverty may increase with the elimination of funds aimed at stabilizing the prices of agricultural commodities.	Does not give sufficient consideration to key determinants of inequality such as corruption and trade openness.
Younger and Benin (2013)	Analyses the inequality and poverty consequences of increasing the budgetary share of the agricultural sector in Ghana using Ghana Living Standards Survey, for 2012–2013.	Simulations analysing the return to agricultural spending within the cocoa and non-cocoa sub-sectors.	Public spending on the agricultural sector is highly progressive. It also has the tendency to reduce inequality and poverty considerably.	Does not consider the means through which fiscal space can be expanded in order to increase funding towards the agricultural sector.

(b) Studies that Do Not Find an Equalizing Effect of the Agricultural Sector

Author	Objective and Data	Methodology	Impact and Findings	Observation
Viet (2010)	Examines the impact of the agricultural sector on inequality and poverty in Vietnam using the Vietnam Household Living Standard Surveys for 2002 and 2004	Fixed Effects.	Crop production, forestry and livestock production have no clear impact on income inequality.	Fails to investigate the impact of agricultural spending on different income percentiles.
Wang et al. (2019)	Investigates the redistributive effect of agricultural subsidies in Bhutan using household surveys collected by the authors in 2017.	OLS.	Agricultural subsidies are often hijacked by the wealthy and thus have potential disequalizing effects.	Fails to examine the potential long-term impact of agricultural subsidies on income inequality.

focus on assessing the impact of the spending reallocations on a summary index of inequality. Meanwhile, our paper equally examines the summary index of inequality, but delves deeper, by assessing the impact of the spending reallocations on three distinct parts of the income distribution, thereby allowing for the determination of the spending reallocations that are pro-poor, pro-middle income, and pro-rich. Second, our study focuses on middle income countries, providing a detailed comparison between lower and upper middle income countries. Conversely, Doumbia and Kinda (2019) consider a sample of developed and developing countries, without splitting their sample by national income levels. Meanwhile, the relevance of such disaggregation is underscored by the significant disparities between developed and developing countries vis-à-vis economic and political institutions. Hence, in a bid to ensure our results are more reliable and realistic, we not only study the middle-income countries as a whole, but also split our sample by income levels and analyse results thereafter. Third, in contrast to Doumbia and Kinda (2019), who examine a single measure of inequality, we consider three different inequality measures, particularly as different measures of inequality may provide varying rankings of the income distribution, necessitating the relevance of analysing results using alternative inequality measures. Our main contribution, therefore, consists in attempting to fill in this gap.

1.3 Methodology and Data

1.3.1 Model Specification

Equation (1.1) specifies our modelling approach:

$$I_{it} = \alpha + \sum_{j=1}^{n} \beta P_{i,j,t-1} \; + \rho T_{i,t-1} + \varphi Z_{i,t-1} + \chi_i + \theta_t + \varepsilon_{it} \tag{1.1}$$

For each country i observed at time t, the dependent variable I_{it} is an index of income inequality. We start with the Atkinson index as a summary measure of inequality.[5] $P_{i,j,t-1}$ denotes the share of total government spending on sector j. $T_{i,t-1}$ stands for the share of total government expenditure in GDP. Total government expenditure is the sum of the expenditures incurred on all sectors j ranging from 1 to n. $Z_{i,t-1}$ collects the control variables. Following Acosta-Ormaechea and Morozumi (2017) and Doumbia and Kinda (2019), our study mitigates any endogeneity bias arising from potential reverse causality by taking a one-year lag of all regressors. χ_i represents the country fixed effects and θ_t the time fixed effects; α, β, ρ and φ are vectors that collect the parameter estimates, and ε_{it} captures the error term. Notice that each of the sectoral expenditures is expressed as a share of the sum of all sectoral expenditures (i.e., total government expenditure), and since $\sum_{j=1}^{n} \beta P_{i,j,t-1} = 1$, perfect multicollinearity would arise if each of them is included in a regression model (see e.g., Devarajan et al., 1996; Gupta et al., 2005; Bose et al., 2007; Acosta-Ormaechea and Morozumi, 2017; Doumbia and Kinda, 2019; Chu et al., 2020). Accordingly, the share of total spending for one sector is always excluded from the regressions. Subsequently, the expenditure incurred on each sector would be measured in relative terms, specifically, in terms of their share within total expenditure. The exclusion of a given sector – let's say sector f – due to perfect multicollinearity, implies that this omitted sectoral expenditure for f would instead be measured by the sectoral expenditures that are left in the model, and this is how the impact of the reallocation from sector f to sector j is measured. In such a scenario, the resulting coefficients of the remaining sectors (following the exclusion of f) thus tell us what happens to the left-hand side variable (i.e., income inequality), when the expenditure that would have been allocated to f is redirected towards the remaining sectors. When sector f is omitted from equation (1.1), the resulting equation becomes:

[5] See section 1.3.2 for more details on the dependent variable.

$$Gini_{it} = \alpha + \sum_{j=1}^{n-1} (\beta_j - \beta_f)\, P_{i,j,t-1} \; + \rho T_{i,t-1} + \varphi Z_{i,t-1} + \chi_i + \theta_t + \varepsilon_{it} \tag{1.2}$$

Notice that $\frac{\partial Gini_{it}}{\partial P_{i,j,t-1}} = (\beta_j - \beta_f)$ represents the difference between the marginal effect of j and f. Accordingly, $(\beta_j - \beta_f)$ captures the marginal effect[6] on inequality of reallocating spending from sector f towards sector j. Put differently, $(\beta_j - \beta_f)$ captures the coefficient of j when financed by cuts in the expenditures allocated to f. In the analysis, we devote special attention to the redistributive effect of reallocating spending towards the social protection sector, the health sector, the education sector and the agricultural sector.

In evaluating the impact of government spending reallocations on the different income groups, we also replace the inequality index with three distinct percentile income shares, capturing three different income groups. We use the fixed effects estimator, where Driscoll and Kraay (1998) standard errors are employed in adjusting for potential heteroscedasticity and autocorrelation within the residuals. Further discussion concerning the model specification is provided in Appendix A.1.1.

As noted in section 1.2, there is no consensus regarding the redistributive impact of social spending sectors. Therefore, we employ a two tailed test, where the null hypothesis is that financing social spending sectors through cuts in the remaining sectoral expenditures has no significant impact on inequality.

1.3.2 Sample Selection and Measurement of Variables

To examine the redistributive effect of financing social spending sectors through cuts in the remaining sectoral expenditures, we employ the Statistics on Public Expenditure for Economic Development (SPEED) Database for 50 middle-income countries over the period 2005–2015. This sample comprises 28 upper and 22 lower middle-income countries, based on the classification of the World Bank in 2019.[7] We employ panel data analysis in annual frequency. Through the inclusion of time and country fixed effects, panel data analysis makes it possible to account for the redistributive impacts of existing policy changes over time and across countries.

[6] Appendix A.1.1 shows that the resulting coefficients of the sectors that are left in the model actually represent the difference between their marginal effects (when sector f is left in the model) and the marginal effect that would be obtained for sector f if it were left in the model.

[7] The upper middle-income countries (with per capita income between \$3,996 and \$12,375 per year) include: Algeria, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Brazil, Bulgaria, Colombia, Dominican Republic, Fiji, Guatemala, Iran, Jamaica, Jordan, Kazakhstan, Malaysia, Maldives, Mauritius, Mexico, Namibia, Peru, Russia, Serbia, South Africa, Thailand, Turkey and Venezuela. The lower middle-income countries (with per capita income between \$1,026 and \$3,995 per year) are: Angola, Bangladesh, Bhutan, Bolivia, Cape Verde, The Republic of Congo, Egypt, El-Salvador, Eswatini, Ghana, Kenya, Lesotho, Morocco, Myanmar, Nigeria, Pakistan, Papua New Guinea, Philippines, Tunisia, Ukraine, Zambia and Kyrgyz Republic.

Dependent Variables

In examining the redistributive effects of reallocating government spending towards social spending sectors, we start with the Atkinson inequality measure.[8] As pointed out by Atkinson (1970), and later on demonstrated by Weymark (1981) and Yaari (1987), underlying any measure of income inequality is some concept of social welfare; more specifically, the family of rank-dependent measures of inequality reflects an underlying social welfare value. However, while for the other measures it remains implicit, the Atkinson index explicitly reveals this value.[9] This is done through the parameter ε in the Atkinson index, which is defined as:

$$A_\varepsilon(y_1, \cdots, y_n) = \begin{cases} 1 - \frac{1}{\mu}(\frac{1}{N}\sum_{i=1}^{N} y_i^{1-\varepsilon})^{\frac{1}{1-\varepsilon}} \; for \; 0 \leq \varepsilon \neq 1 \\ 1 - \frac{1}{\mu}(\prod_{i=1}^{N} y_i)^{\frac{1}{N}} \; for \; \varepsilon = 1 \end{cases} \tag{1.3}$$

where y_i is individual income and μ is mean income. ε is referred to as the inequality aversion parameter, because it regulates the sensitivity of the implied social welfare losses arising from inequality. For $\varepsilon = 0$, there is no aversion to inequality and the marginal increases in income produce the same social welfare whether they go to a poor or rich individual. For $\varepsilon = \infty$, there is infinite aversion to inequality and the marginal social welfare of income of the poorest individual is infinitely larger than that of any richer individual. We believe this property of the Atkinson index to be particularly important in a welfare analysis such as the one undertaken here, where we aim to assess the equalizing effect of government's spending reallocations. Indeed, this goes back to the point of Dalton (1920), which inspired Atkinson's work on the measurement of inequality, according to which it is not the distribution of income as such that matters, but its effects on the distribution of, and the total, economic welfare. As indices of inequality are not purely statistical objective devices but are intrinsically linked to normative views, the Atkinson index, making explicit the different views about social justice, is particularly appropriate to our analysis on the equality effect of government welfare spending reallocations. Data on the Atkinson index are retrieved from the Global Consumption and Income Project Database. The database computes the Atkinson index with an inequality aversion parameter (ε) of 2. To understand the impact of government spending reallocations in favour of social spending sectors on different parts of the income distribution, rather than on an overall measure of inequality of the distribution, we replace the Atkinson index with three different percentile income shares. The tenth percentile (10th percentile$_{it}$) represents the relatively poor, low-income group,

[8] In Appendix A.3 we replace the Atkinson index with the Gini coefficient and the Theil index.

[9] For instance, the Gini coefficient is particularly sensitive to transfers that take place in the central part of the income distribution while the Theil index is particularly sensitive to transfers that take place in the lower end of the income distribution (Atkinson, 2008).

the fiftieth percentile (50th percentile$_{it}$) represents the middle-income group and the ninetieth percentile (90th percentile$_{it}$) represents the relatively rich, high-income group. Data are obtained from the Global Consumption and Income Project Database.[10]

Independent variables

The government sectoral expenditures we focus on include seven sectors: social protection (SPS_{it}), health (HS_{it}), education (ES_{it}), transport and communication (TCS_{it}), defence (DS_{it}), agricultural (AS_{it}) and other sectors (OS_{it}). The data for these sectoral expenditures are sourced from the Statistics on Public Expenditure for Economic Development (SPEED) Database, which provides unique information on the composition of total government spending.[11] Each sectoral expenditure is expressed as a share of the sum of all the sectoral expenditures considered.[12] As such, it is impossible to obtain the sum of all the sectoral expenditures when data are missing for one or more sectoral expenditures in any one year. By extension, it becomes impossible to obtain the budget share for each sector. Accordingly, we record missing data for all sectors in any year in which data are missing for one or more sectors. Our analysis also includes controls for various other factors that the literature has found to be associated with the possible impact of spending reallocations on income inequality. Population density has been found to be both positively (Midlarsky, 1982; Midlarsky and Roberts, 1985) and negatively (Campante and Do, 2007; Milanovic, 2018) associated with inequality. Political stability, for which the evidence generally predicts that it aids a more equitable distribution of income, while political instability does the opposite (Bircan et al., 2010). Although the exact impact of unemployment on inequality is unclear, the hypothesis that unemployment is disequalizing is consistently reported in the literature (Parker, 1998). The basis of this hypothesis is that low income households often represent a considerable percentage of those who get retrenched during periods of high unemployment. The resulting decline in their earnings may increase income inequality (Blank et al., 1993). The relationship between GDP per capita and income inequality has a long tradition in economics, dating back to the seminal analysis by Kuznets (Kuznets, 1955). Also, empirical findings built out of micro- and macro-level datasets reveal that financial crises may be accompanied by a rise in income inequality (Baldacci et al., 2002; Kaltenbrunner et al., 2015). We equally include the consumer price index to capture the role of inflation, which is associated with widening income gaps (Fischer, 1993; Braun, 1994) but also with increased earnings for low-income households (Akyol, 2004; Doepke and Schneider, 2006; Camera and Chien, 2014; Adam and Tzamourani, 2016). Finally, we consider revenue from taxation,

[10] Sensitivity analysis in Appendix A.4 looks at the 20th, 40th and 80th percentiles.

[11] Due to limited data for some countries, our analysis covers the period between 2005 and 2015 and focuses on seven key sectors that are commonly discussed in the literature.

[12] Each sector comprises capital and recurrent expenditures. See Appendix A.1.2 for details on what is included in each of the sectoral spending.

whose redistributive effect has been found to depend largely on the relative importance of the equalizing direct, and disequalizing indirect, taxes (Jakobsson, 1976; Fellman, 1976; Wang and Piesse, 2010).[13]

1.3.3 Summary Statistics

Table 1.5 shows that the income share held increases as the percentile increases, with the 90th percentile accounting for the highest income share. In the estimation sample, it can be seen that lower middle-income countries have a higher average Atkinson index than upper middle-income countries. Also, the maximum Atkinson index among the upper middle-income countries is higher than that of the lower middle-income countries. Meanwhile, the minimum Atkinson index among the lower middle-income countries is considerably greater than that of the upper middle-income countries.

Table (1.5) Summary Statistics

	All Middle				Upper Middle				Lower Middle			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Atkinson Index	57.73	13.22	30.43	84.46	54.90	13.28	30.43	84.46	61.19	12.31	40.18	81.49
10th percentile	1.36	0.61	0.25	2.82	1.49	0.59	0.25	2.82	1.21	0.59	0.35	2.34
50th percentile	5.46	1.09	2.56	8.13	5.72	1.16	2.56	8.13	5.14	0.91	3.71	6.74
90th percentile	15.44	0.88	11.59	18.92	15.52	1.01	11.59	18.92	15.35	0.69	14.16	17.44
SPS	14.34	13.44	0.00	55.22	16.91	12.72	0.12	48.17	10.14	13.57	0.00	55.22
HS	7.96	3.76	0.17	29.35	8.71	3.29	2.01	16.75	6.73	4.15	0.17	29.35
ES	14.02	6.54	1.44	42.82	13.87	6.56	3.12	42.82	14.27	6.50	1.44	33.93
TCS	5.90	6.66	0.07	60.74	6.12	7.46	0.24	60.74	5.56	5.12	0.07	26.21
DS	6.96	4.92	0.07	30.06	7.02	5.17	0.62	30.06	6.86	4.52	0.07	21.40
AS	3.14	2.50	0.23	14.44	2.73	2.06	0.23	9.82	3.81	2.99	0.28	14.44
OS	47.64	17.24	0.00	88.72	44.61	16.83	0.00	82.94	52.60	16.82	17.45	88.72

Table 1.5 is created using the Global Consumption and Income Project Database and Statistics on Public Expenditure for Economic Development (SPEED) Database. SD represents the standard deviation. Min and Max respectively represent the minimum and maximum observation in the relevant sample. SPS, HS, ES, TCS, DS, AS and OS, represent the respective shares within total expenditure of the social protection sector, health sector, education sector, transport and communication sector, defence sector, agricultural sector and other sectors.

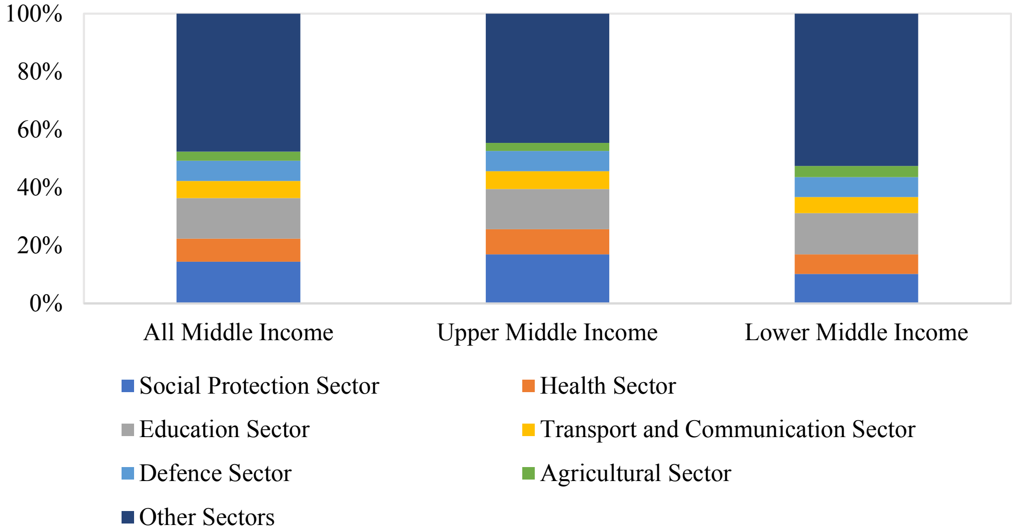
Figure 1.3 also shows that the average spending on social protection and health sectors is higher in upper middle-income countries compared to lower middle-income countries, while the latter have a substantially larger proportion of spending on other sectors than the former countries.

1.4 Results and Interpretations

Table 1.6 reports a summary of the main results of the analysis of spending reallocations from the transport and communication sector (TCS), the Defence sector (DS) and the Other sectors (OS) to the Social Protection sector (top panel A) the Health sector (second panel B), the education sector (third panel C) and the Agriculture sector (bottom panel D), for the whole sample of middle income countries as well as for the two subsamples of lower middle income and upper middle income countries (the three lines in

[13] Further details regarding each of the variables are provided in Appendix A.1.2.

Figure (1.3) Composition of Government Spending, 2005–2015



Note: Figure 1.3 is created using the Statistics on Public Expenditure for Economic Development (SPEED) Database

each panel). The Table focuses on the Atkinson index and the 10th, 50th and 90th percentiles of the income distribution. [14]

Given the enormous amount of data and information, we structure the presentation of the results by focusing on the impact on income inequality from a particular type of sector reallocation, looking also at the three different parts of the income distribution and any potential difference between upper and lower middle-income countries.

The analysis shows that, within the entire set of middle-income countries, inequality reduces unambiguously only in cases of spending reallocation towards the education sector (panel C) from all the sectors: the transport and communication sector (TCS), defence sector (DS) and other sectors (OS). The same cannot be said for spending reallocation towards the social protection (panel A), health (panel B) and agriculture sector (panel D), where, when significant, the results suggest that inequality increases. Moreover, the equalizing result of spending reallocations towards the education sector does not hold for the subsample of lower middle-income countries. Similarly, while spending reallocations towards the agriculture sector tend to be associated with increases in inequality, particularly significant if from the transport and communication sector and the defence sector, this is the case for the lower-middle income, and not for the upper middle-income countries.

[14] A positive sign under the Atkinson index columns means that overall inequality increases as a result of the specific spending reallocation. A positive sign under the income percentiles columns means that the income share held by the respective percentile increases as a result of the specific spending reallocation. The detailed results are all in Appendix tables A.21-A.212.

Table (1.6) Summary of Main Results

	Atkinson			10th Percentile			50th Percentile			90th Percentile		
(A) Spending Reallocations towards the Social Protection Sector												
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
All middle-income	+**	+	+***	–***	–	–***	–**	–	–***	+***	+***	–
Upper middle-income	+*	–	+***	–***	+	–***	–	–	–***	+**	+**	–*
Lower middle-income	–*	+	+*	+**	–	–	+	–	–**	+	+	–*
(B) Spending Reallocations towards the Health Sector												
	Atkinson			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
All middle-income	+	–	+	–	+	–**	+	+	–	+	+	–*
Upper middle-income	–	–	+*	+	–	–	+	+	–	+***	+**	–
Lower middle-income	–*	–***	+	+**	+***	–	+	+**	–*	–***	–***	–***
(C) Spending Reallocations towards the Education Sector												
	Atkinson			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
All middle-income	–*	–***	–*	+*	+***	+*	+**	+***	+	+***	+***	+
Upper middle-income	–***	–***	–	+***	+***	+	+**	+***	+	+***	+***	+
Lower middle-income	+	+***	+**	–	–***	–**	–***	–***	–***	–***	–***	–***
(D) Spending Reallocations towards the Agricultural Sector												
	Atkinson			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
All middle-income	+**	+	+**	–*	–	–*	–**	–*	–***	–	–	–**
Upper middle-income	–*	–**	–	+	+*	+	+**	+***	+	+	+	–**
Lower middle-income	+***	+***	+***	–***	–***	–***	–***	–***	–***	–***	–***	–***

Note: *p < .10. **p < .05. ***p < .01.

In the subsample of upper middle-income countries and the full sample, spending reallocations towards social protection and health sectors neither reduce inequality nor benefit the low and middle-income groups. However, in lower middle-income countries, reallocations towards the social protection and health sectors have the potential to be equalizing, especially when they come from the transport and communication sector as well as other sectors.

We now turn to the results for the three social groups. Beginning with the full sample, our results reveal the 10th percentile benefits from reallocations towards the education sector from the transport and communication sector, defence sector and other sectors. Moving on to the income share held by the 50th percentile, the middle-class equally benefits from reallocations to the education sector from the transport and communication sector as well as other sectors. Moreover, the 10th and 50th percentiles lose out in the case of transfers to the social protection and health sectors that are funded from the transport and communication sector and from the defence sector. However, the income share held by the 90th percentile increases with reallocations towards the social protection sector from the transport and communication sector as well as other sectors. For example, reallocations from the transport and communication sector as well as other sectors towards the social protection sector benefit the 90th percentile without any detectable impact on the 10th and 50th percentiles. Also, the 90th percentile benefits from reallocations towards the education sector from the transport and communication sector as well as other sectors. The redistributive impact of other spending reallocations is either ambiguous or reduces the income share held by the 90th percentile.

Within the subsample of the upper middle-income countries, we find that inequality decreases in those countries that finance the education sector with cuts in the expenditures allocated to the transport and communication sector as well as other sectors. Unsurprisingly, these inequality-reducing reallocations increase the income share held by the 10th and 50th percentiles. Also, both the 10th and 50th percentiles benefit from reallocations towards the agricultural sector from other sectors. Additionally, the 50th percentile equally gains from reallocations towards the agricultural sector from the transport and communication sector. Similar to the results for the combined sample, we find that spending reallocations towards the social protection and health sectors neither reduce inequality nor benefit the 10th and 50th percentiles in the subsample of upper middle-income countries. Instead, such reallocations have the tendency to benefit the 90th percentile without reducing inequality. For example, reallocations from the transport and communication sector, as well as those from other sectors, towards the social protection and health sectors do not reduce inequality but positively benefit the 90th percentile without any noticeable effect on the low- and middle-income groups.

In the case of lower middle-income countries, we find that reallocations towards the social protection and health sectors increase the income share held by the 10th percentile. More specifically, this share increases when the social protection sector and the health sector are financed by cuts in the transport and communication sector. The income share held by the 50th percentile increases when the health sector is funded by cuts in other sectors, while the redistributive impact of the spending reallocations on the 90th percentile is either ambiguous or associated with a reduction in its income share.

It is also crucial to discuss the sizes of the parameter estimates as they reveal the magnitude by which inequality reduces following the various spending reallocations explored in this study. For this purpose, we focus on the inequality-reducing spending reallocations (as revealed above). Beginning with the overall sample of middle-income countries, as mentioned earlier, we observe a reduction in inequality within this sample, when the education sector is financed by cuts in various sectors. However, the most sizable reduction in inequality is observed when the education sector is financed by cuts in other sectors (0.225), followed by the transport and communication sector (0.130), and then the defence sector (0.061). Turning to the upper middle-income countries, a decrease in inequality occurs within this subsample when the agricultural sector is financed through cuts in other sectors as well as the transport and communication sector. However, a more substantial decline in inequality (0.331) is observed when the former serves to fund the agricultural sector. Moving onto the lower middle-income countries, as indicated above, a decrease in inequality occurs within this subsample with spending reallocations in favour of the social protection and health sectors. Equalizing impacts are observed for spending reallocations in favour of the social protection sector only when the reallocations are financed by cuts in spending on the transport and communication sector. Meanwhile, spending reallocations in favour of the health sector tend to be inequality-reducing if the reallocations are financed by cuts in other sectors as well as the transport and communication sector, with the latter being associated with a more sizable decline in inequality. Upon analysing the impact of the spending reallocations on the percentile income shares, we observe a clear pattern in the sizes of the parameter estimates: the reallocations that lead to the most sizable decrease in inequality are consistently accompanied by the most substantial increase in the 10th and 50th percentile income shares.

In terms of rationalizing the results obtained (in light of existing realities within middle income-countries), it is crucial to mention that our finding regarding the impact of spending reallocations in favour of the education sector aligns with our initial expectations. As noted by Becker (1964), there exists a positive relationship between education spending and the accumulation of human capital. As individuals acquire higher levels of education, their prospects of securing meaningful employment increase, consequently elevating their income potential and narrowing the income gap. In this regard, Anyanwu and Erhijakpor (2007) reveal that significant advancements were recorded in primary and secondary school enrolment ratios in emerging economies, (to which middle income countries belong), between the 1990s and 2005. Accordingly, it is not surprising that, for the overall sample of middle income countries, we find that inequality reduces with inclusive benefits across income groups when spending reallocations favour the education sector. Likewise, our finding regrading the equalizing impact of spending reallocations towards the agricultural sector, within the upper middle-income countries is in line with the data and empirical evidence within this sub-sample. In this regard, IMF (2014*a*) demonstrates in their study focusing on upper middle income countries that there has been no significant shift in employment from agriculture to industry or services. Similarly, Doungmanee (2016) highlights the prominent role of the agricultural sector in upper middle income countries. Equally expected is our finding that spending reallocations towards social protection and health sectors reduce inequality in lower middle-income countries. As noted by ILO (2021), lower middle-income countries are beginning to make significant progress in the implementation of social security programmes particularly with regards to the establishment of universal pensions as part of national social protection frameworks. Additionally, data from the Statistics on Public Expenditure for Economic Development (SPEED) database demonstrates an upward trend in health spending within lower middle-income countries, rising from 0.64 to 2.77 (measured in billions of constant 2010 US dollars) between 2000 and 2017. Consequently, it is unsurprising that our study reveals a reduction in inequality when public spending is reallocated towards social protection and health sectors in the sub-sample of lower middle-income countries.

Overall, the analysis provided suggests that when we look at the three social groups, identified by the three different parts of the income distribution, again the most significant results appear in the case of spending reallocations towards the education sector. In fact, all the three percentiles experience an increase in their share of income as a result of spending reallocations from the transport and communication sector, defence sector and other sectors to the education sector with some interesting provisos. For example, on one side, reallocations from the transport and communication sector, as well as other sectors, towards the education sector, tend to reduce inequality as well as impact positively on the 10th, 50th and 90th percentile income shares in the case of the upper middle income-countries and the full sample, while the share of income of the three social groups decreases in the case of lower middle-income countries. This is interesting for two reasons. One is because the reduction in the overall measure of inequality in the income distribution applies to the upper middle-income countries but not to the lower middle countries. Second, it is associated with increases in the income held by the relatively poor, the middle income, but also the relatively rich group. Therefore, the decrease in income inequality overall must have come at the expense of other parts of the income distribution. On the other side, reallocating spending away from the defence sector to the education sector is also equalizing but, this time, only the 10th percentile benefits from such a reallocation.

Our specification also includes controls for a set of factors the literature has found to be relevant. In most cases, the control variables that are overall inequality-reducing are found to also benefit the 10th percentile. By contrast, the control variables that are inequality-increasing often reduce the income share held by the 10th percentile and/or benefit the 90th percentile. Overall, our empirical findings on the income inequality effects of the control variables are consistent with many related studies. Total government expenditure generally reduces inequality and this is consistent with the findings of Claus et al. (2012), which suggest that inequality reduction may fall if a huge share of total government spending is allocated towards raising the incomes of the poor. Further, the findings for population density are in tandem with those of Campante and Do (2007) and Milanovic (2018), which explain the exceptional circumstances under which inequality reduces as population density increases. Additionally, most of the findings for per capita income provide support for Kuznets (1955) inverted-U hypothesis, which predicts a non-linear relationship between the level of income and inequality. Likewise, the results for unemployment are similar to those of Blank et al. (1993), which predict that unemployment increases inequality. Similarly, the findings for inflation are consistent with those of Camera and Chien (2014), which indicate that inflation reduces inequality if a moderate increase in the general price level is occasioned by a rise in the prices of goods and services produced by low-income groups. Also, the results obtained for taxation revenue are analogous to those of Jakobsson (1976), which indicates that inequality may fall if progressive taxes make up a substantial percentage of taxation. Additionally, the findings for the GFC are consistent with those of Baldacci et al. (2002) and Kaltenbrunner et al. (2015), predicting that a financial crisis can be associated with an increase in inequality. Finally, the results for political stability are in agreement with those of Bircan et al. (2010), which suggest that political stability aids equitable distribution of income.

1.5 Robustness Checks

We run six robustness checks: we use the Gini coefficient and the Theil index, instead of the Atkinson index; we look at three additional points in the distribution, the 20th, 40th and 80th percentiles; we add further controls to the regression to account for trade openness, corruption and incumbent government's party orientation; we look at the long-run impact of spending reallocations and, finally, we interact sectoral spending with a range of institutional variables, such as government effectiveness and regulatory environment. We start by assessing changes to the dependent variable side. This is important to understand the extent to which the results depend on the measure of inequality adopted, being well known that different measures of income inequality could provide different rankings of distributions. The results are shown in Appendix A.3. Generally, the findings for the middle-income countries as a whole remain unchanged, with inequality reducing following spending reallocations in favour of the education sector.

Second, we look at the impact of spending reallocations on three additional percentiles, the 20th, the 40th and the 80th percentiles, representing three new versions of the relatively poor, median and rich sections of the income distribution respectively. Consistent with previous results, we find that the 20th, 40th and 80th percentiles benefit from spending reallocations towards the education sector (Appendix A.4).

We then look at the impact of changes to the right-hand side of the model specification. First, we include trade openness, corruption, and incumbent government's party orientation as additional control variables.[15] The results, shown in Appendix A.5, suggest that, with the inclusion of these variables, the impact of the spending reallocations on inequality, and on the different income groups, largely remains unchanged.

We also run additional robustness tests by using 2- and 4-year lead values of the dependent variables in order to examine the long run impact of the spending reallocations, as shown in Appendix A.6 and

[15]Data on these variables are respectively retrieved from the Our World in Data database, the Worldwide Governance Indicators (WGI) and the Database of Political Institutions (DPI).

A.7 respectively. Generally, reallocations towards the education sector remain equalizing for the sample of the middle-income countries as a whole. Additionally, with the use of 4-year lead values of the Atkinson index, reallocations from the defense sector towards the social protection sector, health sector, education sector and agricultural sector are associated with a reduction in inequality for the whole sample of middle-income countries. Similarly, reallocations towards the social protection sector, health sector and education sector are inequality reducing within the sample of upper middle-income countries. Likewise, within the sample of lower middle-income countries, when 4-year lead values of the Atkinson measure of inequality are introduced in the specification, inequality reduces when reallocations are made from other sectors towards the social protection sector, health sector and the education sector. These results suggest that, within the full sample, inequality may also reduce with reallocations towards the social protection sector, health sector and agricultural sector; however, the impact of these reallocations may be delayed. On the contrary, reallocations towards the education sector has a more immediate effect. A similar remark can be observed concerning reallocations towards the social protection and health sectors within the upper middle-income countries. Meanwhile, within the lower middle-income countries, inequality may also reduce with reallocations towards the education sector; however, the equalizing impact of such reallocations may be delayed compared to reallocations towards the social protection and health sectors.

Based on the literature highlighting the wide-ranging economic implications of political institutions (see, for example Persson and Tabellini, 2003; McManus and Ozkan, 2018), we also examine how various institutional variables affect the impact of the spending re-allocations on income inequality. The institutional variables considered are: government effectiveness, regulatory quality, adherence to the rule of law, control of corruption and political stability. Specifically, We include interaction terms between the sectoral expenditures and each of the institutional variables.[16] The complete results for the regressions are provided in Appendix A.8 and A.9. The figures in Appendix A.8 show, across different levels of government effectiveness, the marginal effect of spending reallocations to the education sector from the transport and communication sector, defence sector and other sectors, at 90% confidence intervals. For all these reallocations, the marginal effects are significantly negative across a reasonable range of the levels of government effectiveness. For example, the left subfigure in the second row of Appendix Figure A.81 shows that, when financed by the defence sector, the marginal effects of the education sector are significantly negative when the level of government effectiveness is roughly between -0.38 and 1.27. Also, for these spending reallocations, the marginal effects exhibit a negative slope (supported by the significantly negative coefficients on the interaction terms as provided in Table A.91) and this suggests that the absolute value of the marginal effects increases, as government effectiveness rises. Hence, as the

[16] Data on these institutional variables are obtained from the Worldwide Governance Indicators (WGI). A larger value represents a better quality of the institutional variables.

level of government effectiveness increases, the equalizing impact of the spending reallocations increases as well. Put differently, at low levels of government effectiveness, the inequality reducing impact of the relevant spending reallocation is low; however, the impact becomes higher at high levels of government effectiveness. The results from Appendix A.8 and A.9 suggest that a similar comment can be made concerning the inequality impact of these spending reallocations across different levels of regulatory quality, adherence to the rule of law, control of corruption and political stability. Taken as a whole, the robustness checks suggest the previous findings are not the result of a mere statistical anomaly.

1.6 Summary and Conclusions

This paper investigated the redistributive impact of financing social spending sectors through cuts in the other sectoral expenditures, within a panel of 50 middle-income countries over the period 2005–2015. In particular, we examined empirically the important reallocation issue as to how middle-income countries can increase funding towards social spending sectors without undermining debt sustainability. This study, in effect, assumes government spending to be fixed, and evaluates the inequality effect of financing social spending sectors through cuts in the remaining sectoral expenditures. The social spending sectors considered as recipients of reallocations were four: the social protection sector, the health sector, the education sector and the agricultural sector. The sectors considered for financing the four social spending sectors included three sectors: the defence sector, the transport and communication sector, and the remainder "other sectors". We also investigated how the income percentile of different income groups, the relatively poor, middle-income and rich groups, were affected by the spending reallocations towards the four social spending sectors. Likewise, we assessed the extent to which the results differ by country's per capita national income.

We found a number of interesting novel results of immediate policy relevance. First, the income gap within the full sample of middle-income countries can be reduced if the education sector is financed by cuts in the expenditures allocated to the transport and communication sector, defence sector and the other sectors. Second, we revealed empirically that all three income groups we focused on benefit if the education sector is financed by cuts in the expenditures allocated to the other sectors. Third, the equalizing role of reallocations in favor of the agricultural sector becomes particularly evident in the case of upper middle-income countries. Similarly, the inequality-reducing impact of reallocations towards the social protection and health sectors is particularly present in lower middle-income countries.

These results suggest that consideration of the redistributive impacts of spending reallocations is important in middle-income countries. Overall, policymakers should be able to achieve inequality-reducing spending reallocations by financing social spending sectors through cuts in expenditure on the transport and communication sector, defence sector and the "other sectors", while keeping an overall neutral fiscal stance. However, in funding sectors that have a more immediate impact on reducing inequality, the specific social spending sector to be prioritized differs for the upper and the lower middle-income countries. Our analysis suggests that upper middle-income countries should prioritize reallocations in favor of the education and agricultural sectors, while lower middle-income countries should give greater emphasis to reallocations towards the social protection and health sectors. Along with revealing the kinds of spending reallocations that are inequality-reducing within middle-income countries, we equally recommend that, when reallocating away from the relevant financing sectors (i.e., the sectors from which expenditure is being reallocated towards the social spending sectors), policymakers should place greater priority on inefficient expenditures (within the financing sectors), particularly, as emerging countries continue to contend with "white elephant" projects (see, for example Robinson and Torvik, 2005; Schiavo-Campo, 2007; Ronsholt, 2013) [17]. Our baseline results were shown to remain robust after an exensive battery of robustness checks.

A notable limitation encountered in our analysis involves the limited availability of data. Due to such data constraints, the time-frame covered in this study was restricted to the period between 2005 and 2015. Future research may, therefore, examine the redistributive impact of the spending reallocations over a longer time-span, when the relevant data become available. Similarly, the degree of sectoral disaggregation could become more refined in future extensions. Finally, more theoretical research could help in better explaining the economic drivers and institutional mechanisms behind the uncovered patterns in the data.

[17] Robinson and Torvik (2005) reveal that emerging economies (to which middle income countries belong), are grappling with issues of budget misallocation, as a significant portion of government funds are frequently directed towards unproductive infrastructural projects (i.e, "white elephants")

Appendix A

Appendix to Chapter 1

A.1 Model and Variables

A.1.1 Model Specification

Equation (1.1) is comprehensively stated as follows:

$$
\begin{aligned}
&Atkinson_{it} = \\
&\alpha + \beta_1 \left(\frac{SPS_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\beta_2 \left(\frac{HS_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\beta_3 \left(\frac{ES_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\beta_4 \left(\frac{TCS_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\beta_5 \left(\frac{DS_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\beta_6 \left(\frac{AS_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\beta_7 \left(\frac{OS_{i,t-1}}{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}} \right) + \\
&\rho \left(\frac{SPS_{i,t-1} + HS_{i,t-1} + ES_{i,t-1} + TCS_{i,t-1} + DS_{i,t-1} + AS_{i,t-1} + OS_{i,t-1}}{GDP_{i,t-1}} \right) + \\
&\varphi Z_{i,t-1} + \chi_i + \theta_t + \varepsilon_{i,t} \qquad \text{(A.1)}
\end{aligned}
$$

In equation (A.1) $SPS_{i,t-1}$, $HS_{i,t-1}$, $ES_{i,t-1}$, $TCS_{i,t-1}$, $DS_{i,t-1}$, $AS_{i,t-1}$ and $OS_{i,t-1}$ each capture the expenditures allocated to the social protection sector, health sector, education sector, transport and communication sector, defence sector, agricultural sector and other sectors respectively.

Since the summation of $SPS_{i,t-1}$, $HS_{i,t-1}$, $ES_{i,t-1}$, $TCS_{i,t-1}$, $DS_{i,t-1}$, $AS_{i,t-1}$ and $OS_{i,t-1}$ gives the total government expenditure, which is denoted as $TE_{i,t-1}$, equation (A.1) is re-written as:

$$
\begin{aligned}
Atkinson_{it} = \alpha + \beta_1 \left(\frac{SPS_{i,t-1}}{TE_{i,t-1}} \right) + \beta_2 \left(\frac{HS_{i,t-1}}{TE_{i,t-1}} \right) + \beta_3 \left(\frac{ES_{i,t-1}}{TE_{i,t-1}} \right) + \beta_4 \left(\frac{TCS_{i,t-1}}{TE_{i,t-1}} \right) + \beta_5 \left(\frac{DS_{i,t-1}}{TE_{i,t-1}} \right) + \\
\beta_6 \left(\frac{AS_{i,t-1}}{TE_{i,t-1}} \right) + \beta_7 \left(\frac{OS_{i,t-1}}{TE_{i,t-1}} \right) + \rho \left(\frac{TE_{i,t-1}}{GDP_{i,t}} \right) + \varphi Z_{i,t-1} + \chi_i + \theta_t + \varepsilon_{i,t} \qquad \text{(A.2)}
\end{aligned}
$$

It would be observed that each of the sectoral expenditures is expressed as a share of the sum of all sectoral expenditures (i.e. total government expenditure). Accordingly:

$$\left(\frac{SPS_{i,t-1}}{TE_{i,t-1}}\right)+\left(\frac{HS_{i,t-1}}{TE_{i,t-1}}\right)+\left(\frac{ES_{i,t-1}}{TE_{i,t-1}}\right)+\left(\frac{TCS_{i,t-1}}{TE_{i,t-1}}\right)+\left(\frac{DS_{i,t-1}}{TE_{i,t-1}}\right)+\left(\frac{AS_{i,t-1}}{TE_{i,t-1}}\right)+\left(\frac{OS_{i,t-1}}{TE_{i,t-1}}\right)=1 \tag{A.3}$$

Consequently, if we include the budget share for all sectors in a regression model, there would be perfect multicollinearity. In avoiding this, the budget share for one sector is omitted from each regression conducted.

If the defence sector is omitted from equation (A.2), the equation becomes:

$$\begin{aligned} Atkinson_{it} = \alpha &+ (\beta_1-\beta_5)\left(\frac{SPS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_2-\beta_5)\left(\frac{HS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_3-\beta_5)\left(\frac{ES_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_4-\beta_5)\left(\frac{TCS_{i,t-1}}{TE_{i,t-1}}\right)+ \\ &(\beta_6-\beta_5)\left(\frac{AS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_7-\beta_5)\left(\frac{OS_{i,t-1}}{TE_{i,t-1}}\right)+\rho\left(\frac{TE_{i,t-1}}{GDP_{i,t}}\right)+\varphi Z_{i,t-1}+\chi_i+\theta_t+\varepsilon_{i,t} \end{aligned} \tag{A.4}$$

The resulting coefficients of the sectors that are left in equation (A.4) represent the difference between their marginal effect (when the defence sector is left in the model) and the marginal effect that would be obtained for the defence sector, if it is left in the model. The exclusion of the defence sector, due to perfect multicollinearity, implies that the information/expenditure that would have been measured by this sector would instead be measured by the remaining sectors that are left in the model (since they are all perfectly correlated). Hence, the resulting coefficients tell us what happens to the left-hand side variable (i.e., the Atkinson index) when the expenditures that would have been allocated to the defence sector are redirected towards the remaining sectors.

Accordingly, each of these coefficients capture the marginal effect on inequality of making reallocations from the defence sector towards the remaining sectors that are left in the model.

This paper evaluates the inequality-impact of financing the social protection sector, health sector, education sector and agricultural sector through cuts in the expenditures that are allocated to the defence sector, transport and communication sector as well as other sectors. Similarly, when we omit the transport and communication sector and the other sectors , instead of the defence sector, we have equations (A.5) and (A.6) respectively:

$$\begin{aligned} Atkinson_{it} = \alpha &+ (\beta_1-\beta_4)\left(\frac{SPS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_2-\beta_4)\left(\frac{HS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_3-\beta_4)\left(\frac{ES_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_5-\beta_4)\left(\frac{DS_{i,t-1}}{TE_{i,t-1}}\right)+ \\ &(\beta_6-\beta_4)\left(\frac{AS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_7-\beta_4)\left(\frac{OS_{i,t-1}}{TE_{i,t-1}}\right)+\rho\left(\frac{TE_{i,t-1}}{GDP_{i,t}}\right)+\varphi Z_{i,t-1}+\chi_i+\theta_t+\varepsilon_{i,t} \end{aligned} \tag{A.5}$$

$$\begin{aligned} Atkinson_{it} = \alpha &+ (\beta_1-\beta_7)\left(\frac{SPS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_2-\beta_7)\left(\frac{HS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_3-\beta_7)\left(\frac{ES_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_4-\beta_7)\left(\frac{TCS_{i,t-1}}{TE_{i,t-1}}\right)+ \\ &(\beta_5-\beta_7)\left(\frac{DS_{i,t-1}}{TE_{i,t-1}}\right)+(\beta_6-\beta_7)\left(\frac{AS_{i,t-1}}{TE_{i,t-1}}\right)+\rho\left(\frac{TE_{i,t-1}}{GDP_{i,t}}\right)+\varphi Z_{i,t-1}+\chi_i+\theta_t+\varepsilon_{i,t} \end{aligned} \tag{A.6}$$

A.1.2 Additional information on variables

Social Protection Sector

Government expenditure on the social protection sector (SPS) includes capital and recurrent expenditures. The capital expenditures comprise social infrastructures such as: construction of low-cost or social housing, purchase of emergency-related equipment, provision of short- and long-term shelter to the poor, and provision of shelter for pre-school children. The recurrent expenditures include salaries of social workers, old age pensions, maternity allowance, parental leave benefits and unemployment benefits. Expenditure on the social protection sector, as well as on all other sectors discussed further below, is measured as a percentage of total government expenditure.

Health Sector

Public spending on the health sector (HS) includes capital expenditures, such as: construction of hospitals, acquisition of medical appliances and equipment, purchase of ambulances, construction of rehabilitation centers, and provision of accommodation for hospital staff. It also includes recurrent expenditures, such as: salaries of health workers, drugs funds, health insurance, grants and subsidies in support of healthcare-related research.

Education Sector

Government expenditure on the education sector (ES) equally includes capital and recurrent expenditures. Some of the capital expenditures are: building of primary schools, secondary institutions, and tertiary institutions. The recurrent expenditures include: salaries of tutors employed in public schools, scholarships, grants, loans and allowances in support of pupils.

Agricultural Sector

Public spending on the agricultural sector (AS) includes capital expenditures such as: construction of irrigation and drainage systems as well as the purchase of mechanized farm implements. It also includes recurrent expenditures such as: salaries and other administrative costs incurred on the agricultural sector as well as grants and loans provided to farmers.

Defence Sector

Government expenditure on the defence sector (DS) includes capital expenditures such as procurement of fire-arms and ammunitions. It also comprises recurrent expenditures such expenditures incurred on serving and retired members of the armed forces as well as other administrative costs on military services. The recurrent expenditures also include grants and loans in support of military related research and development.

Transport and Communication Sector

Public spending on the transport and communication sector (TCS) includes capital expenditures incurred on the construction of roads, water transport systems, railway lines as well as wireless and satellite communication systems. It also includes recurrent expenditures such as salaries and other administrative costs incurred on the transport and communication sectors as well as routine maintenance costs incurred on transport and communication systems.

Other Sectors

Although government spending on other sectors (OS) captures a variety of capital and recurrent expenditures, a crucial component of these expenditures comprise the budgetary allocations made for the construction of civil service buildings as well as the remuneration of the personnel working within the service.

Population Density

Population density (PD) measures the average number of individuals in a square kilometre within a country. This variable is reported as the ratio of a country's population to its land-mass. Data are from World Bank's World Development Indicators.

Political Stability

Political stability (PS) is an index which measures the likelihood of violence and terrorism in a country. The index ranges between –2.5 and 2.5. While lower values indicate a higher tendency for a country to experience violence and terrorism, higher values indicate the opposite. Data are retrieved from the Worldwide Governance Indicators (WGI).

Unemployment

The Unemployment rate (Unemployment) represents the percentage of unemployed individuals within the labour force. The labour force is made up of people who are willing and able to work. Data are from the International Labour Organization (ILO).

Per Capita GDP

Per Capita GDP (GDPPC) represents the ratio of the gross domestic product to the total population of a country. Data are sourced from World Bank's World Development Indicators.

Global Financial Crisis

Global financial crisis (GFC) captures the period between 2007 and 2009 during which the global financial market experienced extreme stress and many countries suffered a balance sheet recession. A dummy variable is used to capture the impact of the GFC: it takes the values of one during the crisis years and zero otherwise.

Inflation

Inflation (Inflation) is captured by the consumer price index (CPI). It measures the yearly changes in the cost an average consumer incurs on purchasing a basket of goods and services. This variable is measured in percentage terms per annum. Data is sourced from World Bank's World Development Indicators.

Taxation Revenue

Taxation revenue (Tax) represents the sum of the mandatory transfers which the central government receives from tax payers (individuals and legal entities). This variable is expressed as a percentage of GDP. Data are from World Bank's World Development Indicators.

Total Government Expenditure

Total government expenditure (TE) represents the sum of government spending on the social protection sector, health sector, education sector, transport and communication sector, agricultural sector, defence sector and other sectors. This variable is also measured as a percentage of GDP. Data are from the Statistics on Public Expenditure for Economic Development (SPEED) Database.

A.2 Main Results: Financing Social Spending Sectors through Cuts in the Remaining Sectoral Expenditures

Table (A.21) All Middle-Income Countries: Financing the Social Protection Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.118**	0.007	0.198***	-0.007***	-0.002	-0.011***	-0.008**	-0.002	-0.016***	0.012***	0.017***	-0.007
	(0.040)	(0.023)	(0.042)	(0.001)	(0.001)	(0.003)	(0.004)	(0.001)	(0.003)	(0.003)	(0.004)	(0.007)
Rest	0.108***	-0.127***	0.159**	-0.005***	0.006***	-0.008**	-0.006*	0.009***	-0.012***	-0.004*	0.008***	-0.022***
	(0.029)	(0.007)	(0.056)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.002)	(0.002)	(0.006)
TE	-0.043*	-0.095***	-0.040	0.003**	0.005***	0.002*	0.001	0.005***	0.002	-0.000	0.004	0.001
	(0.020)	(0.022)	(0.030)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.003)	(0.004)	(0.004)	(0.004)
PD	-0.031***	-0.032***	-0.026***	0.003***	0.003***	0.002***	0.002***	0.003***	0.002***	-0.003***	-0.003***	-0.004***
	(0.007)	(0.010)	(0.008)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	37.340***	36.848***	43.866***	-2.917***	-2.891***	-3.248***	-2.172**	-2.092***	-2.591***	2.919**	3.083**	2.471*
	(6.631)	(5.386)	(6.764)	(0.345)	(0.283)	(0.345)	(0.671)	(0.613)	(0.664)	(1.111)	(1.128)	(1.301)
$Log(GDPPC)^2$	-2.422***	-2.380***	-2.845***	0.179***	0.177***	0.200***	0.150***	0.145***	0.178***	-0.179**	-0.190**	-0.149*
	(0.366)	(0.280)	(0.356)	(0.021)	(0.017)	(0.020)	(0.037)	(0.032)	(0.035)	(0.061)	(0.061)	(0.070)
Unemployment	0.316***	0.325***	0.344***	-0.018***	-0.018***	-0.019***	-0.019***	-0.019***	-0.021***	-0.011	-0.011	-0.012
	(0.057)	(0.053)	(0.051)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)	(0.011)	(0.011)	(0.012)
Inflation	-0.046**	-0.057***	-0.050**	0.004***	0.004***	0.004***	0.001	0.001	0.001	-0.001	-0.001	-0.001
	(0.015)	(0.015)	(0.017)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Tax	-6.501	-5.399	-12.105***	0.389*	0.331*	0.671***	0.524**	0.387	0.842***	0.367	0.121	0.533
	(3.616)	(3.307)	(3.189)	(0.203)	(0.173)	(0.191)	(0.218)	(0.239)	(0.217)	(0.274)	(0.230)	(0.352)
GFC	2.535***	1.989***	3.179***	-0.158***	-0.106***	-0.190***	-0.143***	-0.122***	-0.182***	-0.119**	-0.106*	-0.152**
	(0.322)	(0.318)	(0.315)	(0.014)	(0.015)	(0.016)	(0.024)	(0.024)	(0.018)	(0.046)	(0.052)	(0.053)
PS	-0.777*	-0.440	-0.754*	0.061*	0.044	0.060*	0.036***	0.011	0.031***	0.043	0.017	0.025
	(0.353)	(0.385)	(0.360)	(0.028)	(0.032)	(0.028)	(0.008)	(0.008)	(0.008)	(0.088)	(0.083)	(0.101)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.283	0.300	0.274	0.275	0.289	0.267	0.288	0.308	0.284	0.070	0.081	0.076
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.22) All Middle-Income Countries: Financing the Health Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	0.011	-0.048	0.099	-0.002	0.001	-0.007**	0.003	0.007	-0.005	0.005	0.002	-0.014*
	(0.099)	(0.072)	(0.061)	(0.004)	(0.003)	(0.003)	(0.008)	(0.005)	(0.004)	(0.004)	(0.006)	(0.007)
Rest	0.117***	-0.088***	0.169***	-0.006***	0.004***	-0.009***	-0.007**	0.005***	-0.013***	0.001	0.012***	-0.019***
	(0.026)	(0.009)	(0.043)	(0.001)	(0.000)	(0.002)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.005)
TE	-0.052**	-0.079***	-0.048	0.003**	0.004***	0.003*	0.002	0.004**	0.003	-0.002	0.005	0.000
	(0.020)	(0.022)	(0.029)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)	(0.004)
PD	-0.034***	-0.030***	-0.028***	0.003***	0.002***	0.002***	0.003***	0.003***	0.002***	-0.004***	-0.003***	-0.004***
	(0.008)	(0.008)	(0.008)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	39.526***	40.373***	46.609***	-3.016***	-3.079***	-3.389***	-2.398***	-2.468***	-2.879***	3.039**	3.630**	2.829*
	(7.512)	(7.218)	(7.512)	(0.398)	(0.402)	(0.407)	(0.689)	(0.636)	(0.652)	(1.187)	(1.238)	(1.351)
Log(GDPPC)^2	-2.554***	-2.603***	-3.013***	0.185***	0.189***	0.209***	0.164***	0.168***	0.195***	-0.187**	-0.224***	-0.172**
	(0.416)	(0.387)	(0.399)	(0.024)	(0.023)	(0.023)	(0.037)	(0.033)	(0.033)	(0.064)	(0.067)	(0.072)
Unemployment	0.313***	0.325***	0.341***	-0.018***	-0.018***	-0.019***	-0.019***	-0.019***	-0.020***	-0.013	-0.010	-0.013
	(0.059)	(0.056)	(0.054)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)	(0.011)	(0.010)	(0.011)
Inflation	-0.051***	-0.053***	-0.053**	0.004***	0.004***	0.004***	0.001	0.001	0.001	-0.001	-0.001	-0.001
	(0.015)	(0.014)	(0.017)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	-7.428	-7.256	-13.087***	0.406	0.426	0.704**	0.598**	0.611**	0.952***	0.624*	-0.243	0.564
	(4.176)	(4.308)	(3.946)	(0.231)	(0.244)	(0.233)	(0.258)	(0.260)	(0.259)	(0.287)	(0.312)	(0.330)
GFC	2.106***	2.349***	2.916***	-0.113***	-0.128***	-0.156***	-0.131***	-0.148***	-0.185***	-0.146**	-0.087	-0.161**
	(0.321)	(0.293)	(0.327)	(0.014)	(0.015)	(0.017)	(0.025)	(0.020)	(0.021)	(0.054)	(0.048)	(0.059)
PS	-0.815*	-0.820**	-0.856**	0.065*	0.066**	0.067**	0.041***	0.043***	0.041***	0.016	-0.015	-0.005
	(0.411)	(0.337)	(0.377)	(0.029)	(0.025)	(0.027)	(0.012)	(0.008)	(0.009)	(0.074)	(0.081)	(0.083)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.285	0.285	0.273	0.275	0.272	0.264	0.292	0.290	0.284	0.046	0.076	0.051
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.23) All Middle-Income Countries: Financing the Education Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.130*	-0.225***	-0.061*	0.007*	0.012***	0.003*	0.011**	0.017***	0.004	0.025***	0.020***	0.003
	(0.066)	(0.040)	(0.031)	(0.004)	(0.003)	(0.002)	(0.005)	(0.003)	(0.003)	(0.005)	(0.006)	(0.009)
Rest	0.110***	-0.049***	0.188***	-0.006***	0.002***	-0.010***	-0.007**	0.002***	-0.015***	0.001	0.009**	-0.021***
	(0.027)	(0.007)	(0.022)	(0.001)	(0.000)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.006)
TE	-0.091***	-0.091***	-0.095***	0.005***	0.005***	0.005***	0.005***	0.005**	0.006**	0.002	0.005	0.005
	(0.022)	(0.025)	(0.027)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)	(0.004)
PD	-0.029***	-0.027**	-0.023**	0.002***	0.002***	0.002***	0.002***	0.002***	0.002**	-0.004***	-0.003***	-0.004***
	(0.008)	(0.009)	(0.009)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Log(GDPPC)	23.452***	31.680***	30.767***	-2.200***	-2.594***	-2.590***	-1.151*	-1.622***	-1.633**	4.489***	4.026***	4.320***
	(3.852)	(3.368)	(4.255)	(0.256)	(0.265)	(0.216)	(0.567)	(0.418)	(0.609)	(1.002)	(1.087)	(1.216)
Log(GDPPC)^2	-1.558***	-2.066***	-2.033***	0.134***	0.159***	0.160***	0.087**	0.116***	0.118***	-0.277***	-0.249***	-0.264***
	(0.187)	(0.181)	(0.178)	(0.016)	(0.017)	(0.013)	(0.029)	(0.020)	(0.030)	(0.054)	(0.059)	(0.065)
Unemployment	0.320***	0.338***	0.347***	-0.018***	-0.019***	-0.019***	-0.019***	-0.020***	-0.021***	-0.014	-0.011	-0.013
	(0.058)	(0.056)	(0.055)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)	(0.011)	(0.011)	(0.011)
Inflation	-0.055***	-0.060***	-0.058***	0.004***	0.004***	0.004***	0.001	0.002	0.001	-0.000	-0.000	-0.000
	(0.013)	(0.014)	(0.015)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	-5.582	-9.191**	-11.285***	0.325	0.555**	0.630**	0.437*	0.684**	0.782***	0.505*	0.031	0.418
	(3.731)	(3.371)	(3.426)	(0.205)	(0.199)	(0.209)	(0.228)	(0.224)	(0.216)	(0.252)	(0.303)	(0.289)
GFC	1.900***	2.281***	2.649***	-0.100***	-0.123***	-0.140***	-0.118***	-0.144***	-0.167***	-0.118**	-0.080	-0.132**
	(0.402)	(0.324)	(0.371)	(0.018)	(0.016)	(0.018)	(0.031)	(0.023)	(0.024)	(0.051)	(0.045)	(0.055)
PS	-0.492	-0.689	-0.500	0.048	0.059*	0.048*	0.017	0.029**	0.014*	-0.014	-0.020	-0.039
	(0.414)	(0.407)	(0.318)	(0.032)	(0.031)	(0.026)	(0.011)	(0.012)	(0.006)	(0.070)	(0.071)	(0.084)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.303	0.293	0.294	0.292	0.280	0.283	0.311	0.302	0.306	0.065	0.078	0.071
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.24) All Middle-Income Countries: Financing the Agricultural Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.260**	0.132	0.254**	-0.012*	-0.005	-0.012*	-0.020**	-0.012*	-0.022***	-0.004	-0.010	-0.023**
	(0.101)	(0.094)	(0.092)	(0.006)	(0.006)	(0.006)	(0.007)	(0.005)	(0.006)	(0.006)	(0.006)	(0.008)
Rest	0.115***	-0.095***	0.165***	-0.006***	0.004***	-0.009***	-0.007*	0.006***	-0.013***	0.001	0.012***	-0.019***
	(0.033)	(0.015)	(0.048)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.005)
TE	-0.043*	-0.081***	-0.042	0.003**	0.004***	0.003*	0.002	0.004**	0.002	-0.003	0.005	-0.000
	(0.020)	(0.023)	(0.029)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)	(0.004)
PD	-0.032***	-0.032***	-0.027***	0.003***	0.003***	0.002***	0.003***	0.003***	0.002***	-0.004***	-0.003***	-0.004***
	(0.006)	(0.007)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	33.390***	35.070***	42.647***	-2.761***	-2.888***	-3.253***	-1.843**	-1.929***	-2.457***	3.266**	3.982***	3.051*
	(6.166)	(4.248)	(5.515)	(0.307)	(0.262)	(0.301)	(0.748)	(0.586)	(0.638)	(1.249)	(1.190)	(1.408)
Log(GDPPC)^2	-2.198***	-2.305***	-2.782***	0.170***	0.178***	0.201***	0.132**	0.137***	0.171***	-0.200**	-0.243***	-0.185**
	(0.321)	(0.192)	(0.266)	(0.018)	(0.015)	(0.016)	(0.041)	(0.029)	(0.032)	(0.067)	(0.062)	(0.075)
Unemployment	0.299***	0.301***	0.332***	-0.017***	-0.017***	-0.019***	-0.017***	-0.017***	-0.019***	-0.013	-0.008	-0.012
	(0.058)	(0.057)	(0.051)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.011)	(0.011)	(0.012)
Inflation	-0.044**	-0.053***	-0.048**	0.004***	0.004***	0.004***	0.000	0.001	0.001	-0.001	-0.001	-0.001
	(0.016)	(0.015)	(0.018)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	-7.413*	-9.401**	-12.958***	0.412*	0.546**	0.707**	0.587**	0.697**	0.927***	0.618**	0.086	0.543
	(3.957)	(3.591)	(3.604)	(0.222)	(0.208)	(0.220)	(0.229)	(0.228)	(0.220)	(0.267)	(0.285)	(0.300)
GFC	2.198***	2.242***	2.969***	-0.116***	-0.123***	-0.157***	-0.140***	-0.141***	-0.191***	-0.150**	-0.074	-0.164**
	(0.440)	(0.314)	(0.381)	(0.018)	(0.015)	(0.018)	(0.035)	(0.025)	(0.025)	(0.060)	(0.050)	(0.062)
PS	-0.842*	-0.905**	-0.873**	0.066**	0.070**	0.067**	0.044***	0.047***	0.043***	0.017	-0.003	-0.005
	(0.376)	(0.368)	(0.368)	(0.028)	(0.028)	(0.027)	(0.009)	(0.009)	(0.008)	(0.076)	(0.075)	(0.084)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.285	0.289	0.273	0.275	0.274	0.264	0.290	0.295	0.282	0.046	0.078	0.051
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.25) Upper Middle-Income Countries: Financing the Social Protection Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.113*	-0.035	0.275***	-0.006***	0.002	-0.013***	-0.009	-0.000	-0.019***	0.013**	0.020**	-0.015*
	(0.056)	(0.041)	(0.030)	(0.002)	(0.001)	(0.002)	(0.005)	(0.003)	(0.003)	(0.005)	(0.007)	(0.007)
Rest	0.130***	-0.181***	0.241***	-0.007***	0.010***	-0.011***	-0.008**	0.012***	-0.014***	-0.003	0.012***	-0.031***
	(0.027)	(0.015)	(0.041)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
TE	-0.121**	-0.194***	-0.113***	0.007***	0.011***	0.006***	0.006**	0.011***	0.006***	0.001	0.007	0.003
	(0.041)	(0.040)	(0.024)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.007)	(0.007)	(0.007)
PD	-0.057***	-0.062***	-0.046***	0.004***	0.005***	0.004***	0.004***	0.005***	0.004***	-0.005***	-0.004***	-0.005***
	(0.004)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Log(GDPPC)	-261.447***	-284.328***	-232.850***	9.918***	11.116***	8.239***	22.746***	24.500***	21.030***	11.706***	14.917***	12.244***
	(21.577)	(20.947)	(19.809)	(1.256)	(1.156)	(1.033)	(1.429)	(1.410)	(1.710)	(2.443)	(2.279)	(1.700)
Log(GDPPC)^2	14.859***	16.175***	13.208***	-0.566***	-0.635***	-0.469***	-1.278***	-1.378***	-1.179***	-0.695***	-0.879***	-0.722***
	(1.253)	(1.226)	(1.184)	(0.073)	(0.067)	(0.061)	(0.083)	(0.083)	(0.102)	(0.143)	(0.134)	(0.100)
Unemployment	0.598***	0.643***	0.701***	-0.040***	-0.042***	-0.045***	-0.019*	-0.022**	-0.025**	0.012	0.012	0.006
	(0.127)	(0.112)	(0.128)	(0.007)	(0.006)	(0.007)	(0.009)	(0.008)	(0.009)	(0.012)	(0.012)	(0.013)
Inflation	-0.046**	-0.048**	-0.051**	0.004***	0.004***	0.004***	0.000	0.000	0.000	-0.003	-0.003	-0.003
	(0.016)	(0.017)	(0.016)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-21.761***	-14.346**	-32.284***	0.753**	0.361	1.324***	1.948***	1.404***	2.578***	1.949**	1.069*	2.342**
	(5.305)	(4.988)	(5.546)	(0.258)	(0.247)	(0.265)	(0.349)	(0.317)	(0.438)	(0.606)	(0.499)	(0.743)
GFC	3.807***	3.689***	4.992***	-0.197***	-0.191***	-0.259***	-0.235***	-0.223***	-0.306***	-0.199**	-0.159*	-0.271***
	(0.267)	(0.243)	(0.251)	(0.012)	(0.012)	(0.011)	(0.025)	(0.021)	(0.019)	(0.067)	(0.071)	(0.083)
PS	-2.948**	-2.458**	-2.946**	0.209***	0.183**	0.211***	0.136***	0.102**	0.136***	-0.148	-0.194	-0.181
	(0.946)	(0.994)	(1.025)	(0.060)	(0.063)	(0.063)	(0.038)	(0.033)	(0.039)	(0.158)	(0.150)	(0.161)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.427	0.473	0.413	0.418	0.459	0.402	0.428	0.476	0.417	0.109	0.131	0.119
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.26) Upper Middle-Income Countries: Financing the Health Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.045	-0.024	0.165*	0.000	-0.001	-0.009	0.007	0.006	-0.006	0.024***	0.018**	-0.002
	(0.111)	(0.102)	(0.088)	(0.006)	(0.006)	(0.005)	(0.008)	(0.006)	(0.004)	(0.007)	(0.007)	(0.010)
Rest	0.136***	-0.151***	0.253***	-0.007***	0.008***	-0.012***	-0.010**	0.009***	-0.016***	0.001	0.014***	-0.026***
	(0.029)	(0.014)	(0.024)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.003)	(0.002)	(0.004)	(0.005)
TE	-0.131**	-0.188***	-0.125***	0.008***	0.011***	0.007***	0.008**	0.011***	0.007***	-0.001	0.008	0.002
	(0.045)	(0.034)	(0.029)	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.007)	(0.007)	(0.006)
PD	-0.061***	-0.059***	-0.049***	0.004***	0.004***	0.004***	0.005***	0.005***	0.004***	-0.005***	-0.004***	-0.005***
	(0.004)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	-236.365***	-307.946***	-226.107***	8.834***	12.767***	8.193***	21.215***	25.080***	20.425***	5.322**	14.129***	6.635***
	(23.346)	(21.353)	(19.389)	(1.515)	(1.328)	(0.991)	(1.314)	(1.370)	(1.734)	(1.785)	(2.822)	(1.880)
Log(GDPPC)^2	13.415***	17.521***	12.812***	-0.503***	-0.729***	-0.466***	-1.189***	-1.411***	-1.143***	-0.331**	-0.834***	-0.402***
	(1.352)	(1.248)	(1.154)	(0.088)	(0.078)	(0.059)	(0.077)	(0.079)	(0.103)	(0.105)	(0.167)	(0.113)
Unemployment	0.602***	0.645***	0.707***	-0.040***	-0.042***	-0.045***	-0.019*	-0.022**	-0.026**	0.009	0.012	0.006
	(0.129)	(0.113)	(0.125)	(0.007)	(0.006)	(0.007)	(0.009)	(0.008)	(0.008)	(0.013)	(0.012)	(0.013)
Inflation	-0.051**	-0.051***	-0.056**	0.004***	0.004***	0.004***	0.001	0.001	0.001	-0.002	-0.003*	-0.003
	(0.016)	(0.014)	(0.017)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-21.992***	-16.391**	-32.549***	0.762**	0.453	1.331***	1.878***	1.667***	2.606***	2.374***	0.932**	2.444***
	(4.892)	(6.248)	(5.688)	(0.240)	(0.310)	(0.275)	(0.316)	(0.395)	(0.441)	(0.402)	(0.409)	(0.475)
GFC	0.124	1.279***	1.533***	-0.005	-0.046***	-0.057***	0.016	-0.109***	-0.125***	-0.141***	-0.359***	-0.386***
	(0.198)	(0.141)	(0.240)	(0.009)	(0.011)	(0.012)	(0.017)	(0.007)	(0.011)	(0.037)	(0.041)	(0.048)
PS	-3.011**	-2.758**	-3.049**	0.211***	0.198***	0.216***	0.144***	0.134***	0.149***	-0.150	-0.212	-0.188
	(0.996)	(0.961)	(1.052)	(0.061)	(0.058)	(0.063)	(0.038)	(0.034)	(0.039)	(0.139)	(0.130)	(0.138)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.432	0.452	0.413	0.421	0.440	0.401	0.437	0.442	0.414	0.095	0.126	0.102
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.27) Upper Middle-Income Countries: Financing the Education Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.189***	-0.273***	-0.018	0.011***	0.016***	0.004	0.013**	0.019***	0.002	0.036***	0.028***	0.002
	(0.057)	(0.035)	(0.041)	(0.003)	(0.002)	(0.003)	(0.004)	(0.002)	(0.005)	(0.006)	(0.006)	(0.007)
Rest	0.119***	-0.099***	0.325***	-0.007***	0.005***	-0.016***	-0.008**	0.005***	-0.021***	0.003*	0.010**	-0.033***
	(0.032)	(0.013)	(0.053)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.006)	(0.001)	(0.004)	(0.005)
TE	-0.168***	-0.191***	-0.184***	0.010***	0.011***	0.011***	0.010***	0.011***	0.011***	0.003	0.008	0.007
	(0.043)	(0.031)	(0.033)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.006)	(0.007)	(0.006)
PD	-0.056***	-0.059***	-0.046***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	-0.005***	-0.004***	-0.006***
	(0.004)	(0.002)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-267.635***	-275.259***	-254.090***	10.345***	10.496***	9.499***	23.815***	23.766***	22.842***	9.119***	13.755***	11.514***
	(25.757)	(19.233)	(23.900)	(1.560)	(1.056)	(1.499)	(1.304)	(1.445)	(1.389)	(1.455)	(1.598)	(1.438)
$Log(GDPPC)^2$	15.313***	15.706***	14.517***	-0.596***	-0.603***	-0.546***	-1.345***	-1.340***	-1.288***	-0.560***	-0.819***	-0.693***
	(1.474)	(1.136)	(1.359)	(0.089)	(0.062)	(0.085)	(0.075)	(0.085)	(0.081)	(0.078)	(0.096)	(0.069)
Unemployment	0.655***	0.686***	0.769***	-0.043***	-0.045***	-0.049***	-0.023**	-0.025***	-0.030***	0.003	0.009	0.000
	(0.121)	(0.106)	(0.109)	(0.007)	(0.006)	(0.006)	(0.009)	(0.007)	(0.007)	(0.013)	(0.012)	(0.013)
Inflation	-0.048***	-0.057***	-0.054***	0.004***	0.004***	0.004***	0.000	0.001*	0.001	-0.003	-0.003	-0.004
	(0.013)	(0.014)	(0.013)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-17.221**	-18.612***	-26.570***	0.480	0.607**	0.994***	1.557***	1.755***	2.186***	1.874***	0.954**	1.780**
	(5.838)	(5.254)	(5.812)	(0.270)	(0.258)	(0.274)	(0.392)	(0.359)	(0.428)	(0.473)	(0.420)	(0.553)
GFC	0.914***	1.289***	1.798***	-0.025**	-0.046***	-0.072***	-0.087***	-0.113***	-0.145***	-0.385***	-0.368***	-0.420***
	(0.281)	(0.183)	(0.236)	(0.010)	(0.008)	(0.010)	(0.022)	(0.011)	(0.011)	(0.046)	(0.044)	(0.051)
PS	-2.786**	-2.917**	-2.704**	0.199***	0.209***	0.198***	0.127***	0.139***	0.123***	-0.175	-0.212	-0.233
	(0.955)	(1.029)	(0.967)	(0.059)	(0.061)	(0.058)	(0.030)	(0.036)	(0.030)	(0.141)	(0.133)	(0.145)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.465	0.458	0.458	0.459	0.448	0.449	0.467	0.453	0.458	0.120	0.132	0.131
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.28) Upper Middle-Income Countries: Financing the Agricultural Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	-0.218*	-0.331**	-0.082	0.009	0.015*	0.003	0.016**	0.024***	0.008	0.011	0.008	-0.017**
	(0.104)	(0.129)	(0.098)	(0.006)	(0.007)	(0.005)	(0.007)	(0.007)	(0.007)	(0.010)	(0.009)	(0.007)
Rest	0.124***	-0.134***	0.248***	-0.007***	0.007***	-0.012***	-0.008**	0.008***	-0.016***	0.002	0.015***	-0.026***
	(0.038)	(0.011)	(0.027)	(0.001)	(0.001)	(0.002)	(0.004)	(0.001)	(0.002)	(0.001)	(0.003)	(0.005)
TE	-0.123**	-0.188***	-0.124***	0.007***	0.011***	0.007***	0.007**	0.011***	0.007***	-0.002	0.008	0.001
	(0.044)	(0.032)	(0.025)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.006)	(0.007)	(0.006)
PD	-0.056***	-0.061***	-0.046***	0.004***	0.004***	0.004***	0.004***	0.005***	0.004***	-0.005***	-0.004***	-0.006***
	(0.004)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Log(GDPPC)	-288.911***	-301.862***	-267.939***	11.205***	11.849***	9.949***	25.376***	25.911***	23.904***	8.891***	14.328***	10.610***
	(20.535)	(20.429)	(19.962)	(1.233)	(1.086)	(1.114)	(1.169)	(1.771)	(1.711)	(2.375)	(2.374)	(1.916)
Log(GDPPC)^2	16.416***	17.159***	15.196***	-0.639***	-0.676***	-0.566***	-1.427***	-1.457***	-1.341***	-0.536***	-0.846***	-0.631***
	(1.203)	(1.200)	(1.179)	(0.073)	(0.065)	(0.066)	(0.067)	(0.102)	(0.100)	(0.137)	(0.140)	(0.112)
Unemployment	0.626***	0.667***	0.727***	-0.041***	-0.043***	-0.046***	-0.021*	-0.024**	-0.027**	0.008	0.013	0.006
	(0.133)	(0.103)	(0.125)	(0.007)	(0.006)	(0.007)	(0.010)	(0.008)	(0.009)	(0.014)	(0.012)	(0.014)
Inflation	-0.048**	-0.057**	-0.055**	0.004**	0.004***	0.004***	0.000	0.001	0.001	-0.003	-0.003*	-0.004*
	(0.020)	(0.018)	(0.019)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-18.401**	-16.162**	-28.528***	0.595*	0.490	1.150***	1.625***	1.558***	2.305***	2.304***	0.939**	2.268***
	(5.828)	(5.810)	(5.799)	(0.287)	(0.295)	(0.290)	(0.363)	(0.371)	(0.433)	(0.396)	(0.366)	(0.449)
GFC	4.033***	4.109***	5.216***	-0.207***	-0.213***	-0.270***	-0.246***	-0.257***	-0.325***	-0.232**	-0.140*	-0.258**
	(0.217)	(0.140)	(0.171)	(0.010)	(0.011)	(0.010)	(0.025)	(0.011)	(0.014)	(0.077)	(0.070)	(0.087)
PS	-2.715**	-2.767**	-2.787**	0.198**	0.202**	0.205**	0.121**	0.127**	0.128**	-0.165	-0.212	-0.208
	(1.013)	(1.056)	(1.078)	(0.063)	(0.064)	(0.065)	(0.040)	(0.039)	(0.041)	(0.148)	(0.135)	(0.144)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.434	0.452	0.418	0.422	0.438	0.404	0.435	0.445	0.418	0.089	0.126	0.096
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.29) Lower Middle-Income Countries: Financing the Social Protection Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.053*	0.014	0.204*	0.004**	-0.001	-0.009	0.000	-0.001	-0.020**	0.001	0.003	-0.019*
	(0.028)	(0.033)	(0.097)	(0.002)	(0.002)	(0.005)	(0.003)	(0.003)	(0.008)	(0.002)	(0.002)	(0.010)
Rest	-0.076	0.071***	0.186*	0.006**	-0.004***	-0.008	0.001	-0.003**	-0.019**	-0.003	-0.009***	-0.022**
	(0.044)	(0.017)	(0.086)	(0.003)	(0.001)	(0.005)	(0.003)	(0.001)	(0.006)	(0.002)	(0.002)	(0.009)
TE	-0.024	0.009	-0.068	0.000	-0.002	0.002	0.001	-0.000	0.005	0.006**	0.000	0.010***
	(0.042)	(0.032)	(0.049)	(0.002)	(0.001)	(0.002)	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)	(0.002)
PD	-0.082***	-0.086***	-0.089***	0.004**	0.004***	0.004**	0.007***	0.007***	0.008***	0.007***	0.007***	0.008***
	(0.017)	(0.018)	(0.018)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Log(GDPPC)	360.015***	365.950***	362.383***	-18.605***	-18.900***	-18.604***	-26.000***	-26.359***	-26.464***	-18.212***	-19.411***	-18.875***
	(43.576)	(48.698)	(44.892)	(2.511)	(2.898)	(2.767)	(2.626)	(2.770)	(2.303)	(1.729)	(1.237)	(1.356)
Log(GDPPC)^2	-26.191***	-26.577***	-26.257***	1.346***	1.363***	1.339***	1.874***	1.899***	1.901***	1.307***	1.396***	1.349***
	(2.953)	(3.336)	(3.036)	(0.172)	(0.201)	(0.190)	(0.178)	(0.190)	(0.156)	(0.123)	(0.091)	(0.097)
Unemployment	-0.235	-0.229	-0.255	0.022***	0.022***	0.023***	-0.001	-0.002	-0.000	-0.027*	-0.030*	-0.026*
	(0.149)	(0.150)	(0.151)	(0.006)	(0.007)	(0.007)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)
Inflation	-0.107***	-0.099***	-0.106***	0.007***	0.007***	0.008***	0.007***	0.006**	0.006**	0.007*	0.005*	0.006
	(0.022)	(0.021)	(0.021)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Tax	14.578***	15.572***	18.717***	-0.264	-0.373*	-0.523**	-1.356***	-1.334***	-1.604***	-2.055***	-1.847***	-2.235***
	(3.805)	(3.516)	(4.556)	(0.166)	(0.177)	(0.222)	(0.304)	(0.275)	(0.302)	(0.287)	(0.243)	(0.218)
GFC	-0.693*	-0.849**	-3.740***	-0.047**	-0.038**	0.162***	0.081**	0.090**	0.274***	0.149**	0.177***	0.215***
	(0.325)	(0.325)	(0.232)	(0.015)	(0.015)	(0.017)	(0.030)	(0.031)	(0.017)	(0.049)	(0.038)	(0.022)
PS	1.365***	1.212**	1.547***	-0.032*	-0.022	-0.038**	-0.118***	-0.112**	-0.140**	-0.066*	-0.051*	-0.093*
	(0.378)	(0.378)	(0.466)	(0.015)	(0.016)	(0.016)	(0.035)	(0.036)	(0.048)	(0.030)	(0.026)	(0.048)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.463	0.467	0.465	0.424	0.426	0.422	0.517	0.519	0.524	0.336	0.353	0.345
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.210) Lower Middle-Income Countries: Financing the Health Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.168*	-0.110***	0.092	0.014**	0.008***	-0.000	0.005	0.005**	-0.015*	-0.023***	-0.019***	-0.046***
	(0.076)	(0.027)	(0.095)	(0.005)	(0.001)	(0.005)	(0.004)	(0.002)	(0.007)	(0.003)	(0.002)	(0.011)
Rest	-0.074	0.085***	0.173*	0.006*	-0.006***	-0.007	0.001	-0.004**	-0.019**	-0.003	-0.002	-0.025**
	(0.042)	(0.020)	(0.085)	(0.003)	(0.001)	(0.004)	(0.003)	(0.001)	(0.006)	(0.002)	(0.002)	(0.009)
TE	-0.025	-0.001	-0.067	0.000	-0.001	0.002	0.002	0.000	0.005	0.006*	0.005	0.010***
	(0.046)	(0.053)	(0.052)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.001)
PD	-0.081***	-0.094***	-0.088***	0.003**	0.004***	0.004**	0.007***	0.008***	0.008***	0.007***	0.007***	0.008***
	(0.019)	(0.016)	(0.019)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	366.891***	382.060***	368.042***	-19.147***	-20.114***	-19.075***	-26.337***	-27.132***	-26.711***	-16.757***	-17.211***	-17.406***
	(40.426)	(34.224)	(41.690)	(2.321)	(2.018)	(2.572)	(2.437)	(1.986)	(2.122)	(2.258)	(1.679)	(1.692)
Log(GDPPC)^2	-26.665***	-27.702***	-26.650***	1.383***	1.448***	1.372***	1.897***	1.953***	1.918***	1.206***	1.241***	1.247***
	(2.746)	(2.352)	(2.818)	(0.159)	(0.141)	(0.176)	(0.166)	(0.137)	(0.143)	(0.160)	(0.120)	(0.121)
Unemployment	-0.264*	-0.247*	-0.278*	0.024***	0.023***	0.025***	-0.000	-0.001	0.001	-0.033*	-0.034*	-0.032*
	(0.132)	(0.126)	(0.135)	(0.006)	(0.005)	(0.006)	(0.011)	(0.011)	(0.011)	(0.015)	(0.015)	(0.015)
Inflation	-0.117***	-0.122***	-0.115***	0.008***	0.008***	0.008***	0.007***	0.007***	0.006**	0.005	0.004	0.003
	(0.020)	(0.020)	(0.020)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Tax	12.251**	13.295**	16.554**	-0.075	-0.184	-0.345	-1.253***	-1.225***	-1.502***	-2.534***	-2.422***	-2.744***
	(4.944)	(4.940)	(5.314)	(0.225)	(0.211)	(0.245)	(0.371)	(0.375)	(0.354)	(0.258)	(0.284)	(0.234)
GFC	-0.478	-0.406	-0.800	-0.064***	-0.069**	-0.053*	0.071*	0.069*	0.109***	0.194***	0.195***	0.248***
	(0.360)	(0.455)	(0.453)	(0.018)	(0.026)	(0.026)	(0.032)	(0.035)	(0.030)	(0.043)	(0.043)	(0.034)
PS	1.224***	1.290***	1.416***	-0.020	-0.024	-0.028	-0.113***	-0.116***	-0.133**	-0.093**	-0.094**	-0.120*
	(0.321)	(0.230)	(0.403)	(0.015)	(0.020)	(0.016)	(0.029)	(0.022)	(0.042)	(0.033)	(0.031)	(0.053)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.465	0.472	0.466	0.427	0.436	0.425	0.518	0.522	0.525	0.352	0.352	0.364
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.211) Lower Middle-Income Countries: Financing the Education Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.147	0.216***	0.496**	-0.007	-0.013***	-0.026**	-0.014***	-0.015***	-0.042***	-0.028***	-0.027***	-0.061***
	(0.086)	(0.065)	(0.160)	(0.005)	(0.004)	(0.009)	(0.004)	(0.004)	(0.010)	(0.007)	(0.005)	(0.012)
Rest	-0.082**	0.017	0.243**	0.007***	-0.001	-0.011*	0.001	0.000	-0.023***	-0.001	-0.000	-0.030***
	(0.031)	(0.015)	(0.098)	(0.002)	(0.001)	(0.005)	(0.002)	(0.001)	(0.006)	(0.003)	(0.002)	(0.009)
TE	0.021	0.014	-0.031	-0.003	-0.002	0.000	-0.001	-0.001	0.003	0.001	0.001	0.006**
	(0.032)	(0.035)	(0.042)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)
PD	-0.104***	-0.103***	-0.116***	0.005***	0.005***	0.005***	0.009***	0.009***	0.010***	0.010***	0.010***	0.011***
	(0.023)	(0.023)	(0.024)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	409.307***	402.195***	418.131***	-21.568***	-21.019***	-21.828***	-29.320***	-29.305***	-30.487***	-24.134***	-24.111***	-25.771***
	(53.595)	(56.848)	(56.313)	(3.172)	(3.405)	(3.437)	(3.110)	(3.221)	(2.985)	(0.508)	(0.504)	(1.110)
Log(GDPPC)^2	-29.363***	-28.854***	-29.832***	1.536***	1.497***	1.546***	2.088***	2.085***	2.159***	1.690***	1.689***	1.792***
	(3.608)	(3.815)	(3.754)	(0.215)	(0.231)	(0.232)	(0.211)	(0.217)	(0.199)	(0.029)	(0.030)	(0.067)
Unemployment	-0.246*	-0.243	-0.269*	0.023***	0.023***	0.024***	-0.001	-0.001	0.001	-0.028**	-0.029**	-0.026**
	(0.130)	(0.137)	(0.136)	(0.006)	(0.006)	(0.006)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)
Inflation	-0.097***	-0.103***	-0.093***	0.007***	0.007***	0.007***	0.006**	0.006**	0.005**	0.006*	0.006*	0.004
	(0.024)	(0.022)	(0.021)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Tax	16.355***	18.578***	21.665***	-0.359**	-0.540**	-0.683***	-1.492***	-1.536***	-1.824***	-2.383***	-2.360***	-2.735***
	(2.916)	(3.726)	(4.059)	(0.150)	(0.169)	(0.201)	(0.238)	(0.294)	(0.272)	(0.217)	(0.240)	(0.262)
GFC	-3.919***	-3.864***	-4.114***	0.139***	0.134***	0.143***	0.309***	0.306***	0.338***	0.328***	0.331***	0.369***
	(0.204)	(0.190)	(0.240)	(0.013)	(0.013)	(0.018)	(0.020)	(0.019)	(0.017)	(0.031)	(0.029)	(0.020)
PS	0.947**	1.023***	1.167**	-0.004	-0.010	-0.015	-0.093***	-0.093**	-0.114**	-0.039*	-0.040*	-0.065*
	(0.292)	(0.289)	(0.391)	(0.012)	(0.013)	(0.012)	(0.028)	(0.029)	(0.041)	(0.017)	(0.019)	(0.029)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.473	0.471	0.476	0.435	0.431	0.434	0.526	0.526	0.536	0.362	0.362	0.379
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity..

Table (A.212) Lower Middle-Income Countries: Financing the Agricultural Sector - Main Results

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.419***	0.435***	0.551***	-0.017***	-0.021***	-0.026***	-0.035***	-0.030***	-0.044***	-0.037***	-0.028***	-0.045***
	(0.062)	(0.071)	(0.089)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.006)	(0.007)	(0.005)	(0.010)
Rest	-0.013	0.017	0.129	0.003	-0.002*	-0.005	-0.003*	0.000	-0.015*	-0.006**	-0.003	-0.019**
	(0.030)	(0.011)	(0.108)	(0.002)	(0.001)	(0.006)	(0.002)	(0.001)	(0.007)	(0.002)	(0.003)	(0.008)
TE	-0.013	-0.007	-0.040	-0.001	-0.001	0.001	0.001	0.000	0.003	0.006*	0.004	0.009***
	(0.048)	(0.049)	(0.061)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.002)
PD	-0.086***	-0.088***	-0.091***	0.004***	0.004***	0.004***	0.007***	0.007***	0.008***	0.007***	0.008***	0.008***
	(0.015)	(0.014)	(0.017)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Log(GDPPC)	345.403***	347.447***	348.585***	-17.923***	-18.030***	-17.926***	-24.947***	-25.076***	-25.544***	-17.211***	-17.907***	-18.042***
	(47.618)	(47.243)	(48.143)	(2.749)	(2.857)	(2.968)	(2.888)	(2.693)	(2.494)	(1.693)	(0.954)	(1.221)
Log(GDPPC)^2	-25.358***	-25.490***	-25.532***	1.307***	1.312***	1.304***	1.814***	1.825***	1.852***	1.251***	1.302***	1.306***
	(3.236)	(3.221)	(3.256)	(0.188)	(0.197)	(0.203)	(0.197)	(0.184)	(0.169)	(0.123)	(0.074)	(0.092)
Unemployment	-0.310*	-0.300*	-0.319*	0.026***	0.025***	0.027***	0.004	0.003	0.004	-0.024*	-0.027*	-0.024*
	(0.145)	(0.147)	(0.148)	(0.006)	(0.007)	(0.006)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)
Inflation	-0.109***	-0.108***	-0.105***	0.007***	0.007***	0.007***	0.007***	0.006***	0.006***	0.007*	0.006*	0.006
	(0.018)	(0.018)	(0.017)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Tax	13.872**	14.502***	15.721**	-0.214	-0.330*	-0.362	-1.324***	-1.229***	-1.408***	-2.102***	-1.977***	-2.157***
	(4.733)	(4.402)	(5.217)	(0.189)	(0.174)	(0.232)	(0.387)	(0.363)	(0.356)	(0.388)	(0.325)	(0.288)
GFC	-1.665***	-4.627***	-1.886***	-0.001	0.169***	0.008	0.152***	0.361***	0.177***	0.217***	0.378***	0.248***
	(0.216)	(0.152)	(0.273)	(0.009)	(0.006)	(0.015)	(0.022)	(0.018)	(0.021)	(0.042)	(0.016)	(0.038)
PS	1.323***	1.349***	1.457***	-0.027	-0.029*	-0.032*	-0.119***	-0.119***	-0.135***	-0.082***	-0.086***	-0.102**
	(0.351)	(0.337)	(0.391)	(0.015)	(0.015)	(0.015)	(0.031)	(0.031)	(0.040)	(0.022)	(0.021)	(0.037)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.481	0.481	0.482	0.436	0.436	0.436	0.536	0.535	0.540	0.353	0.353	0.358
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

A.3 Robustness Check 1: Replacing Atkinson Index with Alternative Inequality Measures

Table (A.31) All Middle-Income Countries: Financing Social Spending Sectors - Gini Index

	Gini			Gini			Gini			Gini		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.015	-0.044	0.139**									
	(0.035)	(0.025)	(0.045)									
HS				-0.004	-0.021	0.125**						
				(0.063)	(0.050)	(0.051)						
ES							-0.076*	-0.105***	0.045			
							(0.034)	(0.016)	(0.042)			
AS										0.211**	0.167**	0.289***
										(0.075)	(0.055)	(0.061)
Rest	0.058***	-0.067***	0.169***	0.048**	-0.064***	0.162***	0.045**	-0.049***	0.172***	0.050*	-0.071***	0.157***
	(0.015)	(0.005)	(0.031)	(0.018)	(0.004)	(0.032)	(0.018)	(0.008)	(0.045)	(0.023)	(0.008)	(0.026)
TE	-0.037*	-0.065***	-0.045*	-0.035*	-0.062**	-0.044*	-0.055**	-0.066**	-0.068***	-0.030	-0.065***	-0.039*
	(0.020)	(0.019)	(0.022)	(0.018)	(0.020)	(0.020)	(0.019)	(0.021)	(0.018)	(0.019)	(0.020)	(0.020)
PD	-0.014***	-0.014**	-0.010*	-0.014**	-0.013**	-0.011*	-0.011**	-0.013**	-0.008	-0.014***	-0.015***	-0.011**
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.003)	(0.004)	(0.004)
Log(GDPPC)	25.191***	24.944***	29.803***	25.643***	24.673***	29.739***	17.586***	22.641***	21.572***	20.104**	19.141***	25.322***
	(5.460)	(5.152)	(5.789)	(5.894)	(5.509)	(5.864)	(4.520)	(3.863)	(5.371)	(6.790)	(5.310)	(6.128)
Log(GDPPC)^2	-1.530***	-1.509***	-1.834***	-1.557***	-1.494***	-1.829***	-1.058***	-1.368***	-1.323***	-1.239***	-1.183***	-1.575***
	(0.284)	(0.256)	(0.280)	(0.306)	(0.278)	(0.283)	(0.222)	(0.179)	(0.252)	(0.356)	(0.257)	(0.297)
Unemployment	0.080	0.085	0.093*	0.085	0.084	0.095*	0.088	0.088	0.098*	0.068	0.058	0.082
	(0.053)	(0.052)	(0.050)	(0.055)	(0.052)	(0.051)	(0.054)	(0.052)	(0.050)	(0.056)	(0.052)	(0.050)
Inflation	-0.025**	-0.030***	-0.026**	-0.027**	-0.028***	-0.027**	-0.029***	-0.031***	-0.030***	-0.023**	-0.027***	-0.024*
	(0.008)	(0.006)	(0.010)	(0.009)	(0.007)	(0.011)	(0.007)	(0.006)	(0.008)	(0.009)	(0.007)	(0.011)
Tax	-5.644**	-5.080**	-8.525***	-6.745**	-4.726	-8.958***	-5.833**	-5.906**	-8.011***	-7.393**	-7.008**	-9.631***
	(2.396)	(2.117)	(2.313)	(2.710)	(2.660)	(2.573)	(2.403)	(2.189)	(2.271)	(2.452)	(2.372)	(2.307)
GFC	1.589***	1.673***	1.991***	1.777***	1.748***	2.202***	1.671***	1.715***	2.066***	1.796***	1.635***	2.216***
	(0.281)	(0.276)	(0.268)	(0.273)	(0.230)	(0.241)	(0.321)	(0.240)	(0.276)	(0.370)	(0.262)	(0.291)
PS	-0.197	-0.019	-0.103	-0.132*	-0.066	-0.051	0.030	-0.040	0.131	-0.175*	-0.156**	-0.096
	(0.108)	(0.088)	(0.187)	(0.069)	(0.079)	(0.126)	(0.060)	(0.055)	(0.140)	(0.078)	(0.066)	(0.133)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.211	0.221	0.212	0.208	0.221	0.211	0.218	0.222	0.223	0.212	0.230	0.213
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except one social spending sector as well as the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.32) Upper Middle-Income Countries: Financing Social Spending Sectors - Gini Index

	Gini			Gini			Gini			Gini		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.026	-0.048	0.258***									
	(0.055)	(0.048)	(0.065)									
HS				-0.014	0.007	0.238***						
				(0.057)	(0.058)	(0.044)						
ES							-0.103*	-0.123***	0.130*			
							(0.050)	(0.027)	(0.062)			
AS										-0.011	-0.053	0.220*
										(0.083)	(0.079)	(0.098)
Rest	0.061***	-0.093***	0.276***	0.053*	-0.089***	0.270***	0.046	-0.067***	0.307***	0.049	-0.081***	0.269***
	(0.014)	(0.010)	(0.036)	(0.026)	(0.009)	(0.044)	(0.026)	(0.013)	(0.067)	(0.029)	(0.011)	(0.042)
TE	-0.081**	-0.119***	-0.093***	-0.078**	-0.117***	-0.091***	-0.097**	-0.118***	-0.123***	-0.074*	-0.117***	-0.090***
	(0.027)	(0.028)	(0.021)	(0.032)	(0.026)	(0.024)	(0.033)	(0.026)	(0.030)	(0.033)	(0.026)	(0.023)
PD	-0.021***	-0.023***	-0.013***	-0.021***	-0.022***	-0.014***	-0.019***	-0.022***	-0.012***	-0.019***	-0.023***	-0.013***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.002)
Log(GDPPC)	-187.739***	-201.203***	-182.734***	-171.836***	-218.310***	-175.679***	-184.514***	-198.282***	-188.314***	-185.102***	-199.502***	-184.377***
	(17.569)	(17.942)	(18.112)	(14.336)	(15.478)	(14.707)	(15.872)	(17.719)	(17.866)	(12.884)	(19.830)	(16.990)
$Log(GDPPC)^2$	10.757***	11.530***	10.441***	9.849***	12.510***	10.038***	10.626***	11.380***	10.814***	10.609***	11.431***	10.536***
	(1.046)	(1.072)	(1.096)	(0.840)	(0.914)	(0.893)	(0.919)	(1.061)	(1.025)	(0.772)	(1.179)	(1.025)
Unemployment	0.142	0.162	0.212	0.149	0.160	0.212	0.175	0.176	0.245*	0.153	0.163	0.214
	(0.143)	(0.136)	(0.135)	(0.150)	(0.135)	(0.135)	(0.146)	(0.129)	(0.122)	(0.153)	(0.130)	(0.137)
Inflation	-0.021***	-0.022***	-0.022***	-0.022***	-0.021***	-0.022***	-0.021***	-0.025***	-0.022***	-0.021***	-0.024***	-0.021***
	(0.004)	(0.003)	(0.006)	(0.004)	(0.003)	(0.006)	(0.003)	(0.003)	(0.006)	(0.004)	(0.003)	(0.005)
Tax	-20.987***	-16.788***	-26.717***	-21.908***	-16.756***	-26.850***	-19.573***	-18.128***	-23.805***	-21.333***	-18.146***	-26.194***
	(3.647)	(3.569)	(4.222)	(3.580)	(4.134)	(4.152)	(4.148)	(3.620)	(4.415)	(4.035)	(4.160)	(4.484)
GFC	2.930***	2.837***	3.758***	-0.026	2.093***	2.404***	1.944***	2.072***	2.535***	3.025***	2.907***	3.764***
	(0.368)	(0.374)	(0.357)	(0.226)	(0.161)	(0.199)	(0.284)	(0.195)	(0.210)	(0.435)	(0.285)	(0.328)
PS	-0.211	0.054	0.004	-0.214	0.013	0.010	-0.113	-0.090	0.180	-0.148	-0.093	0.060
	(0.282)	(0.191)	(0.250)	(0.264)	(0.188)	(0.231)	(0.175)	(0.154)	(0.163)	(0.283)	(0.192)	(0.252)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.295	0.318	0.307	0.294	0.317	0.306	0.309	0.316	0.328	0.293	0.314	0.306
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except one social spending sector as well as the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.33) Lower Middle-Income Countries: Financing Social Spending Sectors - Gini Index

	Gini			Gini			Gini			Gini		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.071***	-0.071***	0.040									
	(0.017)	(0.009)	(0.045)									
HS				0.001	0.019	0.150***						
				(0.031)	(0.013)	(0.044)						
ES							0.084*	0.113**	0.277***			
							(0.042)	(0.042)	(0.078)			
AS										0.266***	0.248***	0.326***
										(0.042)	(0.033)	(0.043)
Rest	0.002	0.040***	0.109**	-0.016	-0.004	0.125**	-0.022	-0.022**	0.152***	0.016	-0.021*	0.093
	(0.019)	(0.010)	(0.043)	(0.018)	(0.009)	(0.042)	(0.018)	(0.010)	(0.044)	(0.015)	(0.010)	(0.053)
TE	-0.010	0.013	-0.031	-0.016	-0.019	-0.042	0.003	-0.004	-0.026	-0.012	-0.019	-0.029
	(0.021)	(0.017)	(0.024)	(0.022)	(0.024)	(0.025)	(0.015)	(0.019)	(0.021)	(0.025)	(0.028)	(0.031)
PD	-0.042***	-0.045***	-0.047***	-0.047***	-0.047***	-0.052***	-0.058***	-0.058***	-0.066***	-0.050***	-0.047***	-0.054***
	(0.009)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)	(0.007)	(0.006)	(0.007)
Log(GDPPC)	178.979***	183.780***	181.805***	178.232***	176.906***	180.379***	202.631***	205.403***	209.584***	171.176***	168.662***	174.565***
	(24.072)	(24.182)	(21.992)	(21.309)	(21.602)	(19.475)	(25.690)	(27.655)	(25.205)	(22.473)	(21.705)	(20.358)
Log(GDPPC)^2	-12.910***	-13.260***	-13.081***	-12.876***	-12.771***	-12.982***	-14.455***	-14.591***	-14.865***	-12.494***	-12.331***	-12.708***
	(1.652)	(1.669)	(1.503)	(1.475)	(1.485)	(1.339)	(1.746)	(1.858)	(1.693)	(1.551)	(1.493)	(1.398)
Unemployment	-0.059	-0.051	-0.066	-0.031	-0.033	-0.039	-0.036	-0.050	-0.049	-0.074	-0.086	-0.076
	(0.086)	(0.087)	(0.088)	(0.083)	(0.086)	(0.085)	(0.074)	(0.078)	(0.076)	(0.079)	(0.085)	(0.082)
Inflation	-0.055**	-0.046**	-0.050**	-0.055**	-0.057**	-0.050**	-0.052**	-0.057**	-0.047*	-0.058**	-0.060***	-0.053**
	(0.017)	(0.016)	(0.018)	(0.020)	(0.019)	(0.021)	(0.020)	(0.018)	(0.021)	(0.020)	(0.018)	(0.020)
Tax	9.430***	8.839***	10.668***	11.030***	11.571***	13.011***	11.680***	12.421***	14.191***	10.485***	9.724**	11.118***
	(2.212)	(1.927)	(2.405)	(2.353)	(2.671)	(2.582)	(1.936)	(2.436)	(2.315)	(2.973)	(3.017)	(3.113)
GFC	-0.802**	-0.919***	-1.609***	-0.829**	-0.822**	-1.082**	-1.799***	-1.677***	-1.964***	-1.349***	-2.169***	-1.501***
	(0.277)	(0.251)	(0.158)	(0.346)	(0.349)	(0.353)	(0.237)	(0.193)	(0.231)	(0.251)	(0.118)	(0.285)
PS	0.569**	0.501*	0.696**	0.826***	0.824***	0.962***	0.654***	0.578**	0.787***	0.833***	0.802***	0.929***
	(0.225)	(0.224)	(0.291)	(0.180)	(0.185)	(0.249)	(0.156)	(0.178)	(0.221)	(0.171)	(0.202)	(0.211)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.418	0.424	0.422	0.408	0.408	0.414	0.416	0.417	0.423	0.429	0.431	0.432
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except one social spending sector as well as the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.34) All Middle-Income Countries: Financing Social Spending Sectors - Theil Index

	Theil			Theil			Theil			Theil		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.001	-0.001	0.003***									
	(0.001)	(0.000)	(0.000)									
HS				-0.001	-0.001	0.002*						
				(0.001)	(0.001)	(0.001)						
ES							-0.003***	-0.003***	-0.000			
							(0.001)	(0.000)	(0.001)			
AS										0.003**	0.002*	0.004***
										(0.001)	(0.001)	(0.001)
Rest	0.001**	-0.002***	0.003***	0.001**	-0.001***	0.003***	0.001**	-0.001***	0.003***	0.001*	-0.001***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
TE	-0.001	-0.001***	-0.001	-0.001*	-0.001**	-0.001	-0.001***	-0.001***	-0.001***	-0.000	-0.001**	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PD	-0.000***	-0.000**	-0.000*	-0.000***	-0.000**	-0.000*	-0.000*	-0.000*	-0.000	-0.000***	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	0.289**	0.269**	0.371**	0.318**	0.300**	0.398***	0.080	0.168**	0.157	0.231*	0.208*	0.329**
	(0.111)	(0.103)	(0.121)	(0.116)	(0.111)	(0.120)	(0.088)	(0.072)	(0.108)	(0.120)	(0.094)	(0.114)
Log(GDPPC)^2	-0.020***	-0.018***	-0.025***	-0.022***	-0.020***	-0.027***	-0.007	-0.012***	-0.012**	-0.017**	-0.015***	-0.023***
	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.004)	(0.003)	(0.005)	(0.006)	(0.004)	(0.005)
Unemployment	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Inflation	-0.000	-0.000**	-0.000	-0.000	-0.000*	-0.000	-0.000**	-0.000**	-0.000**	-0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax	-0.091*	-0.059	-0.141***	-0.115**	-0.076	-0.160***	-0.086*	-0.095**	-0.128**	-0.111**	-0.100**	-0.153***
	(0.044)	(0.038)	(0.039)	(0.050)	(0.051)	(0.047)	(0.044)	(0.040)	(0.040)	(0.045)	(0.041)	(0.040)
GFC	0.030***	0.025***	0.037***	0.028***	0.027***	0.036***	0.025***	0.027***	0.033***	0.030***	0.026***	0.037***
	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)	(0.007)	(0.005)	(0.006)	(0.008)	(0.006)	(0.006)
PS	-0.008***	-0.004***	-0.007***	-0.008***	-0.007***	-0.007***	-0.003*	-0.005**	-0.001	-0.008***	-0.008***	-0.007***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.243	0.266	0.244	0.245	0.260	0.247	0.269	0.271	0.274	0.243	0.267	0.245
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except one social spending sector as well as the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.35) Upper Middle-Income Countries: Financing Social Spending Sectors - Theil Index

	Theil			Theil			Theil			Theil		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.001	-0.001	0.004***									
	(0.001)	(0.001)	(0.001)									
HS				-0.002	-0.001	0.002**						
				(0.001)	(0.001)	(0.001)						
ES							-0.003***	-0.004***	0.001			
							(0.001)	(0.000)	(0.001)			
AS										-0.003**	-0.004**	0.000
										(0.001)	(0.001)	(0.001)
Rest	0.001***	-0.002***	0.004***	0.001**	-0.002***	0.004***	0.001*	-0.001***	0.005***	0.001	-0.002***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
TE	-0.002**	-0.003***	-0.002***	-0.002**	-0.003***	-0.002***	-0.002**	-0.003***	-0.003***	-0.002**	-0.003***	-0.002***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
PD	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-3.865***	-4.270***	-3.713***	-3.375***	-4.375***	-3.382***	-3.868***	-4.132***	-3.904***	-4.123***	-4.475***	-4.055***
	(0.266)	(0.257)	(0.253)	(0.265)	(0.261)	(0.247)	(0.316)	(0.246)	(0.313)	(0.228)	(0.235)	(0.214)
Log(GDPPC)^2	0.219***	0.243***	0.210***	0.191***	0.249***	0.191***	0.221***	0.235***	0.223***	0.234***	0.254***	0.230***
	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.018)	(0.015)	(0.017)	(0.013)	(0.014)	(0.013)
Unemployment	0.004	0.004*	0.005**	0.004	0.004*	0.005**	0.004**	0.004**	0.006***	0.004*	0.004**	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Inflation	-0.000**	-0.000**	-0.000**	-0.000**	-0.000***	-0.000**	-0.000***	-0.000***	-0.000**	-0.000	-0.000**	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax	-0.357***	-0.237***	-0.464***	-0.370***	-0.261***	-0.472***	-0.304***	-0.277***	-0.385***	-0.325***	-0.246***	-0.418***
	(0.072)	(0.064)	(0.076)	(0.063)	(0.077)	(0.073)	(0.082)	(0.065)	(0.079)	(0.076)	(0.069)	(0.074)
GFC	0.049***	0.045***	0.063***	0.002	0.029***	0.034***	0.027***	0.030***	0.038***	0.052***	0.049***	0.065***
	(0.006)	(0.006)	(0.006)	(0.004)	(0.003)	(0.005)	(0.006)	(0.004)	(0.005)	(0.006)	(0.004)	(0.005)
PS	-0.019**	-0.012**	-0.017**	-0.020**	-0.015**	-0.018**	-0.017**	-0.017**	-0.012**	-0.016**	-0.015*	-0.014*
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.005)	(0.006)	(0.005)	(0.007)	(0.007)	(0.007)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.346	0.402	0.352	0.353	0.392	0.357	0.392	0.402	0.412	0.351	0.394	0.358
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except one social spending sector as well as the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.36) Lower Middle-Income Countries: Financing Social Spending Sectors - Theil Index

	Theil			Theil			Theil			Theil		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.000	-0.000	0.003**									
	(0.000)	(0.000)	(0.001)									
HS				-0.001	-0.001	0.003**						
				(0.001)	(0.000)	(0.001)						
ES							0.003***	0.003***	0.008***			
							(0.001)	(0.001)	(0.002)			
AS										0.006***	0.005***	0.008***
										(0.001)	(0.001)	(0.001)
Rest	-0.000	0.001***	0.003**	-0.000	0.001**	0.003**	-0.000	-0.000	0.004***	0.000	0.000	0.003*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
TE	-0.000	0.000	-0.001	-0.000	-0.000	-0.001	0.000	0.000	-0.001	-0.000	-0.000	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PD	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	4.544***	4.634***	4.618***	4.571***	4.710***	4.630***	5.223***	5.207***	5.417***	4.356***	4.387***	4.450***
	(0.495)	(0.514)	(0.450)	(0.471)	(0.385)	(0.425)	(0.526)	(0.553)	(0.512)	(0.533)	(0.489)	(0.477)
$Log(GDPPC)^2$	-0.328***	-0.335***	-0.333***	-0.330***	-0.340***	-0.334***	-0.372***	-0.371***	-0.384***	-0.318***	-0.320***	-0.324***
	(0.034)	(0.035)	(0.031)	(0.032)	(0.026)	(0.029)	(0.036)	(0.037)	(0.034)	(0.036)	(0.034)	(0.032)
Unemployment	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Inflation	-0.001***	-0.001**	-0.001**	-0.001***	-0.001***	-0.001**	-0.001**	-0.001**	-0.001**	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax	0.251***	0.246***	0.294***	0.245***	0.243***	0.291***	0.282***	0.294***	0.344***	0.248***	0.236***	0.264***
	(0.052)	(0.047)	(0.054)	(0.060)	(0.063)	(0.060)	(0.037)	(0.048)	(0.046)	(0.067)	(0.062)	(0.065)
GFC	-0.017**	-0.019***	-0.049***	-0.016**	-0.016**	-0.023***	-0.056***	-0.055***	-0.060***	-0.030***	-0.065***	-0.034***
	(0.005)	(0.005)	(0.003)	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
PS	0.020***	0.018**	0.023**	0.020***	0.020***	0.023***	0.015***	0.015***	0.019**	0.020***	0.021***	0.023***
	(0.006)	(0.006)	(0.008)	(0.005)	(0.004)	(0.007)	(0.004)	(0.004)	(0.006)	(0.005)	(0.005)	(0.006)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.507	0.512	0.514	0.508	0.511	0.514	0.519	0.519	0.529	0.528	0.527	0.531
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except one social spending sector as well as the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

A.4 Robustness Check 2: Replacing the Percentiles with the 20th, 40th and 80th Percentiles

Table (A.41) All Middle-Income Countries: Financing the Social Protection Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.007**	-0.001	-0.011***	-0.008**	-0.002	-0.014***	-0.000	0.007*	-0.016**
	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.004)	(0.003)	(0.005)
Rest	-0.006**	0.006***	-0.008**	-0.006*	0.008***	-0.011**	-0.006***	0.011***	-0.020***
	(0.002)	(0.000)	(0.004)	(0.003)	(0.001)	(0.004)	(0.002)	(0.001)	(0.004)
TE	0.002**	0.005***	0.002	0.001	0.005***	0.001	0.002	0.007*	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.004)
PD	0.002***	0.002**	0.001**	0.002***	0.003***	0.002***	-0.000	-0.000	-0.001**
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-2.685***	-2.679***	-3.029***	-2.599***	-2.549***	-2.986***	0.853	1.014	0.339
	(0.317)	(0.259)	(0.326)	(0.508)	(0.438)	(0.501)	(1.153)	(1.155)	(1.233)
Log(GDPPC)^2	0.177***	0.176***	0.199***	0.178***	0.174***	0.203***	-0.048	-0.059	-0.014
	(0.019)	(0.016)	(0.019)	(0.027)	(0.022)	(0.026)	(0.064)	(0.063)	(0.067)
Unemployment	-0.020***	-0.021***	-0.021***	-0.021***	-0.021***	-0.022***	-0.012	-0.012	-0.014
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.008)	(0.008)	(0.009)
Inflation	0.002**	0.003**	0.002*	0.001	0.001	0.001	0.000	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Tax	0.268	0.238	0.565***	0.438**	0.345	0.749***	0.575*	0.324	0.874**
	(0.170)	(0.142)	(0.134)	(0.187)	(0.196)	(0.174)	(0.279)	(0.279)	(0.276)
GFC	-0.152***	-0.143***	-0.186***	-0.141***	-0.129***	-0.178***	-0.150***	-0.119**	-0.194***
	(0.016)	(0.015)	(0.015)	(0.021)	(0.020)	(0.016)	(0.039)	(0.042)	(0.037)
PS	0.051*	0.035	0.050	0.041**	0.020	0.038**	0.028	-0.004	0.016
	(0.026)	(0.028)	(0.027)	(0.016)	(0.017)	(0.017)	(0.049)	(0.048)	(0.058)
Countries	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308
R squared	0.323	0.333	0.315	0.317	0.332	0.311	0.116	0.144	0.119
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.42) All Middle-Income Countries: Financing the Health Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.002	0.001	-0.007**	0.001	0.005	-0.006	0.007	0.008	-0.009
	(0.006)	(0.004)	(0.003)	(0.007)	(0.005)	(0.003)	(0.006)	(0.006)	(0.006)
Rest	-0.006***	0.004***	-0.009**	-0.007**	0.005***	-0.011***	-0.005**	0.009***	-0.019***
	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.004)
TE	0.003**	0.004***	0.002	0.002*	0.004**	0.002	0.002	0.006	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.003)
PD	0.002***	0.002**	0.002**	0.003***	0.002***	0.002***	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-2.772***	-2.835***	-3.147***	-2.782***	-2.866***	-3.227***	0.695	0.921	0.237
	(0.370)	(0.347)	(0.374)	(0.549)	(0.498)	(0.521)	(1.138)	(1.128)	(1.171)
Log(GDPPC)^2	0.182***	0.186***	0.207***	0.189***	0.194***	0.218***	-0.038	-0.053	-0.008
	(0.022)	(0.020)	(0.021)	(0.030)	(0.026)	(0.027)	(0.062)	(0.061)	(0.062)
Unemployment	-0.020***	-0.021***	-0.021***	-0.020***	-0.021***	-0.022***	-0.013	-0.012	-0.014
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.008)	(0.008)	(0.009)
Inflation	0.002**	0.003**	0.003**	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	0.295	0.313	0.596***	0.490*	0.528**	0.832***	0.768**	0.371	1.000**
	(0.196)	(0.196)	(0.168)	(0.222)	(0.219)	(0.208)	(0.316)	(0.356)	(0.339)
GFC	-0.148***	-0.162***	-0.191***	-0.135***	-0.153***	-0.185***	-0.145***	-0.130***	-0.192***
	(0.016)	(0.014)	(0.016)	(0.022)	(0.018)	(0.019)	(0.042)	(0.036)	(0.039)
PS	0.053*	0.054**	0.055*	0.046**	0.048**	0.047**	0.021	0.007	0.010
	(0.028)	(0.024)	(0.027)	(0.019)	(0.015)	(0.017)	(0.037)	(0.043)	(0.046)
Countries	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308
R squared	0.323	0.321	0.313	0.319	0.315	0.309	0.115	0.142	0.119
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.43) All Middle-Income Countries: Financing the Education Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.006	0.011***	0.002	0.009*	0.015***	0.003	0.020***	0.023***	0.004
	(0.004)	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.004)	(0.003)	(0.007)
Rest	-0.006***	0.002***	-0.010***	-0.007**	0.002***	-0.013***	-0.004**	0.006***	-0.021***
	(0.002)	(0.000)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.006)
TE	0.005***	0.004***	0.005***	0.005***	0.004**	0.005**	0.006	0.007*	0.007**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.003)
PD	0.002**	0.002**	0.001**	0.002***	0.002***	0.002**	-0.001***	-0.000*	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-2.010***	-2.425***	-2.402***	-1.719***	-2.162***	-2.172***	2.359*	1.789	1.926
	(0.182)	(0.199)	(0.186)	(0.380)	(0.250)	(0.412)	(1.067)	(1.022)	(1.208)
Log(GDPPC)^2	0.135***	0.161***	0.160***	0.123***	0.150***	0.153***	-0.141**	-0.107*	-0.112
	(0.011)	(0.015)	(0.011)	(0.018)	(0.012)	(0.019)	(0.059)	(0.056)	(0.065)
Unemployment	-0.020***	-0.021***	-0.022***	-0.021***	-0.022***	-0.022***	-0.014	-0.013	-0.014
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.008)	(0.008)	(0.009)
Inflation	0.003**	0.003**	0.003**	0.001	0.002	0.002	0.001	0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	0.217	0.436**	0.526***	0.359*	0.613***	0.698***	0.570*	0.512	0.775**
	(0.170)	(0.142)	(0.146)	(0.195)	(0.178)	(0.175)	(0.279)	(0.329)	(0.283)
GFC	-0.136***	-0.158***	-0.176***	-0.123***	-0.149***	-0.169***	-0.125**	-0.124***	-0.167***
	(0.020)	(0.015)	(0.018)	(0.027)	(0.020)	(0.022)	(0.045)	(0.037)	(0.041)
PS	0.037	0.048	0.038	0.025	0.037*	0.024*	-0.013	-0.006	-0.027
	(0.029)	(0.029)	(0.025)	(0.018)	(0.020)	(0.013)	(0.039)	(0.039)	(0.054)
Countries	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308
R squared	0.337	0.327	0.328	0.335	0.325	0.328	0.146	0.153	0.153
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.44) All Middle-Income Countries: Financing the Agricultural Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	-0.017**	-0.010*	-0.017***	-0.020**	-0.012**	-0.021***	-0.012*	-0.009**	-0.023***
	(0.006)	(0.005)	(0.005)	(0.007)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)
Rest	-0.006**	0.005***	-0.009**	-0.007**	0.005***	-0.011***	-0.005*	0.010***	-0.019***
	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.002)	(0.001)	(0.004)
TE	0.002**	0.004***	0.002	0.002	0.004**	0.002	0.001	0.006	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)
PD	0.002***	0.002***	0.002**	0.003***	0.003***	0.002***	-0.000	0.000	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-2.383***	-2.505***	-2.883***	-2.254***	-2.371***	-2.832***	1.137	1.427	0.591
	(0.307)	(0.198)	(0.274)	(0.577)	(0.416)	(0.480)	(1.232)	(1.110)	(1.219)
Log(GDPPC)^2	0.160***	0.168***	0.191***	0.158***	0.166***	0.195***	-0.064	-0.082	-0.029
	(0.016)	(0.011)	(0.015)	(0.031)	(0.020)	(0.024)	(0.069)	(0.060)	(0.066)
Unemployment	-0.019***	-0.019***	-0.021***	-0.019***	-0.019***	-0.021***	-0.012	-0.010	-0.013
	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.008)	(0.008)	(0.009)
Inflation	0.002*	0.003**	0.002*	0.001	0.001	0.001	0.000	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Tax	0.336*	0.468**	0.641***	0.505**	0.637***	0.841***	0.705**	0.521	0.906***
	(0.178)	(0.146)	(0.147)	(0.200)	(0.183)	(0.179)	(0.263)	(0.311)	(0.274)
GFC	-0.149***	-0.155***	-0.191***	-0.141***	-0.146***	-0.189***	-0.157**	-0.121**	-0.201***
	(0.023)	(0.015)	(0.019)	(0.032)	(0.021)	(0.023)	(0.051)	(0.040)	(0.043)
PS	0.056*	0.060*	0.058*	0.049**	0.053**	0.050**	0.021	0.013	0.009
	(0.027)	(0.027)	(0.027)	(0.016)	(0.016)	(0.016)	(0.042)	(0.042)	(0.050)
Countries	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308
R squared	0.326	0.326	0.315	0.319	0.321	0.310	0.112	0.147	0.116
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.45) Upper Middle-Income Countries: Financing the Social Protection Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.007*	0.001	-0.014***	-0.009*	-0.000	-0.017***	-0.002	0.008	-0.024***
	(0.003)	(0.002)	(0.002)	(0.005)	(0.003)	(0.002)	(0.006)	(0.006)	(0.006)
Rest	-0.007***	0.009***	-0.012***	-0.008**	0.011***	-0.012***	-0.006***	0.014***	-0.026***
	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
TE	0.006**	0.010***	0.006***	0.006**	0.010***	0.005***	0.006	0.013**	0.007
	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.005)	(0.005)	(0.004)
PD	0.003***	0.003***	0.003***	0.004***	0.004***	0.004***	0.000	0.001**	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	14.601***	15.463***	12.885***	20.655***	22.009***	18.847***	21.737***	24.808***	21.078***
	(1.199)	(1.271)	(1.438)	(1.372)	(1.425)	(1.753)	(1.564)	(1.253)	(1.411)
Log(GDPPC)^2	-0.820***	-0.870***	-0.721***	-1.156***	-1.234***	-1.052***	-1.248***	-1.424***	-1.208***
	(0.070)	(0.076)	(0.086)	(0.080)	(0.084)	(0.104)	(0.092)	(0.076)	(0.085)
Unemployment	-0.032***	-0.035***	-0.038***	-0.024**	-0.027***	-0.030***	0.001	-0.001	-0.006
	(0.008)	(0.007)	(0.007)	(0.009)	(0.007)	(0.008)	(0.012)	(0.011)	(0.012)
Inflation	0.002**	0.002**	0.002**	0.000	0.001	0.001	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	1.032***	0.727***	1.616***	1.684***	1.244***	2.302***	2.346***	1.470***	2.936***
	(0.219)	(0.213)	(0.244)	(0.290)	(0.270)	(0.360)	(0.491)	(0.387)	(0.556)
GFC	-0.213***	-0.213***	-0.277***	-0.225***	-0.218***	-0.292***	-0.256***	-0.223***	-0.339***
	(0.014)	(0.010)	(0.012)	(0.022)	(0.016)	(0.015)	(0.050)	(0.053)	(0.054)
PS	0.179**	0.157**	0.182**	0.157***	0.128**	0.160**	-0.020	-0.068	-0.039
	(0.059)	(0.063)	(0.065)	(0.046)	(0.047)	(0.051)	(0.085)	(0.075)	(0.082)
Countries	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180
R squared	0.463	0.493	0.447	0.462	0.500	0.447	0.171	0.229	0.179
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.46) Upper Middle-Income Countries: Financing the Health Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.001	-0.002	-0.011**	0.004	0.003	-0.007	0.019**	0.016**	-0.005
	(0.007)	(0.006)	(0.005)	(0.008)	(0.007)	(0.004)	(0.006)	(0.006)	(0.005)
Rest	-0.007***	0.008***	-0.012***	-0.009**	0.008***	-0.014***	-0.006**	0.012***	-0.026***
	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.005)
TE	0.007**	0.009***	0.006***	0.007**	0.010***	0.006***	0.007	0.013**	0.008
	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	(0.005)	(0.005)
PD	0.003***	0.003***	0.003***	0.005***	0.004***	0.004***	0.001	0.001*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	13.683***	17.232***	13.048***	19.440***	23.032***	18.630***	17.680***	24.279***	17.821***
	(1.007)	(0.971)	(1.231)	(1.206)	(1.241)	(1.637)	(1.215)	(1.787)	(1.795)
Log(GDPPC)^2	-0.767***	-0.971***	-0.730***	-1.086***	-1.292***	-1.039***	-1.015***	-1.393***	-1.021***
	(0.059)	(0.057)	(0.074)	(0.071)	(0.072)	(0.098)	(0.071)	(0.105)	(0.107)
Unemployment	-0.033***	-0.035***	-0.038***	-0.024**	-0.027***	-0.031***	-0.000	-0.001	-0.007
	(0.008)	(0.007)	(0.007)	(0.009)	(0.007)	(0.008)	(0.012)	(0.011)	(0.012)
Inflation	0.002**	0.002***	0.003**	0.001	0.001	0.001	0.000	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	1.046***	0.799**	1.617***	1.634***	1.446***	2.319***	2.447***	1.668***	3.012***
	(0.204)	(0.274)	(0.246)	(0.265)	(0.341)	(0.360)	(0.396)	(0.485)	(0.532)
GFC	0.000	-0.077***	-0.089***	0.018	-0.087***	-0.101***	-0.060*	-0.270***	-0.297***
	(0.011)	(0.007)	(0.013)	(0.015)	(0.007)	(0.012)	(0.030)	(0.027)	(0.029)
PS	0.181**	0.170**	0.186**	0.163***	0.154***	0.170***	-0.012	-0.047	-0.030
	(0.060)	(0.058)	(0.064)	(0.048)	(0.045)	(0.051)	(0.068)	(0.058)	(0.067)
Countries	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180
R squared	0.465	0.477	0.446	0.467	0.471	0.443	0.182	0.223	0.188
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.47) Upper Middle-Income Countries: Financing the Education Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.007*	0.012***	0.000	0.010**	0.016***	0.002	0.027***	0.028***	0.002
	(0.003)	(0.002)	(0.002)	(0.004)	(0.002)	(0.003)	(0.005)	(0.002)	(0.007)
Rest	-0.007***	0.005***	-0.016***	-0.008**	0.005***	-0.018***	-0.004*	0.008***	-0.033***
	(0.002)	(0.000)	(0.003)	(0.003)	(0.001)	(0.004)	(0.002)	(0.002)	(0.008)
TE	0.008***	0.010***	0.009***	0.009***	0.010***	0.010***	0.010*	0.013**	0.013**
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.005)	(0.005)	(0.005)
PD	0.003***	0.003***	0.003***	0.004***	0.004***	0.004***	-0.000	0.000	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	14.885***	15.101***	13.960***	21.498***	21.437***	20.429***	21.674***	23.645***	22.260***
	(1.133)	(1.316)	(1.251)	(1.219)	(1.495)	(1.402)	(1.294)	(1.266)	(1.467)
Log(GDPPC)^2	-0.841***	-0.851***	-0.787***	-1.210***	-1.205***	-1.148***	-1.255***	-1.364***	-1.286***
	(0.067)	(0.079)	(0.075)	(0.071)	(0.088)	(0.083)	(0.071)	(0.075)	(0.075)
Unemployment	-0.035***	-0.037***	-0.041***	-0.027***	-0.030***	-0.034***	-0.006	-0.005	-0.013
	(0.007)	(0.006)	(0.006)	(0.008)	(0.007)	(0.006)	(0.012)	(0.011)	(0.011)
Inflation	0.002***	0.003***	0.003***	0.000	0.001*	0.001	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	0.824***	0.945***	1.350***	1.358***	1.554***	1.965***	1.971***	1.708***	2.372***
	(0.249)	(0.215)	(0.252)	(0.337)	(0.296)	(0.358)	(0.484)	(0.449)	(0.533)
GFC	-0.053***	-0.075***	-0.100***	-0.063**	-0.089***	-0.117***	-0.269***	-0.280***	-0.330***
	(0.015)	(0.009)	(0.013)	(0.020)	(0.010)	(0.011)	(0.037)	(0.031)	(0.032)
PS	0.172**	0.181**	0.171**	0.149***	0.162**	0.149***	-0.038	-0.045	-0.072
	(0.060)	(0.064)	(0.062)	(0.044)	(0.050)	(0.046)	(0.067)	(0.057)	(0.073)
Countries	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180
R squared	0.487	0.478	0.476	0.492	0.478	0.480	0.227	0.239	0.247
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.48) Upper Middle-Income Countries: Financing the Agricultural Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.006	0.013*	0.000	0.012	0.020**	0.006	0.022***	0.026***	0.001
	(0.006)	(0.006)	(0.005)	(0.007)	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)
Rest	-0.007**	0.007***	-0.012***	-0.008**	0.007***	-0.014***	-0.005	0.012***	-0.025***
	(0.002)	(0.000)	(0.002)	(0.003)	(0.000)	(0.001)	(0.003)	(0.002)	(0.004)
TE	0.006**	0.009***	0.006***	0.007**	0.010***	0.006***	0.006	0.013**	0.007
	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.005)	(0.005)	(0.004)
PD	0.003***	0.003***	0.003***	0.004***	0.004***	0.004***	-0.000	0.001**	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	15.629***	16.031***	14.352***	22.765***	23.120***	21.264***	23.117***	25.992***	22.996***
	(1.065)	(1.579)	(1.534)	(1.184)	(1.853)	(1.823)	(1.102)	(1.420)	(1.024)
Log(GDPPC)^2	-0.878***	-0.901***	-0.804***	-1.276***	-1.296***	-1.189***	-1.327***	-1.491***	-1.317***
	(0.063)	(0.093)	(0.091)	(0.069)	(0.107)	(0.107)	(0.064)	(0.084)	(0.063)
Unemployment	-0.033***	-0.036***	-0.039***	-0.025**	-0.028***	-0.032***	-0.002	-0.002	-0.008
	(0.008)	(0.006)	(0.007)	(0.009)	(0.007)	(0.008)	(0.014)	(0.011)	(0.013)
Inflation	0.002**	0.003***	0.003**	0.001	0.001	0.001	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	0.907***	0.862***	1.472***	1.424***	1.400***	2.076***	2.179***	1.504***	2.648***
	(0.245)	(0.248)	(0.259)	(0.312)	(0.316)	(0.362)	(0.424)	(0.422)	(0.489)
GFC	-0.222***	-0.232***	-0.286***	-0.235***	-0.247***	-0.308***	-0.280***	-0.245***	-0.350***
	(0.014)	(0.007)	(0.010)	(0.021)	(0.008)	(0.011)	(0.053)	(0.042)	(0.048)
PS	0.170**	0.176**	0.177**	0.145**	0.152**	0.153**	-0.040	-0.058	-0.059
	(0.063)	(0.066)	(0.067)	(0.049)	(0.053)	(0.054)	(0.077)	(0.058)	(0.072)
Countries	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180
R squared	0.466	0.474	0.448	0.467	0.472	0.447	0.174	0.224	0.183
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.49) Lower Middle-Income Countries: Financing the Social Protection Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.003	-0.001	-0.010*	0.001	-0.001	-0.017**	0.001	0.002	-0.023**
	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.007)	(0.002)	(0.002)	(0.009)
Rest	0.004	-0.004***	-0.009*	0.002	-0.004**	-0.016**	-0.002	-0.005***	-0.025**
	(0.002)	(0.001)	(0.005)	(0.002)	(0.001)	(0.006)	(0.002)	(0.001)	(0.008)
TE	0.001	-0.001	0.003	0.001	-0.000	0.005	0.003	-0.000	0.007*
	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)	(0.003)
PD	0.005***	0.005***	0.005***	0.006***	0.007***	0.007***	0.008***	0.008***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	-20.633***	-20.987***	-20.751***	-24.940***	-25.303***	-25.298***	-23.821***	-24.487***	-24.514***
	(2.674)	(2.903)	(2.741)	(2.649)	(2.824)	(2.439)	(2.301)	(2.122)	(1.733)
Log(GDPPC)^2	1.491***	1.515***	1.495***	1.799***	1.824***	1.818***	1.713***	1.762***	1.756***
	(0.180)	(0.197)	(0.184)	(0.179)	(0.193)	(0.164)	(0.159)	(0.149)	(0.120)
Unemployment	0.007	0.007	0.008	0.000	-0.000	0.001	-0.013	-0.015	-0.012
	(0.009)	(0.010)	(0.010)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)
Inflation	0.006***	0.006***	0.006***	0.006***	0.006**	0.006**	0.007**	0.005**	0.005**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-0.863***	-0.904***	-1.067***	-1.264***	-1.259***	-1.497***	-1.728***	-1.603***	-1.962***
	(0.187)	(0.194)	(0.239)	(0.262)	(0.245)	(0.282)	(0.362)	(0.303)	(0.295)
GFC	0.006	0.015	0.177***	0.061*	0.070**	0.248***	0.137***	0.153***	0.284***
	(0.021)	(0.021)	(0.012)	(0.028)	(0.029)	(0.014)	(0.038)	(0.035)	(0.024)
PS	-0.072**	-0.064**	-0.081**	-0.107***	-0.100**	-0.125**	-0.117**	-0.110**	-0.147**
	(0.023)	(0.023)	(0.026)	(0.032)	(0.033)	(0.042)	(0.038)	(0.037)	(0.057)
Countries	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128
R squared	0.474	0.477	0.475	0.517	0.520	0.523	0.456	0.461	0.468
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.410) Lower Middle-Income Countries: Financing the Health Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	0.007*	0.004**	-0.006	0.006	0.005**	-0.012*	-0.006*	-0.004**	-0.031***
	(0.004)	(0.001)	(0.005)	(0.004)	(0.002)	(0.006)	(0.003)	(0.001)	(0.009)
Rest	0.004	-0.004**	-0.009	0.002	-0.004***	-0.015**	-0.002	-0.002	-0.025***
	(0.002)	(0.001)	(0.005)	(0.002)	(0.001)	(0.006)	(0.002)	(0.002)	(0.008)
TE	0.001	-0.000	0.003	0.002	0.000	0.005	0.003	0.002	0.008*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
PD	0.005***	0.005***	0.005***	0.006***	0.007***	0.007***	0.008***	0.008***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Log(GDPPC)	-20.892***	-21.684***	-20.955***	-25.242***	-26.073***	-25.523***	-23.531***	-24.058***	-24.144***
	(2.582)	(2.175)	(2.636)	(2.505)	(2.048)	(2.294)	(2.301)	(1.801)	(1.721)
$Log(GDPPC)^2$	1.509***	1.563***	1.509***	1.819***	1.878***	1.834***	1.693***	1.732***	1.731***
	(0.175)	(0.147)	(0.177)	(0.170)	(0.140)	(0.154)	(0.160)	(0.126)	(0.119)
Unemployment	0.008	0.007	0.009	0.002	0.001	0.002	-0.015	-0.016	-0.014
	(0.008)	(0.008)	(0.009)	(0.011)	(0.010)	(0.011)	(0.013)	(0.013)	(0.013)
Inflation	0.007***	0.007***	0.006***	0.007***	0.007***	0.006***	0.006**	0.006**	0.005*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-0.770***	-0.816***	-0.981***	-1.161***	-1.149***	-1.393***	-1.859***	-1.779***	-2.114***
	(0.229)	(0.247)	(0.273)	(0.323)	(0.334)	(0.329)	(0.361)	(0.378)	(0.307)
GFC	-0.002	-0.006	0.014	0.051	0.049	0.083**	0.146***	0.146***	0.200***
	(0.021)	(0.027)	(0.025)	(0.029)	(0.033)	(0.028)	(0.039)	(0.040)	(0.034)
PS	-0.066***	-0.069***	-0.075***	-0.100***	-0.104***	-0.117***	-0.129***	-0.131***	-0.157**
	(0.017)	(0.013)	(0.020)	(0.025)	(0.018)	(0.035)	(0.035)	(0.031)	(0.055)
Countries	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128
R squared	0.474	0.480	0.475	0.518	0.523	0.523	0.456	0.457	0.468
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.411) Lower Middle-Income Countries: Financing the Education Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.008	-0.011**	-0.025**	-0.012**	-0.014***	-0.036***	-0.021***	-0.022***	-0.056***
	(0.005)	(0.004)	(0.009)	(0.005)	(0.004)	(0.009)	(0.003)	(0.002)	(0.009)
Rest	0.004**	-0.001	-0.012*	0.002	-0.000	-0.020***	-0.000	0.001	-0.031***
	(0.002)	(0.001)	(0.005)	(0.002)	(0.001)	(0.006)	(0.003)	(0.001)	(0.007)
TE	-0.001	-0.001	0.001	-0.001	-0.001	0.002	-0.001	-0.001	0.004
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)
PD	0.006***	0.006***	0.006***	0.008***	0.008***	0.009***	0.010***	0.010***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Log(GDPPC)	-23.159***	-22.749***	-23.602***	-28.011***	-27.849***	-28.956***	-28.406***	-28.666***	-30.063***
	(3.202)	(3.426)	(3.343)	(3.196)	(3.339)	(3.149)	(1.732)	(1.796)	(1.394)
$Log(GDPPC)^2$	1.654***	1.625***	1.677***	1.996***	1.984***	2.053***	2.009***	2.025***	2.112***
	(0.215)	(0.228)	(0.222)	(0.215)	(0.223)	(0.209)	(0.124)	(0.126)	(0.097)
Unemployment	0.007	0.007	0.009	0.001	0.001	0.002	-0.014	-0.013	-0.012
	(0.008)	(0.009)	(0.009)	(0.010)	(0.011)	(0.010)	(0.012)	(0.012)	(0.012)
Inflation	0.006***	0.006***	0.005***	0.006**	0.006***	0.005**	0.006**	0.006**	0.004*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-0.955***	-1.062***	-1.218***	-1.381***	-1.440***	-1.686***	-1.974***	-1.970***	-2.345***
	(0.154)	(0.200)	(0.222)	(0.208)	(0.265)	(0.259)	(0.236)	(0.288)	(0.227)
GFC	0.176***	0.175***	0.186***	0.272***	0.270***	0.295***	0.364***	0.359***	0.405***
	(0.013)	(0.011)	(0.014)	(0.017)	(0.016)	(0.014)	(0.026)	(0.027)	(0.022)
PS	-0.051**	-0.056**	-0.062**	-0.082***	-0.084**	-0.099**	-0.095***	-0.090***	-0.121**
	(0.017)	(0.018)	(0.020)	(0.025)	(0.026)	(0.035)	(0.025)	(0.028)	(0.045)
Countries	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128
R squared	0.481	0.480	0.484	0.525	0.525	0.533	0.472	0.472	0.489
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity.

Table (A.412) Lower Middle-Income Countries: Financing the Agricultural Sector - 20th, 40th and 80th Percentiles

	20th Percentile			40th Percentile			80th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	-0.023***	-0.023***	-0.029***	-0.032***	-0.028***	-0.039***	-0.040***	-0.032***	-0.050***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.003)	(0.007)
Rest	0.000	-0.001	-0.006	-0.002	-0.000	-0.012*	-0.006***	0.000	-0.021**
	(0.001)	(0.001)	(0.006)	(0.002)	(0.001)	(0.007)	(0.002)	(0.001)	(0.008)
TE	0.001	0.000	0.002	0.001	0.000	0.003	0.002	0.002	0.006
	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)
PD	0.005***	0.005***	0.005***	0.007***	0.007***	0.007***	0.008***	0.008***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-19.839***	-19.984***	-20.003***	-23.951***	-24.110***	-24.418***	-22.708***	-22.954***	-23.579***
	(2.916)	(2.800)	(2.938)	(2.923)	(2.738)	(2.648)	(2.415)	(1.959)	(1.768)
Log(GDPPC)^2	1.446***	1.456***	1.455***	1.742***	1.754***	1.772***	1.651***	1.671***	1.707***
	(0.197)	(0.189)	(0.197)	(0.198)	(0.186)	(0.179)	(0.168)	(0.138)	(0.124)
Unemployment	0.011	0.010	0.011	0.005	0.005	0.006	-0.009	-0.010	-0.009
	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)	(0.013)	(0.014)	(0.013)
Inflation	0.006***	0.006***	0.006***	0.007***	0.006***	0.006***	0.007**	0.006**	0.005**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-0.827***	-0.852***	-0.906**	-1.224***	-1.163***	-1.301***	-1.749***	-1.586***	-1.831***
	(0.241)	(0.228)	(0.287)	(0.340)	(0.320)	(0.337)	(0.459)	(0.412)	(0.360)
GFC	0.059***	0.216***	0.069***	0.127***	0.322***	0.147***	0.212***	0.418***	0.246***
	(0.013)	(0.009)	(0.016)	(0.020)	(0.015)	(0.019)	(0.030)	(0.020)	(0.026)
PS	-0.070***	-0.072***	-0.076***	-0.106***	-0.106***	-0.118***	-0.129***	-0.129***	-0.151**
	(0.019)	(0.019)	(0.019)	(0.027)	(0.027)	(0.034)	(0.032)	(0.033)	(0.047)
Countries	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128
R squared	0.489	0.489	0.490	0.535	0.535	0.538	0.477	0.475	0.484
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity

A.5 Robustness Check 3: Inclusion of Trade Openness, Corruption and Party Orientation

Table (A.51) All Middle-Income Countries: Financing the Social Protection Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.154***	0.009	0.158**	-0.009***	-0.002*	-0.010**	-0.010**	-0.002	-0.013***	0.013***	0.016***	-0.011
	(0.046)	(0.020)	(0.057)	(0.002)	(0.001)	(0.004)	(0.004)	(0.001)	(0.004)	(0.002)	(0.004)	(0.007)
Rest	0.147***	-0.153***	0.109	-0.007***	0.008***	-0.006	-0.009**	0.010***	-0.009*	-0.002	0.007***	-0.025***
	(0.040)	(0.011)	(0.071)	(0.002)	(0.001)	(0.004)	(0.003)	(0.001)	(0.004)	(0.002)	(0.002)	(0.007)
TE	-0.042*	-0.101***	-0.027	0.003**	0.006***	0.002	0.001	0.006***	0.001	-0.001	0.002	0.001
	(0.019)	(0.021)	(0.029)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.004)	(0.004)
PD	-0.035***	-0.035***	-0.028***	0.003***	0.003***	0.002***	0.003***	0.003***	0.002***	-0.003***	-0.003***	-0.003***
	(0.007)	(0.010)	(0.008)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Log(GDPPC)	53.790***	54.701***	57.172***	-3.637***	-3.680***	-3.808***	-3.434***	-3.468***	-3.637***	4.859***	4.911***	4.749***
	(9.680)	(8.892)	(9.958)	(0.591)	(0.546)	(0.599)	(0.458)	(0.440)	(0.436)	(0.677)	(0.792)	(0.920)
Log(GDPPC)^2	-3.217***	-3.252***	-3.486***	0.214***	0.215***	0.227***	0.213***	0.213***	0.229***	-0.283***	-0.288***	-0.271***
	(0.566)	(0.530)	(0.584)	(0.035)	(0.033)	(0.035)	(0.027)	(0.025)	(0.026)	(0.041)	(0.046)	(0.054)
Unemployment	0.419***	0.438***	0.439***	-0.023***	-0.024***	-0.024***	-0.025***	-0.026***	-0.026***	-0.004	-0.004	-0.003
	(0.053)	(0.052)	(0.045)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.010)	(0.010)	(0.011)
Inflation	-0.014	-0.027	-0.025	0.002*	0.003**	0.003**	-0.002	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.020)	(0.019)	(0.024)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Tax	-0.851	-0.396	-9.146**	0.118	0.087	0.531**	0.198	0.095	0.678**	0.477*	0.210	0.576*
	(4.196)	(3.273)	(3.480)	(0.257)	(0.184)	(0.227)	(0.228)	(0.227)	(0.210)	(0.252)	(0.272)	(0.289)
GFC	3.482***	2.993***	4.071***	-0.200***	-0.149***	-0.230***	-0.203***	-0.191***	-0.238***	-0.083**	-0.083*	-0.100**
	(0.276)	(0.348)	(0.350)	(0.018)	(0.023)	(0.023)	(0.015)	(0.021)	(0.015)	(0.034)	(0.038)	(0.038)
PS	-0.891***	-0.509*	-0.952**	0.069**	0.050*	0.071**	0.038***	0.011	0.039***	0.045	0.024	0.025
	(0.253)	(0.271)	(0.296)	(0.023)	(0.026)	(0.026)	(0.011)	(0.010)	(0.008)	(0.097)	(0.093)	(0.107)
Log(TO)	-8.934**	-9.033***	-7.381**	0.402**	0.408**	0.322	0.548***	0.566***	0.452***	-0.147	-0.104	-0.222*
	(2.869)	(2.558)	(3.094)	(0.171)	(0.153)	(0.186)	(0.133)	(0.112)	(0.137)	(0.119)	(0.125)	(0.100)
Corruption	-0.931	-1.171	-0.596	0.073	0.085	0.055	0.095	0.113	0.073	-0.614*	-0.598*	-0.650*
	(1.776)	(1.557)	(1.942)	(0.068)	(0.057)	(0.077)	(0.153)	(0.138)	(0.159)	(0.305)	(0.287)	(0.293)
PO	-0.250	-0.292	-0.231	0.029**	0.031**	0.028**	0.003	0.006	0.002	-0.094***	-0.091***	-0.090***
	(0.200)	(0.203)	(0.177)	(0.011)	(0.011)	(0.010)	(0.015)	(0.015)	(0.014)	(0.009)	(0.008)	(0.006)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.323	0.342	0.302	0.307	0.324	0.291	0.319	0.343	0.306	0.118	0.125	0.127
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO),Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation

Table (A.52) All Middle-Income Countries: Financing the Health Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	0.036	-0.046	0.051	-0.003	0.001	-0.005	0.002	0.007	-0.002	0.002	-0.002	-0.021**
	(0.112)	(0.075)	(0.064)	(0.005)	(0.003)	(0.003)	(0.008)	(0.005)	(0.004)	(0.003)	(0.005)	(0.006)
Rest	0.155***	-0.105***	0.121*	-0.008***	0.005***	-0.007*	-0.010***	0.006***	-0.010**	0.002*	0.011***	-0.022***
	(0.034)	(0.014)	(0.058)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.004)	(0.001)	(0.002)	(0.006)
TE	-0.051**	-0.082***	-0.037	0.003***	0.005***	0.003*	0.002*	0.004**	0.002	-0.003	0.003	-0.000
	(0.018)	(0.020)	(0.028)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.004)	(0.004)
PD	-0.038***	-0.032***	-0.029***	0.003***	0.002***	0.002***	0.003***	0.003***	0.002***	-0.003***	-0.003***	-0.003***
	(0.008)	(0.008)	(0.008)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Log(GDPPC)	56.936***	57.684***	60.562***	-3.790***	-3.837***	-3.979***	-3.756***	-3.810***	-3.985***	5.175***	5.504***	5.185***
	(10.713)	(11.241)	(11.667)	(0.628)	(0.665)	(0.676)	(0.570)	(0.567)	(0.566)	(0.782)	(1.038)	(1.036)
Log(GDPPC)^2	-3.401***	-3.458***	-3.694***	0.223***	0.226***	0.238***	0.232***	0.236***	0.251***	-0.301***	-0.326***	-0.298***
	(0.627)	(0.653)	(0.684)	(0.037)	(0.039)	(0.040)	(0.033)	(0.033)	(0.034)	(0.046)	(0.060)	(0.059)
Unemployment	0.418***	0.429***	0.435***	-0.023***	-0.024***	-0.024***	-0.025***	-0.025***	-0.026***	-0.006	-0.004	-0.005
	(0.057)	(0.049)	(0.046)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.010)	(0.009)	(0.011)
Inflation	-0.019	-0.025	-0.029	0.003**	0.003**	0.003*	-0.001	-0.001	-0.000	-0.002	-0.002**	-0.002
	(0.020)	(0.021)	(0.025)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Tax	-1.944	-2.809	-10.237**	0.147	0.215	0.574*	0.285	0.362	0.800**	0.673*	-0.238	0.536
	(4.605)	(5.215)	(4.406)	(0.281)	(0.317)	(0.281)	(0.264)	(0.290)	(0.267)	(0.300)	(0.342)	(0.341)
GFC	3.058***	3.351***	3.790***	-0.153***	-0.169***	-0.191***	-0.196***	-0.215***	-0.242***	-0.117***	-0.069	-0.121**
	(0.279)	(0.333)	(0.341)	(0.019)	(0.022)	(0.022)	(0.019)	(0.017)	(0.017)	(0.036)	(0.038)	(0.039)
PS	-0.921**	-0.940***	-1.063***	0.072**	0.074***	0.079**	0.043***	0.044***	0.049***	0.021	-0.008	-0.004
	(0.299)	(0.239)	(0.311)	(0.024)	(0.020)	(0.025)	(0.009)	(0.012)	(0.008)	(0.086)	(0.091)	(0.092)
Log(TO)	-8.979***	-8.292**	-7.219**	0.404**	0.366*	0.311	0.552***	0.507***	0.438**	-0.152	-0.045	-0.178
	(2.732)	(2.853)	(3.066)	(0.165)	(0.174)	(0.188)	(0.122)	(0.128)	(0.135)	(0.116)	(0.139)	(0.111)
Corruption	-1.118	-1.206	-0.774	0.083	0.087	0.064	0.115	0.120	0.091	-0.646*	-0.615**	-0.673**
	(1.764)	(1.690)	(1.967)	(0.067)	(0.064)	(0.077)	(0.153)	(0.151)	(0.162)	(0.311)	(0.269)	(0.295)
PO	-0.261	-0.263	-0.239	0.030**	0.030***	0.029**	0.004	0.004	0.003	-0.095***	-0.090***	-0.090***
	(0.196)	(0.172)	(0.171)	(0.010)	(0.009)	(0.009)	(0.014)	(0.013)	(0.013)	(0.007)	(0.007)	(0.005)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.326	0.321	0.301	0.308	0.302	0.287	0.324	0.318	0.304	0.097	0.121	0.103
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO),Corruption and PO respectively represent the log of Trade Openness, Controlof Corruption and the party orientation of the incumbent government.

Table (A.53) All Middle-Income Countries: Financing the Education Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.102	-0.229***	-0.118***	0.005	0.012***	0.005***	0.010*	0.018***	0.008**	0.024***	0.019***	-0.001
	(0.068)	(0.037)	(0.034)	(0.004)	(0.003)	(0.001)	(0.004)	(0.002)	(0.003)	(0.003)	(0.004)	(0.008)
Rest	0.148***	-0.067***	0.137***	-0.008***	0.003***	-0.008***	-0.009**	0.003***	-0.011***	0.002	0.007**	-0.023***
	(0.035)	(0.009)	(0.034)	(0.001)	(0.000)	(0.002)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.007)
TE	-0.092***	-0.093***	-0.084***	0.005***	0.005***	0.005***	0.005***	0.005***	0.005**	0.001	0.004	0.004
	(0.022)	(0.023)	(0.026)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.004)	(0.003)
PD	-0.031***	-0.029***	-0.024**	0.002***	0.002***	0.002***	0.002***	0.002***	0.002**	-0.003***	-0.003***	-0.003***
	(0.008)	(0.008)	(0.009)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	41.347***	50.823***	45.863***	-3.004***	-3.446***	-3.239***	-2.528***	-3.060***	-2.804***	6.253***	5.768***	6.314***
	(8.833)	(10.987)	(9.024)	(0.619)	(0.732)	(0.611)	(0.336)	(0.433)	(0.320)	(0.830)	(1.011)	(1.126)
Log(GDPPC)^2	-2.425***	-3.031***	-2.770***	0.173***	0.202***	0.191***	0.155***	0.189***	0.177***	-0.370***	-0.343***	-0.370***
	(0.521)	(0.663)	(0.541)	(0.037)	(0.044)	(0.037)	(0.019)	(0.027)	(0.019)	(0.049)	(0.058)	(0.064)
Unemployment	0.427***	0.439***	0.443***	-0.024***	-0.024***	-0.024***	-0.025***	-0.026***	-0.026***	-0.006	-0.005	-0.005
	(0.054)	(0.049)	(0.048)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.010)	(0.009)	(0.011)
Inflation	-0.022	-0.032	-0.034	0.003**	0.003**	0.003**	-0.001	-0.000	-0.000	-0.001	-0.001*	-0.001
	(0.017)	(0.020)	(0.022)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	0.068	-5.145	-8.426*	0.055	0.361	0.496*	0.111	0.459*	0.626**	0.603*	0.096	0.451
	(4.221)	(3.968)	(3.978)	(0.254)	(0.258)	(0.261)	(0.240)	(0.235)	(0.223)	(0.302)	(0.396)	(0.315)
GFC	2.888***	3.273***	3.550***	-0.142***	-0.165***	-0.177***	-0.185***	-0.211***	-0.227***	-0.091**	-0.060	-0.095**
	(0.357)	(0.369)	(0.382)	(0.021)	(0.024)	(0.025)	(0.026)	(0.020)	(0.021)	(0.035)	(0.036)	(0.039)
PS	-0.567*	-0.812**	-0.687**	0.054*	0.067**	0.059**	0.016	0.031***	0.020*	-0.008	-0.013	-0.035
	(0.278)	(0.269)	(0.243)	(0.026)	(0.025)	(0.023)	(0.009)	(0.007)	(0.010)	(0.083)	(0.085)	(0.095)
Log(TO)	-9.084**	-8.095**	-7.352**	0.410**	0.354*	0.318	0.559***	0.495***	0.449***	-0.139	-0.068	-0.167
	(2.799)	(2.806)	(3.046)	(0.167)	(0.173)	(0.186)	(0.129)	(0.126)	(0.136)	(0.121)	(0.146)	(0.114)
Corruption	-1.368	-1.399	-1.083	0.098	0.099	0.082	0.131	0.131	0.110	-0.609*	-0.593*	-0.638**
	(1.578)	(1.679)	(1.722)	(0.056)	(0.062)	(0.063)	(0.140)	(0.148)	(0.145)	(0.294)	(0.273)	(0.274)
PO	-0.242	-0.242	-0.229	0.029**	0.028***	0.028***	0.003	0.002	0.002	-0.096***	-0.091***	-0.091***
	(0.179)	(0.161)	(0.159)	(0.009)	(0.009)	(0.009)	(0.013)	(0.012)	(0.012)	(0.008)	(0.008)	(0.005)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.345	0.327	0.322	0.326	0.308	0.307	0.344	0.329	0.328	0.113	0.122	0.120
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.54) All Middle-Income Countries: Financing the Agricultural Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.202**	0.040	0.124	-0.010*	-0.001	-0.007	-0.016**	-0.007	-0.014*	-0.004	-0.010	-0.028**
	(0.082)	(0.088)	(0.120)	(0.005)	(0.005)	(0.007)	(0.007)	(0.005)	(0.007)	(0.007)	(0.007)	(0.009)
Rest	0.150***	-0.106***	0.121*	-0.008***	0.005***	-0.007*	-0.009**	0.007***	-0.010**	0.002*	0.011***	-0.022***
	(0.041)	(0.015)	(0.060)	(0.002)	(0.001)	(0.003)	(0.004)	(0.001)	(0.004)	(0.001)	(0.002)	(0.006)
TE	-0.043*	-0.084***	-0.033	0.003**	0.005***	0.002*	0.002	0.004***	0.001	-0.003	0.003	-0.001
	(0.019)	(0.021)	(0.028)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.004)	(0.004)
PD	-0.035***	-0.034***	-0.028***	0.003***	0.003***	0.002***	0.003***	0.003***	0.002***	-0.003***	-0.002***	-0.003***
	(0.006)	(0.008)	(0.008)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Log(GDPPC)	52.367***	54.964***	58.587***	-3.607***	-3.758***	-3.933***	-3.255***	-3.401***	-3.643***	5.363***	5.775***	5.384***
	(8.574)	(10.171)	(10.444)	(0.541)	(0.638)	(0.625)	(0.425)	(0.409)	(0.437)	(0.866)	(0.982)	(1.115)
$Log(GDPPC)^2$	-3.137***	-3.312***	-3.576***	0.212***	0.222***	0.235***	0.203***	0.213***	0.231***	-0.312***	-0.340***	-0.309***
	(0.505)	(0.612)	(0.615)	(0.032)	(0.038)	(0.036)	(0.025)	(0.025)	(0.026)	(0.050)	(0.054)	(0.063)
Unemployment	0.411***	0.412***	0.435***	-0.023***	-0.023***	-0.024***	-0.024***	-0.024***	-0.025***	-0.005	-0.002	-0.004
	(0.047)	(0.043)	(0.040)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.011)	(0.009)	(0.011)
Inflation	-0.013	-0.027	-0.025	0.002*	0.003**	0.003*	-0.002	-0.001	-0.001	-0.002	-0.002**	-0.002
	(0.020)	(0.020)	(0.025)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Tax	-1.192	-4.963	-9.337*	0.116	0.334	0.537*	0.234	0.448*	0.732**	0.727**	0.156	0.586
	(4.571)	(4.239)	(4.206)	(0.279)	(0.267)	(0.278)	(0.243)	(0.240)	(0.226)	(0.308)	(0.384)	(0.341)
GFC	3.171***	3.241***	3.853***	-0.158***	-0.164***	-0.194***	-0.205***	-0.207***	-0.248***	-0.114**	-0.052	-0.119**
	(0.308)	(0.306)	(0.352)	(0.017)	(0.020)	(0.022)	(0.025)	(0.018)	(0.019)	(0.039)	(0.040)	(0.041)
PS	-0.919***	-1.002***	-1.048***	0.072**	0.077***	0.078**	0.043***	0.047***	0.049***	0.023	0.003	-0.002
	(0.276)	(0.260)	(0.298)	(0.023)	(0.022)	(0.024)	(0.012)	(0.011)	(0.010)	(0.085)	(0.085)	(0.091)
Log(TO)	-8.843**	-7.993**	-7.228**	0.399**	0.352*	0.313	0.535***	0.485***	0.431**	-0.163	-0.093	-0.189
	(2.886)	(2.802)	(3.170)	(0.172)	(0.172)	(0.192)	(0.133)	(0.123)	(0.142)	(0.124)	(0.149)	(0.116)
Corruption	-0.955	-1.312	-0.677	0.076	0.093	0.061	0.100	0.124	0.080	-0.645*	-0.596*	-0.673*
	(1.807)	(1.784)	(1.963)	(0.069)	(0.068)	(0.077)	(0.157)	(0.157)	(0.163)	(0.315)	(0.282)	(0.298)
PO	-0.249	-0.262	-0.234	0.029**	0.030***	0.028**	0.003	0.004	0.002	-0.095***	-0.090***	-0.091***
	(0.197)	(0.166)	(0.172)	(0.010)	(0.009)	(0.009)	(0.014)	(0.012)	(0.013)	(0.007)	(0.008)	(0.005)
Countries	50	50	50	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308	308	308	308
R squared	0.323	0.322	0.300	0.307	0.302	0.287	0.319	0.321	0.302	0.097	0.122	0.103
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.55) Upper Middle-Income Countries: Financing the Social Protection Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.158**	-0.000	0.344***	-0.008**	-0.000	-0.018***	-0.011*	-0.001	-0.021***	0.019***	0.023***	-0.030***
	(0.067)	(0.046)	(0.041)	(0.003)	(0.002)	(0.004)	(0.005)	(0.003)	(0.002)	(0.003)	(0.005)	(0.007)
Rest	0.143***	-0.194***	0.276***	-0.007***	0.010***	-0.015**	-0.009**	0.013***	-0.015***	-0.000	0.009***	-0.051***
	(0.034)	(0.018)	(0.070)	(0.002)	(0.001)	(0.005)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.007)
TE	-0.103**	-0.177***	-0.104***	0.006***	0.010***	0.006***	0.006*	0.011***	0.006***	0.004	0.009	0.010*
	(0.033)	(0.033)	(0.027)	(0.002)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.006)	(0.005)	(0.005)
PD	-0.055***	-0.060***	-0.043***	0.004***	0.004***	0.003***	0.004***	0.005***	0.003***	-0.004***	-0.003***	-0.004***
	(0.004)	(0.005)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	-241.764***	-258.748***	-239.864***	9.275***	10.218***	9.208***	21.408***	22.686***	21.162***	20.961***	23.206***	26.235***
	(40.386)	(37.059)	(47.682)	(1.995)	(1.817)	(2.311)	(2.647)	(2.479)	(3.232)	(1.415)	(1.755)	(2.884)
$Log(GDPPC)^2$	13.871***	14.873***	13.689***	-0.536***	-0.592***	-0.528***	-1.207***	-1.282***	-1.189***	-1.185***	-1.316***	-1.475***
	(2.249)	(2.104)	(2.675)	(0.110)	(0.102)	(0.128)	(0.150)	(0.143)	(0.184)	(0.078)	(0.094)	(0.154)
Unemployment	0.702***	0.766***	0.796***	-0.045***	-0.049***	-0.050***	-0.023**	-0.027***	-0.028***	0.034**	0.034**	0.029**
	(0.114)	(0.104)	(0.112)	(0.006)	(0.005)	(0.006)	(0.009)	(0.008)	(0.008)	(0.012)	(0.012)	(0.012)
Inflation	-0.012	-0.013	-0.036*	0.003**	0.003**	0.004**	-0.001	-0.001	0.000	0.001	0.000	0.002
	(0.016)	(0.015)	(0.019)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-19.719***	-12.041**	-33.269***	0.792**	0.370	1.494***	1.808***	1.243***	2.608***	2.099***	1.200**	2.523***
	(5.397)	(4.707)	(6.029)	(0.285)	(0.251)	(0.303)	(0.355)	(0.304)	(0.506)	(0.532)	(0.469)	(0.618)
GFC	4.169***	4.679***	1.795***	-0.185***	-0.236***	-0.076***	-0.256***	-0.266***	-0.127***	-0.043	0.005	-0.422***
	(0.261)	(0.319)	(0.222)	(0.023)	(0.028)	(0.009)	(0.027)	(0.022)	(0.015)	(0.078)	(0.088)	(0.035)
PS	-2.739***	-2.197**	-2.693**	0.193***	0.164**	0.190***	0.129***	0.092***	0.128***	-0.077	-0.118	-0.146
	(0.810)	(0.783)	(0.891)	(0.054)	(0.054)	(0.058)	(0.039)	(0.027)	(0.034)	(0.137)	(0.136)	(0.136)
Log(TO)	-6.060**	-6.692**	-3.233	0.211	0.247	0.064	0.260*	0.311**	0.096	-1.008**	-0.898**	-1.217***
	(2.627)	(2.443)	(2.974)	(0.167)	(0.153)	(0.191)	(0.116)	(0.105)	(0.124)	(0.317)	(0.317)	(0.306)
Corruption	0.727	0.351	2.126	-0.013	0.008	-0.086	0.025	0.053	-0.054	-0.698	-0.657	-0.866**
	(1.345)	(0.897)	(1.508)	(0.058)	(0.034)	(0.069)	(0.154)	(0.119)	(0.155)	(0.402)	(0.360)	(0.341)
PO	-0.522	-0.591*	-0.760**	0.049***	0.052***	0.061***	0.009	0.013	0.023	-0.162***	-0.164***	-0.139***
	(0.315)	(0.319)	(0.270)	(0.015)	(0.015)	(0.012)	(0.025)	(0.026)	(0.024)	(0.013)	(0.014)	(0.018)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.444	0.494	0.428	0.434	0.479	0.421	0.434	0.485	0.420	0.198	0.211	0.224
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.56) Upper Middle-Income Countries: Financing the Health Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.019	-0.014	0.224**	-0.000	-0.001	-0.013**	0.006	0.006	-0.007*	0.023*	0.017**	-0.023
	(0.117)	(0.103)	(0.093)	(0.007)	(0.006)	(0.005)	(0.007)	(0.006)	(0.004)	(0.011)	(0.007)	(0.013)
Rest	0.160***	-0.152***	0.297***	-0.008***	0.008***	-0.016***	-0.011***	0.009***	-0.017***	0.005***	0.013***	-0.044***
	(0.035)	(0.016)	(0.036)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.001)	(0.003)	(0.005)
TE	-0.119**	-0.177***	-0.123***	0.007***	0.010***	0.007***	0.007**	0.011***	0.007***	0.001	0.009	0.007
	(0.038)	(0.029)	(0.026)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.006)	(0.006)	(0.005)
PD	-0.061***	-0.058***	-0.046***	0.004***	0.004***	0.004***	0.005***	0.004***	0.004***	-0.004***	-0.003***	-0.004***
	(0.005)	(0.005)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Log(GDPPC)	-221.807***	-291.263***	-241.353***	8.467***	12.211***	9.513***	19.768***	23.827***	20.804***	14.875***	21.929***	19.600***
	(29.835)	(28.366)	(42.072)	(1.375)	(1.217)	(1.934)	(2.284)	(2.238)	(2.986)	(1.532)	(2.323)	(2.087)
Log(GDPPC)^2	12.717***	16.668***	13.740***	-0.489***	-0.702***	-0.544***	-1.111***	-1.342***	-1.165***	-0.842***	-1.247***	-1.104***
	(1.692)	(1.593)	(2.376)	(0.077)	(0.067)	(0.107)	(0.132)	(0.128)	(0.172)	(0.083)	(0.125)	(0.107)
Unemployment	0.698***	0.719***	0.783***	-0.045***	-0.046***	-0.050***	-0.022**	-0.024***	-0.027***	0.027*	0.031*	0.023
	(0.119)	(0.094)	(0.108)	(0.006)	(0.005)	(0.006)	(0.009)	(0.007)	(0.007)	(0.014)	(0.014)	(0.014)
Inflation	-0.018	-0.030*	-0.048*	0.003**	0.004***	0.005***	-0.001	0.000	0.001	0.001	-0.001	0.000
	(0.017)	(0.016)	(0.022)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-19.050***	-15.410*	-33.655***	0.752**	0.533	1.509***	1.714***	1.576***	2.655***	2.605***	0.883	2.580***
	(5.236)	(7.076)	(6.330)	(0.278)	(0.372)	(0.321)	(0.340)	(0.434)	(0.517)	(0.535)	(0.542)	(0.726)
GFC	0.482**	1.460***	1.870***	-0.026*	-0.059***	-0.081***	0.007	-0.108***	-0.132***	-0.087	-0.313***	-0.376***
	(0.157)	(0.153)	(0.170)	(0.013)	(0.014)	(0.009)	(0.016)	(0.009)	(0.010)	(0.048)	(0.043)	(0.047)
PS	-2.824***	-2.660**	-2.852**	0.197***	0.187***	0.198***	0.138***	0.131***	0.144***	-0.090	-0.157	-0.168
	(0.835)	(0.819)	(0.937)	(0.055)	(0.054)	(0.060)	(0.035)	(0.029)	(0.035)	(0.123)	(0.123)	(0.121)
Log(TO)	-5.973**	-4.079	-2.167	0.204	0.108	0.006	0.244*	0.114	0.002	-0.861*	-0.705	-0.934**
	(2.368)	(2.622)	(2.813)	(0.157)	(0.178)	(0.192)	(0.113)	(0.115)	(0.128)	(0.393)	(0.412)	(0.404)
Corruption	0.454	-0.223	1.767	0.001	0.038	-0.068	0.057	0.096	-0.021	-0.789	-0.699*	-0.934**
	(1.399)	(1.137)	(1.545)	(0.057)	(0.043)	(0.068)	(0.157)	(0.144)	(0.157)	(0.436)	(0.353)	(0.369)
PO	-0.498*	-0.346	-0.668**	0.047***	0.039***	0.056***	0.005	-0.003	0.015	-0.132***	-0.148***	-0.111***
	(0.266)	(0.215)	(0.220)	(0.013)	(0.011)	(0.011)	(0.022)	(0.018)	(0.020)	(0.012)	(0.013)	(0.014)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.449	0.461	0.424	0.437	0.450	0.416	0.442	0.444	0.415	0.174	0.198	0.192
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.57) Upper Middle-Income Countries: Financing the Education Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.185***	-0.294***	-0.008	0.011***	0.017***	0.002	0.014***	0.021***	0.004	0.032***	0.021***	-0.020***
	(0.046)	(0.036)	(0.040)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.006)	(0.006)
Rest	0.148***	-0.095***	0.341***	-0.008***	0.004***	-0.018***	-0.009**	0.005***	-0.020***	0.006***	0.011***	-0.048***
	(0.037)	(0.017)	(0.031)	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.004)	(0.001)	(0.002)	(0.006)
TE	-0.157***	-0.179***	-0.177***	0.009***	0.010***	0.011***	0.010**	0.011***	0.011***	0.004	0.009	0.010*
	(0.037)	(0.026)	(0.027)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	(0.006)	(0.005)
PD	-0.056***	-0.056***	-0.043***	0.004***	0.004***	0.003***	0.004***	0.004***	0.003***	-0.005***	-0.003***	-0.005***
	(0.004)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	-239.039***	-249.957***	-250.050***	9.157***	9.557***	9.772***	21.505***	21.947***	22.045***	16.822***	21.667***	22.481***
	(32.486)	(43.102)	(34.052)	(1.621)	(2.085)	(1.603)	(2.154)	(2.883)	(2.314)	(2.603)	(2.958)	(4.193)
$Log(GDPPC)^2$	13.855***	14.385***	14.383***	-0.537***	-0.555***	-0.567***	-1.222***	-1.241***	-1.246***	-0.965***	-1.237***	-1.281***
	(1.842)	(2.435)	(1.942)	(0.091)	(0.117)	(0.091)	(0.124)	(0.165)	(0.134)	(0.137)	(0.156)	(0.223)
Unemployment	0.766***	0.774***	0.858***	-0.049***	-0.050***	-0.054***	-0.027***	-0.027***	-0.032***	0.022	0.029*	0.018
	(0.111)	(0.086)	(0.097)	(0.006)	(0.005)	(0.005)	(0.008)	(0.006)	(0.006)	(0.014)	(0.015)	(0.014)
Inflation	-0.007	-0.035*	-0.039*	0.002**	0.004***	0.004**	-0.002*	0.000	0.000	-0.000	-0.002	-0.001
	(0.014)	(0.016)	(0.020)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-12.733*	-17.706**	-26.815***	0.386	0.680*	1.125***	1.285**	1.651***	2.168***	2.129***	0.859*	1.975***
	(6.893)	(5.743)	(6.308)	(0.341)	(0.304)	(0.320)	(0.442)	(0.382)	(0.458)	(0.443)	(0.461)	(0.563)
GFC	1.074***	1.485***	2.089***	-0.039***	-0.061***	-0.092***	-0.087***	-0.114***	-0.149***	-0.351***	-0.319***	-0.402***
	(0.260)	(0.147)	(0.163)	(0.010)	(0.008)	(0.006)	(0.022)	(0.012)	(0.010)	(0.043)	(0.044)	(0.046)
PS	-2.561***	-2.814***	-2.541**	0.183***	0.197***	0.181***	0.118***	0.136***	0.120***	-0.112	-0.159	-0.202
	(0.723)	(0.853)	(0.811)	(0.050)	(0.056)	(0.054)	(0.023)	(0.026)	(0.023)	(0.129)	(0.129)	(0.135)
Log(TO)	-7.300**	-4.493	-3.508	0.281	0.135	0.081	0.335**	0.157	0.099	-0.760*	-0.668	-0.810*
	(2.517)	(2.707)	(2.934)	(0.161)	(0.180)	(0.194)	(0.109)	(0.114)	(0.118)	(0.379)	(0.408)	(0.377)
Corruption	-0.569	-0.644	0.723	0.062	0.065	-0.006	0.123	0.126	0.046	-0.716	-0.681*	-0.867**
	(1.302)	(1.235)	(1.245)	(0.048)	(0.047)	(0.048)	(0.152)	(0.151)	(0.139)	(0.408)	(0.348)	(0.333)
PO	-0.445	-0.379	-0.633**	0.044***	0.041***	0.054***	0.002	-0.002	0.013	-0.136***	-0.147***	-0.114***
	(0.252)	(0.237)	(0.231)	(0.013)	(0.012)	(0.012)	(0.020)	(0.019)	(0.020)	(0.012)	(0.013)	(0.014)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.487	0.468	0.469	0.478	0.460	0.464	0.478	0.458	0.460	0.189	0.200	0.208
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.58) Upper Middle-Income Countries: Financing the Agricultural Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	-0.227*	-0.356**	-0.069	0.011	0.017**	0.002	0.016**	0.024***	0.008	0.006	-0.001	-0.045***
	(0.105)	(0.130)	(0.132)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.008)	(0.007)
Rest	0.149***	-0.134***	0.294***	-0.008***	0.007***	-0.016***	-0.009**	0.008***	-0.017***	0.006***	0.014***	-0.044***
	(0.044)	(0.011)	(0.044)	(0.002)	(0.001)	(0.003)	(0.004)	(0.001)	(0.002)	(0.001)	(0.002)	(0.004)
TE	-0.111**	-0.177***	-0.124***	0.007***	0.010***	0.007***	0.007**	0.011***	0.007***	0.000	0.009	0.006
	(0.036)	(0.028)	(0.024)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	(0.006)	(0.005)
PD	-0.056***	-0.060***	-0.044***	0.004***	0.004***	0.003***	0.004***	0.004***	0.004***	-0.005***	-0.003***	-0.005***
	(0.004)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	-279.034***	-286.381***	-284.351***	11.165***	11.569***	11.462***	24.216***	24.654***	24.375***	17.281***	21.359***	22.559***
	(32.950)	(40.743)	(41.511)	(1.728)	(2.075)	(2.137)	(2.364)	(2.960)	(2.925)	(2.830)	(2.794)	(3.525)
$Log(GDPPC)^2$	15.987***	16.375***	16.194***	-0.643***	-0.665***	-0.655***	-1.366***	-1.389***	-1.369***	-0.981***	-1.215***	-1.274***
	(1.827)	(2.291)	(2.319)	(0.095)	(0.115)	(0.118)	(0.133)	(0.168)	(0.166)	(0.156)	(0.149)	(0.191)
Unemployment	0.730***	0.746***	0.812***	-0.047***	-0.048***	-0.051***	-0.024**	-0.025***	-0.029***	0.027*	0.033**	0.024
	(0.127)	(0.086)	(0.109)	(0.006)	(0.004)	(0.005)	(0.010)	(0.007)	(0.008)	(0.014)	(0.014)	(0.015)
Inflation	-0.016	-0.039**	-0.047**	0.003**	0.004***	0.005***	-0.001	0.000	0.001	0.000	-0.002	-0.001
	(0.018)	(0.016)	(0.021)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Tax	-15.230**	-15.405**	-29.435***	0.563	0.565	1.307***	1.463***	1.485***	2.350***	2.628***	0.953*	2.499***
	(6.184)	(6.085)	(6.229)	(0.323)	(0.326)	(0.326)	(0.382)	(0.386)	(0.491)	(0.494)	(0.474)	(0.666)
GFC	4.870***	4.777***	5.784***	-0.245***	-0.240***	-0.293***	-0.278***	-0.273***	-0.334***	-0.079	0.011	-0.108
	(0.271)	(0.407)	(0.473)	(0.026)	(0.035)	(0.036)	(0.023)	(0.018)	(0.018)	(0.086)	(0.100)	(0.093)
PS	-2.493**	-2.651**	-2.562**	0.181**	0.189**	0.185**	0.114**	0.124***	0.121***	-0.097	-0.151	-0.181
	(0.870)	(0.910)	(0.963)	(0.057)	(0.060)	(0.062)	(0.039)	(0.032)	(0.037)	(0.135)	(0.131)	(0.132)
Log(TO)	-6.024**	-3.886	-2.322	0.207	0.096	0.013	0.246*	0.110	0.018	-0.863**	-0.700	-0.910**
	(2.358)	(2.490)	(2.713)	(0.157)	(0.170)	(0.186)	(0.109)	(0.110)	(0.119)	(0.382)	(0.401)	(0.386)
Corruption	0.612	-0.235	1.797	-0.006	0.039	-0.068	0.042	0.094	-0.027	-0.808*	-0.698*	-0.955**
	(1.441)	(1.151)	(1.520)	(0.060)	(0.044)	(0.067)	(0.159)	(0.145)	(0.156)	(0.431)	(0.352)	(0.366)
PO	-0.563**	-0.405	-0.728***	0.050***	0.042***	0.059***	0.010	-0.000	0.019	-0.132***	-0.151***	-0.111***
	(0.247)	(0.225)	(0.199)	(0.012)	(0.011)	(0.009)	(0.020)	(0.017)	(0.018)	(0.013)	(0.013)	(0.016)
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	180	180	180	180	180	180	180	180	180	180	180	180
R squared	0.452	0.461	0.430	0.440	0.448	0.422	0.441	0.447	0.419	0.170	0.199	0.186
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO),Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.59) Lower Middle-Income Countries: Financing the Social Protection Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.058*	-0.060*	0.072	0.005***	0.003*	-0.003	0.001	0.004	-0.011	0.001	0.003	-0.012
	(0.029)	(0.032)	(0.108)	(0.001)	(0.002)	(0.006)	(0.003)	(0.003)	(0.010)	(0.003)	(0.004)	(0.012)
Rest	0.005	0.033	0.130	0.002	-0.002	-0.006	-0.004*	-0.001	-0.014*	-0.004*	-0.009***	-0.015
	(0.032)	(0.026)	(0.089)	(0.002)	(0.002)	(0.005)	(0.002)	(0.001)	(0.007)	(0.002)	(0.003)	(0.010)
TE	-0.050*	-0.030	-0.075**	0.002	0.001	0.003	0.003	0.002	0.005*	0.005*	-0.001	0.008***
	(0.025)	(0.018)	(0.032)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
PD	-0.065**	-0.068**	-0.071***	0.002	0.002	0.003*	0.006***	0.006***	0.007***	0.008***	0.009***	0.009***
	(0.021)	(0.023)	(0.020)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Log(GDPPC)	395.830***	399.697***	399.065***	-20.789***	-20.977***	-20.877***	-27.985***	-28.207***	-28.435***	-17.575***	-18.707***	-18.037***
	(38.646)	(40.546)	(35.966)	(2.395)	(2.617)	(2.408)	(2.388)	(2.313)	(1.878)	(1.736)	(1.265)	(1.515)
Log(GDPPC)^2	-28.213***	-28.497***	-28.417***	1.472***	1.485***	1.476***	1.981***	2.000***	2.013***	1.252***	1.336***	1.283***
	(2.622)	(2.770)	(2.433)	(0.163)	(0.180)	(0.164)	(0.162)	(0.158)	(0.127)	(0.124)	(0.093)	(0.108)
Unemployment	-0.166	-0.159	-0.174	0.019**	0.019**	0.020**	-0.007	-0.007	-0.006	-0.034**	-0.036**	-0.033**
	(0.134)	(0.133)	(0.134)	(0.006)	(0.006)	(0.006)	(0.011)	(0.011)	(0.011)	(0.012)	(0.013)	(0.011)
Inflation	-0.154***	-0.146***	-0.148***	0.010***	0.010***	0.010***	0.009***	0.009***	0.008***	0.007	0.005	0.006
	(0.029)	(0.030)	(0.028)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.004)
Tax	21.865***	21.158***	23.243***	-0.650***	-0.668***	-0.772***	-1.820***	-1.690***	-1.877***	-2.206***	-1.948***	-2.283***
	(5.208)	(4.731)	(5.209)	(0.188)	(0.179)	(0.223)	(0.443)	(0.398)	(0.366)	(0.383)	(0.303)	(0.301)
GFC	0.842***	0.725**	0.572*	-0.130***	-0.125***	-0.120***	-0.015	-0.008	0.018	0.124**	0.158***	0.158***
	(0.238)	(0.283)	(0.274)	(0.015)	(0.017)	(0.018)	(0.022)	(0.025)	(0.020)	(0.046)	(0.041)	(0.034)
PS	0.699	0.665	0.850	0.003	0.007	-0.002	-0.076	-0.078	-0.095	-0.052	-0.044	-0.072
	(0.734)	(0.746)	(0.814)	(0.028)	(0.027)	(0.029)	(0.060)	(0.062)	(0.071)	(0.038)	(0.034)	(0.050)
Log(TO)	-12.826***	-12.654***	-12.678***	0.635***	0.631***	0.635***	0.880***	0.863***	0.854***	0.546***	0.492***	0.520***
	(2.233)	(2.332)	(2.315)	(0.143)	(0.149)	(0.148)	(0.116)	(0.121)	(0.123)	(0.077)	(0.072)	(0.079)
Corruption	-4.566**	-4.498**	-4.624**	0.343***	0.341***	0.348***	0.169	0.162	0.171	-0.456***	-0.478***	-0.453***
	(1.809)	(1.801)	(1.742)	(0.061)	(0.060)	(0.058)	(0.109)	(0.109)	(0.103)	(0.074)	(0.077)	(0.071)
PO	-0.392***	-0.371***	-0.410***	0.031***	0.030***	0.032***	0.011**	0.009*	0.012*	-0.052**	-0.059**	-0.052***
	(0.098)	(0.106)	(0.120)	(0.006)	(0.006)	(0.007)	(0.004)	(0.005)	(0.006)	(0.017)	(0.021)	(0.016)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.559	0.561	0.561	0.516	0.517	0.516	0.601	0.601	0.604	0.411	0.427	0.415
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.510) Lower Middle-Income Countries: Financing the Health Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.201***	-0.194***	-0.054	0.016***	0.014***	0.008*	0.007*	0.009***	-0.006	-0.027***	-0.024***	-0.044***
	(0.053)	(0.029)	(0.080)	(0.003)	(0.001)	(0.004)	(0.003)	(0.002)	(0.007)	(0.005)	(0.004)	(0.011)
Rest	-0.018	0.046**	0.122	0.003	-0.004***	-0.005	-0.002	-0.001	-0.014*	-0.003*	-0.001	-0.019*
	(0.028)	(0.020)	(0.087)	(0.002)	(0.001)	(0.005)	(0.002)	(0.001)	(0.007)	(0.002)	(0.002)	(0.009)
TE	-0.064*	-0.048	-0.090**	0.003*	0.001	0.004*	0.004	0.003	0.006*	0.004	0.003	0.007***
	(0.029)	(0.035)	(0.036)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
PD	-0.070**	-0.077***	-0.075***	0.003*	0.003**	0.003*	0.007***	0.007***	0.007***	0.009***	0.009***	0.009***
	(0.023)	(0.021)	(0.022)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Log(GDPPC)	414.747***	425.338***	416.491***	-22.127***	-22.941***	-22.132***	-28.941***	-29.338***	-29.275***	-15.273***	-15.540***	-15.706***
	(26.897)	(20.230)	(25.419)	(1.679)	(1.380)	(1.743)	(1.794)	(1.250)	(1.377)	(2.929)	(2.231)	(2.488)
Log(GDPPC)^2	-29.491***	-30.210***	-29.578***	1.563***	1.617***	1.560***	2.046***	2.075***	2.069***	1.097***	1.118***	1.126***
	(1.863)	(1.422)	(1.750)	(0.117)	(0.097)	(0.121)	(0.123)	(0.087)	(0.094)	(0.206)	(0.158)	(0.175)
Unemployment	-0.189	-0.184	-0.198	0.021***	0.021***	0.022***	-0.006	-0.006	-0.005	-0.040**	-0.041**	-0.039**
	(0.111)	(0.109)	(0.111)	(0.005)	(0.005)	(0.005)	(0.009)	(0.009)	(0.009)	(0.015)	(0.015)	(0.015)
Inflation	-0.176***	-0.176***	-0.172***	0.012***	0.012***	0.012***	0.011***	0.010***	0.010***	0.004	0.004	0.003
	(0.035)	(0.036)	(0.036)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Tax	18.802**	18.267**	20.842**	-0.410	-0.418	-0.568*	-1.683**	-1.573**	-1.777***	-2.733***	-2.620***	-2.864***
	(7.123)	(7.528)	(6.951)	(0.306)	(0.311)	(0.306)	(0.537)	(0.561)	(0.467)	(0.278)	(0.321)	(0.297)
GFC	1.330**	1.351**	1.080*	-0.166***	-0.169***	-0.157***	-0.039	-0.037	-0.006	0.192***	0.194***	0.235***
	(0.506)	(0.584)	(0.496)	(0.030)	(0.037)	(0.031)	(0.033)	(0.035)	(0.027)	(0.039)	(0.040)	(0.027)
PS	0.857	0.943	0.980	-0.001	-0.008	-0.006	-0.090*	-0.093*	-0.105	-0.084**	-0.086**	-0.104**
	(0.622)	(0.555)	(0.683)	(0.027)	(0.024)	(0.028)	(0.048)	(0.046)	(0.058)	(0.032)	(0.034)	(0.045)
Log(TO)	-12.710***	-12.399***	-12.635***	0.638***	0.616***	0.639***	0.866***	0.850***	0.848***	0.487***	0.475***	0.463***
	(2.327)	(2.278)	(2.408)	(0.139)	(0.140)	(0.144)	(0.128)	(0.122)	(0.134)	(0.112)	(0.099)	(0.117)
Corruption	-5.299**	-5.470**	-5.355**	0.397***	0.413***	0.402***	0.204	0.206	0.206	-0.561***	-0.562***	-0.559***
	(2.103)	(2.158)	(2.061)	(0.079)	(0.082)	(0.078)	(0.119)	(0.122)	(0.114)	(0.075)	(0.074)	(0.075)
PO	-0.346**	-0.288***	-0.371**	0.029***	0.025***	0.031***	0.007	0.005	0.009	-0.060***	-0.061***	-0.057***
	(0.111)	(0.086)	(0.134)	(0.005)	(0.004)	(0.006)	(0.005)	(0.005)	(0.007)	(0.014)	(0.017)	(0.013)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.564	0.567	0.566	0.527	0.531	0.526	0.603	0.603	0.606	0.434	0.433	0.440
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.511) Lower Middle-Income Countries: Financing the Education Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.291***	0.349***	0.567***	-0.015***	-0.020***	-0.031***	-0.023***	-0.023***	-0.044***	-0.029***	-0.028***	-0.054***
	(0.042)	(0.046)	(0.108)	(0.003)	(0.002)	(0.007)	(0.002)	(0.003)	(0.007)	(0.005)	(0.003)	(0.011)
Rest	-0.027	-0.076***	0.222**	0.004**	0.004***	-0.011**	-0.002	0.006***	-0.021***	-0.001	0.000	-0.023**
	(0.033)	(0.013)	(0.078)	(0.002)	(0.001)	(0.004)	(0.002)	(0.001)	(0.006)	(0.002)	(0.004)	(0.009)
TE	0.002	-0.019	-0.041	-0.001	-0.000	0.001	-0.001	0.000	0.003	0.000	0.000	0.004**
	(0.014)	(0.016)	(0.023)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
PD	-0.102***	-0.100***	-0.113***	0.004**	0.004**	0.005***	0.009***	0.009***	0.010***	0.011***	0.011***	0.013***
	(0.025)	(0.025)	(0.024)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	471.093***	486.290***	481.838***	-25.252***	-25.968***	-25.699***	-32.894***	-34.265***	-34.072***	-24.184***	-24.268***	-25.478***
	(40.591)	(40.084)	(39.099)	(2.582)	(2.509)	(2.611)	(2.538)	(2.612)	(2.213)	(0.604)	(0.950)	(0.990)
Log(GDPPC)^2	-33.038***	-33.918***	-33.689***	1.758***	1.797***	1.783***	2.296***	2.380***	2.372***	1.675***	1.681***	1.758***
	(2.746)	(2.680)	(2.596)	(0.175)	(0.170)	(0.175)	(0.173)	(0.173)	(0.146)	(0.039)	(0.066)	(0.059)
Unemployment	-0.153	-0.188*	-0.172	0.019***	0.021***	0.020***	-0.008	-0.005	-0.006	-0.035***	-0.035**	-0.033***
	(0.111)	(0.102)	(0.113)	(0.005)	(0.005)	(0.005)	(0.009)	(0.008)	(0.009)	(0.009)	(0.011)	(0.009)
Inflation	-0.143***	-0.158***	-0.135***	0.009***	0.010***	0.009***	0.009**	0.009***	0.007**	0.006	0.006	0.005
	(0.033)	(0.029)	(0.032)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.003)	(0.004)	(0.003)	(0.004)
Tax	25.533***	27.537***	29.119***	-0.858***	-1.027***	-1.103***	-2.064***	-2.105***	-2.268***	-2.521***	-2.489***	-2.780***
	(3.543)	(4.765)	(4.307)	(0.110)	(0.155)	(0.173)	(0.346)	(0.424)	(0.329)	(0.277)	(0.341)	(0.300)
GFC	-3.712***	-3.347***	0.677**	0.126***	0.103***	-0.126***	0.299***	0.276***	0.011	0.336***	0.337***	0.148***
	(0.211)	(0.328)	(0.289)	(0.010)	(0.013)	(0.017)	(0.020)	(0.031)	(0.022)	(0.024)	(0.026)	(0.038)
PS	0.524	0.178	0.706	0.018	0.036	0.009	-0.067	-0.039	-0.084	-0.033**	-0.032	-0.052*
	(0.556)	(0.597)	(0.657)	(0.022)	(0.022)	(0.025)	(0.045)	(0.052)	(0.057)	(0.014)	(0.025)	(0.025)
Log(TO)	-12.939***	-13.875***	-12.849***	0.648***	0.702***	0.648***	0.885***	0.951***	0.868***	0.561***	0.561***	0.544***
	(2.340)	(2.127)	(2.427)	(0.142)	(0.138)	(0.149)	(0.126)	(0.102)	(0.132)	(0.091)	(0.059)	(0.094)
Corruption	-5.340**	-5.814**	-5.558***	0.390***	0.417***	0.403***	0.219*	0.252*	0.235**	-0.387***	-0.387***	-0.369***
	(1.798)	(1.964)	(1.637)	(0.060)	(0.070)	(0.053)	(0.110)	(0.117)	(0.097)	(0.090)	(0.083)	(0.083)
PO	-0.310*	-0.421**	-0.353*	0.027***	0.033**	0.030***	0.005	0.013	0.009	-0.059***	-0.059***	-0.055***
	(0.150)	(0.181)	(0.173)	(0.008)	(0.010)	(0.009)	(0.007)	(0.007)	(0.009)	(0.013)	(0.017)	(0.011)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.575	0.581	0.580	0.536	0.540	0.539	0.614	0.621	0.622	0.437	0.437	0.448
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

Table (A.512) Lower Middle-Income Countries: Financing the Agricultural Sector - Inclusion of Additional Control Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.305***	0.276***	0.374***	-0.013**	-0.014***	-0.019***	-0.024***	-0.018***	-0.029***	-0.021**	-0.015**	-0.028**
	(0.051)	(0.041)	(0.091)	(0.004)	(0.003)	(0.006)	(0.004)	(0.003)	(0.007)	(0.008)	(0.006)	(0.012)
Rest	0.022	-0.020	0.113	0.001	0.001	-0.005	-0.005***	0.002**	-0.013*	-0.004**	-0.004	-0.015
	(0.023)	(0.012)	(0.091)	(0.002)	(0.001)	(0.005)	(0.002)	(0.001)	(0.007)	(0.002)	(0.004)	(0.009)
TE	-0.049	-0.056	-0.069	0.002	0.002	0.003	0.003	0.003	0.005	0.005	0.003	0.007***
	(0.031)	(0.033)	(0.039)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)
PD	-0.073***	-0.070***	-0.077***	0.003*	0.003*	0.003**	0.007***	0.007***	0.007***	0.009***	0.009***	0.009***
	(0.020)	(0.021)	(0.020)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Log(GDPPC)	388.739***	386.476***	392.478***	-20.431***	-20.297***	-20.526***	-27.505***	-27.371***	-28.037***	-17.166***	-17.952***	-17.704***
	(36.375)	(35.935)	(33.783)	(2.264)	(2.377)	(2.270)	(2.270)	(2.040)	(1.781)	(1.546)	(0.909)	(1.345)
Log(GDPPC)^2	-27.846***	-27.708***	-28.090***	1.454***	1.444***	1.459***	1.957***	1.951***	1.993***	1.231***	1.286***	1.267***
	(2.503)	(2.461)	(2.315)	(0.156)	(0.164)	(0.157)	(0.156)	(0.139)	(0.122)	(0.115)	(0.069)	(0.100)
Unemployment	-0.202	-0.212	-0.205	0.021**	0.022***	0.022***	-0.004	-0.004	-0.004	-0.032**	-0.035**	-0.032**
	(0.132)	(0.133)	(0.135)	(0.007)	(0.007)	(0.007)	(0.010)	(0.010)	(0.010)	(0.011)	(0.014)	(0.011)
Inflation	-0.154***	-0.156***	-0.147***	0.010***	0.010***	0.010***	0.009***	0.009***	0.008***	0.007	0.006	0.006
	(0.031)	(0.029)	(0.031)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Tax	21.735***	20.965***	22.447***	-0.639**	-0.662**	-0.725**	-1.814***	-1.655**	-1.829***	-2.207***	-2.111***	-2.254***
	(5.957)	(6.267)	(5.978)	(0.210)	(0.225)	(0.234)	(0.508)	(0.517)	(0.437)	(0.449)	(0.382)	(0.366)
GFC	0.150	-3.986***	-0.047	-0.096***	0.136***	-0.087***	0.032	0.319***	0.055**	0.165***	0.363***	0.191***
	(0.284)	(0.370)	(0.337)	(0.017)	(0.015)	(0.021)	(0.024)	(0.033)	(0.022)	(0.050)	(0.017)	(0.045)
PS	1.026	0.979	1.135	-0.012	-0.010	-0.016	-0.100*	-0.095	-0.113*	-0.075**	-0.085***	-0.089**
	(0.660)	(0.697)	(0.701)	(0.028)	(0.029)	(0.028)	(0.051)	(0.055)	(0.059)	(0.024)	(0.024)	(0.033)
Log(TO)	-11.647***	-11.747***	-11.572***	0.579***	0.584***	0.578***	0.798***	0.806***	0.787***	0.470***	0.442***	0.459***
	(2.497)	(2.451)	(2.595)	(0.153)	(0.154)	(0.158)	(0.136)	(0.129)	(0.145)	(0.098)	(0.087)	(0.105)
Corruption	-5.042**	-5.079**	-5.035**	0.367***	0.371***	0.370***	0.202	0.200	0.196*	-0.428***	-0.454***	-0.432***
	(1.846)	(1.863)	(1.752)	(0.063)	(0.065)	(0.059)	(0.112)	(0.112)	(0.103)	(0.080)	(0.078)	(0.074)
PO	-0.342***	-0.368***	-0.357**	0.029***	0.030***	0.030***	0.007	0.010	0.009	-0.056***	-0.064**	-0.055***
	(0.104)	(0.109)	(0.115)	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.016)	(0.023)	(0.015)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	128	128	128	128	128	128	128	128	128	128	128	128
R squared	0.565	0.565	0.566	0.520	0.520	0.521	0.606	0.605	0.608	0.414	0.418	0.417
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Log(TO), Corruption and PO respectively represent the log of Trade Openness, Control of Corruption and the party orientation of the incumbent government.

A.6 Robustness Check 4: Inequality Impact of Reallocations - 2-Year Lead Values of the Dependent Variables

Table (A.61) All Middle-Income Countries: Long Term Effect of Financing the Social Protection Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.114*	-0.017	0.202***	-0.007**	0.001	-0.013**	-0.007*	0.001	-0.002	0.006	0.016**	0.042***
	(0.055)	(0.015)	(0.053)	(0.003)	(0.001)	(0.004)	(0.004)	(0.001)	(0.002)	(0.006)	(0.006)	(0.010)
Rest	0.120**	-0.174***	0.200***	-0.007**	0.010***	-0.013***	-0.008*	0.009***	-0.001	-0.014***	-0.006	0.028**
	(0.049)	(0.025)	(0.048)	(0.002)	(0.001)	(0.003)	(0.004)	(0.002)	(0.002)	(0.001)	(0.003)	(0.010)
TE	0.026	-0.054	0.030	-0.001	0.004**	-0.001	-0.004	-0.000	-0.005	0.011**	0.005	0.006
	(0.040)	(0.035)	(0.053)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)	(0.004)	(0.006)	(0.005)
PD	-0.043***	-0.047***	-0.035***	0.003***	0.003***	0.003***	0.003**	0.003***	0.002***	-0.003***	-0.004***	-0.003***
	(0.011)	(0.008)	(0.008)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Log(GDPPC)	10.377**	11.851**	19.159***	-0.929**	-1.017**	-1.457***	-0.704**	-0.885**	-1.194***	3.172***	2.126*	2.509**
	(3.906)	(5.000)	(3.972)	(0.321)	(0.376)	(0.290)	(0.265)	(0.296)	(0.244)	(0.794)	(1.087)	(0.934)
Log(GDPPC)^2	-0.508	-0.615	-1.139***	0.046*	0.052*	0.084***	0.049**	0.062**	0.082***	-0.238***	-0.170*	-0.203**
	(0.273)	(0.339)	(0.282)	(0.020)	(0.024)	(0.019)	(0.017)	(0.019)	(0.016)	(0.053)	(0.073)	(0.064)
Unemployment	0.087	0.083*	0.108**	-0.003	-0.003	-0.004	-0.010**	-0.011**	-0.012**	-0.069**	-0.073**	-0.073**
	(0.049)	(0.040)	(0.041)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.025)	(0.027)	(0.025)
Inflation	0.010	-0.006	0.023	-0.000	0.001	-0.001	-0.002	-0.001	-0.003	-0.001	-0.003	-0.001
	(0.014)	(0.008)	(0.020)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.003)
Tax	-7.683	-5.618	-12.962	0.252	0.130	0.564	0.836	0.810	1.194*	0.197	1.079**	0.869***
	(7.317)	(10.077)	(8.469)	(0.373)	(0.523)	(0.406)	(0.515)	(0.660)	(0.619)	(0.253)	(0.315)	(0.245)
GFC	1.133	16.860	-36.296**	6.091***	5.156***	8.412***	8.385***	7.845***	9.662***	7.351**	10.559**	6.682*
	(15.210)	(17.173)	(14.364)	(1.346)	(1.369)	(1.191)	(1.160)	(1.092)	(0.997)	(2.532)	(3.480)	(3.366)
PS	0.123	0.512**	0.387	-0.007	-0.030**	-0.025	-0.040**	-0.057***	-0.032**	-0.102**	-0.067	-0.025
	(0.167)	(0.158)	(0.217)	(0.012)	(0.011)	(0.018)	(0.013)	(0.011)	(0.012)	(0.039)	(0.045)	(0.042)
Countries	49	49	49	49	49	49	49	49	49	49	49	49
Observations	259	259	259	259	259	259	259	259	259	259	259	259
R squared	0.233	0.269	0.229	0.223	0.262	0.220	0.307	0.325	0.296	0.156	0.150	0.155
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.62) All Middle-Income Countries: Long Term Effect of Financing the Health Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.189**	-0.269***	-0.101	0.010**	0.015***	0.004	0.011**	0.017***	0.016***	-0.026***	-0.019***	0.017
	(0.070)	(0.028)	(0.066)	(0.004)	(0.002)	(0.005)	(0.004)	(0.001)	(0.002)	(0.006)	(0.005)	(0.012)
Rest	0.118**	-0.100***	0.215***	-0.007***	0.006***	-0.014**	-0.008*	0.004***	-0.003	-0.009***	0.005	0.036***
	(0.043)	(0.016)	(0.054)	(0.002)	(0.001)	(0.004)	(0.003)	(0.001)	(0.002)	(0.002)	(0.003)	(0.010)
TE	0.003	-0.030	0.005	0.001	0.003	0.001	-0.003	-0.002	-0.004	0.007	0.008	0.002
	(0.044)	(0.042)	(0.052)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.005)
PD	-0.052***	-0.048***	-0.044***	0.004***	0.004***	0.003***	0.003***	0.003***	0.003***	-0.004***	-0.004***	-0.004***
	(0.007)	(0.006)	(0.005)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	22.466***	21.987***	31.603***	-1.601***	-1.545***	-2.145***	-1.450***	-1.593***	-1.964***	3.745**	3.541**	3.435**
	(4.372)	(5.321)	(4.877)	(0.307)	(0.378)	(0.323)	(0.316)	(0.321)	(0.317)	(1.379)	(1.381)	(1.278)
Log(GDPPC)^2	-1.276***	-1.294***	-1.936***	0.089***	0.088***	0.128***	0.097***	0.108***	0.131***	-0.281**	-0.265**	-0.269**
	(0.302)	(0.353)	(0.334)	(0.019)	(0.023)	(0.021)	(0.020)	(0.020)	(0.020)	(0.088)	(0.089)	(0.086)
Unemployment	0.075	0.071	0.094*	-0.003	-0.002	-0.004	-0.010**	-0.010**	-0.011**	-0.074**	-0.075**	-0.076**
	(0.058)	(0.042)	(0.041)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.026)	(0.027)	(0.026)
Inflation	-0.003	0.001	0.010	0.000	0.000	-0.000	-0.001	-0.002	-0.002	-0.001	-0.002	-0.001
	(0.011)	(0.013)	(0.017)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)
Tax	-12.759	-10.525	-17.995	0.539	0.382	0.848	1.150	1.163	1.487*	0.339	0.392	0.714**
	(8.719)	(8.878)	(9.905)	(0.439)	(0.436)	(0.480)	(0.624)	(0.619)	(0.701)	(0.287)	(0.415)	(0.245)
GFC	-39.895**	-20.407	-79.949***	8.378***	7.092***	10.824***	10.898***	10.465***	12.371***	5.664	5.353	3.339
	(16.299)	(19.084)	(18.084)	(1.263)	(1.450)	(1.345)	(1.295)	(1.250)	(1.381)	(4.847)	(4.936)	(4.804)
PS	-0.228	-0.003	0.056	0.012	-0.003	-0.007	-0.018	-0.024*	-0.012	-0.133**	-0.138**	-0.042
	(0.168)	(0.146)	(0.188)	(0.010)	(0.009)	(0.015)	(0.014)	(0.011)	(0.012)	(0.051)	(0.055)	(0.046)
Countries	49	49	49	49	49	49	49	49	49	49	49	49
Observations	259	259	259	259	259	259	259	259	259	259	259	259
R squared	0.253	0.258	0.249	0.242	0.250	0.239	0.325	0.321	0.314	0.138	0.136	0.149
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.63) All Middle-Income Countries: Long Term Effect of Financing the Education Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.126*	-0.204***	-0.019	0.007*	0.011***	-0.000	0.004	0.010**	0.008**	-0.037**	-0.031**	0.010
	(0.062)	(0.046)	(0.053)	(0.003)	(0.002)	(0.004)	(0.005)	(0.004)	(0.003)	(0.011)	(0.010)	(0.015)
Rest	0.113**	-0.101***	0.246***	-0.007***	0.006***	-0.015**	-0.007*	0.005***	-0.004	-0.009**	0.011***	0.040***
	(0.041)	(0.018)	(0.069)	(0.002)	(0.001)	(0.005)	(0.003)	(0.001)	(0.003)	(0.003)	(0.002)	(0.012)
TE	-0.025	-0.040	-0.032	0.002	0.003*	0.003	-0.002	-0.001	-0.002	0.003	0.005	-0.003
	(0.041)	(0.039)	(0.042)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.007)
PD	-0.042***	-0.043***	-0.033***	0.003***	0.003***	0.003***	0.003***	0.003***	0.002***	-0.003***	-0.003***	-0.003***
	(0.010)	(0.008)	(0.006)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Log(GDPPC)	-0.247	10.662	7.268	-0.328	-0.985*	-0.773**	-0.181	-0.838*	-0.651**	1.845	0.861	1.347
	(3.808)	(5.798)	(4.892)	(0.281)	(0.435)	(0.284)	(0.254)	(0.386)	(0.190)	(1.158)	(0.898)	(0.875)
Log(GDPPC)^2	0.132	-0.589	-0.436	0.010	0.053*	0.044**	0.018	0.061**	0.050***	-0.164*	-0.099	-0.142*
	(0.242)	(0.367)	(0.295)	(0.017)	(0.026)	(0.018)	(0.014)	(0.023)	(0.010)	(0.076)	(0.060)	(0.063)
Unemployment	0.084*	0.076*	0.102**	-0.003	-0.003	-0.004	-0.010**	-0.010*	-0.012*	-0.074**	-0.073**	-0.076**
	(0.037)	(0.037)	(0.037)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.006)	(0.024)	(0.024)	(0.023)
Inflation	0.002	0.005	0.015	0.000	0.000	-0.001	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001
	(0.011)	(0.013)	(0.016)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)
Tax	-6.709	-7.225	-11.475	0.202	0.217	0.483	0.790	0.893	1.112	0.746**	0.693*	1.180***
	(8.164)	(8.764)	(8.796)	(0.423)	(0.444)	(0.431)	(0.562)	(0.590)	(0.621)	(0.271)	(0.321)	(0.266)
GFC	49.637**	23.830	13.981	3.351**	4.907**	5.520***	5.996***	7.541***	7.367***	13.707**	16.051***	11.788**
	(15.590)	(21.843)	(18.325)	(1.159)	(1.680)	(1.061)	(1.199)	(1.559)	(0.985)	(3.947)	(3.085)	(3.503)
PS	0.281	0.262*	0.668*	-0.016	-0.016	-0.041	-0.047***	-0.044***	-0.046**	-0.095*	-0.097**	0.009
	(0.155)	(0.137)	(0.297)	(0.011)	(0.010)	(0.023)	(0.012)	(0.010)	(0.014)	(0.041)	(0.035)	(0.030)
Countries	49	49	49	49	49	49	49	49	49	49	49	49
Observations	259	259	259	259	259	259	259	259	259	259	259	259
R squared	0.252	0.256	0.252	0.241	0.248	0.242	0.318	0.316	0.308	0.151	0.157	0.165
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.64) All Middle-Income Countries: Long Term Effect of Financing the Agricultural Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.091	-0.041	0.134	-0.001	0.006	-0.005	-0.013	-0.004	-0.005	-0.016**	-0.005	0.028**
	(0.146)	(0.115)	(0.109)	(0.007)	(0.006)	(0.006)	(0.010)	(0.008)	(0.007)	(0.007)	(0.008)	(0.011)
Rest	0.118*	-0.128***	0.203***	-0.007**	0.007***	-0.013***	-0.008*	0.007***	-0.002	-0.009***	0.001	0.036***
	(0.052)	(0.018)	(0.050)	(0.002)	(0.001)	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.009)
TE	0.026	-0.034	0.029	-0.001	0.003*	-0.001	-0.004	-0.001	-0.005	0.009	0.008	0.004
	(0.040)	(0.036)	(0.053)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.005)
PD	-0.043***	-0.045***	-0.035***	0.003***	0.003***	0.003***	0.003**	0.003***	0.002***	-0.003***	-0.004***	-0.003***
	(0.011)	(0.009)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	11.204***	12.185**	21.174***	-1.097***	-1.150**	-1.685***	-0.546**	-0.718**	-1.117***	3.280**	2.728*	2.924**
	(2.493)	(4.270)	(2.480)	(0.208)	(0.348)	(0.199)	(0.167)	(0.256)	(0.151)	(1.276)	(1.343)	(1.180)
Log(GDPPC)^2	-0.551**	-0.704**	-1.247***	0.055***	0.064**	0.096***	0.041***	0.057***	0.078***	-0.249**	-0.212**	-0.234**
	(0.163)	(0.278)	(0.184)	(0.013)	(0.021)	(0.014)	(0.010)	(0.015)	(0.009)	(0.082)	(0.087)	(0.079)
Unemployment	0.091	0.061	0.115***	-0.004	-0.002	-0.005	-0.010**	-0.009**	-0.011**	-0.073**	-0.074**	-0.075**
	(0.049)	(0.041)	(0.033)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)	(0.026)	(0.027)	(0.025)
Inflation	0.009	0.008	0.021	-0.000	-0.000	-0.001	-0.002	-0.002	-0.003	-0.001	-0.001	-0.000
	(0.016)	(0.016)	(0.022)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Tax	-7.626	-7.094	-12.393	0.227	0.194	0.503	0.880	0.924	1.207	0.672*	0.984**	1.074***
	(7.862)	(9.160)	(8.921)	(0.404)	(0.467)	(0.436)	(0.560)	(0.618)	(0.638)	(0.302)	(0.325)	(0.268)
GFC	-2.575	18.987	-45.609***	6.838***	5.564***	9.469***	7.689***	6.870***	9.293***	7.062	8.250	4.880
	(11.327)	(16.785)	(11.707)	(0.951)	(1.314)	(0.902)	(0.815)	(1.138)	(0.767)	(4.529)	(4.728)	(4.475)
PS	0.128	0.248	0.401	-0.008	-0.015	-0.027	-0.039**	-0.043***	-0.032**	-0.112**	-0.102*	-0.021
	(0.169)	(0.141)	(0.219)	(0.012)	(0.010)	(0.017)	(0.014)	(0.010)	(0.013)	(0.043)	(0.046)	(0.039)
Countries	49	49	49	49	49	49	49	49	49	49	49	49
Observations	259	259	259	259	259	259	259	259	259	259	259	259
R squared	0.233	0.254	0.229	0.224	0.246	0.221	0.307	0.317	0.296	0.133	0.129	0.144
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.65) Upper Middle-Income Countries: Long Term Effect of Financing the Social Protection Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.128*	0.014	0.293***	-0.008**	-0.000	-0.014**	-0.010*	-0.002	-0.010***	0.017*	0.019**	0.035*
	(0.060)	(0.038)	(0.077)	(0.003)	(0.002)	(0.005)	(0.004)	(0.002)	(0.002)	(0.008)	(0.006)	(0.015)
Rest	0.079**	-0.192***	0.249***	-0.006***	0.011***	-0.012**	-0.006**	0.010***	-0.005*	-0.008*	-0.012**	0.014
	(0.029)	(0.025)	(0.067)	(0.002)	(0.001)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)	(0.016)
TE	-0.020	-0.109*	-0.015	0.003	0.008**	0.002	0.001	0.004	-0.001	0.025***	0.015**	0.021***
	(0.056)	(0.047)	(0.058)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.006)	(0.004)
PD	-0.050**	-0.060***	-0.042**	0.004***	0.004***	0.003**	0.003**	0.004**	0.003**	-0.003***	-0.004***	-0.003***
	(0.016)	(0.015)	(0.015)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Log(GDPPC)	-20.002	-72.942	-32.245	-4.357*	-1.443	-4.228**	16.142***	18.434***	15.451***	24.786***	18.929***	21.479***
	(44.860)	(46.348)	(46.379)	(1.971)	(2.028)	(1.770)	(3.135)	(3.560)	(3.760)	(4.546)	(4.337)	(5.258)
Log(GDPPC)^2	1.713	4.688	2.294	0.217*	0.054	0.216*	-0.939***	-1.067***	-0.896***	-1.517***	-1.182***	-1.331***
	(2.488)	(2.601)	(2.567)	(0.109)	(0.114)	(0.097)	(0.176)	(0.203)	(0.211)	(0.260)	(0.248)	(0.304)
Unemployment	0.332**	0.356**	0.399**	-0.018*	-0.020**	-0.023**	-0.022***	-0.024***	-0.026***	-0.140**	-0.145**	-0.142**
	(0.119)	(0.102)	(0.116)	(0.009)	(0.008)	(0.009)	(0.002)	(0.002)	(0.003)	(0.046)	(0.046)	(0.046)
Inflation	-0.064	-0.073	-0.050	0.004	0.004	0.003	0.002	0.002	0.001	0.002	0.001	0.002
	(0.038)	(0.041)	(0.037)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-21.042	-12.875	-27.151	0.838	0.425	1.259	1.821**	1.531*	2.223**	0.061	1.364*	0.506
	(14.390)	(13.588)	(15.662)	(0.799)	(0.746)	(0.862)	(0.705)	(0.666)	(0.799)	(0.659)	(0.649)	(0.732)
GFC	98.963	351.646	145.356	22.962**	8.833	22.507**	-63.443***	-74.768***	-60.759***	-83.893***	-58.369**	-71.177**
	(201.787)	(205.035)	(208.826)	(8.869)	(8.942)	(8.110)	(13.945)	(15.368)	(16.435)	(19.763)	(19.017)	(21.830)
PS	-0.645	-0.465	-0.580	0.016	0.009	0.020	-0.026	-0.029	-0.014	0.002	0.050	0.042
	(0.666)	(0.746)	(0.730)	(0.033)	(0.035)	(0.036)	(0.046)	(0.049)	(0.051)	(0.046)	(0.057)	(0.063)
Countries	27	27	27	27	27	27	27	27	27	27	27	27
Observations	148	148	148	148	148	148	148	148	148	148	148	148
R squared	0.256	0.308	0.260	0.249	0.302	0.246	0.384	0.416	0.377	0.248	0.256	0.247
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.66) Upper Middle-Income Countries: Long Term Effect of Financing the Health Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.491***	-0.522***	-0.284***	0.028***	0.030***	0.019***	0.021***	0.026***	0.019***	-0.035**	-0.037**	-0.007
	(0.037)	(0.049)	(0.061)	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.012)	(0.011)	(0.018)
Rest	0.090**	-0.071**	0.375***	-0.006***	0.005***	-0.019***	-0.007**	0.003*	-0.013***	-0.001	0.003	0.034**
	(0.028)	(0.022)	(0.082)	(0.001)	(0.001)	(0.005)	(0.002)	(0.001)	(0.003)	(0.004)	(0.004)	(0.012)
TE	-0.086	-0.098	-0.093*	0.007**	0.007**	0.006**	0.004	0.004	0.003	0.016***	0.018**	0.013**
	(0.052)	(0.056)	(0.044)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)	(0.004)
PD	-0.070***	-0.068***	-0.063***	0.005***	0.005***	0.004***	0.004***	0.004***	0.004***	-0.005***	-0.005***	-0.004***
	(0.013)	(0.012)	(0.012)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	26.501	3.433	10.011	-7.170**	-5.729*	-6.679**	14.000***	14.446**	13.792**	25.002***	26.783***	21.772***
	(46.224)	(57.969)	(54.860)	(2.112)	(2.705)	(2.385)	(3.514)	(4.572)	(4.300)	(5.193)	(5.200)	(6.053)
Log(GDPPC)^2	-1.129	0.172	-0.377	0.389**	0.307*	0.371**	-0.808***	-0.831**	-0.788**	-1.544***	-1.646***	-1.373***
	(2.579)	(3.251)	(3.115)	(0.118)	(0.152)	(0.136)	(0.200)	(0.260)	(0.246)	(0.301)	(0.304)	(0.355)
Unemployment	0.385***	0.415***	0.478***	-0.022**	-0.024**	-0.027***	-0.025***	-0.027***	-0.030***	-0.139**	-0.138**	-0.135**
	(0.104)	(0.091)	(0.094)	(0.008)	(0.007)	(0.007)	(0.003)	(0.003)	(0.003)	(0.047)	(0.046)	(0.045)
Inflation	-0.080*	-0.076*	-0.064	0.005*	0.004*	0.004	0.002	0.002	0.002	0.001	0.001	0.002
	(0.040)	(0.036)	(0.040)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-26.857*	-23.802	-35.709*	1.218	1.038	1.754*	2.057**	2.086**	2.572**	0.687	0.349	0.363
	(13.436)	(14.768)	(15.929)	(0.762)	(0.830)	(0.892)	(0.646)	(0.729)	(0.784)	(0.633)	(0.936)	(0.556)
GFC	-80.134	32.436	-19.187	33.856***	26.748*	32.061**	-55.259***	-58.086**	-54.442**	-83.359***	-91.297***	-71.316**
	(206.332)	(256.988)	(244.231)	(9.356)	(11.880)	(10.644)	(15.430)	(19.965)	(18.786)	(22.177)	(22.073)	(25.132)
PS	-1.407	-1.486	-1.296	0.060	0.066	0.060	0.012	0.026	0.022	-0.059	-0.067	-0.017
	(0.818)	(0.872)	(0.883)	(0.040)	(0.043)	(0.043)	(0.053)	(0.056)	(0.057)	(0.052)	(0.062)	(0.066)
Countries	27	27	27	27	27	27	27	27	27	27	27	27
Observations	148	148	148	148	148	148	148	148	148	148	148	148
R squared	0.295	0.296	0.310	0.291	0.291	0.297	0.408	0.400	0.402	0.227	0.228	0.236
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. .

Table (A.67) Upper Middle-Income Countries: Long Term Effect of Financing the Education Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.236**	-0.285***	0.025	0.012**	0.016***	0.001	0.006	0.011**	0.002	-0.051***	-0.055***	-0.006
	(0.081)	(0.066)	(0.069)	(0.004)	(0.004)	(0.005)	(0.006)	(0.004)	(0.004)	(0.011)	(0.007)	(0.016)
Rest	0.075*	-0.074***	0.443***	-0.005**	0.005***	-0.022***	-0.006*	0.004***	-0.015***	-0.003	0.015***	0.051***
	(0.033)	(0.012)	(0.098)	(0.002)	(0.001)	(0.006)	(0.003)	(0.001)	(0.004)	(0.004)	(0.003)	(0.014)
TE	-0.072	-0.088	-0.096*	0.006*	0.007**	0.006**	0.003	0.003	0.003	0.013**	0.019**	0.008
	(0.052)	(0.050)	(0.047)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.006)
PD	-0.054**	-0.056***	-0.045**	0.004***	0.004***	0.003**	0.004**	0.004**	0.003**	-0.004***	-0.003***	-0.003***
	(0.017)	(0.015)	(0.015)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	-47.093	-54.606	-89.402*	-2.920	-2.463	-1.053	17.396***	17.410***	18.114***	18.660***	22.123***	11.755*
	(44.613)	(47.713)	(46.173)	(2.002)	(2.094)	(1.876)	(3.092)	(3.826)	(3.691)	(4.857)	(4.596)	(5.295)
Log(GDPPC)^2	3.281	3.647	5.526*	0.134	0.112	0.036	-1.012***	-1.008***	-1.046***	-1.167***	-1.356***	-0.788**
	(2.483)	(2.655)	(2.599)	(0.111)	(0.116)	(0.105)	(0.175)	(0.217)	(0.210)	(0.277)	(0.258)	(0.309)
Unemployment	0.390***	0.407***	0.494***	-0.022**	-0.023**	-0.028***	-0.024***	-0.027***	-0.030***	-0.133**	-0.130**	-0.127**
	(0.106)	(0.100)	(0.102)	(0.008)	(0.008)	(0.008)	(0.002)	(0.002)	(0.004)	(0.044)	(0.041)	(0.040)
Inflation	-0.062	-0.062*	-0.042	0.004	0.004*	0.003	0.002	0.001	0.001	0.002	0.003**	0.003**
	(0.034)	(0.032)	(0.032)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Tax	-14.012	-13.525	-19.501	0.478	0.460	0.835	1.475**	1.565**	1.855**	1.901***	1.231*	1.870***
	(11.904)	(12.746)	(12.930)	(0.672)	(0.701)	(0.718)	(0.562)	(0.618)	(0.638)	(0.472)	(0.576)	(0.365)
GFC	221.448	269.315	386.426	16.453	13.401	9.115	-69.089***	-70.246***	-72.028***	-56.461**	-73.288***	-29.960
	(200.696)	(213.456)	(207.067)	(9.018)	(9.351)	(8.499)	(13.726)	(16.731)	(16.181)	(21.136)	(20.478)	(22.233)
PS	-1.103	-1.172	-0.875	0.042	0.047	0.036	-0.007	0.005	-0.000	-0.080	-0.107*	-0.011
	(0.709)	(0.783)	(0.739)	(0.036)	(0.039)	(0.036)	(0.049)	(0.053)	(0.051)	(0.052)	(0.053)	(0.062)
Countries	27	27	27	27	27	27	27	27	27	27	27	27
Observations	148	148	148	148	148	148	148	148	148	148	148	148
R squared	0.283	0.285	0.308	0.277	0.279	0.292	0.394	0.389	0.392	0.254	0.268	0.274
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.68) Upper Middle-Income Countries: Long Term Effect of Financing the Agricultural Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	-0.250**	-0.353***	0.001	0.012**	0.018***	0.001	0.019**	0.026***	0.016**	-0.042*	-0.042**	-0.011
	(0.097)	(0.093)	(0.092)	(0.005)	(0.004)	(0.006)	(0.006)	(0.007)	(0.006)	(0.018)	(0.018)	(0.030)
Rest	0.103**	-0.120***	0.268***	-0.007***	0.007***	-0.013**	-0.008**	0.006***	-0.007***	0.000	-0.001	0.027*
	(0.038)	(0.013)	(0.066)	(0.002)	(0.001)	(0.004)	(0.003)	(0.001)	(0.002)	(0.005)	(0.003)	(0.014)
TE	-0.024	-0.081	-0.015	0.003	0.006**	0.002	0.001	0.003	-0.001	0.020***	0.020***	0.019***
	(0.053)	(0.053)	(0.055)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.006)	(0.004)
PD	-0.051**	-0.058***	-0.043**	0.004**	0.004***	0.003**	0.003**	0.004**	0.003**	-0.003***	-0.004***	-0.003***
	(0.017)	(0.015)	(0.015)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Log(GDPPC)	-47.318	-69.193	-51.948	-2.992	-1.762	-3.214	18.227***	18.557***	17.259***	19.330***	19.161***	16.789**
	(45.256)	(52.750)	(46.407)	(1.991)	(2.318)	(1.822)	(3.188)	(4.180)	(3.758)	(4.845)	(4.414)	(5.449)
Log(GDPPC)^2	3.312	4.470	3.434	0.137	0.073	0.157	-1.062***	-1.075***	-1.000***	-1.204***	-1.195***	-1.069**
	(2.519)	(2.935)	(2.568)	(0.111)	(0.128)	(0.100)	(0.180)	(0.236)	(0.211)	(0.277)	(0.254)	(0.314)
Unemployment	0.330**	0.374***	0.408**	-0.018*	-0.021**	-0.023**	-0.022***	-0.026***	-0.027***	-0.142**	-0.142**	-0.139**
	(0.124)	(0.104)	(0.120)	(0.009)	(0.008)	(0.009)	(0.003)	(0.002)	(0.003)	(0.048)	(0.046)	(0.046)
Inflation	-0.072	-0.072*	-0.055	0.004	0.004*	0.003	0.002	0.002	0.001	0.001	0.001	0.002
	(0.040)	(0.036)	(0.037)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Tax	-15.488	-11.618	-23.859	0.575	0.369	1.090	1.404**	1.408**	1.921**	1.566**	1.599**	1.289**
	(11.482)	(12.286)	(13.649)	(0.656)	(0.685)	(0.766)	(0.518)	(0.571)	(0.637)	(0.527)	(0.571)	(0.473)
GFC	214.304	334.155	229.506	17.212*	10.272	18.173*	-72.240***	-75.171***	-68.488***	-60.484**	-59.614**	-51.048*
	(203.265)	(236.017)	(209.552)	(8.953)	(10.337)	(8.357)	(14.200)	(18.365)	(16.545)	(21.000)	(18.988)	(22.839)
PS	-0.548	-0.820	-0.554	0.011	0.030	0.018	-0.034	-0.010	-0.016	-0.000	-0.001	0.034
	(0.679)	(0.745)	(0.761)	(0.035)	(0.036)	(0.038)	(0.047)	(0.049)	(0.052)	(0.040)	(0.050)	(0.054)
Countries	27	27	27	27	27	27	27	27	27	27	27	27
Observations	148	148	148	148	148	148	148	148	148	148	148	148
R squared	0.260	0.279	0.262	0.253	0.273	0.247	0.391	0.392	0.378	0.223	0.224	0.230
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.69) Lower Middle-Income Countries: Long Term Effect of Financing the Social Protection Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.079**	-0.220***	-0.045	0.006**	0.013***	-0.001	0.005*	0.015***	0.011	-0.007	0.008*	0.029
	(0.033)	(0.039)	(0.074)	(0.003)	(0.002)	(0.006)	(0.002)	(0.004)	(0.009)	(0.004)	(0.004)	(0.022)
Rest	0.165***	-0.108***	0.159**	-0.007***	0.006***	-0.012*	-0.012***	0.008***	-0.003	-0.019**	0.002	0.022
	(0.034)	(0.015)	(0.065)	(0.002)	(0.001)	(0.006)	(0.003)	(0.001)	(0.006)	(0.008)	(0.001)	(0.018)
TE	0.031	-0.020	0.009	-0.002	0.001	0.000	-0.003	0.001	-0.003	0.001	0.001	-0.005
	(0.058)	(0.066)	(0.050)	(0.003)	(0.004)	(0.002)	(0.004)	(0.004)	(0.005)	(0.004)	(0.003)	(0.007)
PD	-0.065***	-0.057***	-0.070***	0.004***	0.004***	0.004***	0.004***	0.003***	0.004***	0.005***	0.005***	0.004***
	(0.013)	(0.015)	(0.008)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	250.033***	248.486***	267.396***	-14.489***	-14.263***	-15.364***	-16.164***	-16.122***	-17.248***	-10.556***	-11.853***	-11.516***
	(32.885)	(27.768)	(21.807)	(1.959)	(1.850)	(1.418)	(2.075)	(1.626)	(1.425)	(2.100)	(1.247)	(1.622)
Log(GDPPC)^2	-18.191***	-18.143***	-19.439***	1.039***	1.026***	1.101***	1.175***	1.177***	1.254***	0.791***	0.888***	0.867***
	(2.281)	(1.941)	(1.634)	(0.133)	(0.125)	(0.100)	(0.149)	(0.120)	(0.111)	(0.153)	(0.103)	(0.124)
Unemployment	-0.553***	-0.553***	-0.535***	0.039***	0.039***	0.038***	0.025***	0.025***	0.024***	-0.021*	-0.023*	-0.024**
	(0.082)	(0.080)	(0.081)	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)	(0.010)	(0.011)	(0.010)
Inflation	0.191**	0.180**	0.211**	-0.009**	-0.008**	-0.010**	-0.014**	-0.013**	-0.015**	-0.014**	-0.015**	-0.014**
	(0.068)	(0.062)	(0.073)	(0.004)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
Tax	3.008	1.356	1.705	-0.337	-0.288	-0.358	0.159	0.293	0.374	0.657	1.034	1.359
	(9.642)	(11.557)	(7.550)	(0.514)	(0.607)	(0.321)	(0.776)	(0.912)	(0.750)	(0.910)	(0.915)	(1.181)
GFC	-3.108***	-2.976***	-3.470***	0.150***	0.140***	0.170***	0.215***	0.207***	0.234***	0.225***	0.244***	0.229***
	(0.691)	(0.620)	(0.796)	(0.034)	(0.029)	(0.040)	(0.049)	(0.043)	(0.054)	(0.041)	(0.049)	(0.047)
PS	1.674**	2.142***	2.202**	-0.063	-0.087*	-0.100	-0.099**	-0.132***	-0.116**	-0.136***	-0.155***	-0.093
	(0.702)	(0.594)	(0.861)	(0.048)	(0.041)	(0.064)	(0.040)	(0.035)	(0.047)	(0.038)	(0.031)	(0.069)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.477	0.482	0.471	0.462	0.469	0.462	0.468	0.471	0.457	0.372	0.343	0.354
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.610) Lower Middle-Income Countries: Long Term Effect of Financing the Health Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.207***	-0.271***	-0.182	0.015***	0.016***	0.007	0.014***	0.019***	0.021**	-0.016**	-0.000	0.025
	(0.030)	(0.023)	(0.105)	(0.002)	(0.002)	(0.011)	(0.002)	(0.001)	(0.006)	(0.006)	(0.002)	(0.020)
Rest	0.082**	-0.094***	0.103	-0.002	0.005**	-0.009	-0.007***	0.006***	0.001	-0.016*	0.004*	0.022
	(0.027)	(0.025)	(0.082)	(0.002)	(0.002)	(0.008)	(0.002)	(0.002)	(0.005)	(0.007)	(0.002)	(0.017)
TE	-0.008	-0.037	-0.021	0.001	0.002	0.002	0.000	0.002	-0.001	0.002	0.002	-0.004
	(0.065)	(0.070)	(0.050)	(0.004)	(0.004)	(0.002)	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.007)
PD	-0.092***	-0.073***	-0.094***	0.006***	0.005***	0.006***	0.006***	0.005***	0.006***	0.006***	0.005***	0.005***
	(0.009)	(0.011)	(0.005)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	298.440***	274.907***	305.959***	-17.238***	-15.919***	-17.576***	-19.582***	-18.034***	-20.005***	-11.682***	-11.380***	-12.254***
	(19.744)	(24.199)	(20.535)	(1.176)	(1.566)	(1.142)	(1.417)	(1.500)	(1.547)	(1.577)	(1.406)	(1.543)
Log(GDPPC)^2	-21.355***	-19.850***	-21.912***	1.219***	1.133***	1.243***	1.399***	1.300***	1.432***	0.861***	0.853***	0.912***
	(1.670)	(1.895)	(1.755)	(0.091)	(0.114)	(0.091)	(0.121)	(0.124)	(0.130)	(0.125)	(0.114)	(0.126)
Unemployment	-0.543***	-0.556***	-0.541***	0.038***	0.039***	0.038***	0.025***	0.025***	0.024***	-0.026**	-0.025*	-0.026**
	(0.087)	(0.080)	(0.088)	(0.005)	(0.004)	(0.005)	(0.006)	(0.005)	(0.006)	(0.010)	(0.011)	(0.010)
Inflation	0.129**	0.144**	0.144**	-0.006*	-0.006**	-0.006*	-0.010**	-0.011**	-0.010**	-0.012**	-0.014**	-0.012**
	(0.052)	(0.049)	(0.056)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)
Tax	0.954	0.693	0.310	-0.207	-0.243	-0.279	0.307	0.352	0.492	0.519	0.849	1.265
	(12.541)	(13.044)	(10.539)	(0.671)	(0.686)	(0.477)	(0.991)	(1.021)	(0.973)	(0.885)	(0.911)	(1.195)
GFC	-2.494***	-2.602***	-2.733***	0.115***	0.117***	0.128***	0.172***	0.181***	0.182***	0.211***	0.235***	0.213***
	(0.575)	(0.521)	(0.649)	(0.028)	(0.024)	(0.034)	(0.040)	(0.037)	(0.043)	(0.041)	(0.046)	(0.045)
PS	1.393*	1.885**	1.716*	-0.046	-0.070	-0.072	-0.078*	-0.113***	-0.080	-0.142***	-0.171***	-0.090
	(0.590)	(0.550)	(0.802)	(0.043)	(0.040)	(0.063)	(0.033)	(0.032)	(0.043)	(0.034)	(0.027)	(0.069)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.477	0.484	0.475	0.464	0.471	0.466	0.468	0.474	0.465	0.358	0.342	0.349
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.611) Lower Middle-Income Countries: Long Term Effect of Financing the Education Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.078	0.044	0.158	-0.004	-0.005	-0.015	-0.003	0.000	0.001	-0.020**	-0.007*	0.018
	(0.082)	(0.066)	(0.130)	(0.004)	(0.004)	(0.011)	(0.005)	(0.004)	(0.008)	(0.007)	(0.003)	(0.021)
Rest	0.094**	-0.180***	0.156	-0.003	0.010***	-0.012	-0.008***	0.012***	-0.003	-0.016*	0.006**	0.021
	(0.029)	(0.029)	(0.083)	(0.002)	(0.001)	(0.008)	(0.002)	(0.002)	(0.005)	(0.007)	(0.002)	(0.018)
TE	0.010	-0.031	-0.011	-0.001	0.002	0.001	-0.001	0.002	-0.001	0.001	0.001	-0.004
	(0.061)	(0.068)	(0.046)	(0.004)	(0.004)	(0.002)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.006)
PD	-0.086***	-0.085***	-0.091***	0.005***	0.005***	0.006***	0.005***	0.005***	0.005***	0.007***	0.006***	0.006***
	(0.011)	(0.011)	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Log(GDPPC)	268.790***	293.621***	282.644***	-16.014***	-17.270***	-16.798***	-16.796***	-18.524***	-17.454***	-12.764***	-14.462***	-12.893***
	(33.667)	(32.757)	(34.812)	(1.949)	(1.961)	(2.013)	(2.157)	(2.027)	(2.201)	(1.718)	(1.469)	(1.859)
Log(GDPPC)^2	-19.357***	-20.920***	-20.331***	1.134***	1.211***	1.187***	1.214***	1.324***	1.262***	0.930***	1.049***	0.952***
	(2.511)	(2.427)	(2.611)	(0.143)	(0.142)	(0.148)	(0.159)	(0.150)	(0.164)	(0.133)	(0.119)	(0.141)
Unemployment	-0.455***	-0.562***	-0.456***	0.033***	0.040***	0.034***	0.018**	0.025***	0.018**	-0.025**	-0.022*	-0.026**
	(0.086)	(0.089)	(0.084)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.010)	(0.010)	(0.010)
Inflation	0.158**	0.166**	0.178**	-0.007*	-0.008**	-0.009**	-0.012**	-0.012**	-0.013**	-0.012**	-0.014**	-0.013**
	(0.061)	(0.057)	(0.066)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)
Tax	5.503	6.299	5.450	-0.499	-0.607	-0.609*	0.019	0.002	0.170	0.466	0.756	1.170
	(9.148)	(10.858)	(7.309)	(0.465)	(0.569)	(0.290)	(0.791)	(0.893)	(0.778)	(0.817)	(0.883)	(1.133)
GFC	-2.826***	-2.672***	-3.134***	0.134***	0.121***	0.151***	0.195***	0.187***	0.211***	0.211***	0.227***	0.217***
	(0.657)	(0.602)	(0.764)	(0.034)	(0.029)	(0.040)	(0.044)	(0.042)	(0.049)	(0.043)	(0.050)	(0.047)
PS	1.837**	1.729**	2.251**	-0.066	-0.058	-0.096	-0.119**	-0.112**	-0.129**	-0.128***	-0.131***	-0.086
	(0.710)	(0.589)	(0.902)	(0.048)	(0.039)	(0.065)	(0.044)	(0.040)	(0.049)	(0.036)	(0.036)	(0.059)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.453	0.486	0.453	0.440	0.475	0.444	0.444	0.472	0.440	0.359	0.347	0.349
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.612) Lower Middle-Income Countries: Long Term Effect of Financing the Agricultural Sector – 2-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.388	0.241	0.294	-0.014	-0.010	-0.017	-0.031*	-0.019	-0.016	-0.034*	-0.009	0.011
	(0.228)	(0.166)	(0.190)	(0.011)	(0.009)	(0.013)	(0.016)	(0.011)	(0.010)	(0.016)	(0.006)	(0.013)
Rest	0.127**	-0.173***	0.114**	-0.004**	0.009***	-0.011*	-0.010**	0.012***	0.001	-0.018*	0.005**	0.025
	(0.044)	(0.011)	(0.046)	(0.002)	(0.001)	(0.006)	(0.004)	(0.001)	(0.007)	(0.008)	(0.002)	(0.020)
TE	0.028	-0.033	0.010	-0.001	0.002	0.001	-0.003	0.002	-0.003	0.001	0.002	-0.005
	(0.059)	(0.066)	(0.056)	(0.003)	(0.004)	(0.002)	(0.004)	(0.004)	(0.005)	(0.003)	(0.003)	(0.007)
PD	-0.088***	-0.055***	-0.089***	0.005***	0.004***	0.005***	0.006***	0.003***	0.005***	0.006***	0.005***	0.005***
	(0.007)	(0.010)	(0.005)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	257.152***	222.965***	272.074***	-15.121***	-13.115***	-15.886***	-16.525***	-14.188***	-17.345***	-10.750***	-11.062***	-11.271***
	(28.153)	(30.203)	(22.964)	(1.787)	(2.033)	(1.469)	(1.578)	(1.663)	(1.431)	(1.382)	(1.005)	(1.445)
Log(GDPPC)^2	-18.692***	-16.618***	-19.731***	1.081***	0.957***	1.132***	1.202***	1.061***	1.262***	0.807***	0.840***	0.854***
	(1.951)	(2.024)	(1.729)	(0.119)	(0.134)	(0.103)	(0.118)	(0.117)	(0.114)	(0.110)	(0.088)	(0.116)
Unemployment	-0.497***	-0.607***	-0.482***	0.035***	0.041***	0.034***	0.022***	0.029***	0.021***	-0.023**	-0.022*	-0.025**
	(0.088)	(0.070)	(0.082)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.009)	(0.010)	(0.009)
Inflation	0.163**	0.171**	0.181**	-0.008*	-0.008**	-0.009**	-0.012**	-0.013**	-0.013**	-0.012**	-0.014**	-0.013**
	(0.061)	(0.050)	(0.067)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Tax	4.416	0.094	3.373	-0.434	-0.260	-0.505	0.072	0.403	0.304	0.599	1.033	1.382
	(9.930)	(13.288)	(8.867)	(0.541)	(0.705)	(0.406)	(0.774)	(1.024)	(0.818)	(0.874)	(0.960)	(1.192)
GFC	-3.145***	-3.273***	-3.352***	0.147**	0.151***	0.158**	0.221***	0.231***	0.231***	0.230***	0.249***	0.233***
	(0.855)	(0.670)	(0.933)	(0.043)	(0.031)	(0.047)	(0.058)	(0.046)	(0.063)	(0.048)	(0.050)	(0.053)
PS	1.827**	2.460***	2.185**	-0.071	-0.103**	-0.100	-0.110**	-0.155***	-0.114**	-0.144***	-0.168***	-0.089
	(0.765)	(0.636)	(0.858)	(0.052)	(0.043)	(0.065)	(0.041)	(0.036)	(0.043)	(0.032)	(0.030)	(0.066)
Countries	22	22	22	22	22	22	22	22	22	22	22	22
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.460	0.494	0.456	0.443	0.475	0.445	0.453	0.487	0.445	0.364	0.345	0.353
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

A.7 Robustness Check 5: Inequality Impact of Reallocations - 4-Year Lead Values of the Dependent Variables

Table (A.71) All Middle-Income Countries: Long Term Effect of Financing the Social Protection Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.084**	-0.047*	-0.335**	-0.009***	0.001	0.014*	0.001	0.003**	0.016**	-0.007*	-0.014***	0.018
	(0.025)	(0.022)	(0.102)	(0.001)	(0.001)	(0.007)	(0.001)	(0.001)	(0.004)	(0.003)	(0.003)	(0.035)
Rest	0.149***	-0.014	-0.327**	-0.011***	0.003**	0.015	-0.002*	0.000	0.014**	0.007*	-0.004	0.036
	(0.024)	(0.011)	(0.121)	(0.001)	(0.001)	(0.008)	(0.001)	(0.000)	(0.004)	(0.003)	(0.002)	(0.043)
TE	-0.034**	-0.013	0.020	0.004***	0.003***	0.000	-0.001	-0.001*	-0.003**	-0.005	-0.006	-0.006
	(0.011)	(0.007)	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.005)
PD	-0.018*	-0.007	-0.016*	0.001**	0.000	0.001*	0.000	0.000	0.001*	0.001	0.002	0.003
	(0.008)	(0.010)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
Log(GDPPC)	33.273**	32.443**	35.457***	-1.687**	-1.558**	-1.773***	-1.912**	-1.897**	-2.020**	-3.608	-3.757	-3.910
	(9.639)	(8.939)	(8.411)	(0.458)	(0.434)	(0.360)	(0.604)	(0.586)	(0.657)	(2.200)	(2.276)	(2.658)
$Log(GDPPC)^2$	-1.716**	-1.688***	-1.702**	0.086***	0.082***	0.084***	0.107**	0.106**	0.107**	0.160	0.164	0.160
	(0.461)	(0.405)	(0.433)	(0.021)	(0.019)	(0.017)	(0.033)	(0.032)	(0.035)	(0.106)	(0.110)	(0.118)
Unemployment	0.151***	0.203***	0.176***	-0.003	-0.007*	-0.006	-0.002	-0.003	-0.002	-0.060*	-0.058*	-0.055**
	(0.036)	(0.038)	(0.043)	(0.004)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)	(0.026)	(0.025)	(0.019)
Inflation	-0.029***	-0.024**	-0.024	0.001*	0.001	0.001	0.000	0.000	0.000	0.005	0.005	0.006
	(0.006)	(0.007)	(0.014)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.006)	(0.006)
Tax	1.755	-3.196	-3.671**	-0.282**	0.048	0.134	0.159	0.230*	0.242	1.178**	1.024*	0.931
	(1.274)	(2.102)	(0.983)	(0.070)	(0.081)	(0.074)	(0.101)	(0.101)	(0.132)	(0.405)	(0.426)	(0.595)
PS	0.225	0.390	-0.475*	-0.019	-0.034	0.008	0.033	0.031	0.068**	0.078	0.091*	0.179
	(0.342)	(0.404)	(0.213)	(0.014)	(0.021)	(0.017)	(0.021)	(0.021)	(0.022)	(0.044)	(0.037)	(0.137)
Countries	46	46	46	46	46	46	46	46	46	46	46	46
Observations	194	194	194	194	194	194	194	194	194	194	194	194
R squared	0.144	0.118	0.169	0.140	0.106	0.125	0.176	0.174	0.214	0.076	0.076	0.092
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity.

Table (A.72) All Middle-Income Countries: Long Term Effect of Financing the Health Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	0.174**	0.051	-0.274**	-0.013***	-0.003*	0.012	0.003	0.004*	0.017**	0.019***	0.020***	0.036
	(0.045)	(0.033)	(0.088)	(0.002)	(0.002)	(0.006)	(0.002)	(0.002)	(0.005)	(0.004)	(0.002)	(0.034)
Rest	0.132***	-0.045**	-0.342**	-0.011***	0.004***	0.015*	-0.001	0.001	0.015**	0.004	-0.014***	0.024
	(0.019)	(0.014)	(0.108)	(0.001)	(0.001)	(0.007)	(0.001)	(0.001)	(0.004)	(0.003)	(0.003)	(0.036)
TE	-0.021	-0.024**	0.026**	0.003***	0.003***	0.000	-0.001	-0.001	-0.003**	-0.002	-0.009*	-0.003
	(0.011)	(0.009)	(0.009)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.004)
PD	-0.015	-0.009	-0.018*	0.001**	0.001	0.001**	0.000	0.000	0.000*	0.002	0.001	0.003
	(0.008)	(0.010)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.003)
Log(GDPPC)	28.790**	29.085***	33.611***	-1.477**	-1.501***	-1.717***	-1.834**	-1.833**	-2.018**	-4.740	-4.852	-5.004
	(7.778)	(6.761)	(6.561)	(0.375)	(0.300)	(0.263)	(0.585)	(0.579)	(0.680)	(2.704)	(2.783)	(3.241)
Log(GDPPC)^2	-1.424***	-1.479***	-1.556***	0.072***	0.076***	0.080***	0.104**	0.104**	0.107**	0.235	0.233	0.239
	(0.346)	(0.302)	(0.331)	(0.016)	(0.013)	(0.012)	(0.031)	(0.031)	(0.036)	(0.139)	(0.138)	(0.156)
Unemployment	0.158***	0.212***	0.182***	-0.004	-0.008**	-0.006*	-0.002	-0.003	-0.002	-0.058*	-0.055*	-0.055**
	(0.036)	(0.040)	(0.044)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.023)	(0.023)	(0.019)
Inflation	-0.029***	-0.023***	-0.021	0.001*	0.001	0.000	0.001	0.001	0.001	0.006	0.006	0.006
	(0.005)	(0.004)	(0.012)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.005)	(0.006)
Tax	0.540	-0.684	-2.562**	-0.246***	-0.146	0.058	0.329*	0.310	0.313	1.026*	1.920**	0.807*
	(1.219)	(2.623)	(0.903)	(0.055)	(0.155)	(0.071)	(0.151)	(0.160)	(0.161)	(0.444)	(0.625)	(0.335)
PS	0.390	0.571	-0.406*	-0.027*	-0.042**	0.004	0.034	0.031	0.071**	0.123*	0.152**	0.188
	(0.326)	(0.345)	(0.199)	(0.013)	(0.015)	(0.017)	(0.024)	(0.023)	(0.024)	(0.053)	(0.056)	(0.133)
Countries	46	46	46	46	46	46	46	46	46	46	46	46
Observations	194	194	194	194	194	194	194	194	194	194	194	194
R squared	0.135	0.122	0.173	0.136	0.113	0.128	0.171	0.172	0.215	0.066	0.092	0.074
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity.

Table (A.73) All Middle-Income Countries: Long Term Effect of Financing the Education Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.083***	-0.049**	-0.323**	-0.007***	0.004**	0.016*	0.003**	0.004***	0.016***	-0.012	-0.012	0.013
	(0.019)	(0.017)	(0.100)	(0.001)	(0.001)	(0.007)	(0.001)	(0.001)	(0.003)	(0.006)	(0.009)	(0.036)
Rest	0.128***	-0.021	-0.339**	-0.010***	0.002**	0.014	-0.001	0.001	0.015**	0.002	-0.007	0.035
	(0.020)	(0.014)	(0.113)	(0.001)	(0.001)	(0.008)	(0.001)	(0.001)	(0.004)	(0.003)	(0.004)	(0.039)
TE	-0.034*	-0.021**	0.026*	0.004***	0.003***	0.001	-0.001	-0.001	-0.003*	-0.006***	-0.008**	-0.010
	(0.014)	(0.008)	(0.011)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.005)
PD	-0.014	-0.006	-0.017*	0.001**	0.000	0.001*	0.000	0.000	0.001	0.002	0.002	0.004
	(0.008)	(0.010)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.003)
Log(GDPPC)	26.063**	28.474**	36.492***	-1.236*	-1.464**	-1.644***	-1.419**	-1.494*	-1.890*	-5.604*	-4.680**	-6.748
	(9.218)	(9.712)	(7.278)	(0.515)	(0.464)	(0.330)	(0.514)	(0.607)	(0.747)	(2.217)	(1.647)	(3.673)
Log(GDPPC)^2	-1.295**	-1.466**	-1.750***	0.060*	0.076**	0.078***	0.079**	0.084*	0.099*	0.275*	0.215**	0.324
	(0.420)	(0.451)	(0.348)	(0.024)	(0.021)	(0.015)	(0.027)	(0.033)	(0.039)	(0.110)	(0.073)	(0.180)
Unemployment	0.161***	0.205***	0.172***	-0.004	-0.007*	-0.006*	-0.003	-0.003	-0.002	-0.057*	-0.058*	-0.052**
	(0.034)	(0.037)	(0.040)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.001)	(0.025)	(0.027)	(0.018)
Inflation	-0.032***	-0.026***	-0.025	0.001**	0.001	0.001	0.001	0.001	0.000	0.005	0.004	0.005
	(0.007)	(0.006)	(0.013)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.005)	(0.005)
Tax	-0.067	-3.384	-3.961***	-0.212**	0.052	0.115*	0.236	0.248*	0.261	0.796**	0.979**	0.705*
	(1.206)	(1.718)	(0.625)	(0.079)	(0.101)	(0.055)	(0.126)	(0.115)	(0.151)	(0.304)	(0.379)	(0.275)
PS	0.366	0.455	-0.508	-0.026	-0.034	0.005	0.025	0.025	0.067**	0.113**	0.108***	0.218
	(0.358)	(0.413)	(0.252)	(0.016)	(0.019)	(0.020)	(0.021)	(0.022)	(0.025)	(0.034)	(0.024)	(0.130)
Countries	46	46	46	46	46	46	46	46	46	46	46	46
Observations	194	194	194	194	194	194	194	194	194	194	194	194
R squared	0.136	0.117	0.169	0.138	0.105	0.125	0.173	0.173	0.213	0.067	0.073	0.084
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity

Table (A.74) All Middle-Income Countries: Long Term Effect of Financing the Agricultural Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.065*	-0.097**	-0.360**	-0.004	0.010***	0.020**	-0.005**	-0.002	0.010*	0.042*	0.033	0.055
	(0.030)	(0.027)	(0.113)	(0.002)	(0.002)	(0.007)	(0.001)	(0.002)	(0.004)	(0.020)	(0.018)	(0.047)
Rest	0.129***	-0.026**	-0.330**	-0.011***	0.002**	0.014	-0.001	0.001**	0.016**	0.005	-0.009**	0.023
	(0.019)	(0.010)	(0.108)	(0.001)	(0.001)	(0.007)	(0.001)	(0.000)	(0.004)	(0.003)	(0.002)	(0.035)
TE	-0.024*	-0.018**	0.021**	0.003***	0.003***	0.001	-0.002	-0.001	-0.003**	-0.003	-0.008*	-0.003
	(0.012)	(0.007)	(0.008)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)
PD	-0.014	-0.006	-0.016*	0.001**	0.000	0.001*	0.000	0.000	0.001*	0.002	0.002	0.003
	(0.008)	(0.009)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
Log(GDPPC)	32.588***	34.019***	36.351***	-1.839***	-1.955***	-2.065***	-1.603**	-1.608**	-1.721*	-6.036	-6.064	-6.122
	(7.852)	(6.888)	(7.048)	(0.353)	(0.286)	(0.253)	(0.607)	(0.620)	(0.709)	(3.117)	(3.052)	(3.476)
Log(GDPPC)^2	-1.655***	-1.778***	-1.747***	0.093***	0.103***	0.101***	0.089**	0.091**	0.089*	0.299	0.289	0.294
	(0.354)	(0.306)	(0.348)	(0.016)	(0.012)	(0.012)	(0.032)	(0.033)	(0.037)	(0.162)	(0.154)	(0.171)
Unemployment	0.166***	0.214***	0.181**	-0.005	-0.008*	-0.007*	-0.002	-0.002	-0.001	-0.067*	-0.067*	-0.063**
	(0.039)	(0.041)	(0.046)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.028)	(0.029)	(0.021)
Inflation	-0.033***	-0.028***	-0.025	0.001**	0.001	0.001	0.000	0.000	0.000	0.006	0.005	0.006
	(0.007)	(0.007)	(0.013)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.005)	(0.006)
Tax	-0.030	-3.014	-3.714***	-0.221***	0.017	0.096	0.267*	0.250*	0.293*	0.589	0.842**	0.411
	(0.981)	(1.607)	(0.582)	(0.054)	(0.094)	(0.057)	(0.108)	(0.115)	(0.141)	(0.296)	(0.287)	(0.250)
PS	0.339	0.441	-0.467*	-0.024	-0.033	0.006	0.029	0.028	0.070**	0.097	0.099*	0.165
	(0.361)	(0.416)	(0.202)	(0.016)	(0.020)	(0.016)	(0.019)	(0.021)	(0.021)	(0.048)	(0.040)	(0.134)
Countries	46	46	46	46	46	46	46	46	46	46	46	46
Observations	194	194	194	194	194	194	194	194	194	194	194	194
R squared	0.134	0.118	0.169	0.137	0.107	0.127	0.167	0.171	0.216	0.070	0.083	0.077
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity.

Table (A.75) Upper Middle-Income Countries: Long Term Effect of Financing the Social Protection Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	0.076*	-0.061**	-0.535***	-0.009***	0.001	0.027***	0.004***	0.004***	0.025**	0.007	-0.010**	0.027
	(0.034)	(0.016)	(0.098)	(0.002)	(0.001)	(0.006)	(0.000)	(0.000)	(0.008)	(0.006)	(0.004)	(0.049)
Rest	0.164**	0.068*	-0.548***	-0.012***	-0.001	0.030***	-0.001	-0.004**	0.023**	0.019**	-0.012	0.042
	(0.048)	(0.027)	(0.097)	(0.003)	(0.002)	(0.006)	(0.001)	(0.002)	(0.009)	(0.007)	(0.008)	(0.061)
TE	-0.062	0.031	0.044	0.006**	0.002	-0.001	-0.000	-0.004	-0.003	-0.006*	-0.010	-0.006
	(0.033)	(0.046)	(0.022)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)	(0.006)	(0.008)
PD	-0.027**	-0.011	-0.030*	0.001**	0.000	0.001	0.002	0.001	0.002*	0.004	0.005	0.007
	(0.010)	(0.014)	(0.012)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.005)
Log(GDPPC)	85.980	118.990	133.622*	-9.551*	-10.861*	-12.398***	5.758	4.521	4.298*	-3.477	-4.951	-4.210
	(88.123)	(87.423)	(53.258)	(4.610)	(4.679)	(2.580)	(2.894)	(3.040)	(1.870)	(5.625)	(6.869)	(7.711)
Log(GDPPC)^2	-4.670	-6.380	-7.017*	0.539*	0.609*	0.681***	-0.346*	-0.284	-0.277**	0.097	0.164	0.120
	(4.926)	(4.787)	(2.936)	(0.258)	(0.256)	(0.141)	(0.164)	(0.167)	(0.102)	(0.300)	(0.361)	(0.402)
Unemployment	0.559***	0.582***	0.508***	-0.021***	-0.025***	-0.019***	-0.020*	-0.018	-0.015*	-0.145*	-0.134*	-0.131*
	(0.073)	(0.070)	(0.088)	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)	(0.007)	(0.067)	(0.060)	(0.052)
Inflation	-0.096***	-0.111***	-0.058	0.006***	0.007***	0.004*	-0.000	0.000	-0.002	0.001	0.001	-0.004
	(0.020)	(0.025)	(0.030)	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)	(0.008)	(0.009)	(0.003)
Tax	0.683	-11.331**	-2.427	-0.198	0.437**	0.107	0.422*	0.710**	0.251**	3.508	3.222	2.141
	(2.668)	(3.731)	(1.890)	(0.145)	(0.167)	(0.122)	(0.203)	(0.238)	(0.067)	(1.995)	(2.132)	(1.332)
GFC	-351.533	-499.652	-526.100*	44.571*	49.804*	55.025***	-18.140	-11.932	-12.838	37.277	47.235	39.715
	(392.558)	(399.568)	(243.213)	(20.513)	(21.358)	(11.901)	(12.772)	(13.863)	(8.089)	(25.711)	(32.687)	(32.628)
PS	-0.582	-0.446	-1.545**	0.011	0.005	0.062*	0.141**	0.137**	0.184**	0.294*	0.293*	0.384
	(0.745)	(0.767)	(0.537)	(0.040)	(0.043)	(0.029)	(0.054)	(0.051)	(0.066)	(0.144)	(0.126)	(0.246)
Countries	26	26	26	26	26	26	26	26	26	26	26	26
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.233	0.216	0.328	0.229	0.190	0.306	0.275	0.286	0.357	0.160	0.158	0.169
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.76) Upper Middle-Income Countries: Long Term Effect of Financing the Health Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	0.238*	0.141	-0.243**	-0.014*	-0.005	0.014**	0.004	0.003	0.018*	0.080*	0.087**	0.075
	(0.111)	(0.089)	(0.087)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.007)	(0.032)	(0.032)	(0.048)
Rest	0.131**	-0.033	-0.634***	-0.011***	0.001	0.032***	0.001	0.001	0.026**	0.014	-0.025**	0.016
	(0.041)	(0.016)	(0.085)	(0.002)	(0.001)	(0.007)	(0.001)	(0.001)	(0.009)	(0.007)	(0.010)	(0.047)
TE	-0.026	-0.015	0.109**	0.005*	0.003	-0.003	-0.001	-0.000	-0.005	0.007	-0.005	0.008
	(0.040)	(0.031)	(0.032)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.004)	(0.005)
PD	-0.022	-0.018	-0.044**	0.001*	0.000	0.002**	0.001	0.001	0.002	0.003	0.001	0.005
	(0.012)	(0.014)	(0.015)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.006)
Log(GDPPC)	85.068	79.104	101.687*	-9.496*	-9.910*	-10.650***	4.958	5.404*	4.754***	-8.148	-19.286	-7.218
	(80.309)	(76.765)	(43.780)	(4.311)	(4.400)	(2.327)	(2.499)	(2.507)	(0.986)	(7.850)	(10.997)	(7.435)
Log(GDPPC)^2	-4.557	-4.182	-4.879*	0.534*	0.554*	0.567***	-0.297*	-0.322*	-0.309***	0.406	1.037	0.344
	(4.438)	(4.231)	(2.336)	(0.239)	(0.243)	(0.125)	(0.138)	(0.139)	(0.048)	(0.443)	(0.618)	(0.385)
Unemployment	0.509***	0.574***	0.422***	-0.020***	-0.024***	-0.017***	-0.019	-0.019	-0.013	-0.162*	-0.145*	-0.154**
	(0.092)	(0.083)	(0.082)	(0.004)	(0.003)	(0.004)	(0.010)	(0.010)	(0.007)	(0.067)	(0.061)	(0.054)
Inflation	-0.096***	-0.102***	-0.055	0.006***	0.007***	0.004*	-0.000	-0.001	-0.002*	0.000	0.000	-0.002
	(0.022)	(0.020)	(0.031)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.008)	(0.007)	(0.004)
Tax	-3.093	-5.012	4.257*	-0.094	0.276	-0.279**	0.743**	0.617	0.167	3.585	5.869	2.647**
	(2.967)	(4.700)	(1.821)	(0.138)	(0.196)	(0.108)	(0.259)	(0.323)	(0.128)	(1.922)	(3.000)	(0.850)
GFC	-354.346	-316.100	-406.521	44.589*	45.638*	48.393***	-14.897	-16.943	-14.492**	54.159	105.528*	50.442
	(362.305)	(347.355)	(203.496)	(19.354)	(19.908)	(10.914)	(11.323)	(11.302)	(4.587)	(34.006)	(48.703)	(31.436)
PS	-0.329	-0.347	-1.492**	0.004	0.002	0.061**	0.133*	0.135*	0.183**	0.364*	0.330	0.397
	(0.813)	(0.813)	(0.480)	(0.043)	(0.043)	(0.024)	(0.059)	(0.058)	(0.066)	(0.167)	(0.170)	(0.244)
Countries	26	26	26	26	26	26	26	26	26	26	26	26
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.218	0.205	0.362	0.225	0.191	0.321	0.256	0.256	0.360	0.177	0.215	0.175
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.77) Upper Middle-Income Countries: Long Term Effect of Financing the Education Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	0.016	-0.111***	-0.468***	-0.004	0.006***	0.024**	0.010**	0.010**	0.024**	-0.001	-0.013	0.014
	(0.044)	(0.024)	(0.090)	(0.002)	(0.001)	(0.006)	(0.003)	(0.003)	(0.007)	(0.019)	(0.019)	(0.046)
Rest	0.142**	0.011	-0.620***	-0.011***	-0.001*	0.031***	0.000	-0.001	0.025*	0.016*	-0.011	0.050
	(0.041)	(0.007)	(0.100)	(0.002)	(0.001)	(0.007)	(0.001)	(0.001)	(0.010)	(0.007)	(0.009)	(0.057)
TE	-0.080*	-0.035	0.091**	0.007**	0.004*	-0.002	0.001	0.001	-0.004	-0.008*	-0.010***	-0.014
	(0.037)	(0.031)	(0.032)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.008)
PD	-0.025*	-0.014	-0.027*	0.001*	0.000	0.001*	0.002	0.002	0.002*	0.004	0.005	0.006
	(0.012)	(0.016)	(0.011)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.005)
Log(GDPPC)	73.842	90.010	160.296**	-8.599	-9.925*	-13.376***	6.843**	6.726**	3.986	-5.072	-4.906	-9.181
	(83.291)	(78.653)	(57.858)	(4.505)	(4.190)	(3.025)	(2.323)	(2.230)	(2.092)	(4.383)	(4.608)	(9.392)
Log(GDPPC)^2	-4.032	-4.888	-8.442**	0.488	0.558*	0.732***	-0.404**	-0.398**	-0.260*	0.181	0.164	0.383
	(4.643)	(4.359)	(3.164)	(0.251)	(0.231)	(0.166)	(0.133)	(0.127)	(0.112)	(0.238)	(0.249)	(0.490)
Unemployment	0.591***	0.633***	0.428***	-0.024***	-0.027***	-0.017**	-0.022	-0.022	-0.014*	-0.141	-0.133	-0.119**
	(0.091)	(0.092)	(0.066)	(0.004)	(0.003)	(0.004)	(0.011)	(0.011)	(0.006)	(0.071)	(0.069)	(0.045)
Inflation	-0.080**	-0.090**	-0.070*	0.005**	0.006**	0.005**	-0.001*	-0.002*	-0.002*	0.003	0.001	0.000
	(0.024)	(0.024)	(0.030)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.007)	(0.006)	(0.005)
Tax	-0.776	-8.283**	-4.540*	-0.260	0.355*	0.127	0.431**	0.485**	0.307***	3.293*	3.204	2.277*
	(2.024)	(3.196)	(1.821)	(0.137)	(0.155)	(0.121)	(0.134)	(0.164)	(0.067)	(1.476)	(1.898)	(1.014)
GFC	-291.673	-356.567	-646.004*	40.077	45.451*	59.556***	-23.356*	-22.711*	-11.509	45.165*	46.797*	62.668
	(372.412)	(354.349)	(264.948)	(20.079)	(18.976)	(13.902)	(10.175)	(9.816)	(9.175)	(19.725)	(21.424)	(40.227)
PS	-0.730	-0.660	-1.337*	0.025	0.019	0.053	0.156*	0.156*	0.183**	0.275	0.287	0.338
	(0.764)	(0.823)	(0.561)	(0.038)	(0.042)	(0.028)	(0.063)	(0.063)	(0.064)	(0.179)	(0.183)	(0.218)
Countries	26	26	26	26	26	26	26	26	26	26	26	26
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.224	0.206	0.338	0.234	0.197	0.306	0.274	0.275	0.355	0.156	0.158	0.170
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.78) Upper Middle-Income Countries: Long Term Effect of Financing the Agricultural Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	0.419***	0.314*	-0.290	-0.026***	-0.017	0.014	-0.022***	-0.022***	0.005	0.027	0.012	0.051
	(0.098)	(0.139)	(0.206)	(0.006)	(0.009)	(0.014)	(0.003)	(0.003)	(0.009)	(0.029)	(0.026)	(0.088)
Rest	0.126**	-0.018**	-0.530***	-0.010***	0.001	0.027**	0.001	0.002***	0.024**	0.015*	-0.012*	0.031
	(0.048)	(0.007)	(0.106)	(0.002)	(0.000)	(0.007)	(0.001)	(0.000)	(0.008)	(0.007)	(0.005)	(0.051)
TE	-0.045	-0.032	0.037	0.005**	0.003	0.000	-0.001	0.000	-0.003	-0.003**	-0.010	-0.003
	(0.036)	(0.030)	(0.022)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.006)	(0.005)
PD	-0.020	-0.014	-0.031*	0.001	0.000	0.001*	0.001	0.002	0.002	0.005	0.005	0.007
	(0.012)	(0.016)	(0.013)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.003)	(0.006)
Log(GDPPC)	112.627	119.405	146.136**	-10.732*	-11.565*	-12.811***	3.876	4.441	3.039*	-1.529	-3.393	-1.407
	(83.081)	(82.143)	(53.276)	(4.551)	(4.553)	(2.903)	(2.412)	(2.572)	(1.356)	(4.886)	(4.959)	(6.082)
Log(GDPPC)^2	-6.228	-6.606	-7.763**	0.608*	0.653**	0.707***	-0.236	-0.265	-0.203**	-0.017	0.075	-0.039
	(4.607)	(4.551)	(2.937)	(0.253)	(0.252)	(0.161)	(0.134)	(0.145)	(0.073)	(0.265)	(0.263)	(0.322)
Unemployment	0.546***	0.613***	0.527***	-0.021***	-0.026***	-0.022***	-0.019	-0.020*	-0.016*	-0.148*	-0.132*	-0.139**
	(0.099)	(0.091)	(0.093)	(0.004)	(0.004)	(0.005)	(0.010)	(0.010)	(0.007)	(0.064)	(0.059)	(0.054)
Inflation	-0.091***	-0.097***	-0.057	0.006***	0.006***	0.004*	-0.001	-0.001	-0.003*	0.001	0.001	-0.002
	(0.020)	(0.022)	(0.032)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.009)	(0.009)	(0.005)
Tax	-7.916	-12.255**	-4.848	0.131	0.572**	0.164	0.978**	0.783**	0.516***	2.664	2.964	1.454**
	(4.144)	(3.320)	(2.835)	(0.224)	(0.167)	(0.187)	(0.284)	(0.256)	(0.082)	(1.477)	(1.781)	(0.454)
GFC	-463.717	-482.350	-580.049*	49.557*	52.482*	56.881***	-10.201	-12.905	-7.482	29.132	40.422	28.124
	(372.606)	(369.768)	(244.126)	(20.293)	(20.537)	(13.350)	(10.851)	(11.426)	(5.919)	(22.227)	(23.462)	(25.894)
PS	-0.554	-0.600	-1.658**	0.014	0.015	0.069**	0.143**	0.148**	0.193**	0.313*	0.278*	0.379
	(0.764)	(0.785)	(0.472)	(0.041)	(0.041)	(0.024)	(0.051)	(0.049)	(0.060)	(0.130)	(0.118)	(0.225)
Countries	26	26	26	26	26	26	26	26	26	26	26	26
Observations	111	111	111	111	111	111	111	111	111	111	111	111
R squared	0.224	0.210	0.334	0.232	0.199	0.304	0.275	0.278	0.369	0.152	0.159	0.158
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity.

Table (A.79) Lower Middle-Income Countries: Long Term Effect of Financing the Social Protection Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
SPS	-0.054*	-0.092***	0.429***	0.001	0.006**	-0.038***	0.001	0.003*	-0.019***	-0.009***	-0.007***	-0.002
	(0.022)	(0.021)	(0.084)	(0.002)	(0.002)	(0.006)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.002)
Rest	0.037	-0.090***	0.505***	-0.005*	0.008***	-0.043***	-0.002*	0.005***	-0.021***	-0.003**	-0.001	0.005*
	(0.027)	(0.011)	(0.099)	(0.002)	(0.001)	(0.007)	(0.001)	(0.000)	(0.004)	(0.001)	(0.001)	(0.002)
TE	-0.019	-0.035	-0.111***	0.002	0.003*	0.010***	-0.000	0.001	0.004**	-0.000	-0.000	-0.001
	(0.021)	(0.020)	(0.015)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PD	-0.032***	-0.027***	-0.065***	0.003***	0.002***	0.005***	0.001***	0.001***	0.003***	0.001	0.001	0.001
	(0.003)	(0.004)	(0.006)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	62.394***	56.625***	111.079***	-4.756***	-4.565***	-9.193***	-2.539***	-2.313***	-4.749***	0.701	0.120	0.639
	(11.261)	(5.591)	(13.248)	(0.937)	(0.581)	(1.018)	(0.504)	(0.430)	(0.583)	(0.859)	(0.709)	(0.820)
Log(GDPPC)^2	-4.113***	-3.694***	-7.460***	0.313***	0.299***	0.619***	0.163***	0.146***	0.315***	-0.041	0.001	-0.035
	(0.727)	(0.343)	(0.846)	(0.060)	(0.037)	(0.065)	(0.033)	(0.027)	(0.038)	(0.060)	(0.051)	(0.056)
Unemployment	-0.166***	-0.149***	-0.195***	0.013***	0.011**	0.015***	0.005**	0.004**	0.006**	-0.009***	-0.009***	-0.009***
	(0.030)	(0.036)	(0.036)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Inflation	0.048***	0.022	0.067***	-0.004***	-0.002	-0.005***	-0.001	0.001	-0.001***	0.003**	0.002**	0.003**
	(0.005)	(0.012)	(0.006)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Tax	-0.726	-5.738	6.361***	-0.017	0.418	-0.616***	0.152	0.415	-0.148	-0.245	-0.287	-0.176
	(3.331)	(5.093)	(1.211)	(0.277)	(0.401)	(0.086)	(0.152)	(0.222)	(0.089)	(0.144)	(0.238)	(0.141)
PS	0.782**	1.042***	2.197***	-0.057*	-0.082***	-0.179***	-0.031**	-0.045***	-0.092***	-0.020	-0.022	-0.010
	(0.277)	(0.183)	(0.441)	(0.023)	(0.015)	(0.035)	(0.010)	(0.007)	(0.016)	(0.017)	(0.014)	(0.014)
Countries	20	20	20	20	20	20	20	20	20	20	20	20
Observations	83	83	83	83	83	83	83	83	83	83	83	83
R squared	0.218	0.274	0.345	0.211	0.276	0.355	0.246	0.323	0.359	0.106	0.105	0.107
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the social protection sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity.

Table (A.710) Lower Middle-Income Countries: Long Term Effect of Financing the Health Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
HS	-0.053	-0.042***	0.446***	0.002	0.003***	-0.038***	0.003	0.003***	-0.017***	-0.003	0.002	0.007**
	(0.034)	(0.009)	(0.097)	(0.003)	(0.001)	(0.008)	(0.001)	(0.000)	(0.004)	(0.002)	(0.001)	(0.002)
Rest	0.013	-0.112***	0.513***	-0.003	0.009***	-0.043***	-0.001	0.005***	-0.022***	-0.004**	-0.004*	0.006*
	(0.027)	(0.020)	(0.107)	(0.002)	(0.001)	(0.008)	(0.001)	(0.001)	(0.004)	(0.001)	(0.002)	(0.003)
TE	-0.028	-0.036*	-0.120***	0.002	0.003*	0.010***	0.000	0.000	0.004***	-0.001	-0.001	-0.002*
	(0.020)	(0.016)	(0.014)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PD	-0.044***	-0.020**	-0.075***	0.004***	0.002**	0.006***	0.002***	0.001**	0.003***	0.000	0.001	0.000
	(0.007)	(0.006)	(0.009)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Log(GDPPC)	88.985***	38.167***	132.614***	-6.740***	-2.942***	-10.786***	-3.835**	-1.755***	-5.831***	1.453	-1.196	1.202
	(19.483)	(6.803)	(22.616)	(1.551)	(0.587)	(1.686)	(0.985)	(0.406)	(1.077)	(1.112)	(1.015)	(1.147)
Log(GDPPC)^2	-5.834***	-2.472***	-8.832***	0.442***	0.193***	0.721***	0.247**	0.111***	0.385***	-0.088	0.092	-0.068
	(1.253)	(0.462)	(1.464)	(0.100)	(0.039)	(0.109)	(0.064)	(0.026)	(0.070)	(0.072)	(0.073)	(0.074)
Unemployment	-0.190***	-0.115***	-0.220***	0.015***	0.009***	0.017***	0.007**	0.003**	0.008***	-0.008**	-0.006**	-0.009**
	(0.042)	(0.026)	(0.027)	(0.004)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.003)
Inflation	0.023*	0.029*	0.042**	-0.002	-0.003**	-0.004**	0.001	0.000	-0.000	0.002**	0.002	0.002
	(0.011)	(0.012)	(0.012)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	-1.759	-4.886	5.239**	0.075	0.338	-0.508**	0.245	0.385	-0.048	-0.142	-0.244	-0.053
	(4.469)	(4.317)	(2.013)	(0.358)	(0.321)	(0.144)	(0.211)	(0.194)	(0.112)	(0.173)	(0.232)	(0.175)
PS	0.702*	1.234***	2.096***	-0.050*	-0.097***	-0.170***	-0.025*	-0.049***	-0.085***	-0.014	-0.001	-0.004
	(0.281)	(0.227)	(0.435)	(0.024)	(0.018)	(0.035)	(0.010)	(0.008)	(0.015)	(0.020)	(0.016)	(0.015)
Countries	20	20	20	20	20	20	20	20	20	20	20	20
Observations	83	83	83	83	83	83	83	83	83	83	83	83
R squared	0.207	0.281	0.341	0.205	0.284	0.356	0.252	0.323	0.371	0.090	0.102	0.089
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the health sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity.

Table (A.711) Lower Middle-Income Countries: Long Term Effect of Financing the Education Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.097	-0.074**	0.417**	0.005	0.006**	-0.036**	0.004	0.004**	-0.016**	-0.013***	-0.007*	-0.002
	(0.051)	(0.021)	(0.115)	(0.005)	(0.002)	(0.009)	(0.002)	(0.001)	(0.005)	(0.003)	(0.003)	(0.004)
Rest	0.003	-0.096***	0.506***	-0.002	0.008***	-0.043***	-0.001	0.004***	-0.021***	-0.005***	-0.001	0.005*
	(0.029)	(0.019)	(0.107)	(0.003)	(0.001)	(0.008)	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)	(0.003)
TE	-0.030*	-0.036	-0.120***	0.002**	0.003	0.010***	0.000	0.000	0.004***	-0.001	-0.001	-0.002**
	(0.012)	(0.020)	(0.011)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
PD	-0.026***	-0.030***	-0.058***	0.002***	0.002***	0.005***	0.001*	0.001**	0.002***	0.002	0.001	0.001
	(0.006)	(0.004)	(0.007)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDPPC)	54.397***	60.665***	98.292***	-4.099***	-4.925***	-8.097***	-1.917**	-2.318**	-3.873***	-0.068	-0.723	-0.333
	(9.553)	(11.118)	(15.046)	(0.958)	(1.056)	(1.316)	(0.717)	(0.747)	(0.895)	(1.069)	(0.873)	(0.988)
$Log(GDPPC)^2$	-3.639***	-3.942***	-6.633***	0.274***	0.322***	0.549***	0.125**	0.147**	0.259***	0.005	0.056	0.028
	(0.586)	(0.676)	(0.958)	(0.059)	(0.065)	(0.084)	(0.044)	(0.046)	(0.056)	(0.075)	(0.063)	(0.070)
Unemployment	-0.133***	-0.155**	-0.166***	0.011**	0.012**	0.013***	0.003*	0.004*	0.005**	-0.007***	-0.007**	-0.007***
	(0.030)	(0.043)	(0.028)	(0.003)	(0.004)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Inflation	0.030**	0.021	0.047***	-0.002*	-0.002	-0.004***	0.000	0.000	-0.001	0.002**	0.001	0.001
	(0.011)	(0.013)	(0.011)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax	-3.045	-5.327	4.300**	0.161	0.364	-0.444***	0.289**	0.400*	-0.014	-0.442	-0.435	-0.335
	(2.675)	(4.585)	(1.111)	(0.206)	(0.341)	(0.087)	(0.102)	(0.174)	(0.099)	(0.225)	(0.306)	(0.246)
PS	1.212***	0.977***	2.533***	-0.089***	-0.074***	-0.204***	-0.052***	-0.043***	-0.109***	0.014	0.001	0.017*
	(0.181)	(0.144)	(0.392)	(0.014)	(0.013)	(0.029)	(0.007)	(0.010)	(0.013)	(0.012)	(0.014)	(0.008)
Countries	20	20	20	20	20	20	20	20	20	20	20	20
Observations	83	83	83	83	83	83	83	83	83	83	83	83
R squared	0.212	0.274	0.343	0.208	0.276	0.357	0.254	0.321	0.369	0.106	0.100	0.101
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity.

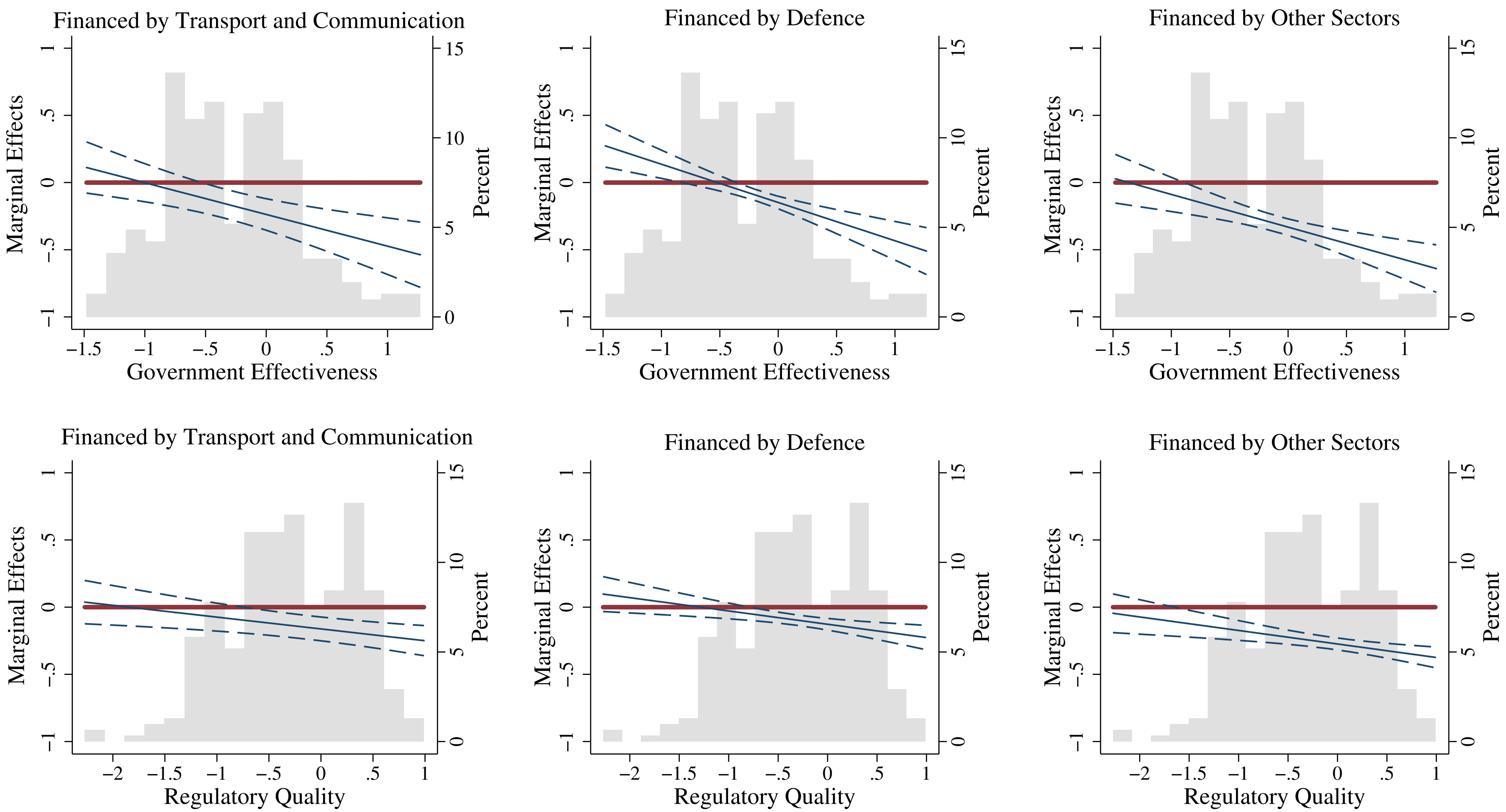
Table (A.712) Lower Middle-Income Countries: Long Term Effect of Financing the Agricultural Sector – 4-Year Lead Values of the Dependent Variables

	Atkinson Inequality Measure			10th Percentile			50th Percentile			90th Percentile		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
AS	-0.028	-0.081	0.351***	0.001	0.008	-0.029***	0.001	0.005*	-0.014**	-0.000	0.003	0.007**
	(0.067)	(0.054)	(0.079)	(0.006)	(0.004)	(0.006)	(0.003)	(0.002)	(0.004)	(0.001)	(0.002)	(0.003)
Rest	0.015	-0.091***	0.592***	-0.003	0.007***	-0.050***	-0.001	0.004***	-0.025***	-0.004**	-0.002	0.005
	(0.026)	(0.014)	(0.134)	(0.002)	(0.001)	(0.010)	(0.001)	(0.001)	(0.005)	(0.001)	(0.001)	(0.003)
TE	-0.027	-0.036	-0.129***	0.002	0.003	0.011***	-0.000	0.000	0.004***	-0.001	-0.001	-0.002*
	(0.016)	(0.019)	(0.016)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PD	-0.038***	-0.027***	-0.068***	0.003***	0.002***	0.006***	0.002***	0.001***	0.003***	0.000	0.001	0.000
	(0.005)	(0.003)	(0.007)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(GDPPC)	75.963***	56.604***	126.679***	-5.719***	-4.498***	-10.358***	-3.035***	-2.253***	-5.363***	1.565	0.316	1.315
	(15.538)	(5.976)	(18.894)	(1.283)	(0.568)	(1.424)	(0.736)	(0.404)	(0.789)	(0.857)	(0.458)	(0.893)
$Log(GDPPC)^2$	-4.948***	-3.697***	-8.303***	0.372***	0.296***	0.681***	0.193**	0.143***	0.348***	-0.097	-0.012	-0.077
	(0.998)	(0.352)	(1.208)	(0.082)	(0.034)	(0.091)	(0.048)	(0.025)	(0.052)	(0.057)	(0.036)	(0.057)
Unemployment	-0.144**	-0.153**	-0.101*	0.011**	0.012**	0.007*	0.004	0.004*	0.002	-0.010***	-0.011***	-0.010***
	(0.048)	(0.044)	(0.039)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Inflation	0.032***	0.021	0.046***	-0.002***	-0.002	-0.004***	0.000	0.000	-0.001	0.002**	0.001	0.002*
	(0.006)	(0.014)	(0.008)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Tax	0.268	-5.742	7.802***	-0.083	0.410	-0.717***	0.121	0.408	-0.201	-0.157	-0.313	-0.088
	(3.128)	(5.186)	(1.587)	(0.258)	(0.391)	(0.130)	(0.132)	(0.211)	(0.109)	(0.154)	(0.305)	(0.157)
PS	0.827**	1.048***	2.381***	-0.060*	-0.081***	-0.194***	-0.032**	-0.044***	-0.100***	-0.015	-0.015	-0.008
	(0.313)	(0.206)	(0.460)	(0.026)	(0.016)	(0.035)	(0.012)	(0.008)	(0.016)	(0.016)	(0.014)	(0.011)
Countries	20	20	20	20	20	20	20	20	20	20	20	20
Observations	83	83	83	83	83	83	83	83	83	83	83	83
R squared	0.198	0.274	0.357	0.196	0.275	0.378	0.235	0.321	0.381	0.090	0.096	0.089
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the agricultural sector and the relevant financing component. The parameter estimate for the constant term is not reported for brevity. The variable representing the global financial crisis is omitted due to multicollinearity..

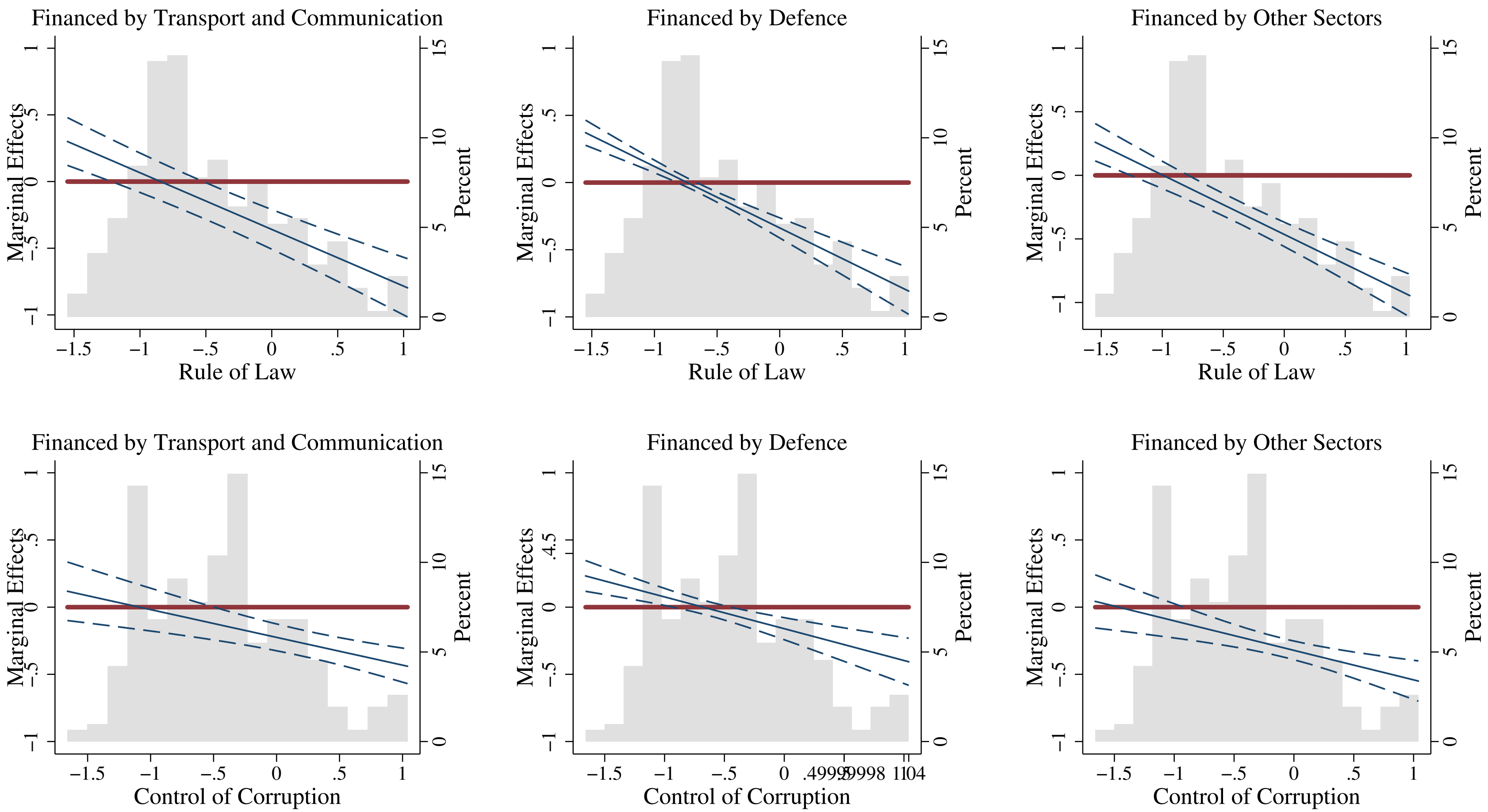
A.8 Robustness Check 6: Spending Reallocations Across Different Institutional Variables

Figure (A.81) Financing the Education Sector: Government Effectiveness and Regulatory Quality



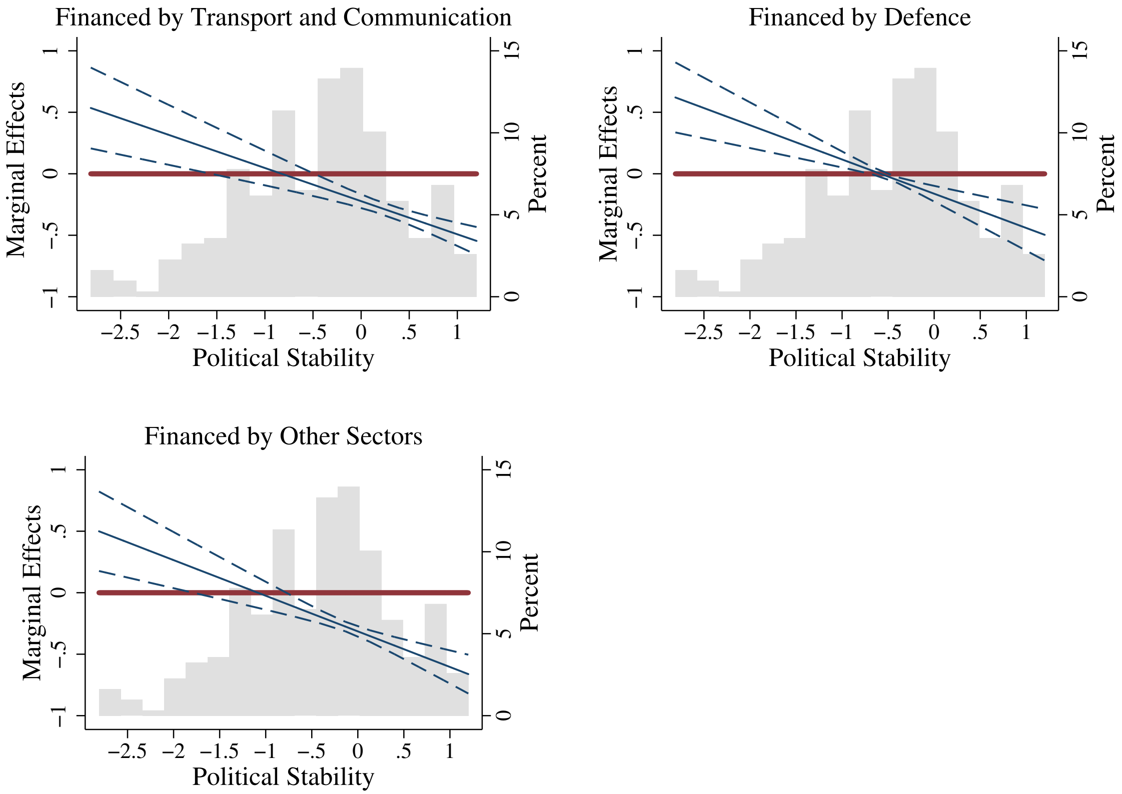
Note: The marginal effects are represented by the solid blue lines. The dashed blue lines represent the corresponding 90 percent confidence intervals. Similarly, the red solid lines denote the points at which the marginal effects are equal to zero. The histograms represent the distribution of the sample in terms of government effectiveness and regulatory quality.

Figure (A.82) Financing the Education Sector: Rule of Law and Corruption Control



Note: The marginal effects are represented by the solid blue lines. The dashed blue lines represent the corresponding 90 percent confidence intervals. Similarly, the red solid lines denote the points at which the marginal effects are equal to zero. The histograms represent the distribution of the sample in terms of rule of law and control of corruption.

Figure (A.83) Financing the Education Sector: Political Stability



Note: The marginal effects are represented by the solid blue lines. The dashed blue lines represent the corresponding 90 percent confidence intervals. Similarly, the red solid lines denote the points at which the marginal effects are equal to zero. The histograms represent the distribution of the sample in terms of political stability.

A.9 Robustness Check 7: Financing the Education Sector Across Different Institutional Variables

Table (A.91) All Middle-Income Countries: Financing the Education Sector - Government Effectiveness, Regulatory Quality and Rule of Law

	GE			RQ			RL		
	TCS	OS	DS	TCS	OS	DS	TCS	OS	DS
ES	-0.237***	-0.331***	-0.148***	-0.162**	-0.274***	-0.127***	-0.359***	-0.464***	-0.337***
	(0.071)	(0.037)	(0.028)	(0.054)	(0.027)	(0.026)	(0.090)	(0.058)	(0.045)
GE	5.670***	5.780***	6.576***						
	(1.350)	(1.249)	(1.110)						
ES*GE	-0.236**	-0.243***	-0.285***						
	(0.083)	(0.074)	(0.071)						
RQ				-0.795	0.133	0.447			
				(0.660)	(0.587)	(0.685)			
ES*RQ				-0.088**	-0.101**	-0.099**			
				(0.038)	(0.037)	(0.038)			
RL							6.587***	7.643***	7.553***
							(1.980)	(1.827)	(1.787)
ES*RL							-0.425***	-0.468***	-0.457***
							(0.067)	(0.062)	(0.061)
Rest	0.105***	-0.042***	0.221***	0.120***	-0.049***	0.168***	0.092**	-0.042***	0.142***
	(0.026)	(0.008)	(0.021)	(0.025)	(0.009)	(0.026)	(0.030)	(0.006)	(0.032)
TE	-0.098***	-0.097***	-0.107***	-0.105***	-0.098***	-0.098***	-0.094***	-0.095**	-0.096**
	(0.023)	(0.029)	(0.030)	(0.024)	(0.028)	(0.029)	(0.026)	(0.032)	(0.034)
PD	-0.022**	-0.021*	-0.016	-0.037***	-0.032***	-0.027**	-0.026***	-0.024***	-0.020**
	(0.009)	(0.009)	(0.010)	(0.009)	(0.010)	(0.010)	(0.007)	(0.007)	(0.008)
Log(GDPPC)	20.619***	28.203***	27.866***	28.368***	34.334***	32.123***	18.715***	24.296***	23.301***
	(5.198)	(3.983)	(6.682)	(4.822)	(4.363)	(4.007)	(4.820)	(3.851)	(5.013)
Log(GDPPC)^2	-1.530***	-1.999***	-2.020***	-1.758***	-2.169***	-2.073***	-1.268***	-1.622***	-1.580***
	(0.241)	(0.172)	(0.312)	(0.277)	(0.254)	(0.197)	(0.261)	(0.205)	(0.263)
Unemployment	0.352***	0.370***	0.382***	0.332***	0.348***	0.356***	0.360***	0.378***	0.385***
	(0.053)	(0.050)	(0.049)	(0.057)	(0.055)	(0.054)	(0.048)	(0.048)	(0.049)
Inflation	-0.046***	-0.051***	-0.048**	-0.055***	-0.059***	-0.058***	-0.052***	-0.056***	-0.055***
	(0.012)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)
Tax	-2.962	-6.574*	-7.961**	-4.098	-8.342**	-10.521**	-4.566	-7.135*	-8.962**
	(3.773)	(3.247)	(3.331)	(3.961)	(3.507)	(3.498)	(3.879)	(3.686)	(3.508)
GFC	1.883***	2.261***	2.627***	1.799***	2.204***	2.547***	1.932***	2.259***	2.560***
	(0.356)	(0.288)	(0.327)	(0.445)	(0.337)	(0.375)	(0.333)	(0.249)	(0.289)
PS	-0.740	-0.934	-0.741*	-0.287	-0.556	-0.415	-0.526*	-0.718**	-0.582**
	(0.504)	(0.511)	(0.396)	(0.427)	(0.421)	(0.339)	(0.243)	(0.244)	(0.198)
Countries	50	50	50	50	50	50	50	50	50
Observations	308	308	308	308	308	308	308	308	308
R squared	0.314	0.304	0.308	0.308	0.296	0.296	0.319	0.312	0.312
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. GE, RQ, and RL represent Government Effectiveness, Regulatory Quality and Rule of Law, respectively.

Table (A.92) All Middle-Income Countries: Financing the Education Sector - Corruption Control and Political Stability

	Corruption			PS		
	TCS	OS	DS	TCS	OS	DS
ES	-0.225***	-0.321***	-0.160**	-0.223***	-0.314***	-0.162***
	(0.060)	(0.042)	(0.050)	(0.033)	(0.024)	(0.039)
Corruption	2.218	2.355	2.915**			
	(1.401)	(1.294)	(1.273)			
ES*Corruption	-0.207***	-0.220**	-0.237***			
	(0.063)	(0.072)	(0.061)			
PS	-0.448*	-0.633**	-0.459**	3.300***	3.404***	3.419***
	(0.236)	(0.215)	(0.150)	(0.694)	(0.769)	(0.840)
ES*PS				-0.270***	-0.290***	-0.279***
				(0.065)	(0.072)	(0.075)
Rest	0.105***	-0.046***	0.189***	0.102***	-0.053***	0.173***
	(0.024)	(0.006)	(0.032)	(0.019)	(0.007)	(0.027)
TE	-0.090***	-0.089***	-0.094***	-0.079**	-0.081**	-0.082**
	(0.021)	(0.025)	(0.028)	(0.026)	(0.031)	(0.032)
PD	-0.027**	-0.026**	-0.022*	-0.028**	-0.027**	-0.023**
	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)
Log(GDPPC)	23.828***	31.634***	29.523***	30.777***	39.383***	37.781***
	(6.447)	(6.994)	(4.973)	(3.554)	(3.754)	(3.505)
Log(GDPPC)^2	-1.586***	-2.067***	-1.971***	-2.013***	-2.544***	-2.467***
	(0.378)	(0.422)	(0.280)	(0.203)	(0.238)	(0.175)
Unemployment	0.331***	0.348***	0.356***	0.368***	0.385***	0.394***
	(0.050)	(0.050)	(0.050)	(0.051)	(0.053)	(0.056)
Inflation	-0.052***	-0.057***	-0.055***	-0.051***	-0.056***	-0.055***
	(0.013)	(0.014)	(0.015)	(0.014)	(0.015)	(0.016)
Tax	-5.818	-9.327**	-11.188**	-7.620*	-10.721**	-12.968***
	(3.788)	(3.590)	(3.486)	(3.557)	(3.451)	(3.330)
GFC	1.959***	2.329***	2.665***	1.676***	1.980***	2.360***
	(0.356)	(0.319)	(0.336)	(0.403)	(0.343)	(0.403)
Countries	50	50	50	50	50	50
Observations	308	308	308	308	308	308
R squared	0.309	0.299	0.301	0.321	0.313	0.313
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: The parentheses contain the standard errors. *p < .10. **p < .05. ***p < .01. Rest represents a composite of all the sectoral expenditures except the education sector and the relevant financing sector. The parameter estimate for the constant term is not reported for brevity. Corruption and PS represent Control of Corruption and Political Stability, respectively.

Chapter 2

Economic Inequality in Middle-Income Countries within a Panel VAR Model: Who Benefits from Public Spending and Tax Shocks?

Abstract

We employ the GMM Panel VAR approach in examining the distributional effects of public spending and tax shocks over different horizons in middle-income countries. We investigate the response of income distribution variables to shocks imposed on three key components of social expenditures: social protection, health expenditures and education spending. We find that unexpected changes in government spending, (such as those witnessed during the COVID-19 pandemic) may contribute towards making a dent in income inequality. However, the specific expenditure under consideration matters in terms of the impact on inequality overall and on different parts of the income distribution. Education spending shocks appear to be most effective in achieving better distributional outcomes, while social protection shocks often exhibit short-lived inequality reducing effects. In high-income countries instead, it is health spending and tax shocks that have a more pronounced distributional impact. Our results are robust to alternative measures of inequality, different orderings of variables as well as the inclusion of inflation.

Keywords: income inequality, public spending and tax shocks, middle-income countries, Panel VAR

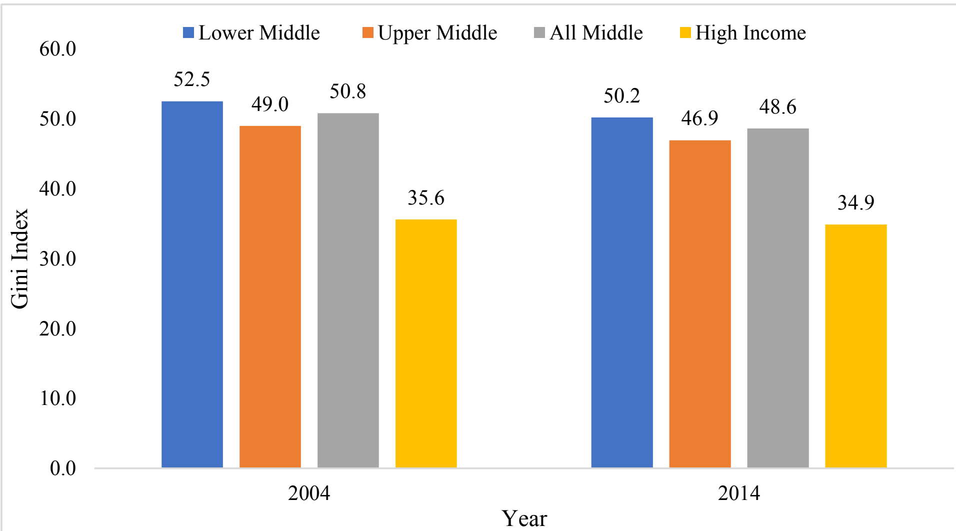
JEL codes: E62, H53, O15

2.1 Introduction

How do unexpected changes in public spending and taxes influence the income distribution in middle-income countries? The distributional implications of fiscal policy have been a long-standing topic of research, often with the aim to shed light on the growth-inequality nexus. Relatively more recently, the issue has gained increased interest as a result of two huge world-wide shocks, which have both prompted substantial fiscal stimulus and resulted in increased public-sector deficits and debt. First, the Global Financial Crisis (GFC) of 2007-2009 resulted in an unprecedented increase in public debt, and has been characterised by hotly debated arguments about the distributional and growth implications of fiscal consolidation approaches, which had been pursued particularly strongly by various European governments. More recently, the substantial government fiscal intervention to counteract the impact of the COVID-19 pandemic has just started to be questioned for its implications on growing public-sector deficits and debt (Bulow et al., 2020).

This paper examines the redistributive effects of tax and public spending *shocks*, the latter considered as unexpected changes in public-sector spending, as opposed to the more traditionally studied contemporaneous impact of government spending on inequality. Our study employs a panel of 56 middle-income countries over the 2004-2014 period. This is an extremely relevant set of countries, not just because of the relative paucity of evidence on the overall distributional incidence of fiscal policy in these countries, but also because they are characterised by relatively higher levels of income inequality, as shown in Figure 2.1.

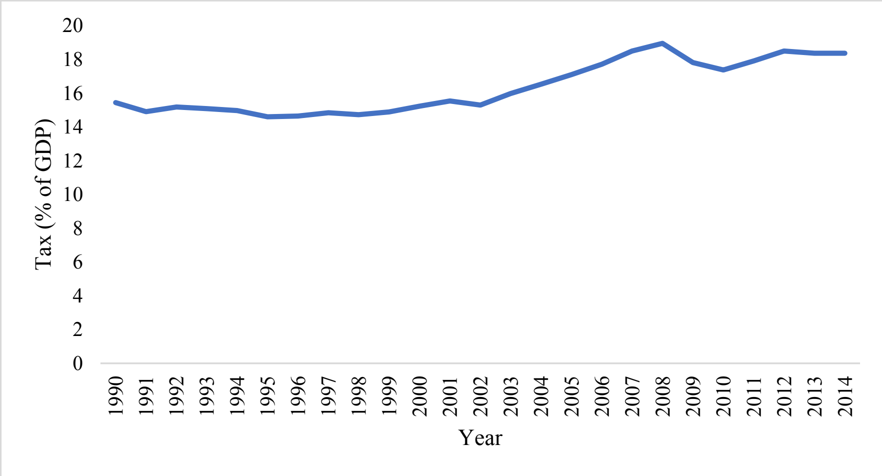
Figure (2.1) Income Inequality within Middle- and High-Income Countries in 2004 and 2014



Source: Data from the Global Consumption and Income Project (GCIP) Database.

Fiscal policy has traditionally been considered an effective instrument through which to influence the distribution of income, even when the main direct target would have been economic growth, whether through impacting aggregate demand or the economy's productive capacity. The composition and combination of

Figure (2.2) Taxation within Middle-Income Countries



Source: Data from the UNU WIDER Government Revenue Dataset.

fiscal policies through spending and taxes is, therefore, critically important to understand the impact they may have on inequality. Middle-income countries are also characterised by relatively low levels of taxes and social spending, which limit the redistributive potential of their fiscal policies. Indeed, while the tax ratio for advanced economies exceeds 30% of GDP, for our set of countries, Figure 2.2 shows that this share has been between 15% and 18% for most of the past three decades. As a result, resources available for social spending are generally more scarce in these countries than in advanced ones (see Figures 2.3 to 2.6).

Most distributional studies within the fiscal policy literature tend to examine the response of inequality to the contemporaneous effect of fiscal policy variables, while giving less attention to the dynamic response of inequality to unexpected changes in these variables. Meanwhile, policymakers are confronted with unforeseen circumstances, such as the GFC and the COVID-19 pandemic already mentioned, that prompted substantial fiscal policy intervention. As a result of the GFC, the share of government spending in GDP for the middle-income countries in our sample increased to 29.8% in 2009, about 4 percentage points greater than the average between 1990 and 2014. Moreover, data from the IMF indicates that in 2020, during the COVID-19 outbreak, public spending as a percentage of GDP in middle-income countries was 5 percentage points higher than the average between 2000 and 2020 (WEO, 2021). It is not hazardous to claim that sudden changes in fiscal policies are likely to become a recurring phenomenon when considering that countries will have to react to the consequences of climate-related disasters, let alone to those caused by the war of Russia in Ukraine and its huge consequences on energy and food prices worldwide.[1]

[1]Moreover, the public might have changed their view on what is expected from government intervention, after the role that governments have assumed in dealing with the consequences of the COVID-19 pandemic, which might have changed the way fiscal policy responses can be utilised.

Figure (2.3) Government Spending: MIC and HIC

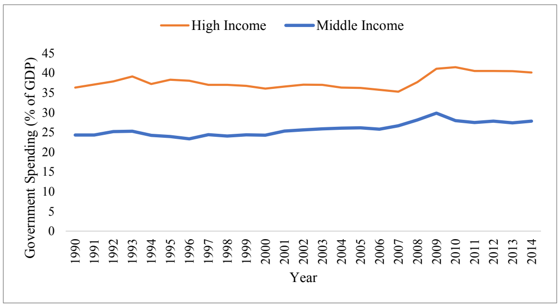


Figure (2.4) Social Protection: MIC and HIC

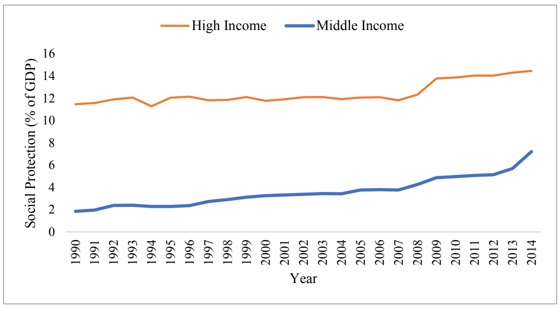


Figure (2.5) Health Spending: MIC and HIC

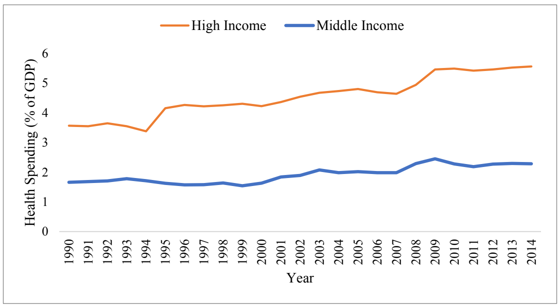
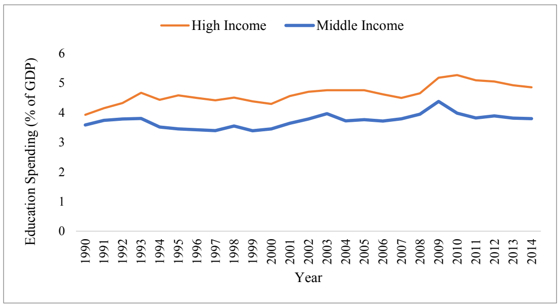


Figure (2.6) Education Spending: MIC and HIC



Note: Figures 2.3-2.6 are computed using the Statistics on Public Expenditures for Economic Development (SPEED) Database.

The relationship between inequality and growth means that it is relevant to have a better understanding of the impact of unexpected fiscal policy measures, and their composition, on inequality in middle-income countries in particular, as this will provide evidence as to the extent to which fiscal policies may hinder or facilitate their growth path and, consequently, their transition to a higher income status.

In this paper, we contribute as follows. First, unlike previous studies, which often analyse the contemporaneous impact of government spending on inequality, we examine the response of inequality to public spending shocks over different horizons. These shocks are identified as unexpected changes in public spending, using orthogonalized impulse response functions (IRFs) and forecast error variance decompositions (FEVDs). We employ a panel of 56 middle income countries over the period 2004–2014. To control for inequality persistence and reverse causality, we adopt a panel Vector Autoregressive (VAR) model implemented through the two-step difference Generalized Method of Moments (GMM) technique proposed by Arellano and Bond (1991). To our knowledge, the present study is the first to adopt the GMM Panel VAR approach in analysing the distributional effects of tax and public spending shocks in middle income countries.

Second, we investigate the response of the key income distribution variables to shocks to taxes as well as three social expenditure variables. Following Clements et al. (2015), we define our social expenditure variables as: social protection, health expenditures and education spending. Although there exists a variety of factors that determine the ultimate impact of these three categories of public-sector expenditures, Oxfam/DFI (2017) observes that they could also possess some equalizing prospects.

Third, we evaluate the effect of the examined fiscal shocks on different parts of the income distribution, namely the low-income group (the 10th percentile), the middle-income group (the 50th percentile) and the high-income group (the 90th percentile).[2] By analysing the impact of the spending shocks on different income groups, we are, in effect, able to determine empirically in our panel whether the shocks are pro-rich, pro-middle class or pro-poor.

Overall, we find that, in our sample of middle-income countries, government and education spending shocks are associated with the most pronounced effects on the income distribution. Shocks imposed on both categories of public expenditures translate into a rise in the income share held by the low- and middle-income groups, with high-income groups benefiting from education spending shocks as well. Furthermore, social protection shocks often exhibit a brief equalizing effect, but health spending shocks generally have no detectable impact on the economic divide. Additionally, social protection and health spending shocks largely benefit the high-income group. As for tax shocks, they neither reduce inequality nor benefit the income groups under study. Our results are robust to alternative measures of inequality, different orderings of the variables as well as the inclusion of inflation. We also examine how the findings for middle-income countries compare with those for high-income countries. Remarkably, we detect equalizing effects of tax and health spending shocks in high-income countries. While we reveal that the same spending shocks could have different distributional effects across middle- and high-income nations, the findings for both sets of countries tend to converge in some areas.

The rest of this paper is organized as follows: Section 2.2 reviews the related literature. Section 2.3 outlines the methodology adopted. Sections 2.4 and 2.5 present and discuss the results. Section 2.6 provides robustness tests. Section 2.7 summarizes and concludes.[3]

2.2 Related Literature

The distributional effects of fiscal policy has been the topic of a vast literature now, most of it focusing on developed countries. In addition, studies tend to focus on the response of inequality to the contemporaneous effect of changes in taxes and public expenditures, while giving less attention to the dynamic distributional impact of such fiscal shocks. These studies can be grouped into three main types, depending on the

[2] We have also carried out analysis for further parts of the distribution, including the 20th, 40th and 80th percentiles. These results are in the Appendix.

[3] Further methodological details and explorations are in the Appendix.

approach they adopt. One type focuses on the distributional consequences of taxes and transfers, mostly by assessing the difference between market income and disposable income inequality determined by the progressivity of the tax system. A review of this literature for developing countries is provided in Bastagli et al. (2015). Amongst the many studies with a single country focus, some that have a comparative approach for developed countries are from Brandolini and Smeeding (2009), Paulus et al. (2010) and Joumard et al. (2012) for OECD and five EU countries, respectively. The latter assesses the impact of in-kind benefits from public housing subsidies, education, and health care.

A second and similar type of studies aims to assess the determinants of net income distributions, typically based on regressions where the Gini coefficient is explained by government actions through taxes and spending. The findings from this type of regression-based studies suggest that greater reliance on income taxes and higher spending on social benefits reduce inequality. More specifically, direct taxes are found to be more redistributive than indirect taxes, and social protection spending reduces inequality (Afonso et al., 2010; Muinelo-Gallo and Roca-Sagalés, 2011; Martinez et al., 2012). For developing countries, the distribution of in-kind social spending has been found to be regressive, due to the relatively reduced access by low-income households to education and health. More specifically, the impact of spending varies across different categories: primary health care spending, for example, is progressive, while higher-level spending is regressive. Similarly, in education, primary education spending is progressive, while secondary and tertiary education spending are regressive (Van de Walle, 1995; Demery, 2000; Gregorio and Lee, 2002). Within this line of literature, more recent studies have focused on the impact of fiscal consolidation measures, which, as mentioned earlier, have been implemented by many countries as a response to the debt sustainability crisis that emerged from the substantial fiscal expansion adopted to address the consequences of the GFC (Woo et al., 2017).

Finally, a third type of studies is based on general equilibrium approaches, whereby the effects of all taxes and expenditures are estimated simultaneously, with no assumptions made or needed on how taxes affect different income groups. Most of these papers find weak redistributive effects of taxes, particularly in developing countries (Martinez et al., 2012). Within this line of research, there are also the popular dynamic stochastic general equilibrium (DSGE) models. The standard ones, based on Smets and Wouters (2003), have a representative agent and, therefore, are not ideal to investigate distributional issues. More recent models have adopted heterogeneous agent types, mostly to assess the impact of monetary policy (Kaplan et al., 2018) while those on the impact of fiscal policy are recent (see, for example, Ferrara and Tirelli, 2017; McManus et al., 2021; Seidl and Seyrich, 2021). Overall, the results of existing studies on developed countries are mixed: while some suggest that the fiscal policy instruments tend to reduce inequality, others indicate the opposite.

In what follows, we concentrate on studies that have examined middle-income countries. Table 2.1 reports 14 such studies.

Table (2.1) Related Studies

Study	Geographical Coverage	Time Period	Methodology	Fiscal Policy	Findings	Observation
Ospina (2010)	19 Latin American countries	1980-2000	2SLS and GMM	Social Spending	Government spending on healthcare tends to be be equalizing.	The GMM technique is more applicable to short panels.
Martinez et al. (2012)	150 Developed and Developing countries across the globe	1970-2009	Difference GMM	Taxes and social spending	The income distribution becomes more egalitarian due to progressive taxes and social spending	Does not evaluate the impact of the fiscal policy variables on different income percentiles.
Claus et al. (2012)	150 Developed, Developing and Transition economies	1970-2009	Difference GMM	Public spending and taxation	Inequality decreases with a rise in the GDP share of government spending (particularly social sectors).	Does not examine the impact of government spending on different income percentiles.
Anyanwu et al. (2016)	17 West African nations	1970-2011	System GMM	Government spending	Inequality increases with an increase in total public expenditure on public goods and redistributive policies.	Use of the GMM technique is more suitable for short panels
Bergh et al. (2020)	140 Countries across varying income levels	1970-2010	Fixed Effect and system GMM estimator	Social spending	In the face of globalisation, all types of social security examined are ineffective at reducing inequality.	Does not consider the dynamic effect of public spending shocks on income inequality.
Furceri et al. (2022)	103 Developing countries across the world	1990-2015	Local Projection Method	Fiscal consolidation through public spending	The economic divide widens persistently following the implementation of austerity measures.	Inequality measures employed generally focus on the Gini index only.
Howie and Atakhanova (2014)	Kazakhstan	1996-2009	Dynamic panel data model	Health spending	Public health programmes reduce inequality in rural regions.	Does not consider the long-run effects of the health programmes on income inequality.
Lustig (2016)	28 Low and Middle-income countries	2010	Commitment to Equity (CEQ) methodology	Health spending	Public healthcare expenditure fails to close the income gap in the presence of healthcare service benefiting the wealthy.	Long-term redistributive effect of publicly sponsored health programmes are not examined.

Table (2.1) Continued: Related Studies

Study	Geographical Coverage	Time Period	Methodology	Fiscal Policy	Findings	Observation
Rudra (2004)	Developing (35) and industrialized countries (11)	1972-1996	Instrumental Variables methods	Health spending	In Less Developed Countries, government spending on healthcare encounters considerable bureaucratic bottle necks and thus fails to lower income inequality.	Largely focuses on the Gini index without examining alternative inequality measures.
Coady and Dizioli (2018)	103 Advanced and Emerging countries across several regions	1990–2005	OLS, SURE, Fixed Effects and GMM.	Education spending	Inequality declines in developing nations when the average number of years spent in education increases for adults aged 25.	Does not analyse the response of the income distribution to education expenditure shocks.
Battistón et al. (2014)	18 Latin American countries	1990-2009	Microsimulation using individual earnings equations.	Education spending	Expenditures raising school enrolment tend to exacerbate economic disparity. The disequalizing impact tends to endure unless the education sector's financing is well-targeted.	The effect of public education spending on the percentile income shares of various income categories is not examined in detail.
Castelló and Doménech (2014)	146 Countries across different income levels	1950–2010	OLS, Fixed Effects and some Instrumental Variables techniques.	Education spending	If having a higher education enhances the odds of earning a better pay, increasing the average number of years spent in school promotes inequality.	Does not adequately examine the impact of education spending on the income percentiles.
Sauer et al. (2020)	73 countries across the world	1981-2010	Fixed Effects	Taxation	Taxation as well as imports from low-income nations help offset the disequalizing impacts of falling labour income shares and rising importation from wealthy nations.	Largely focuses on Gini index and does not explore alternative inequality measures
Alavuotunki et al. (2019)	138 Developed and Developing Countries	1975–2010	Fixed Effects	Taxation	Due to the tax programmes considered, income inequality has worsened.	Does not examine the impact of tax shocks on the economic divide.

Table 2.1 reports the findings of 14 empirical studies regarding the distributional impacts of a variety of fiscal policy variables including: public spending, social securities, health spending, education expenditures and taxation. The studies cover a period that spans from 1950 to 2015, overall. While some studies examine both developed and developing countries (Martinez et al., 2012; Coady and Dizioli, 2018), some concentrate on specific regions (Battistón et al., 2014; Anyanwu et al., 2016) meanwhile, a few others focus strictly on developing countries of varying income levels (Furceri et al., 2022). Also, GMM and panel fixed effects methods appear to be the most common techniques adopted, with 8 papers adopting the former, and 6 employing the latter. In terms of findings, the studies examined arrive at mixed results. While some studies show that the fiscal policy variables are equalizing, others find disequalizing impacts.

More importantly, the literature review provided above reveals that existing studies generally give less attention to the redistributive impact of fiscal shocks as opposed to public sector expected spending and tax. We fill this gap by examining – within a sample of middle-income countries – the effect of tax and public expenditure shocks on a summary measure of inequality (the Gini index) as well on three sections of the income distribution over different forecast horizons. Also, we control for reverse causality by adopting a panel Vector Autoregressive (VAR) model implemented through the two-step difference GMM technique of Arellano and Bond (1991).

Perhaps, the research that is closest to ours is that of Furceri et al. (2022). However, our study differs from Furceri et al. (2022) in three key areas: First, unlike Furceri et al. (2022), our paper considers not only government spending shocks, but also tax shocks. Second, our paper differs from that of Furceri et al. (2022) in terms of the public expenditure shocks considered. Apart from shocks imposed on total government spending, we also examine shocks imposed on key components of social expenditures (social protection, health spending and education expenditures). In contrast, Furceri et al. (2022) only consider shocks imposed on total government spending. Third, our paper departs from that of Furceri et al. (2022) in terms of the methodology adopted towards investigating our research question. While we adopt the panel VAR approach, Furceri et al. (2022) employ the local projections estimator, which is often associated with a relatively high bias, high variance and inaccurate confidence intervals (see, for example Kilian and Kim, 2009).

2.3 Methodology and Data

The measure of income inequality we start with is the Gini index, widely used as it also satisfies most of the conditions that are desirable in an inequality measure (Foster et al., 2013). Following the huge income inequality literature, our Gini index is measured on a scale of 0–100: as the index rises from 0 to 100, inequality increases (see, for example Arestis and Phelps, 2018). However, the Gini index is well-known for being insensitive to changes in the tails of the income distribution, while we also aim to empirically uncover how different income groups respond to the tax and spending shocks. To do so, we employ three different percentile income shares; consequently, we modify our VAR framework by replacing the Gini index with each of the percentile income shares, one after the other.

2.3.1 Model Specification

We employ a three-variable panel vector autoregressive (VAR) model following the seminal paper of Blanchard and Perotti (2002).[4] Our baseline panel VAR model is provided below:

$$Y_{it} = A_0 + A_1 Y_{it-1} + \mu_i + \theta_t + e_{it} \tag{2.1}$$

In equation (2.1), Y_{it} is a vector comprising the variables $Spending_{it}$, Tax_{it} and $Gini_{it}$. $Spending_{it}$ represents public spending in country *i* at time *t*, Tax_{it} is taxation revenue, and $Gini_{it}$ represents the Gini index, our initial measure of income inequality and principal variable of interest. Further, μ_i and θ_t denote the country and time fixed effects, respectively; e_{it} represents the error term. Our choice of variables is underpinned by the theoretical proposition underlying the study published by the IMF in 2015 (Clements et al., 2015), wherein they observe that taxes, as well as spending decisions such as social security, education and health expenditures, are designed not only to directly impact on households' welfare, but also on the income distribution. Therefore, and similarly to the approach of Kabashi (2015), we also replace the public spending variable with three social expenditure variables, one at a time: social protection spending (SPS_{it}), health spending (HS_{it}), and education spending (ES_{it}). Moreover, in examining the impact of the spending shocks on different income groups, we replace the Gini index with three percentile income shares representing three different income groups: the 10th percentile represents the low-income group; the 50th percentile denotes the middle-income group and the 90th percentile the high-income group.[5] Table 2.2 summarises these variables and their data source.

We include both public spending and taxes within the same VAR model since both variables are not independent of each other, as noted by Blanchard and Perotti (2002). Additionally, we use recursive VARs as they are relevant to situations in which the theoretical and empirical literature present mixed evidence about structural identification, as we consider to be the case in this research (see, e.g., Mihailov, 2009).

[4] Blanchard and Perotti (2002) focused on the dynamic effects of fiscal shocks on output, by specifying a three-variable VAR comprising government spending, tax and GDP. They note that the use of a small-dimensional VAR arises from the fact that the VAR framework relies on multiple equations, implying that several parameter estimates would be obtained from only a few variables; a large VAR could grossly undermine degrees of freedom and, by implication, increase standard errors - except in the presence of an extremely large number of observations. Three-variable VARs are also employed by Love and Zicchino (2006), Saxegaard (2014) and IMF (2014*c*).

[5] The Appendix contains further results for the 20th, 40th and 80th percentiles.

Following existing studies (see, Anyanwu et al., 2016; Guzi and Kahanec, 2019), we measure tax as well as the expenditure variables as a percentage of GDP. In Appendices B.1 and B.2, we provide further discussion concerning our panel VAR model and the results of the unit root and stability tests respectively.

2.3.2 Panel VAR Identification

Impulse response functions analyse the reaction of a variable to a shock imposed on another variable, while excluding the effects of other shocks within the VAR system. In other words, impulse response aims at determining the reaction of a variable to the independent impact of shocks to an impulse variable. However, the residuals [6] of the impulse variable are likely to be correlated [7] with other residuals within the VAR framework. Generally, the residuals tend to share a common component (Brooks, 2014). Consequently, it becomes necessary to disentangle the residuals in a way that allows for the isolation of shocks imposed on the impulse variable; and subsequently determine its independent effect on the variable of interest.

In addressing this difficulty, we employ orthogonalized impulse responses, implemented through Cholesky decomposition. To isolate the shock imposed on the impulse variable, this approach decomposes the errors in a manner that modifies their correlation structure. To put this in perspective, consider two equations in a VAR system, such as equation (2.1) above, for two variables, Y_1 and Y_2, whose residuals are correlated. In orthogonalized impulse responses, the correlation is neither ignored nor attributed to both Y_1 and Y_2. Instead, correlations are attributed to variables in accordance with the existing contemporaneous relationship among them. Hence, if a shock to Y_1 has a contemporaneous impact on Y_2 but the reverse is not true, the correlation in residuals is attributed to Y_1; while zero correlation is attributed to Y_2.

In orthogonalized impulse response, the contemporaneous relationship among variables is determined by the order in which variables are entered into the VAR system. When a variable precedes another, the former is assumed to be capable of exhibiting a contemporaneous impact on the latter, while the reverse is not the case. Put differently, orthogonalized impulse response requires the arrangement of variables in descending order of exogeneity. Hence, while the first variable entered into the VAR framework is treated as the most exogenous and capable of having a contemporaneous impact on all other variables, the last variable included in the framework is assumed to be the most endogenous and cannot have a contemporaneous impact on any variable. It impacts on other variables with lags only.

The order in which our variables enter the VAR system is based on a variety of theoretical and empirical findings. First, we assume that public spending impacts on the contemporaneous value of taxation revenue. The rationale behind this assumption is that government spending affects economic activities, which in turn

[6] In impulse response functions, shocks are captured in the residuals of the VAR equations.

[7] In other words, the variance-covariance matrix of the error terms is not likely to be a diagonal matrix (i.e., with zeros in its off-diagonal elements, thereby suggesting no covariance among the residuals).

Table (2.2) Variables definition and data sources

Abbreviation	Description	Data Source
GS	Government spending represents the total expenditure incurred by a government in a given year. All spending variables are measured as a percentage of GDP.	Statistics on Public Expenditures for Economic Development (SPEED)
SPS	Social protection spending includes social securities such as provision of short- and long-term shelter to the poor, unemployment benefits and parental leave benefits.	Statistics on Public Expenditures for Economic Development (SPEED)
HS	Health spending comprises healthcare related expenses such as health insurance, drugs funds, ambulance acquisition, subsidies and grants channelled towards healthcare.	Statistics on Public Expenditures for Economic Development (SPEED)
ES	Education spending includes education expenditures such as grants, scholarships, allowances and loans in support of pupils; as well as construction of academic institutions.	Statistics on Public Expenditures for Economic Development (SPEED)
Tax	Taxation revenue comprises the total government revenue but excludes grants.	UNU WIDER Government Revenue Dataset for 2018
Gini	Gini index compares the average difference between pairs of incomes in a distribution with the distribution's mean.	Global Consumption and Income Project (GCIP) Database
Tenth, Fiftieth and Ninetieth Percentiles	The Tenth, Fifitieth and Ninetieth percentiles respectively reflect the income levels below which the incomes of the bottom 10%, bottom half and top 10% of the distribution fall. The 10th, 50th and 90th percentiles respectively denote the low, middle and high income groups.	Global Consumption and Income Project (GCIP) Database

determine taxation revenue (Blanchard and Perotti, 2002). Moreover, the usual delays in the implementation of tax rates implies that taxation revenue would likely impact on government expenditure with a time-lag

(Narayan and Narayan, 2006; Ramos and Roca-Sagales, 2008). Second, the effect of taxation on the Gini index is likely to be contemporaneous. This assumption is based on the Jakobsson–Fellman theorem, which suggests that redistribution of income represents a core objective of taxation, and this in turn impacts the degree to which the income distribution is egalitarian (Jakobsson, 1976; Fellman, 1976). While the Gini index impacts on other variables with a time lag, the rest of the variables can exhibit a contemporaneous impact on the Gini index. Therefore, our variables enter the VAR system in the following order:

$$Y_{it} = [Spending, Tax, Gini,]' \tag{2.2}$$

We construct the impulse response functions using the VAR estimates and generate their standard errors and confidence intervals through 200 Monte Carlo simulations from the distribution of the panel VAR model. Likewise, we report the (forecast error) variance decompositions, which show the percentage of the variation in the respective dependent variable that arises from its own shocks as compared to shocks to the other variables in the system.

In determining the order (or time lag) of our panel VAR model, we rely on the Model and Moment Selection Criteria (MMSC) proposed by Andrews and Lu (2001) for models estimated with the GMM method.[8] In all our regressions, we utilize a panel VAR model of order one as this yields the lowest MAIC, MBIC and MQIC. In constructing our instrument matrix, we employ the approach of Holtz-Eakin et al. (1988), which replaces missing values with zeros, and thus minimizes the loss of degrees of freedom as more instrument lags are added.[9]

2.3.3 Transformation of the Baseline Model Through Forward Orthogonal Deviations

The reverse-causality/contemporaneous feedback in structural VAR results in endogeneity bias. In time-series VAR, the feedback is eliminated by transforming the VAR and subsequently estimating same, equation by equation using OLS. However, in panel VAR – particularly given a short time-span (as is the case in this paper)[10] – we are unable to employ the OLS method due to the presence of country fixed effects which are correlated with the regressors (i.e., lagged explanatory variables) in the VAR system. In addressing this difficulty, we methodically transform our models using the forward orthogonal deviations

[8] In the Appendix, we have provided the optimum lag length test results for all the panel VAR estimations. Also, it is noteworthy that the MMSC is similar to a number of model selection criteria, such as Akaike information criteria (AIC) (Akaike, 1969), Bayesian information criteria (BIC) (Schwarz, 1978) and the Hannan–Quinn information criteria (HQIC) (Hannan and Quinn, 1979).

[9] We do not adopt the Anderson-Hsiao approach (Anderson and Hsiao, 1982) because it reduces the observations available for regression with every additional instrument lag.

[10] As the timespan tends towards infinity, the endogeneity bias reduces, and the fixed effects estimator can be used (Nickell, 1981). Nonetheless, we do not experiment with the fixed effects estimator since we employ a relatively short time span.

transformation of Arellano and Bover (1995). This approach is computed in two steps. First, for each panel, we subtract the average of all available future observations (which will always be defined even in the presence of missing observations) from the observation available for the relevant period. Second, the resulting value is multiplied by a scale factor. Accordingly, every observation can be transformed through forward orthogonal deviations, except that of the last period. Mathematically, the forward orthogonal deviation for variable *w* is computed with the formula:

$$c_{it}(w_{it} - \frac{1}{T}\sum w_{is}) \tag{2.3}$$

where w_{it} denotes the contemporaneous value of w for country i. Also, w_{is} captures all future observations ahead of w_{it}. Likewise, T_{it} represents the number of future observations from period t within country i. Similarly, c_{it} is a scale factor computed as:

$$c_{it} = \sqrt{\frac{T_{it}}{(T_{it} + 1)}} \tag{2.4}$$

2.3.4 GMM Panel VAR Estimation Technique

We estimate the VAR equations using the two-step difference GMM estimator of Arellano and Bond (1991). We do not use the one-step difference GMM estimator since it employs an arbitrary approximation of the weighting matrix in the GMM estimator (see Roodman, 2009). Also, in addressing the downward bias in the standard errors of the two-step results, we adopt the Windmeijer (2005) finite-sample correction. The two-step difference GMM estimator is expressed as follows:

$$\beta_{GMM} = (X'Z(Z'\widehat{\Omega}Z)^{-1}Z'X)^{-1}X'Z(Z'\widehat{\Omega}Z)^{-1}Z'Y \tag{2.5}$$

where β_{GMM} is a column vector of coefficients, X is a column vector of k regressors, Y is the column vector representing the left-hand side variable, Z denotes the instrument matrix and $\widehat{\Omega}$ is a weighting matrix.

2.3.5 Descriptive Statistics

Table 2.3 shows descriptive statistics for our data: 56 middle-income countries over the period 2004–2014.[11] The countries are: Albania, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus,

[11]The timeframe of this study is determined by data availability constraints. Specifically, in the Global Consumption and Income Project (GCIP) database, the available data for the Gini index ends in 2015. Nevertheless, it should be noted that within this database, the Gini index data for several middle-income countries is only available until 2014. As a result, the timeframe of this study does not extend beyond 2014. Also, our decision to use a relatively short time span is justified by the fact that we employ

Bhutan, Botswana, Brazil, Bulgaria, Cabo Verde, Congo, Rep., Costa Rica, Ecuador, Egypt, El-Salvador, Eswatini, Fiji, Georgia, Ghana, Guatemala, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz, Lesotho, Malaysia, Maldives, Mexico, Moldova, Mongolia, Morocco, Namibia, Nepal, Nigeria, Pakistan, Papua New Guinea, Peru, Philippines, Russia, Serbia, South Africa, Sri Lanka, Tanzania, Thailand, Tunisia, Turkey, Ukraine, Venezuela, Vietnam and Zambia.These are countries that the World Bank categorises as middle income countries. however, not all middle income countries in the World Bank category are included here due to lack of data on public sector spending and/or lack of data on inequality and the income distribution in the data sets employed for our analysis. [12]

Table (2.3) Summary Statistics

	Mean	SD	Min	Max
GS	27.339	10.355	5.000	67.000
SPS	4.559	4.991	0.000	26.476
HS	2.172	1.454	0.037	7.951
ES	3.874	2.294	0.079	14.727
Tax	17.913	7.829	4.975	60.946
Gini	49.748	7.889	32.919	85.165
Tenth	1.417	0.603	0.252	2.829
Fiftieth	5.529	1.074	2.568	8.136
Ninetieth	15.458	0.824	11.600	18.923

Source: Authors' own computation.
Note: GS denotes government spending, SPS is social protection spending, HS is health spending, ES is education spending, Tax is taxation revenue, all as percentage of GDP. Tenth, Fiftieth and Ninetieth denote the income shares held by the 10th, 50th and 90th percentiles, respectively, as percentage of the total income.

The table shows that the average Gini index for middle-income countries is about 49.7, with the maximum being 85.2. Also, the table reveals that, on average, the respective shares of taxation and government spending in GDP are 17.9% and 27.3%. Unsurprisingly considering the relatively large inequalities, the income share held increases as we move along the income distribution from bottom to top.

the difference GMM method in implementing our panel VAR model. As noted by Arellano and Bond (1991), the difference GMM technique is suitable for short panels, rather than long ones. Moreover, existing studies that employ the GMM Panel VAR approach use it in analysing short panels, as in the seminal paper of Holtz-Eakin et al. (1988), which employs a dataset covering 7 years (1976–1982). Similarly, the analysis of Love and Zicchino (2006) covers 11 years (1988-1998).

[12]We employ panel data analysis due to the fact that the middle-income countries are relatively comparable vis-à-vis their public spending patterns (see IMF, 1995). Moreover, panel data analysis is chosen over time series data analysis because the latter requires separate regressions for each middle-income country. Hence, the use of panel data is a more efficient way of realising the objectives of this study.

Accordingly, the 90th percentile holds, on average, the highest income share, around fifteen times greater than that held by the bottom 10th of the income distribution.

2.4 Results and Interpretations

2.4.1 Impulse Response Analysis

To empirically uncover the dynamic behaviour of our panel VAR system, we present graphs of the impulse response functions at the 90% confidence interval (constructed by Monte Carlo simulations). Figure 2.7 reveals the orthogonalized impulse response of inequality to shocks imposed on the fiscal policy variables. A positive shock to government spending has a negative and almost immediate effect on inequality, with the Gini index reducing by as much as 0.243 percentage points in the first year after the shock. The effect peaks in the second year at 0.315 percentage points and remains statistically significant up until the fifth year.

Also, a positive shock to government spending is associated with an increase in the income share held by the 10th and 50th percentiles (Figure 2.8), elevating both income shares one year after impact, (by 0.026 and 0.037 percentage points respectively). In both cases, the effect reaches a climax in the second year, and generally lasts till the fifth year. Meanwhile, a government spending shock has no significant impact on the 90th percentile.

Similarly, after a positive shock to education expenditure, the Gini index decreases by as much as 0.303 percentage points in the first year after the shock. Also, an education spending shock results in an increase in the income shares held by all percentiles under study, with each rising in the year of impact (Figure 2.8). In most cases, the effect peaks in the second year, lying within a range of 0.032 and 0.194 percentage points. While the shock's impact on the 10th and 90th percentiles vanishes by the third year; the 50th percentile continue to benefit from the shock until the fourth year.

Likewise, the first year after a shock to social protection expenditure sees a drop in inequality by 0.241 percentage points. However, this result should be interpreted with caution as the negative impact is barely significant and short-lived; detected only in the year of the shock. Also, a social protection spending shock exhibits an ambiguous impact on the 10th percentile income share; reducing it on impact but later increasing the income share a year after the shock (Figure 2.8). Likewise, a shock to social protection spending exhibits a positive and instantaneous impact on the 90th percentile, making them rise on impact by 0.03 percentage points. The impact however becomes statistically insignificant in subsequent years. Also, we find that a shock to social protection expenditure generally has no statistically significant impact on the 50th percentile.

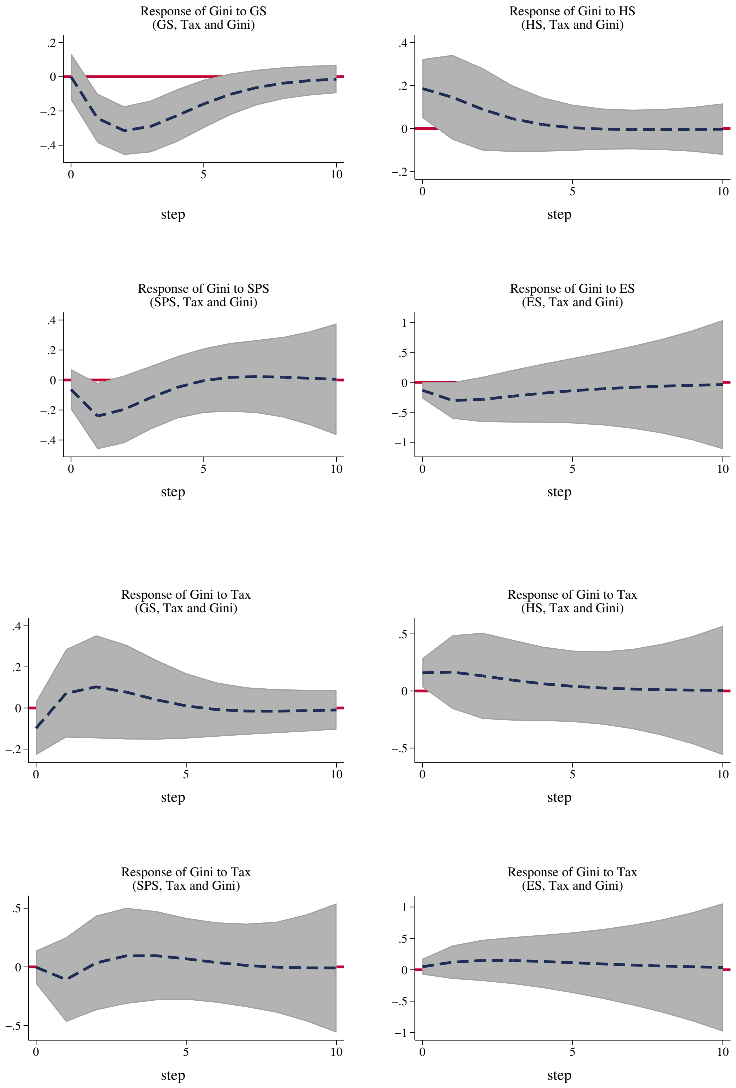
Similarly, a health expenditure shock does not have a significant effect on income inequality as well as the percentiles representing poor and middle-income groups. Nonetheless, it takes just one year before the 90th percentile income share rises, following a positive health spending shock (Figure 2.8). The effect remains positive and statistically significant for an additional year before becoming statistically insignificant in the third year.

Also, Figure 2.7 reveals the orthogonalized impulse response of inequality to shocks imposed on tax. An unexpected change in tax largely exhibits no significant impact on inequality. Likewise, a positive shock to tax generally does not benefit the percentiles representing the low-, middle- and high-income groups (Figure 2.8). In many cases, a tax shock has a negative effect on the percentiles in the year of impact, which often fades away by the third year.

As regards the sizes of the impulse responses, we find that, the reductions in inequality witnessed within a year after public expenditure and education spending shocks are of a similar magnitude, at about 0.3 percentage points. However, following the social protection shock, the magnitude of the inequality reduction tends to be lower, lying around 0.2 percentage points. Similarly, the income shares representing the low and middle income groups generally rise by a similar magnitude (0.3 to 0.4 percentage points) within a year after the public expenditure and education spending shocks.

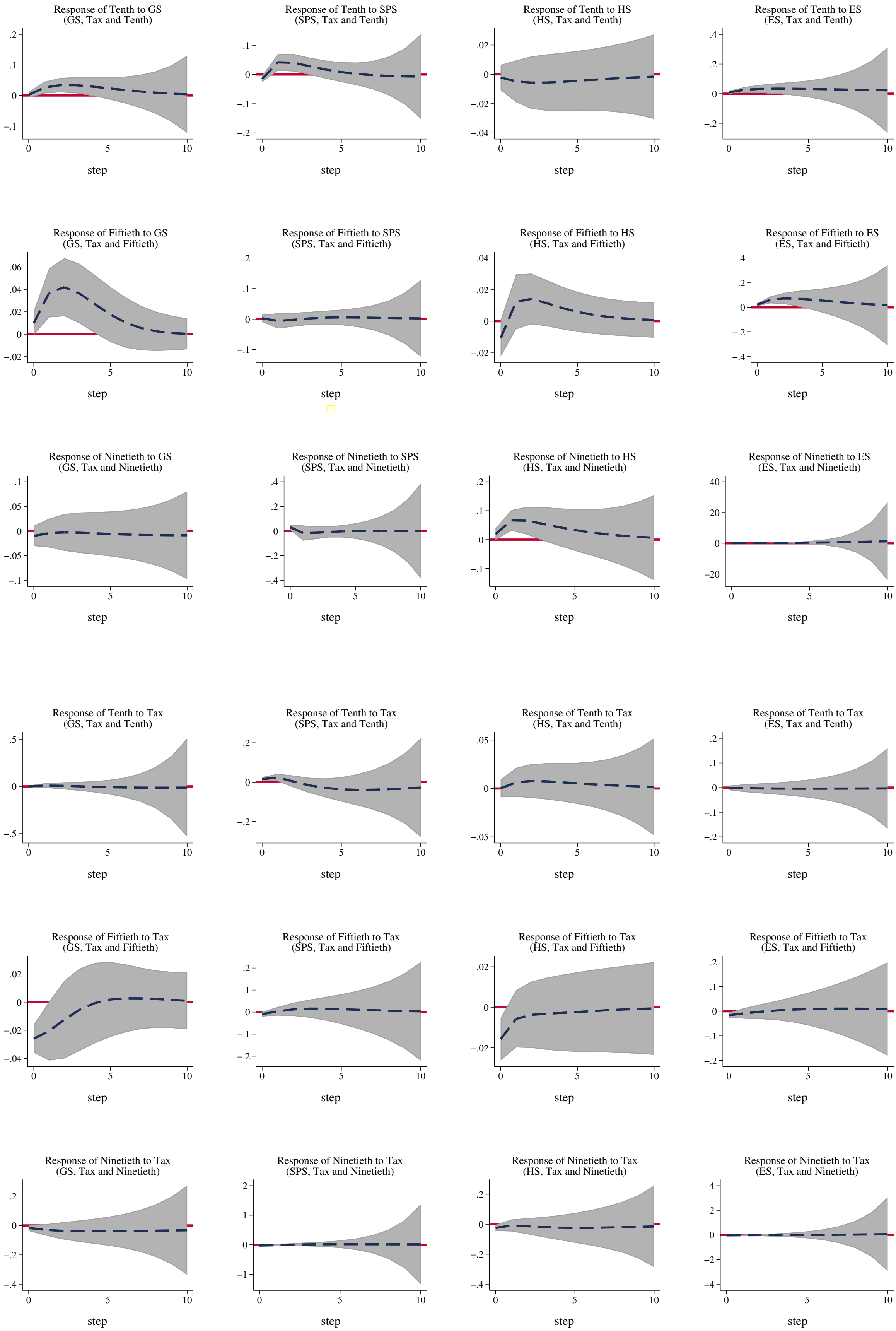
In terms of rationalizing the results obtained (in light of existing realities within middle income-countries), it is noteworthy that our finding concerning the impact of public spending shocks is unsurprising. Previous research by Fournier and Johansson (2016) demonstrates that larger governments have the capacity to spend more on expenditures that have a high tendency to bring about a reduction in inequality. Meanwhile, data from the Statistics on Public Expenditures for Economic Development (SPEED) Database indicates a sharp upward trajectory in public spending within middle income countries, rising from 15.97 to 41.43 (measured in billions of constant 2010 US dollars) between 2000 and 2017. Consequently, it is not surprising that we find inequality reducing with inclusive benefits for the low- and middle-income groups following public spending shocks within middle income countries. Equally expected is our finding regarding the impact of education spending shocks. This can be explained by the work of Becker (1964), which demonstrates that increased investment in education leads to enhanced human capital acquisition. Consequently, individuals are more likely to secure gainful employment, thereby raising their earning potential and reducing the income gap. In this regard, Glewwe and Muralidharan (2016) reveal that there has been a substantial surge in government expenditures on education across many developing nations, with notable increases in Latin America, Sub-Saharan Africa, the Middle East, East Asia, and South Asia. Additionally, Paul et al. (2011) highlight a consistent increase in primary and secondary enrollment rates in emerging countries, (to which middle income countries belong), between 1980 and 2008. Given these developments, it is unsurprising that we find that within middle income countries, education spending shocks reduce inequality as well as benefit all the income groups"

Figure (2.7) Impulse Responses: Spending and Tax Shocks on the Gini Index



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (2.8) Impulse Responses: Spending and Tax Shocks on the Tenth, Fiftieth and Ninetieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (2.4) Variance Decomposition: Gini, Tenth, Fiftieth and Ninetieth Percentiles

Gini Index												
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Gini			SPS, Tax, and Gini			HS, Tax, and Gini			ES, Tax, and Gini		
Gini	GS	Tax	Gini	SPS	Tax	Gini	HS	Tax	Gini	ES	Tax	Gini
1	0.000	0.004	0.996	0.001	0.000	0.999	0.012	0.009	0.979	0.006	0.001	0.993
2	0.016	0.004	0.981	0.017	0.003	0.979	0.017	0.016	0.967	0.031	0.005	0.965
3	0.037	0.006	0.957	0.027	0.003	0.970	0.019	0.021	0.960	0.049	0.010	0.941
4	0.055	0.007	0.938	0.030	0.006	0.964	0.020	0.024	0.957	0.060	0.015	0.925
5	0.066	0.007	0.927	0.031	0.008	0.961	0.020	0.025	0.955	0.067	0.019	0.915

Tenth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Tenth			SPS, Tax, and Tenth			HS, Tax, and Tenth			ES, Tax, and Tenth		
Tenth	GS	Tax	Tenth	SPS	Tax	Tenth	HS	Tax	Tenth	ES	Tax	Tenth
1	0.000	0.000	1.000	0.014	0.015	0.971	0.000	0.000	1.000	0.008	0.000	0.992
2	0.035	0.004	0.962	0.087	0.034	0.879	0.002	0.002	0.996	0.045	0.000	0.955
3	0.081	0.005	0.914	0.139	0.031	0.830	0.003	0.005	0.992	0.089	0.001	0.910
4	0.124	0.005	0.871	0.161	0.039	0.800	0.005	0.008	0.987	0.131	0.001	0.868
5	0.154	0.005	0.840	0.164	0.068	0.768	0.006	0.010	0.984	0.166	0.002	0.832

Fiftieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Fiftieth			SPS, Tax, and Fiftieth			HS, Tax, and Fiftieth			ES, Tax, and Fiftieth		
Fiftieth	GS	Tax	Fiftieth	SPS	Tax	Fiftieth	HS	Tax	Fiftieth	ES	Tax	Fiftieth
1	0.006	0.038	0.956	0.000	0.005	0.995	0.007	0.014	0.979	0.025	0.013	0.962
2	0.062	0.046	0.892	0.002	0.004	0.994	0.012	0.013	0.976	0.150	0.011	0.838
3	0.123	0.048	0.830	0.002	0.010	0.988	0.019	0.012	0.969	0.271	0.009	0.719
4	0.164	0.046	0.789	0.002	0.019	0.980	0.024	0.012	0.964	0.358	0.008	0.633
5	0.185	0.045	0.770	0.003	0.027	0.971	0.026	0.012	0.962	0.415	0.008	0.577

Ninetieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Ninetieth			SPS, Tax, and Ninetieth			HS, Tax, and Ninetieth			ES, Tax, and Ninetieth		
Ninetieth	GS	Tax	Ninetieth	SPS	Tax	Ninetieth	HS	Tax	Ninetieth	ES	Tax	Ninetieth
1	0.002	0.005	0.994	0.016	0.012	0.973	0.006	0.010	0.984	0.082	0.013	0.904
2	0.001	0.013	0.986	0.017	0.013	0.970	0.058	0.008	0.934	0.196	0.011	0.793
3	0.001	0.024	0.975	0.019	0.013	0.968	0.097	0.009	0.895	0.323	0.008	0.669
4	0.001	0.037	0.962	0.019	0.015	0.966	0.120	0.012	0.868	0.436	0.005	0.559
5	0.001	0.051	0.948	0.019	0.018	0.963	0.133	0.016	0.850	0.524	0.003	0.473

2.4.2 Variance Decomposition Analysis

Table 2.4 provides the forecast error variance decompositions for the panel VAR model with the Gini index as the income distribution variable. From the first to the fifth year, the spending variables increase their influence on the variation in inequality, reaching up to 6.6% and 6.7% after 5 years for government and education spending shocks, respectively, which is the highest effect. The corresponding effects at this 5-year horizon of social protection and health expenditure are about half or third, respectively, of the reported magnitude. Taxes have the weakest influence on the variation in inequality, only 0.8% at the same 5-year horizon in the FEVDs. The inference from these empirical findings is that the fiscal variables, but mostly those on the public expenditure rather than the revenue side, are key drivers of income inequality within middle-income countries.

The variance decompositions for the income percentiles follow a similar pattern to that of inequality. Consequently, the results from the variance decompositions lend credence to those from the impulse response functions.

2.5 Comparison to High-Income Countries

In this section, we examine how the results for middle-income countries compare with high-income countries.[13] The impulse responses, shown in Figure 2.9, reveal that the Gini index declines within two years of a government spending shock in high income countries. Likewise, government spending shocks generally benefit the very low-income groups.[14] Following a government spending shock, the income share of the bottom 10th rises two years after and peaks in the fifth year but remains positive until the ninth year (Figure 2.10). Meanwhile, a positive shock to government spending does not exhibit a significantly positive impact on the other percentiles considered.

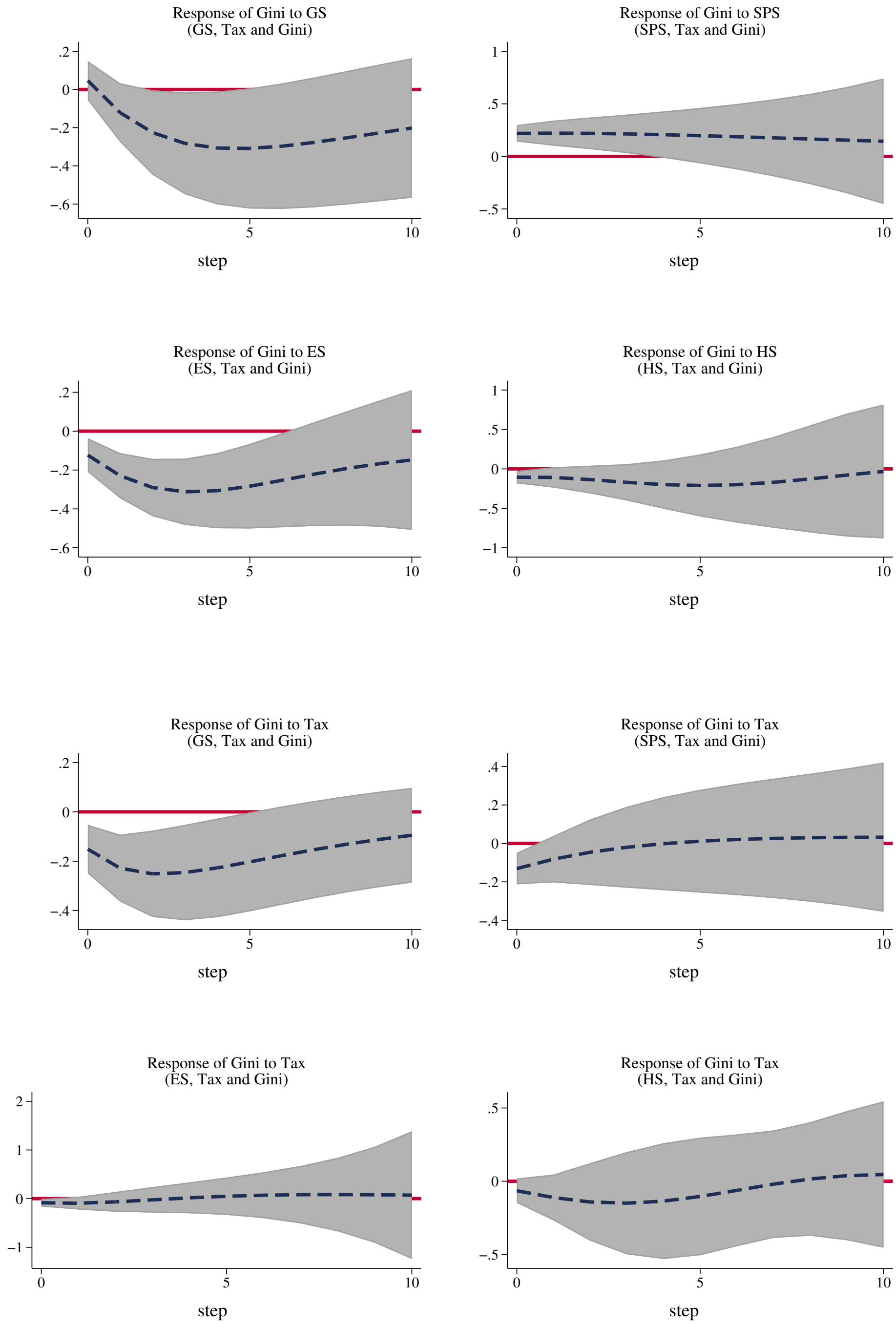
Similarly, a shock to education spending is associated with a decrease in inequality by 0.123 percentage points on impact. The effect peaks at 0.312 percentage points in the third year, and persists till the fifth year. Also, education spending shocks generally benefit the low-income group as well as the very high-income group. The shock is associated with an increase in the income share held by the 10th percentile in the year of impact, peaks in the fourth year but lasts till the fifth year. Likewise, a positive education spending shock

[13] Here, we consider a panel of 43 high income countries, as classified by the World Bank, over the period 2004-2014, and for which data on public sector spending and inequality are available in our datasets. The World Bank classification is based on estimates of gross national income (GNI) per capita in 2021. Countries classified as high income have a minimum GNI per capita of $13,205. Specifically, the high countries considered are: Australia, Austria, Bahamas, Barbados, Belgium, Canada, Chile, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea Rep., Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Seychelles, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States and Uruguay.

[14] Results presented in the Appendix show that government spending shock also benefit the 80th percentile.

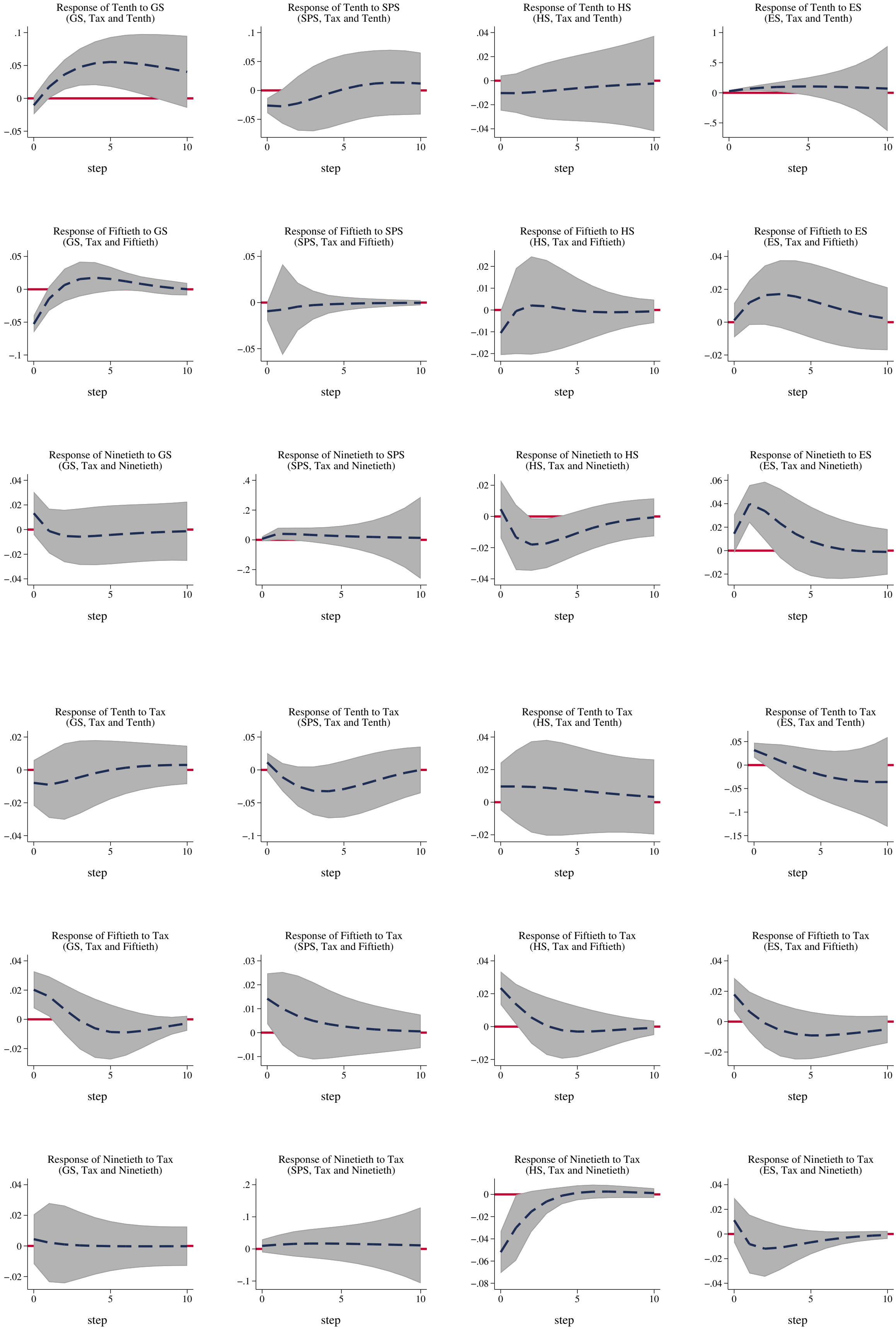
has no immediate impact on the 90th percentile, but increases it by 0.040 percentage points in the first year after the shock. The effect subsequently becomes statistically insignificant in the third year. The education expenditure shock does not have a significant impact on the 50th percentile.

Figure (2.9) Impulse Responses: Spending and Tax Shocks on the Gini Index - High income countries



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (2.10) Impulse Responses: Spending and Tax Shocks on the Tenth, Fiftieth and Ninetieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (2.5) Variance Decomposition: Gini, Tenth, Fiftieth and Ninetieth Percentiles

Gini Index												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Gini			SPS, Tax and Gini			HS, Tax and Gini			ES, Tax and Gini		
Gini	GS	Tax	Gini	SPS	Tax	Gini	HS	Tax	Gini	ES	Tax	Gini
1	0.002	0.017	0.982	0.050	0.018	0.932	0.012	0.005	0.983	0.017	0.008	0.975
2	0.007	0.032	0.961	0.054	0.013	0.932	0.015	0.011	0.974	0.045	0.011	0.945
3	0.021	0.043	0.935	0.058	0.010	0.931	0.022	0.019	0.959	0.076	0.010	0.913
4	0.039	0.052	0.910	0.062	0.009	0.930	0.032	0.027	0.941	0.104	0.009	0.887
5	0.056	0.058	0.887	0.065	0.007	0.928	0.046	0.032	0.922	0.125	0.008	0.868

Tenth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Tenth			SPS, Tax and Tenth			HS, Tax and Tenth			ES, Tax and Tenth		
Tenth	GS	Tax	Tenth	SPS	Tax	Tenth	HS	Tax	Tenth	ES	Tax	Tenth
1	0.004	0.002	0.994	0.025	0.005	0.970	0.004	0.003	0.993	0.025	0.034	0.941
2	0.009	0.003	0.988	0.035	0.006	0.959	0.004	0.004	0.992	0.084	0.027	0.889
3	0.029	0.003	0.968	0.040	0.018	0.942	0.005	0.005	0.990	0.154	0.021	0.826
4	0.058	0.003	0.939	0.041	0.036	0.923	0.005	0.005	0.989	0.222	0.016	0.762
5	0.090	0.003	0.907	0.040	0.054	0.906	0.006	0.006	0.989	0.280	0.015	0.705

Fiftieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Fiftieth			SPS, Tax and Fiftieth			HS, Tax and Fiftieth			ES, Tax and Fiftieth		
Fiftieth	**GS**	Tax	Fiftieth	SPS	Tax	Fiftieth	HS	Tax	Fiftieth	ES	Tax	Fiftieth
1	0.113	0.017	0.870	0.006	0.015	0.979	0.007	0.037	0.956	0.000	0.021	0.979
2	0.077	0.017	0.906	0.009	0.019	0.972	0.005	0.032	0.963	0.006	0.015	0.979
3	0.067	0.016	0.917	0.010	0.021	0.969	0.004	0.029	0.967	0.014	0.012	0.974
4	0.070	0.015	0.916	0.010	0.023	0.967	0.004	0.027	0.968	0.021	0.012	0.967
5	0.075	0.016	0.909	0.011	0.023	0.966	0.004	0.027	0.969	0.027	0.013	0.961

Ninetieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Ninetieth			SPS, Tax and Ninetieth			HS, Tax and Ninetieth			ES, Tax and Ninetieth		
Ninetieth	**GS**	Tax	Ninetieth	SPS	Tax	Ninetieth	HS	Tax	Ninetieth	ES	Tax	Ninetieth
1	0.004	0.000	0.995	0.001	0.002	0.997	0.000	0.056	0.944	0.005	0.003	0.992
2	0.004	0.001	0.996	0.031	0.005	0.964	0.004	0.072	0.923	0.036	0.004	0.960
3	0.004	0.001	0.995	0.053	0.008	0.939	0.010	0.076	0.914	0.057	0.007	0.936
4	0.005	0.001	0.995	0.067	0.012	0.921	0.016	0.076	0.908	0.067	0.009	0.925
5	0.006	0.001	0.994	0.076	0.016	0.908	0.020	0.076	0.904	0.070	0.010	0.920

Source: Author's own computation.

A positive shock to social protection spending neither reduces inequality nor exhibits a significantly positive impact on any of the percentiles considered. In contrast to the results obtained for the middle-income countries, here we find that a positive shock to health spending has a negative and immediate effect on inequality, with the Gini index declining by 0.105 percentage points in the year of the shock. [15] Contrary to the results obtained for middle-income countries, an unexpected rise in taxation largely reduces income inequality. The reduction often occurs in the year of impact and persists for at least one additional year. Interestingly, in the model in which our spending variable is represented by government expenditure, the effect persists till the fifth year. Meanwhile, a shock to taxation benefits the 50th percentile, with the positive effect often being immediate and then fading away by the second year.

The results from the variance decomposition validate those from the impulse responses, showing that the fiscal policy variables we examined contribute significantly to the variations in all the income percentiles considered (see Table 2.5).

2.6 Sensitivity Analysis

2.6.1 Employing Different Measures of Inequality in the Panel VAR

We test the robustness of our results to alternative measures of inequality and to three additional income percentiles.[16] Specifically, we replace the Gini index with the Atkinson inequality measure and the Theil index and also use the 20th, 40th and 80th percentiles, which are alternative proxies for the bottom, middle and top income percentiles previously discussed. This allows us to examine the degree to which our findings potentially depend on the measure of inequality used.[17]

Replacing the Gini coefficient and the income percentiles with these other measures does not change the essence of the results we analyzed as a benchmark specification. Similarly, shocks to government expenditure retain their negative impact on inequality: both the Theil index and the Atkinson inequality measure exhibit negative responses. A positive shock to education spending has a negative and immediate effect on the Theil index and the Atkinson measure of inequality, while a health spending shock, and a positive tax shock, have no statistically significant impact on the Theil index and the Atkinson measure of inequality.

[15] As shown in Appendix Figure B.74, the health spending shock is associated with a sharp decrease in the share of income held by the 80th percentile, by 0.033 percentage points on impact. The effect reaches a climax in the immediate year after the shock at 0.054 percentage points and persists for four additional years. Health spending shocks do not exhibit a significantly positive impact on the remaining percentiles considered.

[16] The related Tables and Figures with full results are available in Appendix B.4

[17] For a detailed discussion of the properties of these inequality measures, amongst others, see Cowell (2000). Data on both the Atkinson index and the Theil index are sourced from the Global Consumption and Income Project Database.

The findings obtained for the 20th, 40th and 80th percentiles generally corroborate the baseline results. Similar to our previous findings, government and education spending shocks tend to benefit the 20th and 40th percentiles, with the 80th percentile benefiting from education spending shocks as well. Also, social protection and health spending shocks exhibit a positive impact on the 80th percentile. Meanwhile, tax shocks generally do not benefit any of the income shares.[18]

2.6.2 Re-ordering the Variables in the Panel VAR

Inclusion of Taxation Before Government Spending

We re-order our panel VAR by including taxation before the public spending variables. This ordering is based on Wagner's law of government expenditure, which suggests that an increase in tax receipts enhances the government's capacity to spend on public goods (Wagner, 1890). Moreover, there exist some middle-income countries which, on average, have recorded budget surpluses over time.[19] For some countries, a budget surplus may be necessary to realize some savings to pay off debts or foot the bills of a capital project; as such, taxation revenue is seen as a benchmark, determining how much the government spends annually (ECLAC/UNESCO, 2005).

It is noteworthy that the ordering of variables has no impact on panel VAR estimates, it only affects impulse responses and variance decompositions (Abrigo and Love, 2016).[20] Accordingly, regardless of the changes in the ordering implemented in this section, the results for the panel VAR regression as well as the stability of the VAR framework would be the same as those provided for the baseline. For this reason, we do not discuss/repeat these results in this section. Instead, we only focus on the impulse responses as well as the variance decomposition results. More specifically, the results show that income inequality declines in response to a positive shock to government spending as well as education expenditure. While a government expenditure shock has a positive effect on the percentiles representing the low- and middle-income groups, a shock to education expenditure exhibits a positive effect on all percentiles under study. In most cases, the impact persists for at least two years.

Also, a positive shock to social protection expenditure elevates the income share of the 90th percentile, based on the impulse responses. Likewise, a social protection expenditure shock initially has a negative effect on the 10th percentile, but the shock eventually has a positive influence on the percentile's share of income in the years following the shock. Consistent with earlier results, a positive health spending shock has no significant impact on inequality, but it exhibits a positive effect on the 90th percentile. In general, a

[18] We provided in Appendix B.3, further details regarding the results obtained for the 20th, 40th and 80th percentiles.

[19] For example, the IMF World Economic Outlook Database (October 2020 Vintage) reveals that between 2004 and 2014, Azerbaijan recorded, on average, a budget surplus of 5.76%.

[20] Our results for the impulse responses are presented in Appendix Figures B.51 - B.53.

positive tax shock does not contribute towards closing the income gap. Also, the income shares generally do not benefit from a tax shock, as shown previously.

Finally, regarding the variance decomposition, the analysis reveals that the fiscal policy variables still contribute to the variations in inequality as well as the income percentiles in a range similar to the benchmark case with the Gini index.

Employing the Reverse of the Baseline Ordering

As is well-known, the results obtained for the impulse responses and variance decompositions in (panel) VARs depend on the ordering of the VAR. For instance, Brooks (2014) recommends the very extreme case of an ordering, which, in our analysis, would correspond to the exact opposite of the one we have used for the baseline. Specifically, the Gini index and government spending are respectively entered as the first and last variables in the panel VAR.[21]

In terms of impulse responses, we find that the inequality impact of government spending and education expenditure is comparable to the baseline results.[22] A shock to social protection spending exhibits a weak and brief negative impact on inequality. As before, a government expenditure shock has a positive effect on the bottom half of the income distribution while a shock to education expenditure exhibits a positive effect on all percentiles considered, with the impact often persisting beyond the second year. Similar to previous findings, a positive health spending shock benefits the top percentiles but has no significant impact on inequality as well as the low and middle-income groups.

Moving on to the distributive effect of tax shocks, we find that an unexpected rise in tax often exhibits a statistically insignificant effect on inequality and, also, across the income distribution. Consistent with the baseline findings, the spending variables, along with tax, contribute to the variations in the income distribution variables.[23]

2.6.3 Inclusion of Inflation in the VAR Model

In this section we include inflation in our VAR model based on the insider-outsider theory which predicts that inflation may exhibit a contemporaneous impact on the Gini index. Specifically, the theory suggests that some workers are granted a pay rise (insiders) during periods of high inflation, while many others are not (outsiders); and this increases income inequality (see, e.g., Fischer, 1993; Braun, 1994; Davtyan, 2017). Similar to Gunasinghe et al. (2020), we assume that inflation is conditioned on the fiscal policy

[21] As a fallout of the new ordering, the response of inequality to government spending becomes constrained to zero in the first period.

[22] All results are in the Appendix Figures B.54 - B.56.

[23] See detailed results for the variance decomposition in Appendix Tables B.51 - B.54.

variables and any feedback impact will likely be with a time-lag. While the precise impact of taxation on inflation may be unclear, the literature generally indicates that inflation is conditioned on taxation. For example, Pitchford and Turnovsky (1976) observe that conventional macroeconomic theory predicts that a tax increase could decrease demand thereby lowering inflation. Nonetheless, Smith (1952) suggests a less straightforward outcome, since inflation could also rise as a consequence of tax hikes.

When looking at the impulse responses, we find that Government spending shock still reduces the income gap between the rich and the poor, and also impacts positively on the percentiles representing the low- and middle-income groups. Also, an education spending shock continues to benefit all income groups while shocks to social protection and to health spending generally benefits the wealthy, with no detectable effect on the low- and middle-income groups. A tax shock mostly has no significant effect on inequality nor exhibits any positive impact on the percentiles under study. The results for the variance decomposition are comparable to baseline findings.[24]

2.7 Concluding Discussion

We employed a panel VAR framework estimated by the GMM to assess the distributional effects of government spending and tax shocks within a sample of 56 middle-income countries for the period ranging from 2004 to 2014. In particular, we investigated the response of three alternative income distribution variables, namely the Gini index, the Theil index and the Atkinson measure of income inequality, to shocks imposed on three social expenditure components, namely, social protection, health and education expenditures, as well as on government expenditure as a whole and on taxes.

We found that shocks to government and education spending tend to exhibit the most pronounced distributional effects, while social protection shocks often exhibit brief equalizing impacts and health spending shocks generally have no apparent effects on inequality. Moreover, shocks to government and education expenditures positively impact the low and middle-income groups, but high-income groups benefit from education spending shocks as well. Generally, the impact of the shock on the various income groups remains significant for at least 3 years. Likewise, social protection and health spending shocks often elevate the income share of those already in the top of the income distribution. Meanwhile, an unexpected rise in taxes largely exhibits no significant impact on inequality, and fails to benefit any particular income group. Our findings bear some similarities to those of De Giorgi and Gambetti (2012) and Gunasinghe et al. (2020), who report related estimates on US and Australian data, respectively. Our results were shown to be robust to alternative measures of inequality, different orderings of variables, and the inclusion of inflation.

[24]Detailed results are in Appendix B.6

We examined how the results for middle-income countries compare with those for high-income countries. Generally, we found that shocks to government and education spending continue to exhibit the most pronounced distributional effects also in high income countries. In contrast to the findings for middle-income countries, however, tax and health spending shocks tend to exhibit a negative, albeit less evident, impact on inequality in high-income countries. Meanwhile, social protection shocks have no noticeable inequality reducing effects in high-income countries. As discussed previously, government and education spending shocks support the middle-income group in middle-income countries; however, in high-income countries, both types of spending shocks do not benefit the middle–income group, but generally enhance the income shares held by the low- and high-income groups. Again, contrary to the results for middle-income countries, we find that, in high-income countries, tax shocks tend to benefit the low-income group and the middle-income group, while health spending shocks tend to reduce the income share of the high-income group. Nonetheless, social protection shocks do not exhibit any detectable impact on the different income groups.

Taking the empirical results as a guide for macroeconomic policies, the most vital implication of this study for middle-income countries is that unexpected changes in government spending, (such as witnessed during the COVID-19 pandemic) may contribute towards making a dent in income inequality. Nonetheless, the income distribution does not respond homogenously to shocks in the various social expenditures under study – hence, the specific expenditure under consideration matters in terms of the impact on inequality overall and on different parts of the income distribution. Education spending shocks appear to be most effective in achieving better distributional outcomes, while social protection shocks often exhibit negative but short-lived inequality reducing effects; interestingly, the equalizing impacts of health spending shocks are witnessed only in high-income countries.

It is noteworthy that data availability issues posed a constraint to the time-span covered in this paper. Hence, the redistributive impact of the spending shocks over a longer time-frame may be examined in future research as the required data become available. In addition, this paper focused on the social spending sectors, and hence, future extensions could examine the distributional impacts of shocks imposed on other sectoral expenditures.

Appendix B

Appendix to Chapter 2

B.1 Additional Technical Information

In arriving at equation (2.1), we begin with the structural VAR models in equations (B.1) to (B.3) below:

$$GS_{it} = \beta_{10} + \beta_{12}Tax_{it} + \beta_{13}Gini_{it} + \gamma_{11}GS_{it-1} + \gamma_{12}Tax_{it-1} + \gamma_{13}Gini_{it-1} + U_{GSit} \quad \text{(B.1)}$$
$$Tax_{it} = \beta_{20} + \beta_{22}GS_{it} + \beta_{23}Gini_{it} + \gamma_{21}GS_{it-1} + \gamma_{22}Tax_{it-1} + \gamma_{23}Gini_{it-1} + U_{Taxit} \quad \text{(B.2)}$$
$$Gini_{it} = \beta_{30} + \beta_{32}GS_{it} + \beta_{33}Tax_{it} + \gamma_{31}GS_{it-1} + \gamma_{32}Tax_{it-1} + \gamma_{33}Gini_{it-1} + U_{Giniit} \quad \text{(B.3)}$$

Equations (B.1) to (B.3) represent the structural VAR equations. The reverse-causality/contemporaneous feedback in the structural VAR models above results in endogeneity bias; and as such we transform the structural VAR in order to eliminate the feedback. For this purpose, we move the contemporaneous variables in equations (B.1) to (B.3) to the left-hand side of each equation and thus obtain equations (B.4) to (B.6) below:

$$GS_{it} - \beta_{12}Tax_{it} - \beta_{13}Gini_{it} = \beta_{10} + \gamma_{11}GS_{it-1} + \gamma_{12}Tax_{it-1} + \gamma_{13}Gini_{it-1} + U_{GSit} \quad \text{(B.4)}$$
$$-\beta_{22}GS_{it} + Tax_{it} - \beta_{23}Gini_{it} = \beta_{20} + \gamma_{21}GS_{it-1} + \gamma_{22}Tax_{it-1} + \gamma_{23}Gini_{it-1} + U_{Taxit} \quad \text{(B.5)}$$
$$-\beta_{32}GS_{it} - \beta_{33}Tax_{it} + Gini_{it} = \beta_{30} + \gamma_{31}GS_{it-1} + \gamma_{32}Tax_{it-1} + \gamma_{33}Gini_{it-1} + U_{Giniit} \quad \text{(B.6)}$$

Using matrices, equations (B.4) to (B.6) can be denoted as:

$$\begin{pmatrix} 1 & -\beta_{12} & -\beta_{13} \\ -\beta_{22} & 1 & -\beta_{23} \\ -\beta_{32} & -\beta_{33} & 1 \end{pmatrix} \begin{pmatrix} GS_{it} \\ Tax_{it} \\ Gini_{it} \end{pmatrix} = \begin{pmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \end{pmatrix} + \begin{pmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} \\ \gamma_{21} & \gamma_{22} & \gamma_{23} \\ \gamma_{31} & \gamma_{32} & \gamma_{33} \end{pmatrix} \begin{pmatrix} GS_{it-1} \\ Tax_{it-1} \\ Gini_{it-1} \end{pmatrix} + \begin{pmatrix} U_{GSit} \\ U_{Taxit} \\ U_{Giniit} \end{pmatrix} \quad \text{(B.7)}$$

and with matrix algebra, equation (B.7) can be simplified as:

$$BY_{it} = \Gamma_0 + \Gamma_1 Y_{t-1} + U_t \quad \text{(B.8)}$$

$$where\ \ B = \begin{pmatrix} 1 & -\beta_{12} & -\beta_{13} \\ -\beta_{22} & 1 & -\beta_{23} \\ -\beta_{32} & -\beta_{33} & 1 \end{pmatrix}, Y_{it} = \begin{pmatrix} GS_{it} \\ Tax_{it} \\ Gini_{it} \end{pmatrix}, \Gamma_0 = \begin{pmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \end{pmatrix}, \Gamma_1 = \begin{pmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} \\ \gamma_{21} & \gamma_{22} & \gamma_{23} \\ \gamma_{31} & \gamma_{32} & \gamma_{33} \end{pmatrix}, U_t = \begin{pmatrix} U_{GSit} \\ U_{Taxit} \\ U_{Giniit} \end{pmatrix} \quad \text{(B.9)}$$

To solve for Y_{it} in equation (B.8) above, we multiply both sides by B^{-1}, and this gives:

$$Y_{it} = A_0 + A_1 Y_{it-1} + e_{it} \quad \text{(B.10)}$$
$$where\ \ A_0 = B^{-1}\Gamma_0, A_1 = B^{-1}\Gamma_1\ and\ e_{it} = B^{-1}U_t \quad \text{(B.11)}$$

Equation (B.10) can be further simplified as follows:

$$GS_{it} = \alpha_{10} + \alpha_{11}GS_{it-1} + \alpha_{12}Tax_{it-1} + \alpha_{13}Gini_{it-1} + e_{GSit} \quad \text{(B.12)}$$
$$Tax_{it} = \alpha_{20} + \alpha_{21}GS_{it-1} + \alpha_{22}Tax_{it-1} + \alpha_{23}Gini_{it-1} + e_{Taxit} \quad \text{(B.13)}$$
$$Gini_{it} = \alpha_{30} + \alpha_{31}GS_{it-1} + \alpha_{32}Tax_{it-1} + \alpha_{33}Gini_{it-1} + e_{Giniit} \quad \text{(B.14)}$$

It is noteworthy that we do not report the constant term in our results for brevity. Also, in each equation, we account for the country and time fixed effects by including country and time specific dummies (denoted as μ_i and θ_t respectively in our baseline equation).

B.2 Panel Unit Root and Stability Tests

As part of our analysis, we conduct unit root tests. As observed by Blundell and Bond (1998), the instruments employed by the GMM estimator tend to be weak if the variables being modelled suffer from unit root. We thus conduct the Levin-Lin-Chu test (Levin et al., 2002). The null hypothesis of the test assumes the panels contain unit roots. We do not employ Fisher-type tests (i.e., Augmented Dickey-Fuller and Phillips-Perron tests) since they are designed for panels with long time-spans, whereas we utilize a short panel of ten years from 2004 to 2014 in our present research. Our test results below suggest that we can reject the null hypothesis of unit root for all the variables.

Table (B.21) Panel VAR Results: Gini Index

	Levin-Lin-Chu test	
	Adjusted t*	p-value
GS	-4.956	0.000
Tax	-8.050	0.000
SPS	-1.795	0.036
HS	-12.723	0.000
ES	-6.309	0.000
Inflation	-9.628	0.000
Gini	-14.099	0.000
Tenth	-9.151	0.000
Twentieth	-7.764	0.000
Fortieth	-8.402	0.000
Fiftieth	-15.658	0.000
Eightieth	-10.890	0.000
Ninetieth	-8.948	0.000
Theil	-12.146	0.000
Atkinson	-7.070	0.000
	H0: Panels contain unit roots	
	Ha: Panels are stationary	

Likewise, we evaluate the stability condition of our panel VAR model. As noted by Lütkepohl (2005) and Hamilton (2020) , all the moduli of the companion matrix have to be less than one for the fitted VAR model to be considered stable. Graphically, this implies that the roots of the companion matrix must lie within the unit circle. When a panel VAR model is not stable, no known interpretation can be given to its impulse response functions and variance decompositions.

B.3 Baseline Results

Table (B.31) Panel VAR Results: Gini Index

Regressors	Regressands											
	GS, Tax and Gini			SPS, Tax and Gini			HS, Tax and Gini			ES, Tax and Gini		
	GS	Tax	Gini	SPS	Tax	Gini	HS	Tax	Gini	ES	Tax	Gini
L.GS	0.565***	-0.127**	-0.100***									
	(0.080)	(0.051)	(0.029)									
L.SPS				0.188	0.413	-0.187*						
				(0.224)	(0.560)	(0.112)						
L.HS							0.555***	-0.281	0.051			
							(0.142)	(0.754)	(0.163)			
L.ES										0.450**	-0.761	-0.384
										(0.177)	(0.775)	(0.277)
L.Tax	0.151	0.641***	0.065	-0.172***	0.539**	-0.024	-0.018	0.786***	0.026	-0.033	0.637**	0.052
	(0.147)	(0.123)	(0.058)	(0.066)	(0.229)	(0.053)	(0.021)	(0.197)	(0.049)	(0.051)	(0.248)	(0.081)
L.Gini	0.008	-0.663***	0.625***	0.138	-2.200***	0.480***	-0.158***	-2.014***	0.396***	-0.064	-0.011	0.518***
	(0.221)	(0.159)	(0.122)	(0.104)	(0.353)	(0.125)	(0.045)	(0.330)	(0.121)	(0.112)	(0.326)	(0.198)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.32) Panel VAR Results: Tenth Percentile

Regressors	Regressands											
	GS, Tax and Tenth			SPS, Tax and Tenth			HS, Tax and Tenth			ES, Tax and Tenth		
	GS	Tax	Tenth	SPS	Tax	Tenth	HS	Tax	Tenth	ES	Tax	Tenth
L.GS	0.800***	-0.172**	0.008**									
	(0.161)	(0.083)	(0.004)									
L.SPS				0.235	0.356	0.041***						
				(0.228)	(0.386)	(0.014)						
L.HS							0.651***	-0.288	-0.005			
							(0.155)	(0.333)	(0.014)			
L.ES										0.779***	-0.753	0.029*
										(0.271)	(0.513)	(0.017)
L.Tax	-0.293	0.749***	0.004	-0.289***	1.056***	0.007	-0.077***	0.539***	0.003	-0.017	0.567***	-0.001
	(0.279)	(0.225)	(0.007)	(0.076)	(0.198)	(0.005)	(0.024)	(0.177)	(0.005)	(0.081)	(0.156)	(0.005)
L.Tenth	-10.736	4.851	0.642***	0.020	2.417	0.538***	-0.244	1.838	0.589***	1.240	-0.004	0.602***
	(7.091)	(3.233)	(0.193)	(1.761)	(3.173)	(0.143)	(0.619)	(2.123)	(0.132)	(1.821)	(3.239)	(0.133)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.33) Panel VAR Results: Fiftieth Percentile

Regressors	Regressands											
	GS, Tax and Fiftieth			SPS, Tax and Fiftieth			HS, Tax and Fiftieth			ES, Tax and Fiftieth		
	GS	Tax	Fiftieth	SPS	Tax	Fiftieth	HS	Tax	Fiftieth	ES	Tax	Fiftieth
L.GS	0.691***	-0.199**	0.011**									
	(0.114)	(0.093)	(0.005)									
L.SPS				0.166	0.809	-0.005						
				(0.255)	(0.507)	(0.013)						
L.HS							0.454***	0.036	0.033*			
							(0.136)	(0.323)	(0.018)			
L.ES										0.795***	-0.536	0.072***
										(0.221)	(0.491)	(0.025)
L.Tax	0.067	0.699***	-0.004	-0.154**	0.892***	0.004	-0.026	0.611***	0.001	0.019	0.801***	0.000
	(0.215)	(0.171)	(0.006)	(0.077)	(0.243)	(0.005)	(0.026)	(0.183)	(0.005)	(0.055)	(0.155)	(0.007)
L.Fiftieth	-2.702	7.952***	0.502***	1.181	0.659	0.608***	1.133*	4.633*	0.522**	0.224	-0.756	0.541***
	(3.464)	(2.720)	(0.156)	(1.539)	(3.806)	(0.199)	(0.635)	(2.732)	(0.204)	(1.020)	(2.463)	(0.180)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.34) Panel VAR Results: Ninetieth Percentile

Regressors	Regressands											
	GS, Tax and Ninetieth			SPS, Tax and Ninetieth			HS, Tax and Ninetieth			ES, Tax and Ninetieth		
	GS	Tax	Ninetieth	SPS	Tax	Ninetieth	HS	Tax	Ninetieth	ES	Tax	Ninetieth
L.GS	0.588***	-0.011	0.003									
	(0.074)	(0.050)	(0.006)									
L.SPS				0.113	0.439	-0.024						
				(0.224)	(0.602)	(0.028)						
L.HS							0.511***	-0.225	0.101***			
							(0.142)	(0.559)	(0.037)			
L.ES										1.044***	-0.839	0.093**
										(0.170)	(0.591)	(0.040)
L.Tax	0.234	0.997***	-0.009	-0.252***	1.048***	-0.002	-0.055**	0.775***	0.002	0.027	0.798***	0.001
	(0.181)	(0.165)	(0.010)	(0.058)	(0.192)	(0.010)	(0.024)	(0.234)	(0.011)	(0.044)	(0.191)	(0.012)
L.Ninetieth	-1.108	1.347	0.649***	-0.174	1.478	0.453***	0.520***	1.639	0.526***	1.318**	0.658	0.774***
	(1.311)	(0.861)	(0.170)	(0.522)	(2.214)	(0.117)	(0.163)	(1.541)	(0.192)	(0.547)	(1.438)	(0.203)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.35) Panel VAR Results: Twentieth Percentile

Regressors	Regressands											
	GS, Tax and Twentieth			SPS, Tax and Twentieth			HS, Tax and Twentieth			ES, Tax and Twentieth		
	GS	Tax	Twentieth	SPS	Tax	Twentieth	HS	Tax	Twentieth	ES	Tax	Twentieth
L.GS	0.714***	-0.254**	0.013***									
	(0.136)	(0.112)	(0.003)									
L.Tax	0.034	0.936***	-0.002	-0.157**	0.901***	0.002	-0.049	0.623***	0.002	-0.019	0.733***	-0.001
	(0.225)	(0.231)	(0.007)	(0.075)	(0.213)	(0.006)	(0.031)	(0.178)	(0.005)	(0.067)	(0.154)	(0.006)
L.SPS				0.049	0.694	0.023*						
				(0.251)	(0.461)	(0.013)						
L.HS							0.559***	-0.163	0.005			
							(0.149)	(0.338)	(0.015)			
L.ES										0.684***	-0.964**	0.041*
										(0.235)	(0.476)	(0.021)
L.Twentieth	-5.073	8.236**	0.485***	3.509*	1.193	0.561***	0.524	1.363	0.753***	1.139	-0.192	0.632***
	(4.888)	(3.753)	(0.141)	(1.852)	(3.798)	(0.198)	(0.807)	(3.363)	(0.167)	(1.350)	(2.629)	(0.160)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.36) Panel VAR Results: Fortieth Percentile

Regressors	Regressands											
	GS, Tax and Fortieth			SPS, Tax and Fortieth			HS, Tax and Fortieth			ES, Tax and Fortieth		
	GS	Tax	Fortieth	SPS	Tax	Fortieth	HS	Tax	Fortieth	ES	Tax	Fortieth
L.GS	0.737***	-0.221**	0.013***									
	(0.124)	(0.099)	(0.005)									
L.SPS				0.325	0.489	0.007						
				(0.201)	(0.507)	(0.010)						
L.HS							0.516***	0.052	0.014			
							(0.129)	(0.304)	(0.015)			
L.ES										0.724***	-0.595	0.061**
										(0.219)	(0.475)	(0.024)
L.Tax	0.025	0.720***	-0.004	-0.196***	0.867***	0.006	-0.018	0.629***	0.002	0.011	0.775***	-0.001
	(0.216)	(0.172)	(0.006)	(0.059)	(0.154)	(0.005)	(0.026)	(0.151)	(0.004)	(0.056)	(0.153)	(0.007)
L.Fortieth	-3.976	8.605***	0.503***	1.964	-1.344	0.692***	1.082*	-0.014	0.517**	0.636	-1.378	0.573***
	(3.904)	(3.019)	(0.160)	(1.625)	(3.688)	(0.142)	(0.650)	(3.079)	(0.206)	(1.096)	(2.586)	(0.178)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.37) Panel VAR Results: Eightieth Percentile

Regressors	Regressands											
	GS, Tax and Eightieth			SPS, Tax and Eightieth			HS, Tax and Eightieth			ES, Tax and Eightieth		
	GS	Tax	Eightieth	SPS	Tax	Eightieth	HS	Tax	Eightieth	ES	Tax	Eightieth
L.GS	0.586***	-0.023	0.002									
	(0.080)	(0.057)	(0.004)									
L.SPS				0.003	0.907	-0.027						
				(0.296)	(0.648)	(0.026)						
L.HS							0.479***	-0.397	0.059**			
							(0.145)	(0.514)	(0.025)			
L.ES										0.755***	-0.739	0.073***
										(0.195)	(0.538)	(0.027)
L.Tax	0.241	0.871***	-0.007	-0.232**	0.929***	0.002	-0.033	0.705***	-0.003	-0.027	0.725***	-0.005
	(0.205)	(0.184)	(0.007)	(0.095)	(0.282)	(0.009)	(0.023)	(0.235)	(0.007)	(0.052)	(0.173)	(0.009)
L.Eightieth	-0.517	2.167*	0.669***	-1.081	1.003	0.468***	0.791**	5.557**	0.475***	0.454	0.238	0.681***
	(2.115)	(1.296)	(0.172)	(1.023)	(3.681)	(0.152)	(0.311)	(2.351)	(0.183)	(0.758)	(1.424)	(0.217)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.38) Lag Order Test: Panel VAR Results - Gini, Tenth, Fiftieth and Ninetieth Percentiles

Gini Index												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-275.583	-48.649	-139.766	-290.076	-74.028	-161.197	-289.878	-69.815	-158.454	-112.370	-18.058	-56.046
2	-234.950	-40.436	-118.535	-259.582	-74.397	-149.113	-252.450	-63.825	-139.801	-80.875	-18.000	-43.326
3	-192.687	-30.591	-95.675	-215.558	-61.238	-123.501	-204.356	-47.168	-110.482	-37.873	-6.435	-19.098
4	-154.025	-24.349	-76.415	-165.129	-41.673	-91.484	-167.180	-41.430	-92.081	.	.	.
Tenth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-167.999	-38.323	-90.389	-173.365	-49.908	-99.719	-111.595	-17.282	-55.270	-120.093	-25.780	-63.768
2	-115.874	-18.617	-57.666	-130.987	-38.394	-75.752	-72.061	-9.186	-34.511	-87.141	-24.266	-49.592
3	-91.256	-26.418	-52.451	-86.047	-24.319	-49.224	-40.138	-8.701	-21.364	-45.128	-13.691	-26.354
4	-43.147	-10.728	-23.744	-43.989	-13.125	-25.578	.	.	.	.	.	.
Fiftieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-195.825	-33.730	-98.813	-122.876	-30.284	-67.642	-171.216	-45.466	-96.117	-115.777	-21.464	-59.452
2	-158.716	-29.039	-81.106	-86.787	-25.059	-49.965	-125.716	-31.403	-69.392	-79.722	-16.847	-42.173
3	-127.592	-30.335	-69.385	-44.014	-13.150	-25.603	-82.570	-19.695	-45.020	-41.303	-9.865	-22.528
4	-86.476	-21.638	-47.671	.	.	.	-36.998	-5.560	-18.223	.	.	.
Ninetieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-189.275	-27.179	-92.262	-194.934	-40.614	-102.878	-172.287	-46.537	-97.188	-157.979	-32.229	-82.880
2	-172.265	-42.588	-94.655	-155.540	-32.083	-81.894	-130.914	-36.602	-74.590	-116.846	-22.534	-60.522
3	-121.745	-24.488	-63.538	-115.838	-23.246	-60.604	-88.023	-25.148	-50.473	-79.661	-16.786	-42.112
4	-83.386	-18.548	-44.581	-86.051	-24.322	-49.228	-42.517	-11.080	-23.742	-45.581	-14.143	-26.806

Table (B.39) Lag Order Test: Panel VAR Results - Twentieth, Fortieth and Eightieth Percentiles

						Twentieth Percentile						
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-169.195	-39.518	-91.585	-113.000	-20.408	-57.766	-115.383	-21.070	-59.058	-117.285	-22.972	-60.960
2	-124.017	-26.760	-65.809	-84.938	-23.210	-48.116	-87.913	-25.038	-50.363	-89.282	-26.407	-51.732
3	-91.295	-26.457	-52.490	-43.409	-12.545	-24.997	-46.321	-14.884	-27.547	-46.033	-14.595	-27.258
4	-43.262	-10.843	-23.859	.	.	.	.	.	.	.	.	.
						Fortieth Percentile						
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-199.439	-37.344	-102.427	-244.583	-59.398	-134.114	-203.422	-46.234	-109.548	-119.109	-24.796	-62.784
2	-158.535	-28.858	-80.925	-211.193	-56.873	-119.137	-161.977	-36.227	-86.878	-87.156	-24.281	-49.606
3	-121.196	-23.939	-62.989	-166.531	-43.074	-92.885	-124.609	-30.296	-68.284	-43.956	-12.519	-25.182
4	-87.634	-22.796	-48.829	-131.216	-38.623	-75.982	-72.352	-9.477	-34.802	.	.	.
						Eightieth Percentile						
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-188.291	-26.195	-91.278	-124.770	-32.178	-69.536	-168.261	-42.511	-93.162	-117.679	-23.366	-61.354
2	-163.954	-34.277	-86.344	-85.948	-24.220	-49.125	-126.991	-32.678	-70.666	-84.181	-21.306	-46.631
3	-119.894	-22.637	-61.687	-43.298	-12.434	-24.887	-83.162	-20.287	-45.612	-40.467	-9.030	-21.693
4	-82.923	-18.085	-44.118	.	.	.	-40.375	-8.937	-21.600	.	.	.

Figure (B.31) Stability Condition: Gini Index

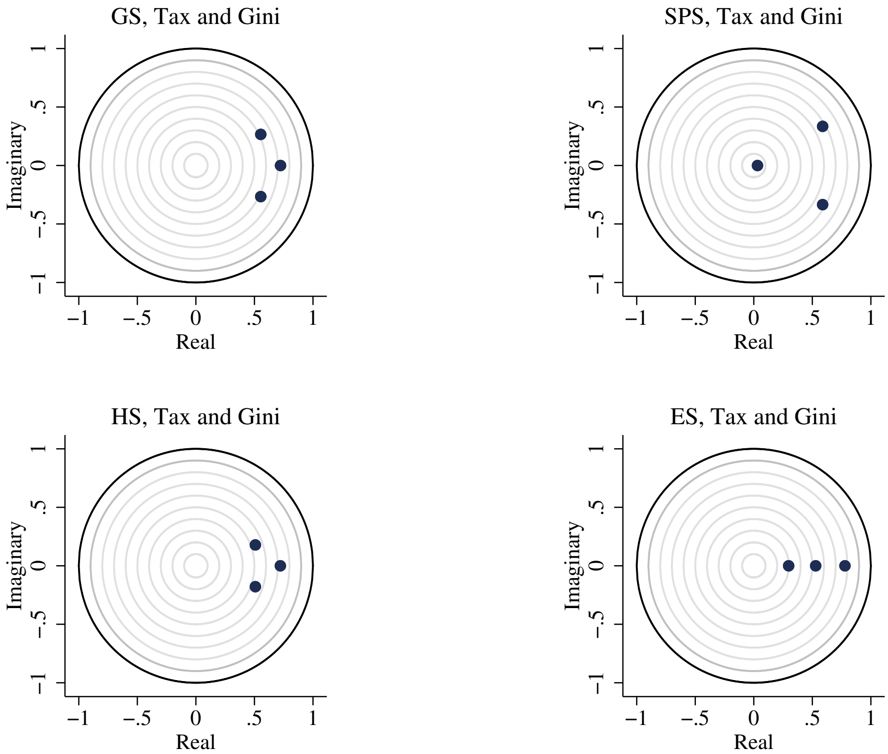


Figure (B.32) Stability Condition: Tenth, Fiftieth and Ninetieth Percentiles

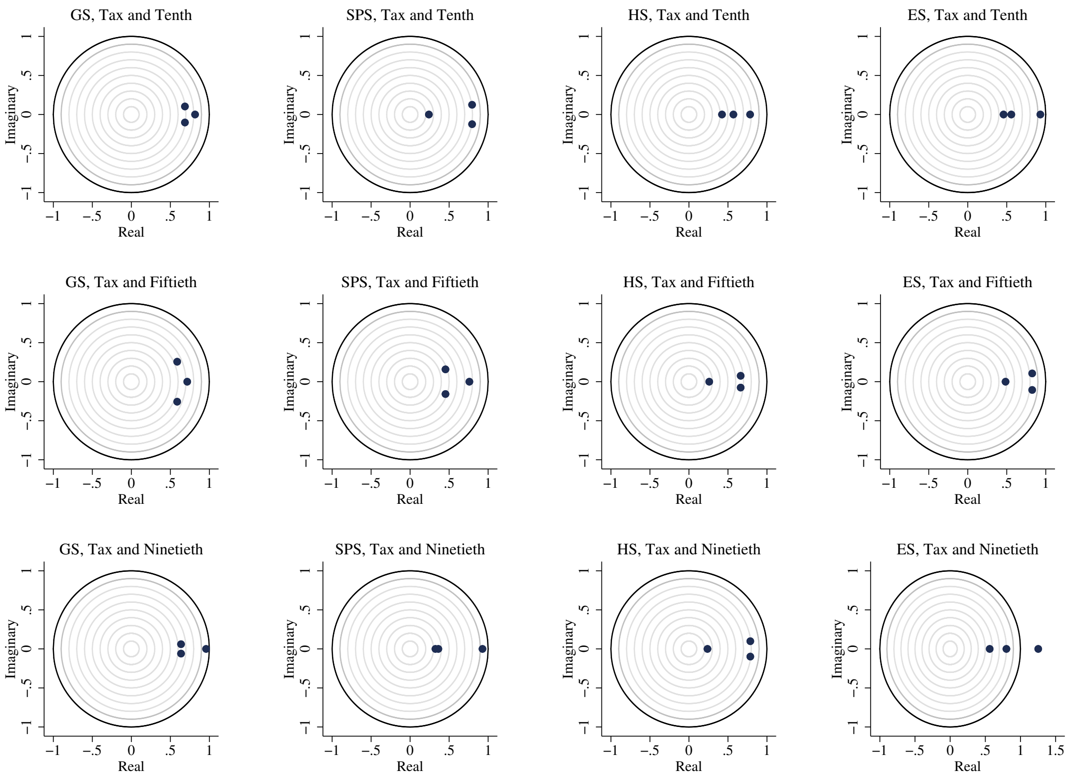


Figure (B.33) Stability Condition: Twentieth, Fortieth and Eightieth Percentiles

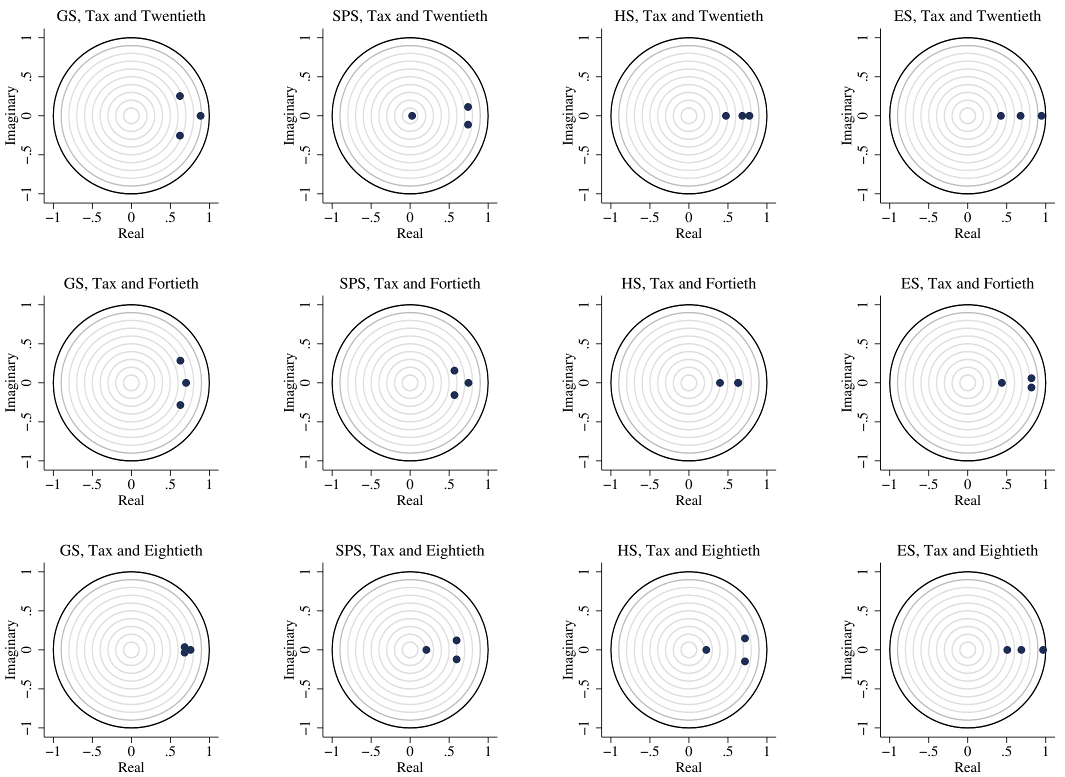
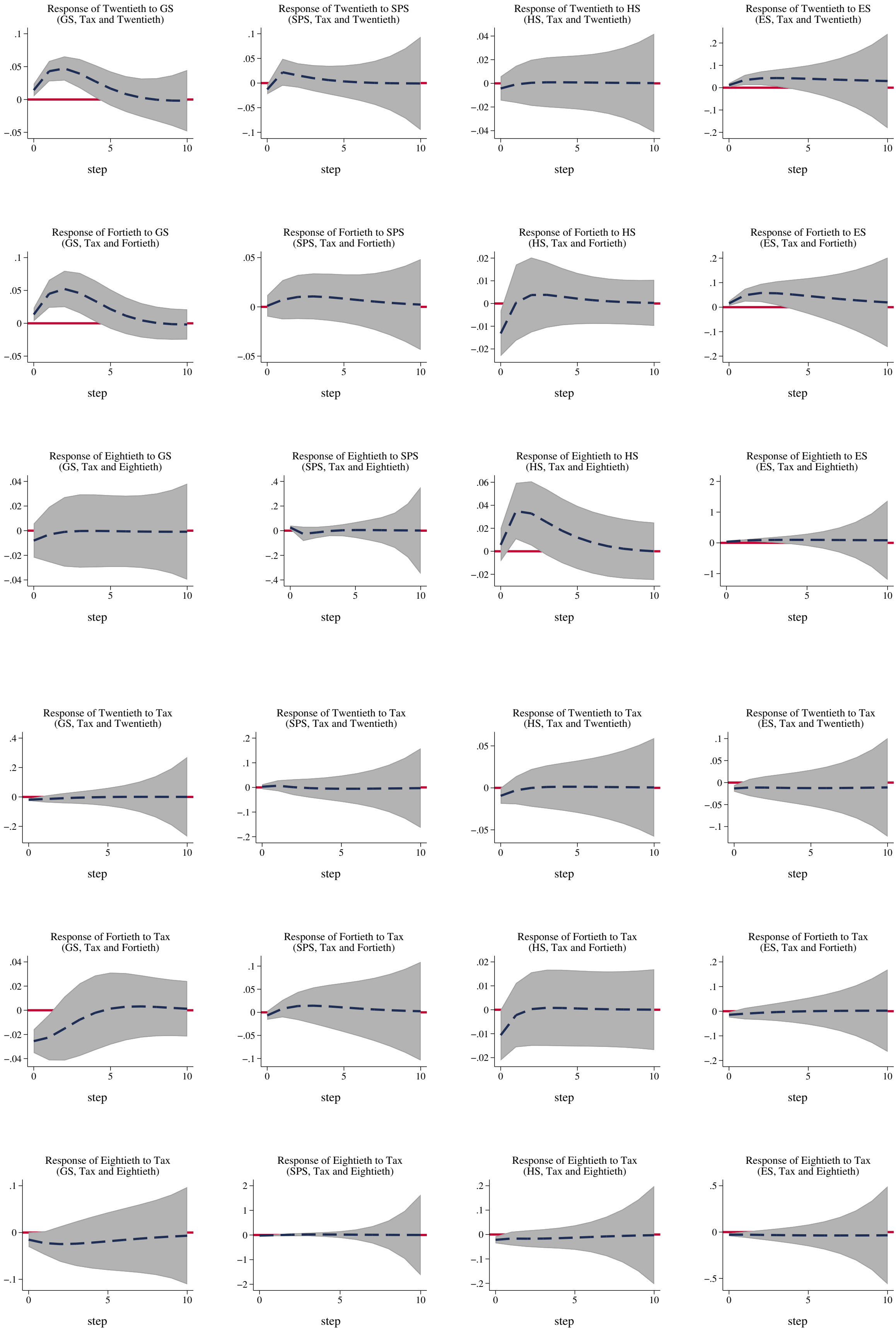


Figure (B.34) Impulse Responses: Spending and Tax Shocks on the Twentieth, Fortieth and Eightieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (B.310) Variance Decomposition: Twentieth, Fortieth and Eightieth Percentiles

	Twentieth Percentile											
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Twentieth			SPS, Tax, and Twentieth			HS, Tax, and Twentieth			ES, Tax, and Twentieth		
Twentieth	GS	Tax	Twentieth	SPS	Tax	Twentieth	HS	Tax	Twentieth	ES	Tax	Twentieth
1	0.015	0.026	0.959	0.012	0.001	0.987	0.001	0.007	0.991	0.011	0.014	0.975
2	0.111	0.030	0.859	0.036	0.003	0.961	0.001	0.005	0.994	0.073	0.017	0.911
3	0.203	0.031	0.766	0.043	0.003	0.954	0.001	0.004	0.995	0.137	0.019	0.844
4	0.257	0.030	0.713	0.045	0.003	0.952	0.001	0.004	0.995	0.191	0.022	0.787
5	0.279	0.029	0.692	0.046	0.004	0.950	0.001	0.004	0.996	0.233	0.025	0.742
	Fortieth Percentile											
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Fortieth			SPS, Tax, and Fortieth			HS, Tax, and Fortieth			ES, Tax, and Fortieth		
Fortieth	GS	Tax	Fortieth	SPS	Tax	Fortieth	HS	Tax	Fortieth	ES	Tax	Fortieth
1	0.011	0.041	0.948	0.000	0.003	0.997	0.011	0.007	0.981	0.015	0.013	0.972
2	0.098	0.052	0.850	0.002	0.005	0.993	0.009	0.006	0.985	0.113	0.013	0.874
3	0.192	0.054	0.754	0.006	0.011	0.983	0.009	0.006	0.985	0.208	0.012	0.780
4	0.252	0.052	0.696	0.009	0.017	0.974	0.010	0.006	0.985	0.279	0.011	0.710
5	0.280	0.050	0.670	0.012	0.022	0.966	0.010	0.006	0.984	0.327	0.010	0.663
	Eightieth Percentile											
Response variable and periods ahead	Impulse variable											
	GS, Tax, and Eightieth			SPS, Tax, and Eightieth			HS, Tax, and Eightieth			ES, Tax, and Eightieth		
Eightieth	GS	Tax	Eightieth	SPS	Tax	Eightieth	HS	Tax	Eightieth	ES	Tax	Eightieth
1	0.002	0.007	0.991	0.022	0.015	0.963	0.001	0.015	0.984	0.038	0.024	0.938
2	0.001	0.015	0.984	0.035	0.014	0.952	0.031	0.019	0.950	0.122	0.029	0.849
3	0.001	0.024	0.975	0.038	0.018	0.945	0.054	0.024	0.923	0.207	0.035	0.758
4	0.001	0.032	0.967	0.037	0.028	0.934	0.066	0.029	0.905	0.279	0.041	0.680
5	0.001	0.039	0.960	0.037	0.039	0.924	0.072	0.034	0.894	0.336	0.047	0.617

B.3.1 Further Discussions on Baseline Results

The parameter estimates from our VAR models provide information about how the income distribution variables are affected by changes in the fiscal policy variables, meanwhile, the impulse responses show the dynamic response of the income distribution variables to a shock imposed on the fiscal policy variables. As a corollary, the impulse responses and estimated coefficients do not generally capture the same information. Interestingly however, our Panel VAR results largely follow the same pattern as our impulse responses (see Appendix Table B.31 - Appendix Table B.37). As such, in situations in which we observe a negative (positive) impulse response for our income distribution variables, we generally observe a similar response for our estimated coefficients obtained from the Panel VAR. Further, Appendix Figures B.31 - B.33 show that the roots of the companion matrix often lie within the unit circle, for the VAR models. Consequently, our VAR models generally satisfy the stability condition.

B.3.2 Further Discussions on the 20th, 40th and 80th Percentiles

Appendix Figure B.34 reveals that the income shares held by the 20th and 40th percentiles increase in the year of impact (by 0.014 and 0.013 percentage points respectively) when there is a positive shock to public expenditure. The greatest increase in the 40th percentile occurs in the second year for both scenarios (0.052 percentage points). For the 80th percentile, however, a government expenditure shock has little effect. The impact is greatest in the second year, with a rise of 0.052 percentage points in the 40th percentile being the highest. Meanwhile, the 80th percentile are not significantly impacted by a public expenditure shock.

As before, the income share held by the 20th, 40th, and 80th percentiles rises instantaneously when there is a shock to education expenditure (Appendix B.34). In most cases, the effects peaks in the second year. The shock's effect on the 80th and 20th percentiles fades in the third and fourth years respectively.

Also, a social protection shock raises the 80th percentile by 0.026 percentage points in the year of impact. Nonetheless, a shock to social protection expenditure generally has no statistically significant impact on 20th and 40th percentiles.

In line with previous results, the 20th and 40th percentiles are not significantly impacted by health expenditure shock. Nonetheless, after a positive health spending shock, the 80th percentile income share rises only after a year (Appendix Figure B.34). The impact however ceases to be statistically insignificant by the third year. Consistent with earlier results, a positive shock to tax generally does not benefit the 20th, 40th and 80th percentiles (Appendix Figure B.34). In many cases, a tax shock has a negative effect on the percentiles in the year of impact, which often fades away by the third year.

B.4 Robustness Test: Replacing the Gini Index with Alternative Inequality Measures

Table (B.41) Panel VAR Results: Atkinson Index

Regressors	Regressands											
	GS, Tax and Atkinson			SPS, Tax and Atkinson			HS, Tax and Atkinson			ES, Tax and Atkinson		
	GS	Tax	Atkinson	SPS	Tax	Atkinson	HS	Tax	Atkinson	ES	Tax	Atkinson
L.GS	0.678***	-0.206***	-0.166***									
	(0.104)	(0.068)	(0.044)									
L.SPS				0.277	0.036	-0.502**						
				(0.278)	(0.649)	(0.228)						
L.HS							0.574***	0.041	-0.160			
							(0.172)	(0.457)	(0.239)			
L.ES										0.573***	0.308	-0.365
										(0.178)	(0.630)	(0.292)
L.Tax	0.076	0.764***	0.071	-0.227**	0.745**	-0.093	-0.055*	0.573**	-0.018	-0.042	0.633***	-0.051
	(0.147)	(0.130)	(0.067)	(0.101)	(0.325)	(0.093)	(0.033)	(0.248)	(0.079)	(0.041)	(0.220)	(0.095)
L.Atkinson	0.302	-0.563***	0.530***	0.141	-0.547	0.535***	0.011	-0.163	0.714***	-0.073	0.203	0.826***
	(0.240)	(0.163)	(0.125)	(0.146)	(0.458)	(0.164)	(0.057)	(0.200)	(0.153)	(0.063)	(0.187)	(0.153)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.42) Panel VAR Results: Theil Index

Regressors	Regressands											
	GS, Tax and Theil			SPS, Tax and Theil			HS, Tax and Theil			ES, Tax and Theil		
	GS	Tax	Theil	SPS	Tax	Theil	HS	Tax	Theil	ES	Tax	Theil
L.GS	0.669***	-0.164**	-0.001*									
	(0.122)	(0.075)	(0.001)									
L.SPS				0.172	0.318	-0.002						
				(0.204)	(0.300)	(0.002)						
L.HS							0.501***	-0.003	-0.006**			
							(0.134)	(0.290)	(0.002)			
L.ES										0.675***	-1.407***	-0.007***
										(0.182)	(0.373)	(0.002)
L.Tax	-0.127	0.549***	0.001	-0.186***	0.421***	0.001**	-0.038	0.527***	-0.000	0.070	0.487***	0.001
	(0.267)	(0.173)	(0.002)	(0.058)	(0.124)	(0.001)	(0.027)	(0.167)	(0.001)	(0.047)	(0.106)	(0.001)
L.Theil	39.090	-32.128**	0.775***	-8.966	-55.125***	0.908***	-3.517	-9.255	0.728***	-20.051***	5.205	0.706***
	(25.928)	(13.849)	(0.197)	(6.932)	(12.291)	(0.109)	(3.099)	(10.302)	(0.198)	(4.636)	(8.585)	(0.102)
Observations	437	437	437	387	387	387	404	404	404	404	404	404
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.43) Lag Order Test: Panel VAR Results - Atkinson Index

	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-274.722	-47.789	-138.905	-122.816	-30.223	-67.581	-115.943	-21.630	-59.618	-113.836	-19.523	-57.511
2	-232.535	-38.021	-116.120	-78.911	-17.182	-42.088	-73.156	-10.281	-35.607	-81.693	-18.818	-44.143
3	-202.328	-40.232	-105.315	-40.107	-9.243	-21.695	-37.458	-6.020	-18.683	-37.156	-5.719	-18.382
4	-165.561	-35.885	-87.951	.	.	.	.	.	.	.	.	.

Table (B.44) Lag Order Test: Panel VAR Results - Theil Index

	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-173.755	-44.078	-96.145	-252.072	-66.888	-141.604	-169.780	-44.030	-94.681	-277.236	-57.173	-145.812
2	-123.071	-25.814	-64.864	-210.468	-56.148	-118.411	-132.573	-38.260	-76.248	-248.689	-60.063	-136.040
3	-95.323	-30.485	-56.518	-168.553	-45.096	-94.907	-92.124	-29.249	-54.575	-206.410	-49.222	-112.536
4	-47.631	-15.212	-28.228	-121.533	-28.941	-66.299	-42.539	-11.101	-23.764	-165.411	-39.661	-90.312

Figure (B.41) Stability Condition: Atkinson Index

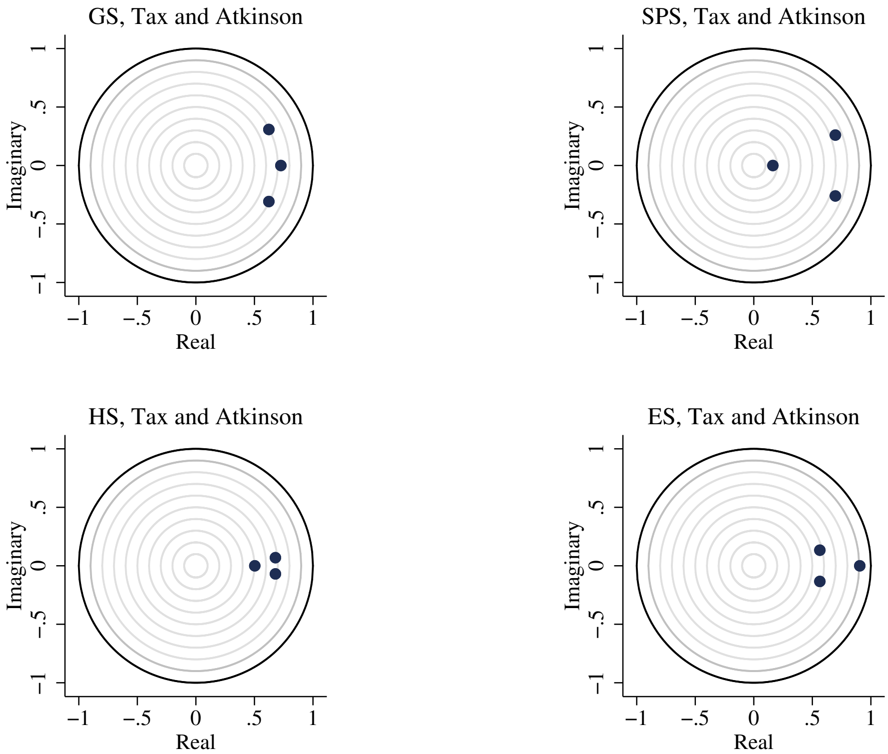


Figure (B.42) Stability Condition: Theil Index

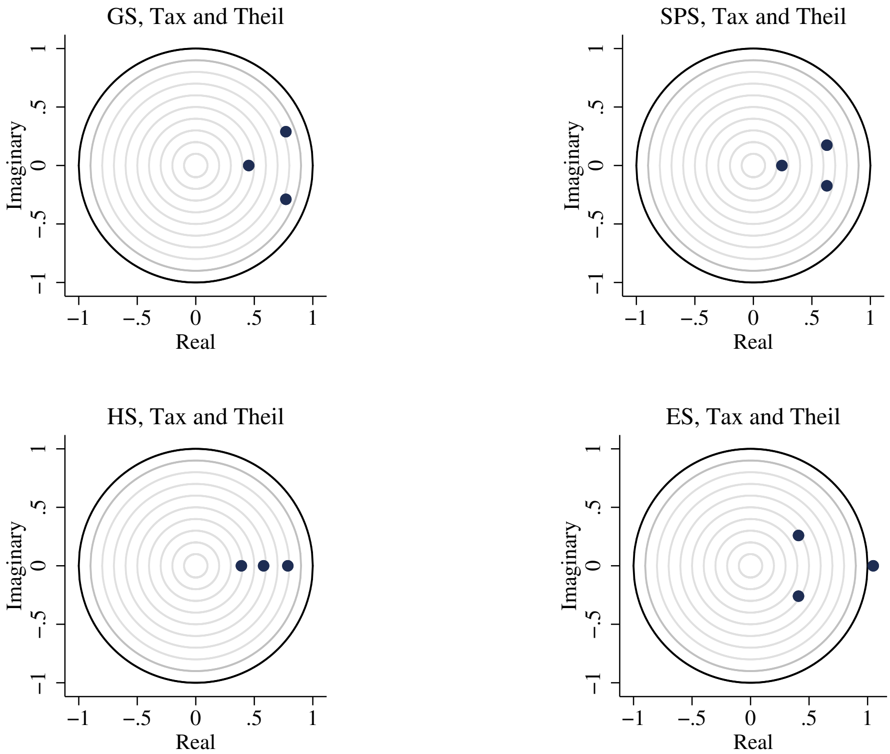
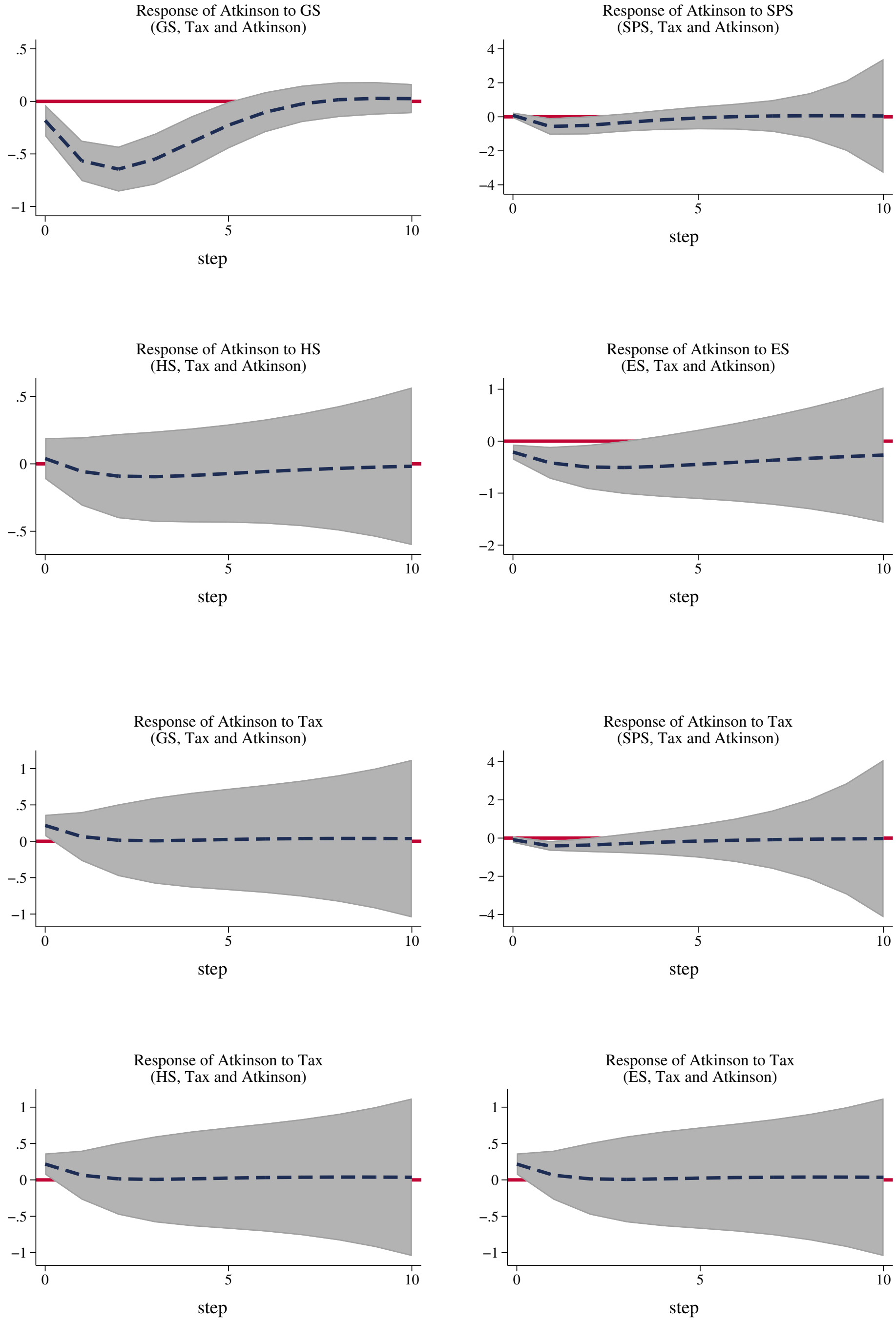
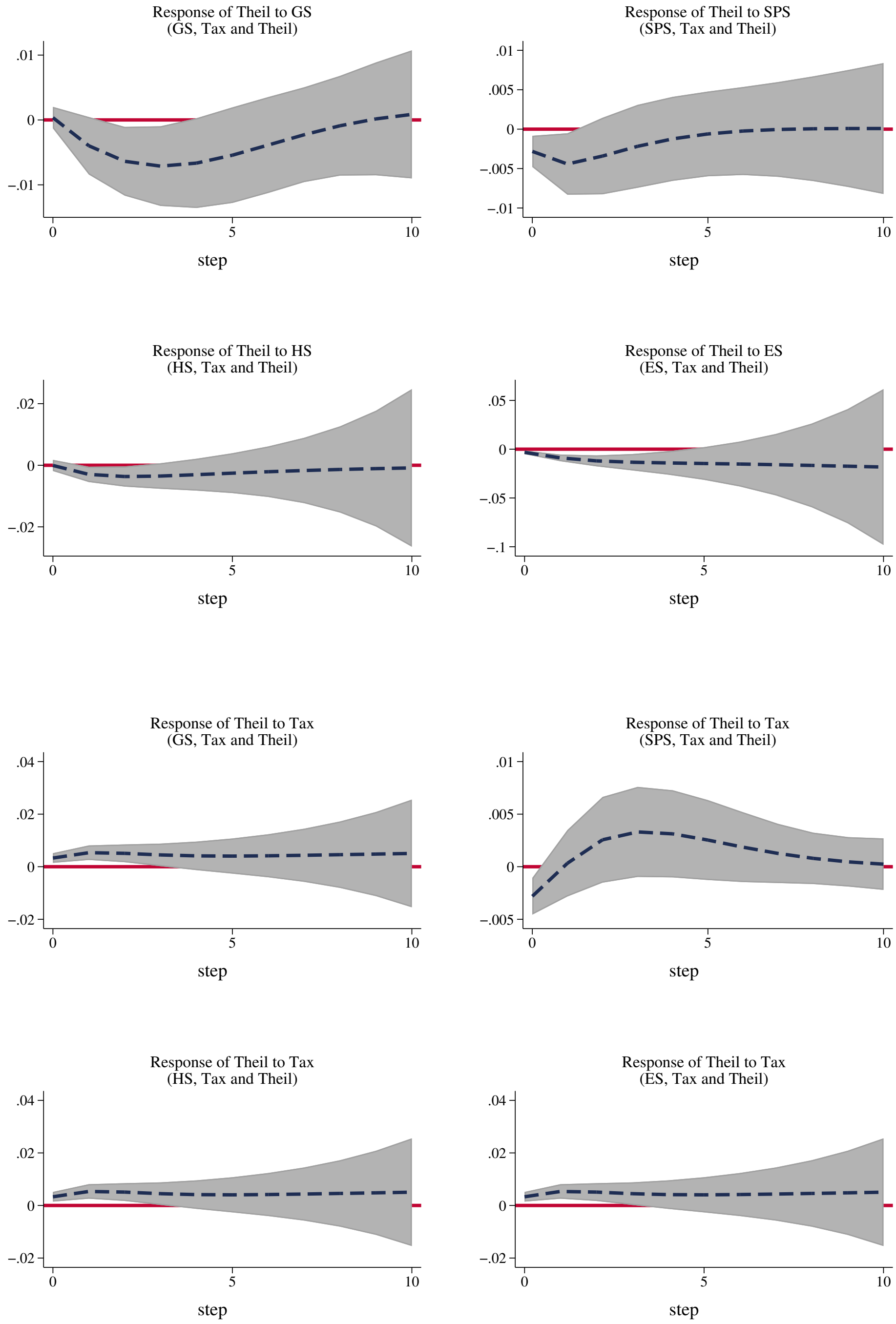


Figure (B.43) Impulse Responses: Spending and Tax Shocks on the Atkinson Index



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.44) Impulse Responses: Spending and Tax Shocks on the Theil Index



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (B.45) Variance Decomposition: Atkinson Index

Response variable and periods ahead	Impulse variable											
	GS, Tax and Atkinson			SPS, Tax and Atkinson			HS, Tax and Atkinson			ES, Tax and Atkinson		
Atkinson	GS	Tax	Atkinson	SPS	Tax	Atkinson	HS	Tax	Atkinson	ES	Tax	Atkinson
1	0.009	0.022	0.969	0.002	0.005	0.993	0.000	0.003	0.996	0.013	0.016	0.971
2	0.070	0.033	0.897	0.062	0.007	0.931	0.001	0.002	0.997	0.038	0.011	0.951
3	0.136	0.039	0.825	0.101	0.006	0.893	0.002	0.002	0.996	0.061	0.009	0.930
4	0.179	0.039	0.782	0.117	0.010	0.873	0.004	0.002	0.994	0.080	0.007	0.912
5	0.198	0.038	0.764	0.121	0.017	0.862	0.005	0.002	0.993	0.094	0.007	0.899

Table (B.46) Variance Decomposition: Theil Index

Response variable and periods ahead	Impulse variable											
	GS, Tax, and Theil			SPS, Tax, and Theil			HS, Tax, and Theil			ES, Tax, and Theil		
Theil	GS	Tax	Theil	SPS	Tax	Theil	HS	Tax	Theil	ES	Tax	Theil
1	0.000	0.005	0.995	0.014	0.011	0.974	0.000	0.010	0.990	0.022	0.015	0.963
2	0.021	0.013	0.966	0.027	0.007	0.966	0.012	0.007	0.981	0.112	0.025	0.863
3	0.061	0.022	0.918	0.029	0.012	0.959	0.025	0.006	0.969	0.202	0.024	0.774
4	0.104	0.029	0.866	0.028	0.019	0.953	0.035	0.006	0.959	0.265	0.020	0.715
5	0.140	0.034	0.826	0.027	0.024	0.949	0.042	0.006	0.952	0.303	0.016	0.681

B.4.1 Further Details on the Atkinson Measure of Inequality and the Theil Index

The Atkinson index has a lower bound of zero, reflecting an equal distribution, and an upper bound of one. An important features of this measure of inequality is that it is the only one to explicitly (and not implicitly, as in all other standard measures of inequality) incorporate society's avertion to inequality and, therefore, the sensitivity of the implied social welfare losses arising from inequality.[1]

Also, the lower bound of the Theil index is zero, representing a society wherein the total income is equally distributed across the citizenry. Unlike the Gini coefficient and the Atkinson index which have an upper bound of one, the Theil index has no upper bound (Foster et al., 2013). Data on the Theil index is also sourced from the Global Consumption and Income Project Database. The database reports Theil's first and second measures of inequality (i.e., such that the orders of the generalized entropy measure are 1 and 0). We begin by conducting a panel unit root test on both the Theil index and the Atkinson inequality measure. Appendix Table B.21 suggests that we can reject the null hypothesis of unit root for both inequality measures.

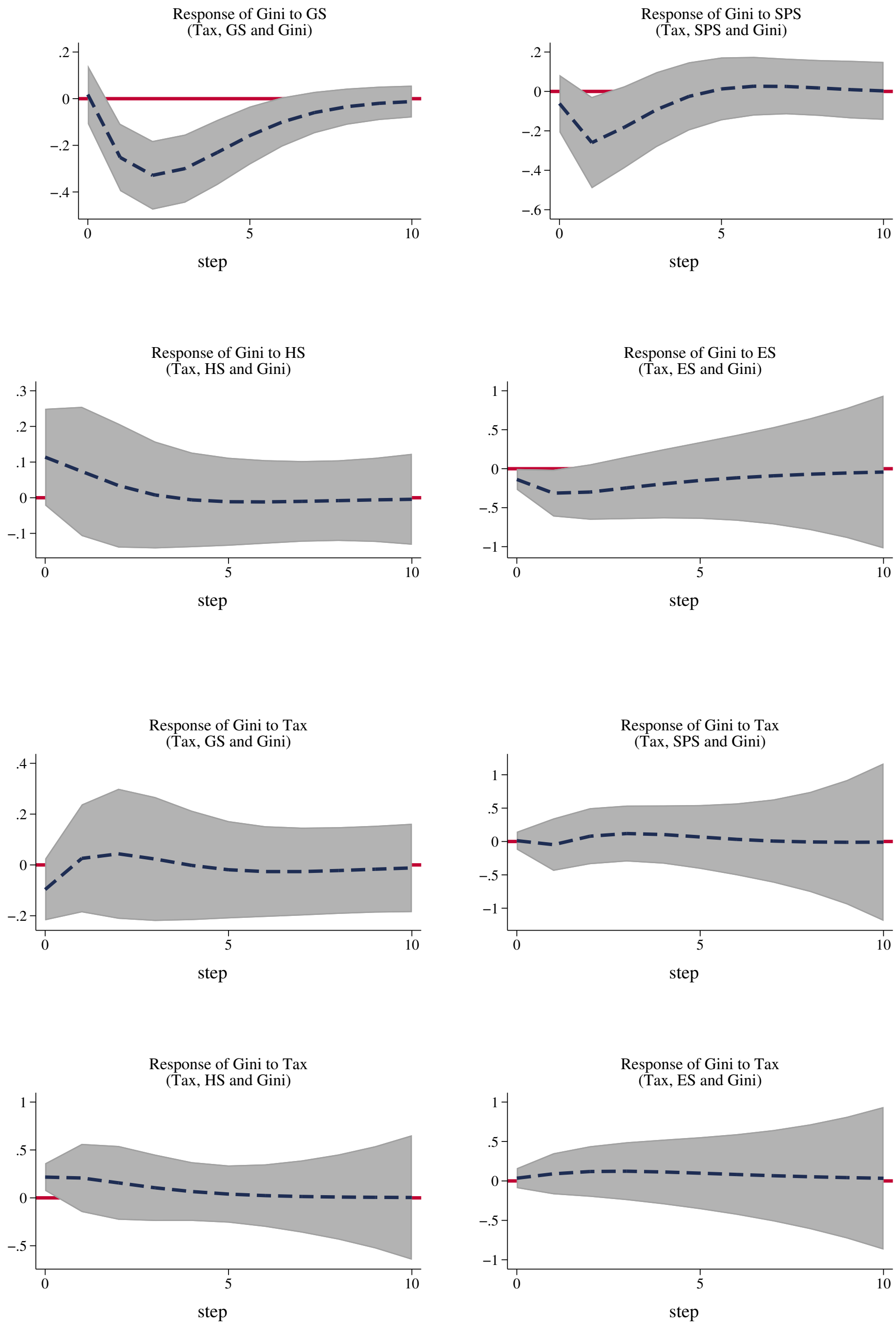
As seen in Appendix Tables B.45 - B.46, between the first and fifth years, the spending and tax variables account for a reasonable portion of the variations in both the Theil index and the Atkinson inequality measure (excluding their own shocks). As a result, the variance decomposition results are comparable to the baseline findings.

Further, Appendix Figures B.41 and B.42 reveals that for all VAR equations, the roots of the companion matrix are contained within the unit circle. Hence, our panel VAR models meet the criteria of stability.

[1] An aversion parameter of zero suggests a society has no aversion to inequality. Meanwhile, a society with an infinite aversion to inequality is assigned a parameter of infinity (∞). Data on the Atkinson index are sourced from the Global Consumption and Income Project Database. The database computes the Atkinson index with an aversion parameter of 2.

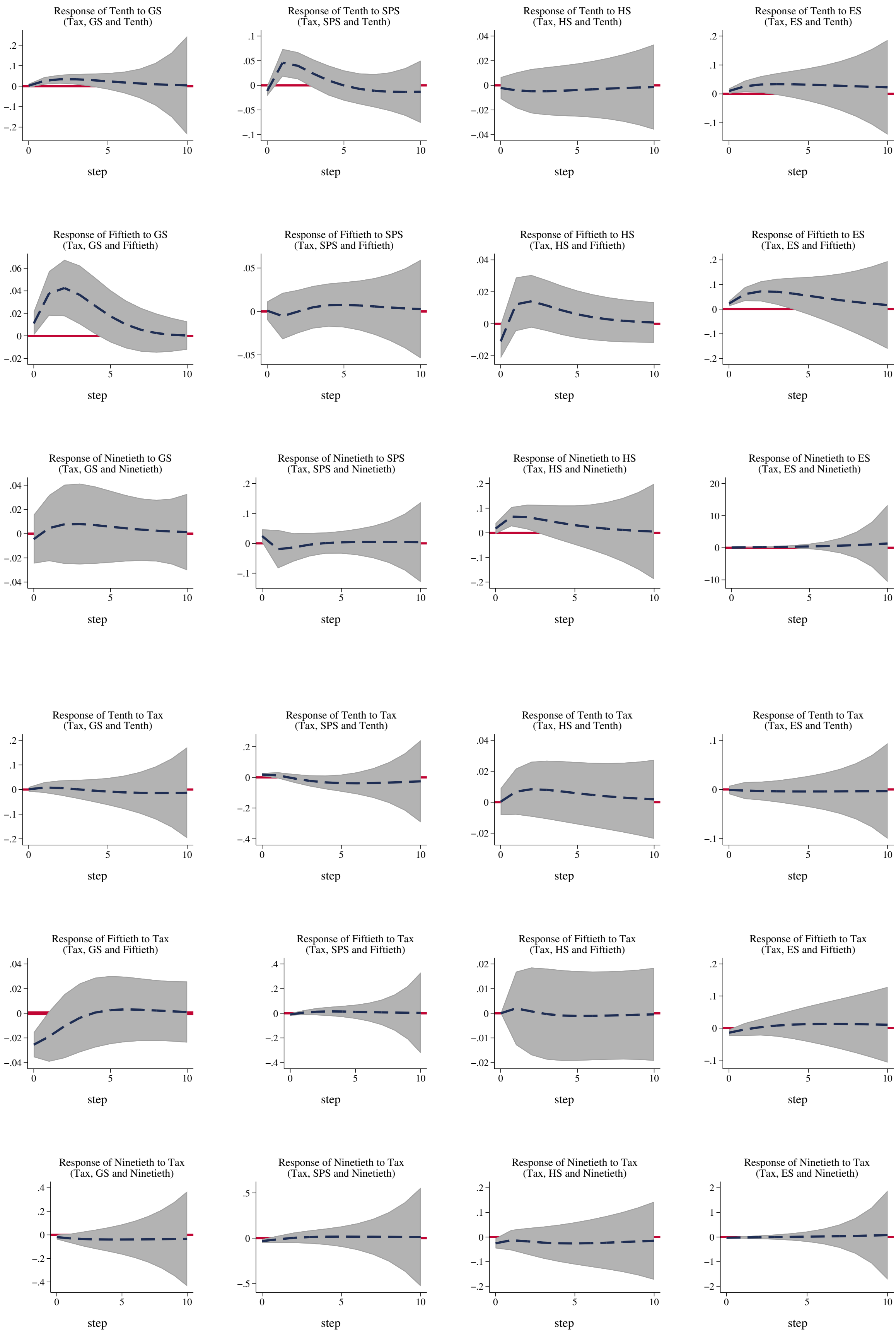
B.5 Robustness Test: Re-ordering the Panel VAR Framework

Figure (B.51) Impulse Responses: Spending and Tax Shocks - Tax Before Spending Variables - Gini Index



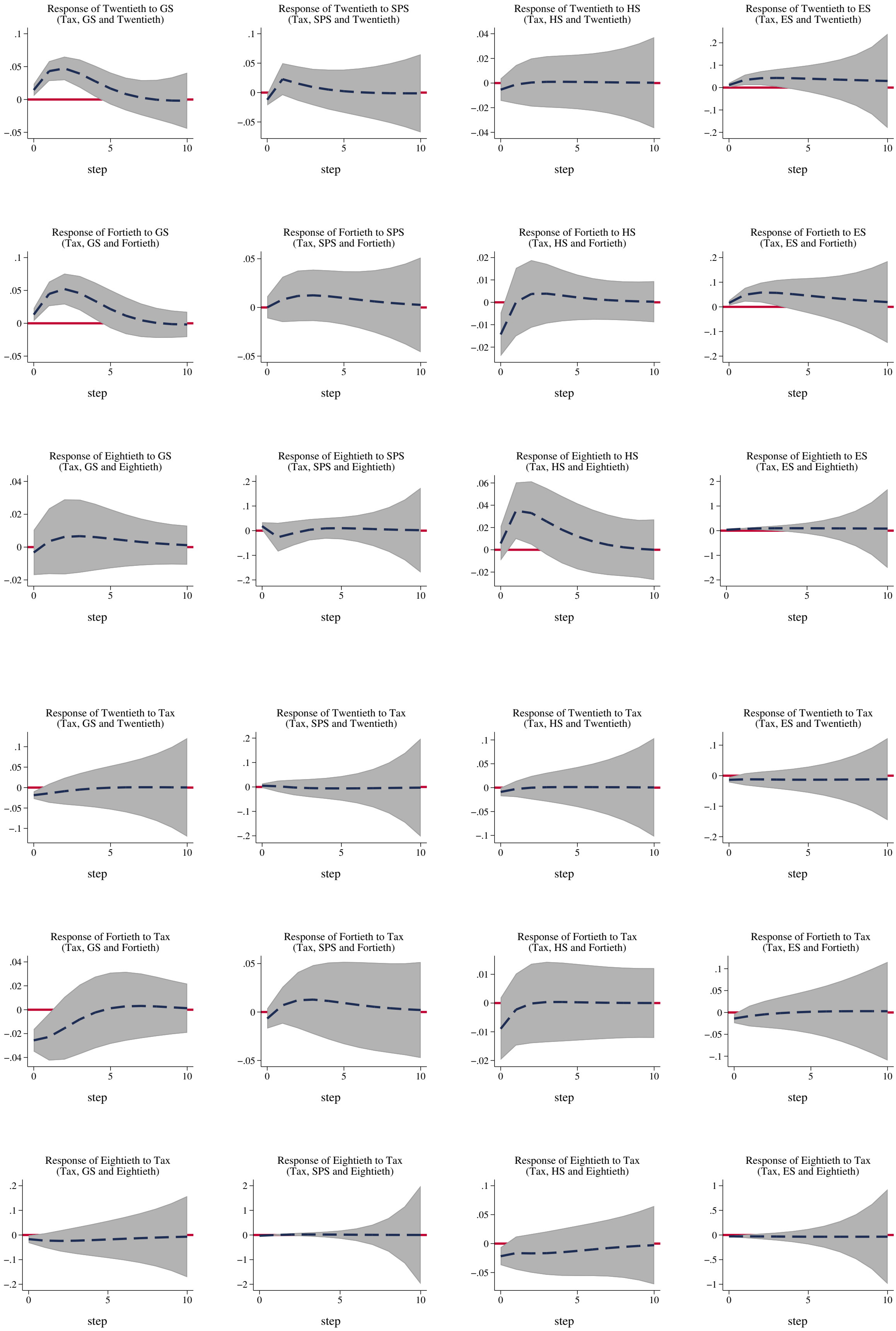
Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.52) Impulse Responses: Spending and Tax Shocks - Tax Before Spending Variables - Tenth, Fiftieth and Ninetieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.53) Impulse Responses: Spending and Tax Shocks - Tax Before Spending Variables - Twentieth, Fortieth and Eightieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (B.51) Variance Decomposition: Tax Before Spending Variables - Gini, Tenth, Fiftieth and Ninetieth Percentiles

	Gini Index											
Response variable and periods ahead	Impulse variable											
	Tax, GS and Gini			Tax, SPS and Gini			Tax, HS and Gini			Tax, ES and Gini		
Gini	Tax	GS	Gini	Tax	SPS	Gini	Tax	HS	Gini	Tax	ES	Gini
1	0.003	0.000	0.996	0.000	0.001	0.999	0.017	0.005	0.979	0.000	0.007	0.993
2	0.003	0.017	0.981	0.001	0.020	0.979	0.027	0.006	0.967	0.003	0.033	0.965
3	0.003	0.041	0.957	0.002	0.028	0.970	0.034	0.006	0.960	0.006	0.053	0.941
4	0.003	0.059	0.938	0.006	0.030	0.964	0.038	0.006	0.957	0.010	0.065	0.925
5	0.003	0.070	0.927	0.009	0.030	0.961	0.039	0.006	0.955	0.012	0.073	0.915

	Tenth Percentile											
Response variable and periods ahead	Impulse variable											
	Tax, GS and Tenth			Tax, SPS and Tenth			Tax, HS and Tenth			Tax, ES and Tenth		
Tenth	Tax	GS	Tenth	Tax	SPS	Tenth	Tax	HS	Tenth	Tax	ES	Tenth
1	0.000	0.000	1.000	0.021	0.008	0.971	0.000	0.000	1.000	0.000	0.008	0.992
2	0.003	0.035	0.962	0.023	0.099	0.879	0.003	0.001	0.996	0.000	0.045	0.955
3	0.005	0.082	0.914	0.022	0.148	0.830	0.006	0.002	0.992	0.001	0.089	0.910
4	0.005	0.124	0.871	0.039	0.161	0.800	0.009	0.003	0.987	0.001	0.131	0.868
5	0.005	0.155	0.840	0.075	0.158	0.768	0.011	0.004	0.984	0.002	0.166	0.832

	Fiftieth Percentile											
Response variable and periods ahead	Impulse variable											
	Tax, GS and Fiftieth			Tax, SPS and Fiftieth			Tax, HS and Fiftieth			Tax, ES and Fiftieth		
Fiftieth	Tax	GS	Fiftieth	Tax	SPS	Fiftieth	Tax	HS	Fiftieth	Tax	ES	Fiftieth
1	0.037	0.007	0.956	0.005	0.000	0.995	0.014	0.007	0.979	0.011	0.027	0.962
2	0.043	0.065	0.892	0.005	0.001	0.994	0.012	0.012	0.976	0.008	0.154	0.838
3	0.043	0.128	0.830	0.011	0.001	0.988	0.012	0.019	0.969	0.007	0.274	0.719
4	0.041	0.169	0.789	0.019	0.002	0.980	0.012	0.024	0.964	0.007	0.359	0.633
5	0.040	0.190	0.770	0.025	0.004	0.971	0.012	0.026	0.962	0.009	0.414	0.577

	Ninetieth Percentile											
Response variable and periods ahead	Impulse variable											
	Tax, GS and Ninetieth			Tax, SPS and Ninetieth			Tax, HS and Ninetieth			Tax, ES and Ninetieth		
Ninetieth	Tax	GS	Ninetieth	Tax	SPS	Ninetieth	Tax	HS	Ninetieth	Tax	ES	Ninetieth
1	0.006	0.000	0.994	0.017	0.010	0.973	0.011	0.005	0.984	0.012	0.083	0.904
2	0.014	0.000	0.986	0.017	0.014	0.970	0.010	0.056	0.934	0.010	0.197	0.793
3	0.024	0.001	0.975	0.016	0.015	0.968	0.012	0.093	0.895	0.007	0.324	0.669
4	0.037	0.002	0.962	0.018	0.016	0.966	0.016	0.115	0.868	0.004	0.437	0.559
5	0.050	0.002	0.948	0.021	0.016	0.963	0.022	0.128	0.850	0.003	0.524	0.473

Table (B.52) Variance Decomposition: Tax Before Spending Variables - Twentieth, Fortieth and Eightieth Percentiles

Twentieth Percentile

Response variable and periods ahead	Impulse variable											
	Tax, GS and Twentieth			Tax, SPS and Twentieth			Tax, HS and Twentieth			Tax, ES and Twentieth		
Twentieth	Tax	GS	Twentieth	Tax	SPS	Twentieth	Tax	HS	Twentieth	Tax	ES	Twentieth
1	0.026	0.016	0.959	0.002	0.011	0.987	0.006	0.002	0.991	0.015	0.011	0.975
2	0.029	0.112	0.859	0.002	0.037	0.961	0.005	0.002	0.994	0.018	0.072	0.911
3	0.029	0.204	0.766	0.002	0.044	0.954	0.004	0.001	0.995	0.021	0.136	0.844
4	0.028	0.258	0.713	0.003	0.046	0.952	0.003	0.001	0.995	0.024	0.189	0.787
5	0.027	0.281	0.692	0.004	0.046	0.950	0.003	0.001	0.996	0.028	0.230	0.742

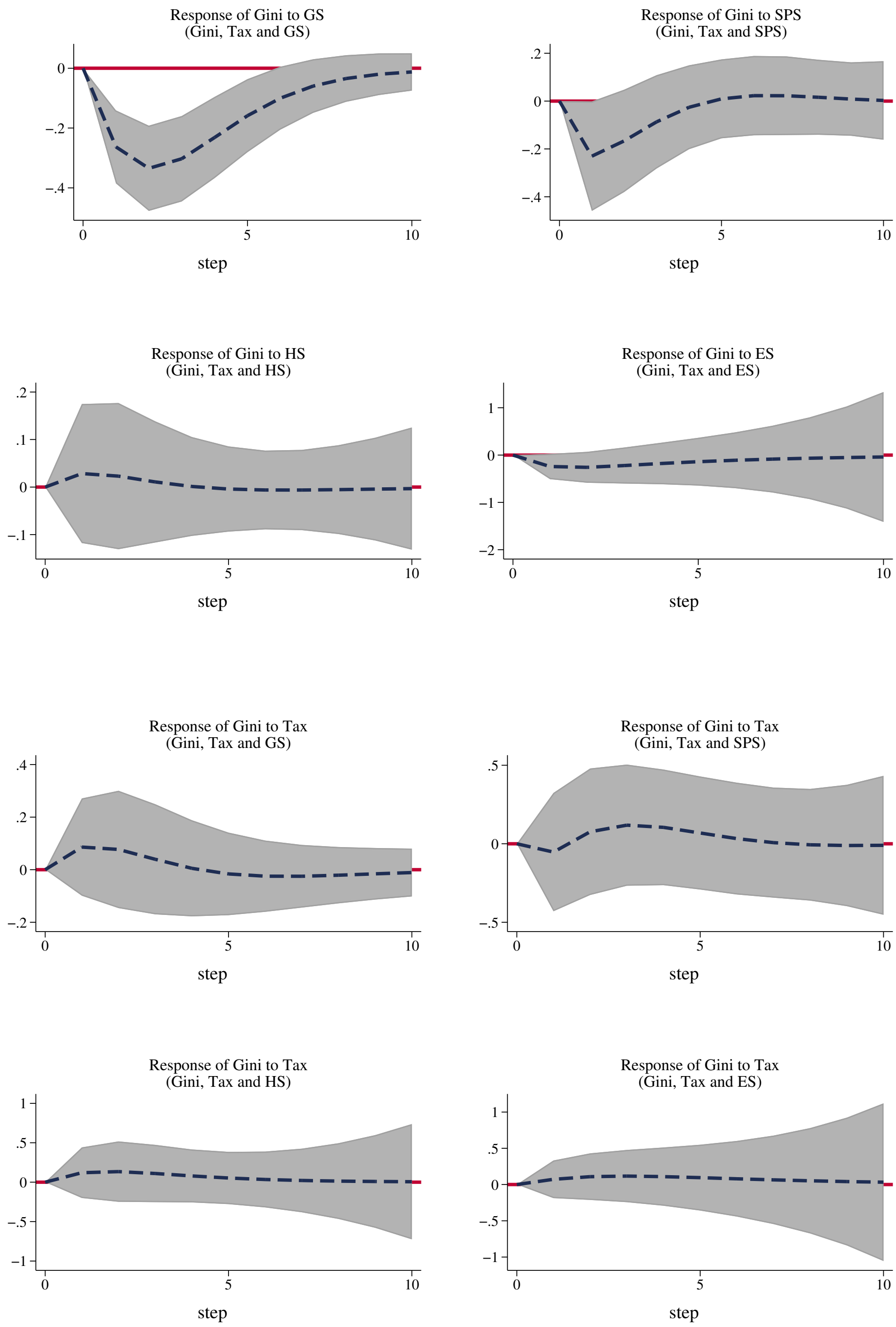
Fortieth Percentile

Response variable and periods ahead	Impulse variable											
	Tax, GS and Fortieth			Tax, SPS and Fortieth			Tax, HS and Fortieth			Tax, ES and Fortieth		
Fortieth	Tax	GS	Fortieth	Tax	SPS	Fortieth	Tax	HS	Fortieth	Tax	ES	Fortieth
1	0.041	0.011	0.948	0.003	0.000	0.997	0.000	0.000	0.000	0.012	0.016	0.972
2	0.053	0.097	0.850	0.004	0.003	0.993	0.005	0.013	0.981	0.011	0.115	0.874
3	0.055	0.191	0.754	0.009	0.008	0.983	0.004	0.011	0.985	0.010	0.210	0.780
4	0.053	0.251	0.696	0.014	0.012	0.974	0.004	0.011	0.985	0.008	0.281	0.710
5	0.051	0.279	0.670	0.018	0.016	0.966	0.004	0.011	0.985	0.008	0.329	0.663

Eightieth Percentile

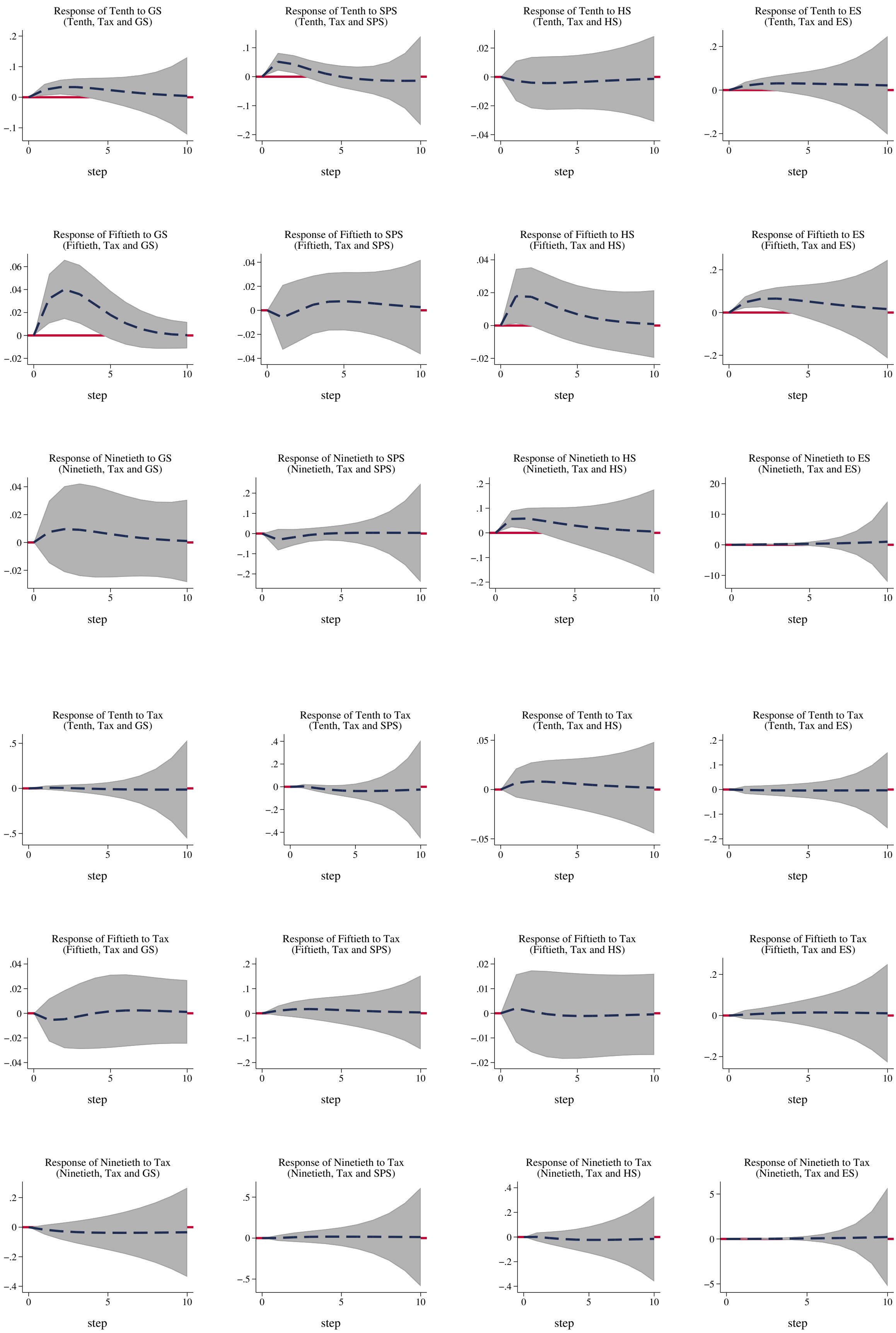
Response variable and periods ahead	Impulse variable											
	Tax, GS and Eightieth			Tax, SPS and Eightieth			Tax, HS and Eightieth			Tax, ES and Eightieth		
Eightieth	Tax	GS	Eightieth	Tax	SPS	Eightieth	Tax	HS	Eightieth	Tax	ES	Eightieth
1	0.008	0.000	0.991	0.026	0.011	0.963	0.015	0.001	0.984	0.023	0.039	0.938
2	0.016	0.000	0.984	0.021	0.027	0.952	0.018	0.031	0.950	0.027	0.124	0.849
3	0.024	0.001	0.975	0.028	0.028	0.945	0.024	0.054	0.923	0.032	0.209	0.758
4	0.032	0.002	0.967	0.038	0.027	0.934	0.029	0.066	0.905	0.038	0.282	0.680
5	0.038	0.002	0.960	0.046	0.029	0.924	0.033	0.072	0.894	0.043	0.340	0.617

Figure (B.54) Impulse Responses: Spending and Tax Shocks - Reverse of Baseline Ordering - Gini Index



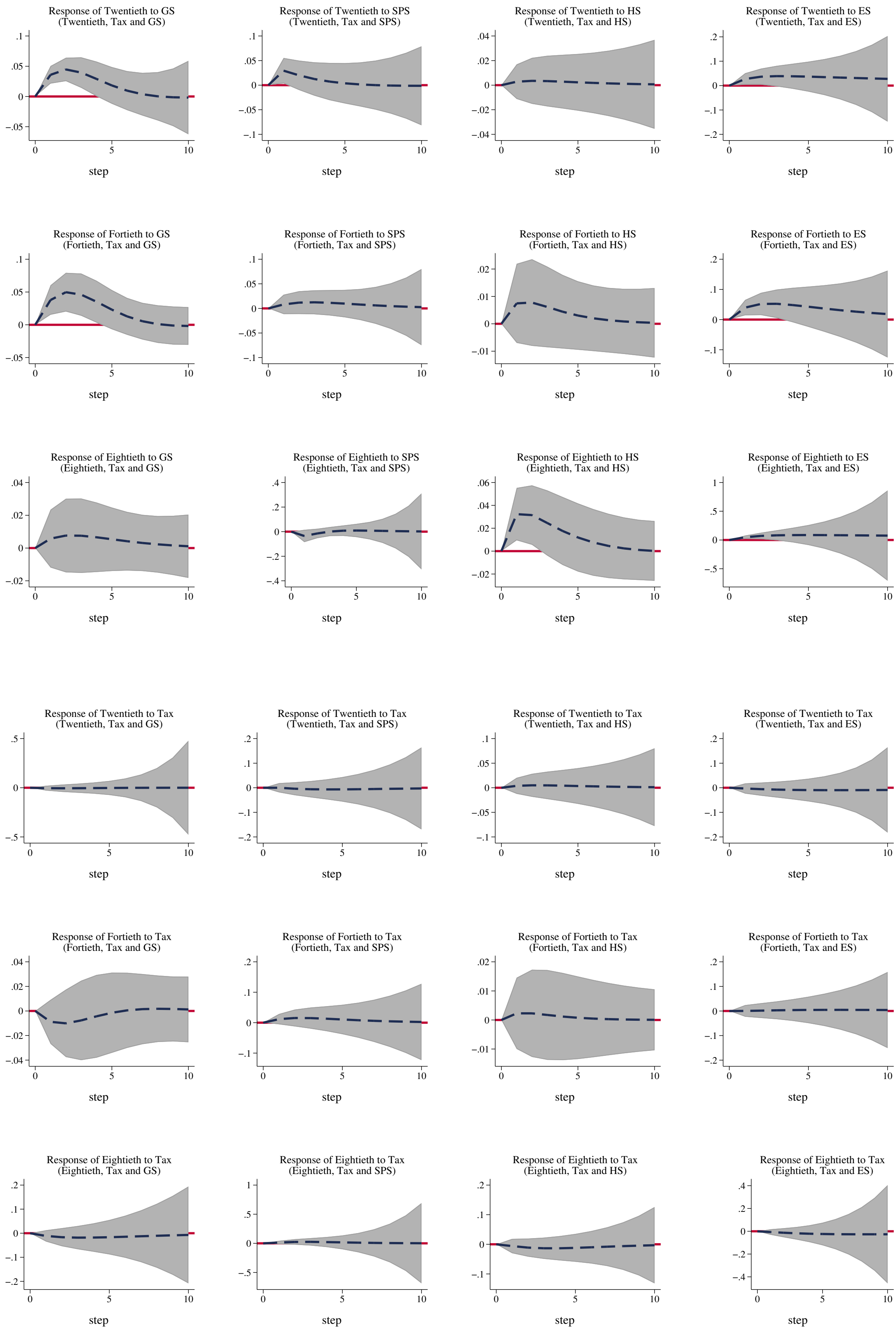
Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.55) Impulse Responses: Spending and Tax Shocks - Reverse of Baseline Ordering - Tenth, Fiftieth and Ninetieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.56) Impulse Responses: Spending and Tax Shocks - Reverse of Baseline Ordering - Twentieth, Fortieth and Eightieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (B.53) Variance Decomposition: Reverse of Baseline Ordering - Gini, Tenth, Fiftieth and Ninetieth Percentiles

	Gini Index											
Response variable and periods ahead	Impulse variable											
	Gini, Tax and GS			Gini, Tax and SPS			Gini, Tax and HS			Gini, Tax and ES		
Gini	Gini	Tax	GS	Gini	Tax	SPS	Gini	Tax	HS	Gini	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.980	0.002	0.018	0.984	0.001	0.015	0.995	0.004	0.000	0.982	0.001	0.016
3	0.954	0.003	0.043	0.976	0.002	0.021	0.990	0.010	0.000	0.964	0.004	0.032
4	0.935	0.003	0.062	0.971	0.006	0.023	0.986	0.013	0.000	0.950	0.008	0.043
5	0.924	0.003	0.073	0.968	0.009	0.023	0.984	0.015	0.000	0.941	0.010	0.049
	Tenth Percentile											
Response variable and periods ahead	Impulse variable											
	Tenth, Tax and GS			Tenth, Tax and SPS			Tenth, Tax and HS			Tenth, Tax and ES		
Tenth	Tenth	Tax	GS	Tenth	Tax	SPS	Tenth	Tax	HS	Tenth	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.967	0.003	0.031	0.881	0.001	0.118	0.997	0.003	0.000	0.977	0.000	0.023
3	0.920	0.004	0.075	0.818	0.006	0.176	0.993	0.006	0.001	0.941	0.000	0.059
4	0.879	0.004	0.118	0.781	0.028	0.191	0.989	0.009	0.002	0.904	0.001	0.095
5	0.847	0.004	0.148	0.748	0.066	0.186	0.986	0.011	0.003	0.872	0.001	0.126
	Fiftieth Percentile											
Response variable and periods ahead	Impulse variable											
	Fiftieth, Tax and GS			Fiftieth, Tax and SPS			Fiftieth, Tax and HS			Fiftieth, Tax and ES		
Fiftieth	Fiftieth	Tax	GS	Fiftieth	Tax	SPS	Fiftieth	Tax	HS	Fiftieth	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.955	0.001	0.043	0.994	0.005	0.001	0.986	0.000	0.014	0.915	0.001	0.084
3	0.897	0.002	0.101	0.984	0.014	0.001	0.974	0.000	0.026	0.810	0.003	0.188
4	0.855	0.002	0.143	0.973	0.025	0.002	0.968	0.000	0.032	0.727	0.006	0.268
5	0.833	0.002	0.165	0.963	0.033	0.004	0.964	0.000	0.035	0.669	0.009	0.322
	Ninetieth Percentile											
Response variable and periods ahead	Impulse variable											
	Ninetieth, Tax and GS			Ninetieth, Tax and GS			Ninetieth, Tax and GS			Ninetieth, Tax and GS		
Ninetieth	Ninetieth	Tax	GS	Ninetieth	Tax	SPS	Ninetieth	Tax	HS	Ninetieth	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.996	0.003	0.001	0.987	0.000	0.013	0.961	0.000	0.039	0.954	0.000	0.046
3	0.988	0.010	0.001	0.982	0.001	0.017	0.929	0.001	0.070	0.874	0.001	0.125
4	0.978	0.020	0.002	0.978	0.004	0.017	0.907	0.003	0.090	0.791	0.003	0.205
5	0.965	0.032	0.003	0.974	0.008	0.017	0.892	0.008	0.101	0.722	0.006	0.272

Source: Author's own computation.

Table (B.54) Variance Decomposition: Reverse of Baseline Ordering - Twentieth, Fortieth and Eightieth Percentiles

	Twentieth Percentile											
Response variable and periods ahead	Impulse variable											
	Twentieth, Tax and GS			Twentieth, Tax and SPS			Twentieth, Tax and HS			Twentieth, Tax and ES		
Twentieth	Twentieth	Tax	GS	Twentieth	Tax	SPS	Twentieth	Tax	HS	Twentieth	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.929	0.001	0.070	0.952	0.000	0.048	0.999	0.001	0.000	0.960	0.000	0.040
3	0.842	0.002	0.156	0.937	0.001	0.062	0.997	0.002	0.001	0.907	0.002	0.091
4	0.783	0.003	0.214	0.932	0.002	0.066	0.996	0.002	0.001	0.859	0.004	0.137
5	0.756	0.003	0.241	0.929	0.004	0.067	0.996	0.003	0.001	0.820	0.006	0.174

	Fortieth Percentile											
Response variable and periods ahead	Impulse variable											
	Fortieth, Tax and GS			Fortieth, Tax and SPS			Fortieth, Tax and HS			Fortieth, Tax and ES		
Fortieth	Fortieth	Tax	GS	Fortieth	Tax	SPS	Fortieth	Tax	HS	Fortieth	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.932	0.004	0.064	0.991	0.006	0.003	0.997	0.000	0.003	0.932	0.000	0.068
3	0.841	0.007	0.152	0.979	0.014	0.008	0.994	0.001	0.006	0.852	0.000	0.148
4	0.775	0.009	0.216	0.967	0.021	0.012	0.992	0.001	0.007	0.788	0.000	0.212
5	0.742	0.009	0.249	0.958	0.025	0.016	0.991	0.001	0.008	0.743	0.001	0.257

	Eightieth Percentile											
Response variable and periods ahead	Impulse variable											
	Eightieth, Tax and GS			Eightieth, Tax and SPS			Eightieth, Tax and HS			Eightieth, Tax and ES		
Eightieth	Eightieth	Tax	GS	Eightieth	Tax	SPS	Eightieth	Tax	HS	Eightieth	Tax	ES
1	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
2	0.997	0.003	0.001	0.964	0.005	0.032	0.973	0.001	0.026	0.957	0.001	0.042
3	0.991	0.007	0.002	0.946	0.019	0.035	0.950	0.004	0.047	0.894	0.003	0.103
4	0.985	0.012	0.002	0.932	0.034	0.034	0.934	0.007	0.059	0.832	0.006	0.162
5	0.980	0.017	0.003	0.921	0.044	0.035	0.924	0.011	0.064	0.779	0.010	0.212

B.6 Robustness Test: Inclusion of Inflation

Table (B.61) Panel VAR Results: Gini Index

Regressors	Regressands															
	GS, Tax, Inflation and Gini				SPS, Tax, Inflation and Gini				HS, Tax, Inflation and Gini				ES, Tax, Inflation and Gini			
	GS	Tax	Inflation	Gini	SPS	Tax	Inflation	Gini	HS	Tax	Inflation	Gini	ES	Tax	Inflation	Gini
L.GS	0.581***	-0.136*	-0.026	-0.105***												
	(0.101)	(0.075)	(0.093)	(0.039)												
L.SPS					-0.025	1.038	0.593	-0.009								
					(0.220)	(0.676)	(0.472)	(0.181)								
L.HS									0.392***	0.105	-0.407	-0.037				
									(0.139)	(0.569)	(0.512)	(0.171)				
L.ES													0.795***	-1.068	-0.517	-0.522**
													(0.131)	(0.866)	(0.487)	(0.223)
L.Tax	0.019	0.596***	-0.332	0.078	-0.254***	0.895***	-0.225	0.068	-0.042	0.643**	-0.290	0.006	0.005	0.733***	-0.139	0.054
	(0.260)	(0.214)	(0.237)	(0.076)	(0.084)	(0.268)	(0.229)	(0.072)	(0.031)	(0.277)	(0.221)	(0.074)	(0.036)	(0.237)	(0.165)	(0.060)
L.Inflation	-0.024	-0.028	0.215	-0.023	-0.036	0.028	0.225*	0.005	0.002	-0.036	0.182	0.016	-0.003	-0.100	0.358***	-0.014
	(0.065)	(0.040)	(0.139)	(0.023)	(0.035)	(0.083)	(0.122)	(0.026)	(0.010)	(0.074)	(0.139)	(0.023)	(0.012)	(0.096)	(0.126)	(0.021)
L.Gini	0.057	-0.677***	-0.096	0.704***	0.186	-0.835*	-0.081	0.973***	-0.025	-1.145**	-0.237	1.120***	-0.026	-0.793	-0.206	0.769***
	(0.328)	(0.248)	(0.246)	(0.138)	(0.143)	(0.478)	(0.236)	(0.136)	(0.065)	(0.517)	(0.222)	(0.150)	(0.057)	(0.498)	(0.198)	(0.130)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.62) Panel VAR Results: Tenth

Regressors	Regressands															
	GS, Tax, Inflation and Tenth				SPS, Tax, Inflation and Tenth				HS, Tax, Inflation and Tenth				ES, Tax, Inflation and Tenth			
	GS	Tax	Inflation	Tenth	SPS	Tax	Inflation	Tenth	HS	Tax	Inflation	Tenth	ES	Tax	Inflation	Tenth
L.GS	0.837***	-0.069	-0.060	0.010***												
	(0.117)	(0.043)	(0.092)	(0.002)												
L.SPS					0.181	-0.351	0.237	0.015								
					(0.175)	(0.412)	(0.464)	(0.012)								
L.HS									0.608***	-0.017	-0.349	-0.001				
									(0.143)	(0.345)	(0.587)	(0.015)				
L.ES													0.953***	-1.093**	0.147	0.011
													(0.243)	(0.499)	(0.615)	(0.017)
L.Tax	0.570***	0.167**	-0.003	-0.009***	-0.216***	0.964***	-0.584**	0.001	-0.046**	0.569***	-0.459**	0.003	-0.014	0.511***	-0.294	0.001
	(0.160)	(0.069)	(0.133)	(0.003)	(0.062)	(0.250)	(0.248)	(0.005)	(0.023)	(0.155)	(0.234)	(0.005)	(0.072)	(0.147)	(0.221)	(0.005)
L.Inflation	0.132**	-0.039	0.300***	0.003	-0.025	0.013	0.065	0.002	-0.004	0.054	0.084	0.000	0.018	-0.003	0.257*	0.000
	(0.055)	(0.031)	(0.112)	(0.002)	(0.028)	(0.051)	(0.144)	(0.002)	(0.006)	(0.044)	(0.156)	(0.002)	(0.018)	(0.050)	(0.136)	(0.002)
L.Tenth	-6.979	3.787*	3.347	0.573***	0.190	6.331	-4.839	0.543***	-0.142	1.427	0.505	0.701***	0.959	0.561	-4.094	0.654***
	(4.479)	(2.037)	(3.927)	(0.111)	(1.103)	(4.972)	(3.318)	(0.148)	(0.580)	(2.561)	(3.865)	(0.131)	(1.575)	(3.610)	(3.291)	(0.138)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.63) Panel VAR Results: Fiftieth

Regressors	Regressands															
	GS, Tax, Inflation and Fiftieth				SPS, Tax, Inflation and Fiftieth				HS, Tax, Inflation and Fiftieth				ES, Tax, Inflation and Fiftieth			
	GS	Tax	Inflation	Fiftieth	SPS	Tax	Inflation	Fiftieth	HS	Tax	Inflation	Fiftieth	ES	Tax	Inflation	Fiftieth
L.GS	0.591***	-0.226***	-0.048	0.009**												
	(0.105)	(0.073)	(0.093)	(0.003)												
L.SPS					0.202	0.525	0.578	-0.016								
					(0.180)	(0.351)	(0.421)	(0.017)								
L.HS									0.453***	-0.134	-0.354	0.018				
									(0.131)	(0.306)	(0.508)	(0.018)				
L.ES													0.974***	-1.190***	-0.723	0.048*
													(0.193)	(0.424)	(0.558)	(0.026)
L.Tax	0.282	0.776***	-0.138	0.001	-0.166**	1.066***	-0.284	0.001	-0.031	0.592***	-0.362	0.004	0.031	0.732***	-0.039	0.005
	(0.200)	(0.160)	(0.196)	(0.005)	(0.071)	(0.212)	(0.269)	(0.006)	(0.027)	(0.164)	(0.243)	(0.006)	(0.047)	(0.129)	(0.186)	(0.006)
L.Inflation	0.018	-0.029	0.333***	0.002	-0.039	0.071	0.182	0.000	-0.003	0.023	0.126	-0.000	-0.003	0.035	0.323**	0.000
	(0.065)	(0.030)	(0.120)	(0.002)	(0.032)	(0.046)	(0.143)	(0.003)	(0.006)	(0.028)	(0.143)	(0.003)	(0.016)	(0.027)	(0.128)	(0.003)
L.Fiftieth	-1.204	9.439***	3.514	0.680***	0.841	6.471*	2.432	0.788***	0.982	7.161***	2.603	0.846***	-0.422	2.787	4.046	0.712***
	(3.377)	(1.902)	(2.961)	(0.114)	(1.248)	(3.457)	(3.920)	(0.182)	(0.633)	(2.556)	(3.642)	(0.173)	(0.945)	(1.784)	(2.938)	(0.158)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.64) Panel VAR Results: Ninetieth

Regressors	Regressands															
	GS, Tax, Inflation and Ninetieth				SPS, Tax, Inflation and Ninetieth				HS, Tax, Inflation and Ninetieth				ES, Tax, Inflation and Ninetieth			
	GS	Tax	Inflation	Ninetieth	SPS	Tax	Inflation	Ninetieth	HS	Tax	Inflation	Ninetieth	ES	Tax	Inflation	Ninetieth
L.GS	0.589***	0.043	0.010	0.005												
	(0.072)	(0.041)	(0.073)	(0.005)												
L.SPS					-0.101	-0.166	0.868**	-0.006								
					(0.149)	(0.252)	(0.376)	(0.019)								
L.HS									0.450***	-0.522	-0.520	0.115***				
									(0.115)	(0.400)	(0.520)	(0.037)				
L.ES													1.021***	0.051	-1.031*	0.102**
													(0.147)	(0.317)	(0.583)	(0.040)
L.Tax	0.329**	1.019***	-0.257	-0.003	-0.223***	0.850***	-0.100	0.003	-0.060***	0.645***	-0.252	0.003	0.054	0.660***	-0.199	-0.003
	(0.168)	(0.144)	(0.192)	(0.009)	(0.039)	(0.126)	(0.153)	(0.008)	(0.018)	(0.136)	(0.179)	(0.009)	(0.033)	(0.131)	(0.170)	(0.012)
L.Inflation	0.005	-0.006	0.169	-0.006**	-0.064**	0.026	0.240*	-0.007**	-0.005	0.050	0.188	-0.008***	0.009	0.023	0.146	-0.006*
	(0.069)	(0.024)	(0.135)	(0.003)	(0.028)	(0.034)	(0.127)	(0.003)	(0.006)	(0.030)	(0.152)	(0.003)	(0.011)	(0.028)	(0.152)	(0.003)
L.Ninetieth	2.047	1.842**	2.040	0.417***	1.070**	2.232**	0.056	0.446***	0.498***	1.386**	0.865	0.396***	1.367***	-0.600	1.288	0.404***
	(1.314)	(0.802)	(1.255)	(0.109)	(0.467)	(0.936)	(1.301)	(0.092)	(0.154)	(0.643)	(1.139)	(0.106)	(0.425)	(0.650)	(1.375)	(0.122)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.65) Panel VAR Results: Twentieth

Regressors	Regressands															
	GS, Tax, Inflation and Twentieth				SPS, Tax, Inflation and Twentieth				HS, Tax, Inflation and Twentieth				ES, Tax, Inflation and Twentieth			
	GS	Tax	Inflation	Twentieth	SPS	Tax	Inflation	Twentieth	HS	Tax	Inflation	Twentieth	ES	Tax	Inflation	Twentieth
L.GS	0.819***	-0.168**	-0.125	0.010***												
	(0.151)	(0.066)	(0.136)	(0.003)												
L.SPS					0.144	0.106	0.463	0.003								
					(0.166)	(0.410)	(0.440)	(0.012)								
L.HS									0.548***	-0.041	-0.310	0.007				
									(0.132)	(0.328)	(0.546)	(0.016)				
L.ES													0.739***	-1.111***	0.265	0.027
													(0.215)	(0.398)	(0.621)	(0.019)
L.Tax	-0.084	0.559***	-0.200	-0.004	-0.178***	0.947***	-0.464*	0.002	-0.027	0.675***	-0.537**	0.005	-0.011	0.628***	-0.321	0.003
	(0.307)	(0.160)	(0.265)	(0.006)	(0.067)	(0.230)	(0.268)	(0.006)	(0.028)	(0.159)	(0.257)	(0.005)	(0.063)	(0.126)	(0.228)	(0.006)
L.Inflation	0.009	-0.018	0.236*	0.003	-0.036	0.040	0.115	0.002	-0.004	0.041	0.080	-0.000	0.001	0.016	0.270**	0.001
	(0.074)	(0.028)	(0.123)	(0.002)	(0.030)	(0.048)	(0.147)	(0.002)	(0.006)	(0.046)	(0.155)	(0.002)	(0.017)	(0.034)	(0.129)	(0.002)
L.Twentieth	-6.842	7.270***	4.552	0.606***	1.748	4.136	-3.738	0.731***	0.583	2.655	-1.479	0.875***	1.154	2.042	-4.316	0.664***
	(5.445)	(2.347)	(4.744)	(0.129)	(1.249)	(5.096)	(4.212)	(0.186)	(0.772)	(3.202)	(4.236)	(0.135)	(1.293)	(2.300)	(3.682)	(0.143)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.66) Panel VAR Results: Fortieth

Regressors	Regressands															
	GS, Tax, Inflation and Fortieth				SPS, Tax, Inflation and Fortieth				HS, Tax, Inflation and Fortieth				ES, Tax, Inflation and Fortieth			
	GS	Tax	Inflation	Fortieth	SPS	Tax	Inflation	Fortieth	HS	Tax	Inflation	Fortieth	ES	Tax	Inflation	Fortieth
L.GS	0.620***	-0.195***	-0.033	0.012***												
	(0.111)	(0.066)	(0.097)	(0.003)												
L.SPS					0.213	0.346	0.479	-0.009								
					(0.174)	(0.335)	(0.412)	(0.015)								
L.HS									0.440***	-0.157	-0.127	0.012				
									(0.120)	(0.287)	(0.487)	(0.017)				
L.ES													0.778***	-0.782*	-0.104	0.035
													(0.209)	(0.425)	(0.610)	(0.022)
L.Tax	0.300	0.785***	-0.097	0.000	-0.160**	0.968***	-0.353	0.002	-0.044*	0.590***	-0.150	0.009*	0.007	0.629***	-0.217	0.002
	(0.198)	(0.146)	(0.197)	(0.005)	(0.070)	(0.206)	(0.268)	(0.006)	(0.024)	(0.162)	(0.211)	(0.005)	(0.055)	(0.133)	(0.234)	(0.006)
L.Inflation	0.036	-0.024	0.295**	0.002	-0.034	0.059	0.146	0.001	-0.005	0.060**	0.332***	0.004	0.010	0.000	0.284**	-0.000
	(0.068)	(0.025)	(0.116)	(0.002)	(0.032)	(0.041)	(0.143)	(0.003)	(0.005)	(0.028)	(0.128)	(0.003)	(0.016)	(0.032)	(0.127)	(0.003)
L.Fortieth	-2.158	8.793***	3.781	0.599***	1.587	3.908	0.829	0.838***	0.732	5.968***	2.880	0.631***	0.432	1.506	0.842	0.798***
	(3.741)	(1.853)	(3.133)	(0.120)	(1.293)	(3.701)	(4.256)	(0.192)	(0.647)	(2.293)	(3.600)	(0.169)	(1.041)	(2.150)	(3.608)	(0.162)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.67) Panel VAR Results: Eightieth

Regressors	Regressands															
	GS, Tax, Inflation and Eightieth				SPS, Tax, Inflation and Eightieth				HS, Tax, Inflation and Eightieth				ES, Tax, Inflation and Eightieth			
	GS	Tax	Inflation	Eightieth	SPS	Tax	Inflation	Eightieth	HS	Tax	Inflation	Eightieth	ES	Tax	Inflation	Eightieth
L.GS	0.557***	-0.085	-0.024	0.004												
	(0.076)	(0.060)	(0.078)	(0.003)												
L.SPS					0.166	0.760**	0.896*	-0.055**								
					(0.189)	(0.386)	(0.517)	(0.025)								
L.HS									0.444***	-0.987*	-0.634	0.056**				
									(0.126)	(0.547)	(0.507)	(0.022)				
L.ES													0.669***	-0.514	-0.483	0.076***
													(0.182)	(0.491)	(0.596)	(0.029)
L.Tax	0.467**	1.074***	-0.235	-0.003	-0.232***	1.182***	-0.248	-0.005	-0.037*	0.600***	-0.287	0.001	0.003	0.670***	-0.213	-0.009
	(0.187)	(0.189)	(0.192)	(0.006)	(0.074)	(0.228)	(0.243)	(0.009)	(0.020)	(0.169)	(0.181)	(0.006)	(0.049)	(0.159)	(0.216)	(0.008)
L.Inflation	0.024	-0.030	0.299**	-0.003	-0.043	0.104**	0.219	-0.005	-0.005	0.034	0.281**	-0.001	0.006	0.009	0.185	-0.005
	(0.061)	(0.029)	(0.132)	(0.002)	(0.031)	(0.046)	(0.148)	(0.004)	(0.006)	(0.027)	(0.143)	(0.003)	(0.013)	(0.039)	(0.131)	(0.003)
L.Eightieth	-0.131	6.165***	1.076	0.781***	-0.236	7.851***	2.796	0.364***	0.578**	9.069***	-0.841	0.509***	0.864	1.467	1.870	0.832***
	(1.812)	(1.245)	(1.805)	(0.124)	(0.828)	(2.428)	(1.882)	(0.129)	(0.259)	(2.001)	(1.646)	(0.129)	(0.577)	(1.451)	(1.857)	(0.192)
Observations	436	436	436	436	386	386	386	386	403	403	403	403	403	403	403	403
Countries	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.68) Lag Order Test: Panel VAR Results - Gini, Tenth, Fiftieth and Ninetieth Percentiles

Gini Index												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-220.319	-47.595	-116.953	-210.750	-46.353	-112.690	-213.659	-46.190	-113.653	-285.095	-61.803	-151.753
2	-142.983	-27.834	-74.073	-144.108	-34.510	-78.734	-144.265	-32.619	-77.594	-208.510	-41.041	-108.504
3	-68.525	-10.951	-34.070	-74.722	-19.923	-42.035	-71.338	-15.515	-38.002	-139.233	-27.587	-72.562
4	.	.	.	.	.	.	.	.	.	-72.907	-17.084	-39.572
Tenth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-439.555	-94.106	-232.823	-215.721	-51.323	-117.660	-213.166	-45.697	-113.160	-210.342	-42.873	-110.336
2	-356.926	-69.052	-184.650	-144.256	-34.658	-78.882	-135.423	-23.777	-68.752	-149.256	-37.610	-82.585
3	-298.859	-68.560	-161.038	-74.724	-19.925	-42.037	-73.949	-18.126	-40.613	-81.945	-26.122	-48.610
4	-236.477	-63.753	-133.111	.	.	.	.	.	.	.	.	.
Fiftieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-292.150	-61.851	-154.330	-207.458	-43.060	-109.397	-211.840	-44.371	-111.834	-271.903	-48.611	-138.561
2	-204.188	-31.464	-100.823	-146.908	-37.309	-81.534	-139.633	-27.987	-72.962	-211.883	-44.414	-111.876
3	-148.274	-33.124	-79.363	-74.741	-19.942	-42.054	-70.733	-14.910	-37.397	-139.269	-27.623	-72.598
4	-74.914	-17.339	-40.458	.	.	.	.	.	.	-72.233	-16.410	-38.898
Ninetieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-286.402	-56.103	-148.582	-353.289	-79.293	-189.855	-301.198	-77.906	-167.856	-290.952	-67.660	-157.610
2	-222.860	-50.136	-119.495	-289.941	-70.745	-159.194	-219.530	-52.061	-119.523	-218.118	-50.649	-118.111
3	-153.243	-38.094	-84.333	-207.856	-43.459	-109.796	-152.176	-40.530	-85.505	-139.579	-27.933	-72.908
4	-75.318	-17.743	-40.863	-154.439	-44.840	-89.065	-74.400	-18.577	-41.064	-79.201	-23.378	-45.866

Table (B.69) Lag Order Test: Panel VAR Results - Twentieth, Fortieth and Eightieth Percentiles

						Twentieth Percentile						
		GS			SPS			HS			ES	
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-220.890	-48.166	-117.524	-212.112	-47.715	-114.052	-213.999	-46.530	-113.993	-215.316	-47.847	-115.310
2	-142.708	-27.559	-73.798	-145.077	-35.479	-79.703	-148.985	-37.339	-82.314	-144.232	-32.586	-77.561
3	-77.500	-19.925	-43.045	-80.500	-25.701	-47.813	-78.906	-23.083	-45.571	-82.073	-26.250	-48.738
4	.	.	.	.	.	.	.	.	.	.	.	.
						Fortieth Percentile						
		GS			SPS			HS			ES	
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-293.022	-62.723	-155.201	-207.854	-43.456	-109.793	-283.237	-59.944	-149.895	-212.698	-45.229	-112.691
2	-206.350	-33.626	-102.984	-148.142	-38.543	-82.768	-212.536	-45.067	-112.529	-141.920	-30.274	-75.249
3	-146.669	-31.519	-77.758	-78.090	-23.290	-45.403	-136.657	-25.011	-69.986	-78.241	-22.418	-44.906
4	-74.135	-16.560	-39.679	.	.	.	-72.461	-16.638	-39.125	.	.	.
						Eightieth Percentile						
		GS			SPS			HS			ES	
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-291.300	-61.001	-153.479	-212.200	-47.803	-114.140	-284.120	-60.828	-150.778	-203.582	-36.113	-103.575
2	-216.453	-43.729	-113.087	-150.948	-41.350	-85.574	-213.185	-45.716	-113.178	-145.447	-33.801	-78.776
3	-151.788	-36.638	-82.877	-74.752	-19.952	-42.065	-145.577	-33.930	-78.906	-75.477	-19.654	-42.142
4	-79.545	-21.971	-45.090	.	.	.	-70.426	-14.603	-39.090	.	.	.

Figure (B.61) Stability Condition: Gini Index

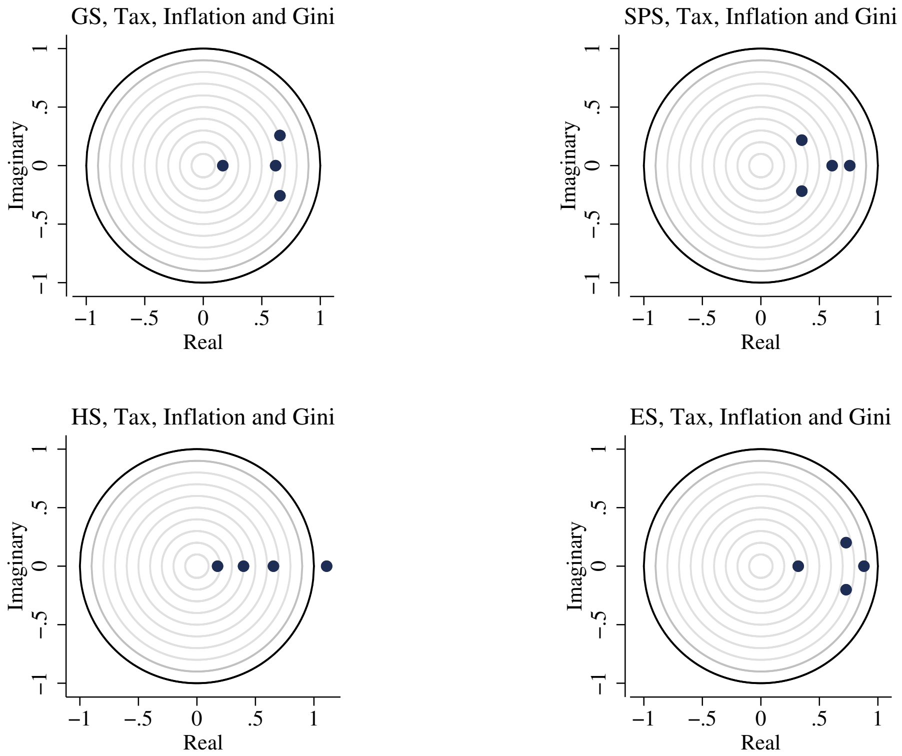


Figure (B.62) Stability Condition: Tenth, Fiftieth and Ninetieth Percentiles

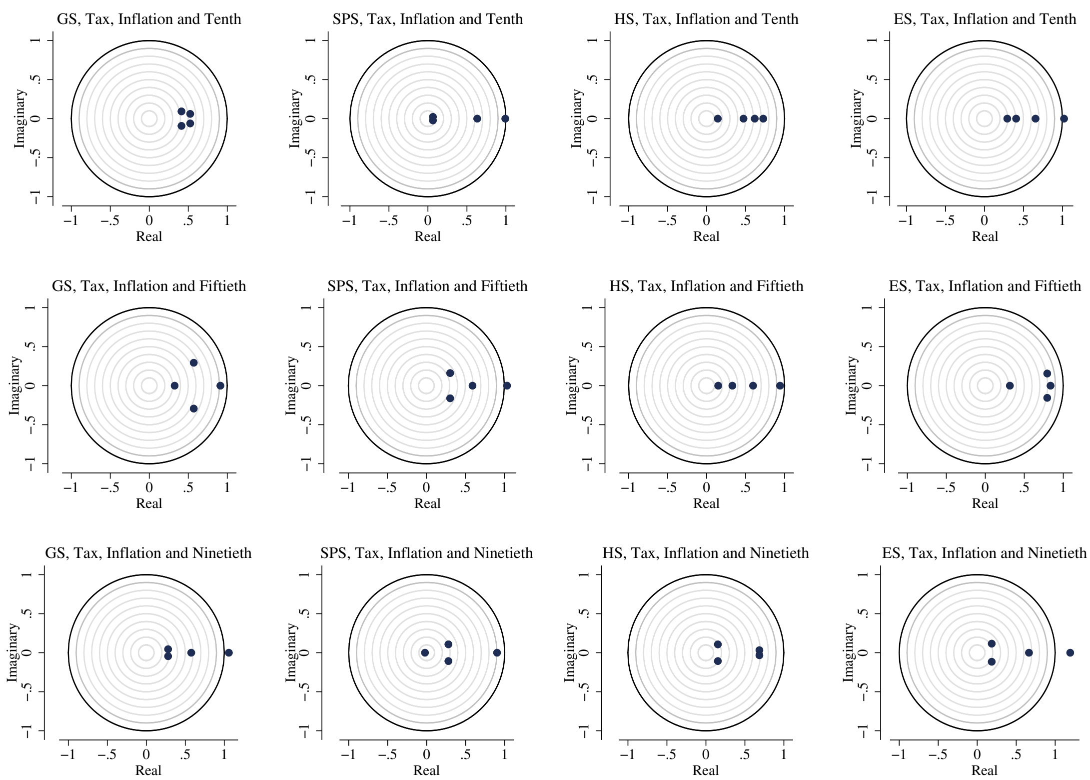


Figure (B.63) Stability Condition: Twentieth, Fortieth and Eightieth Percentiles

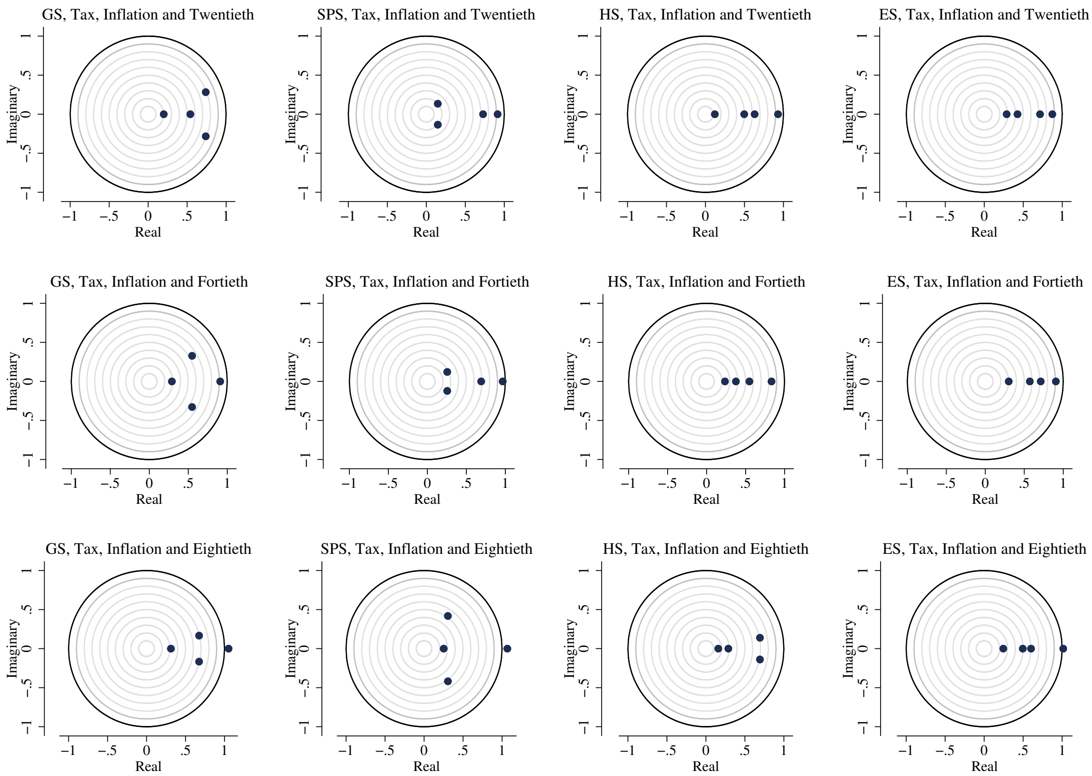
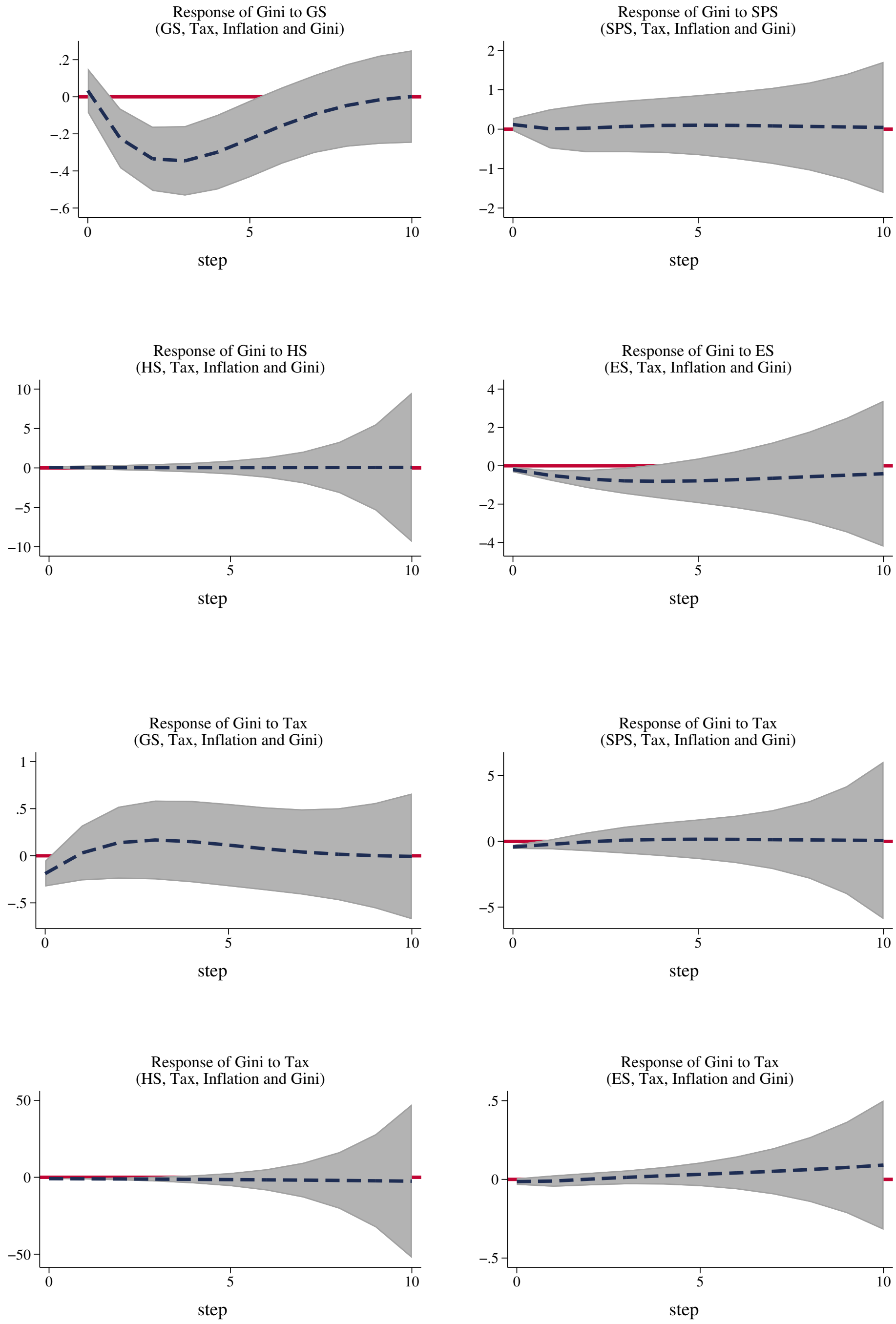
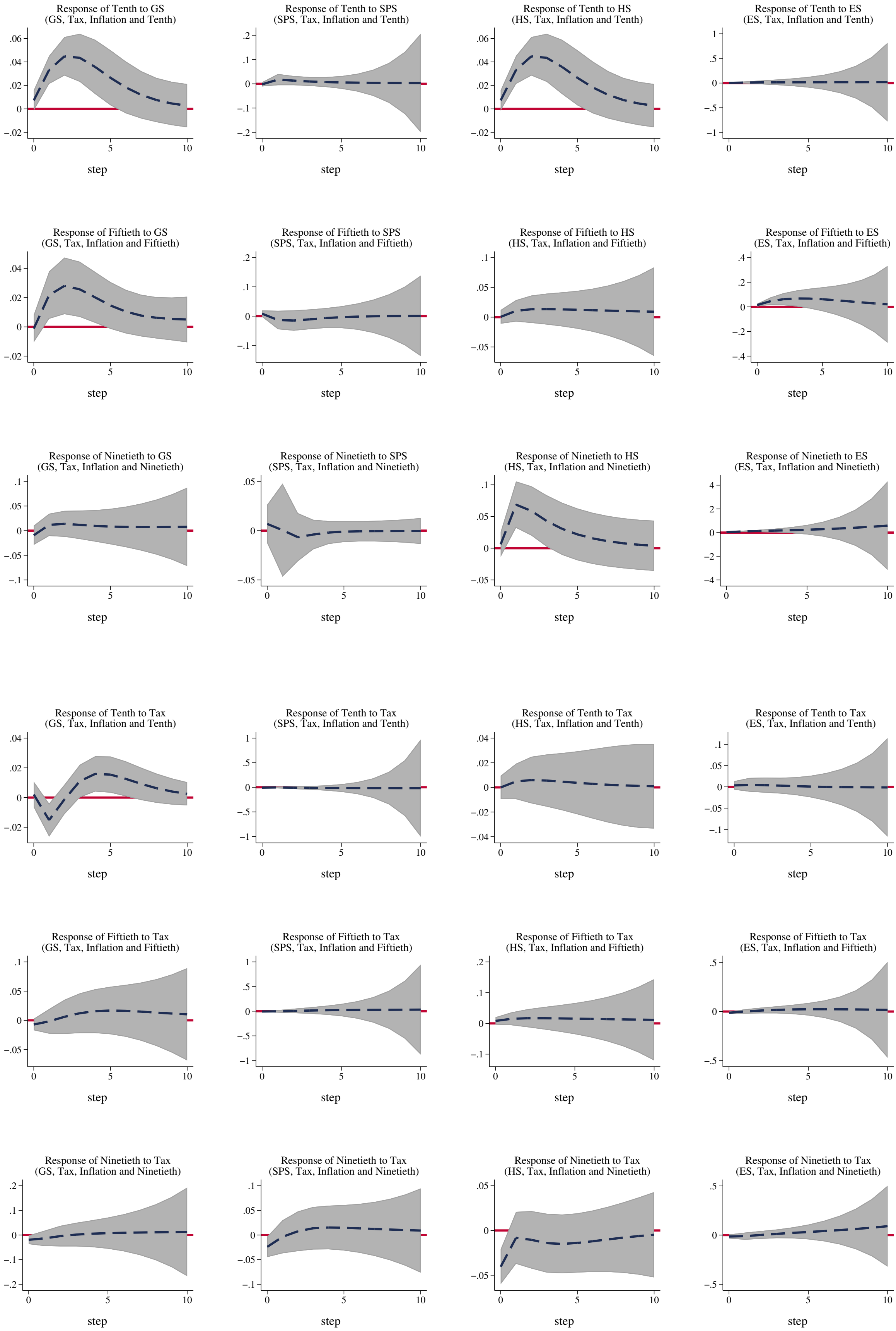


Figure (B.64) Impulse Responses: Spending and Tax Shocks on the Gini Index



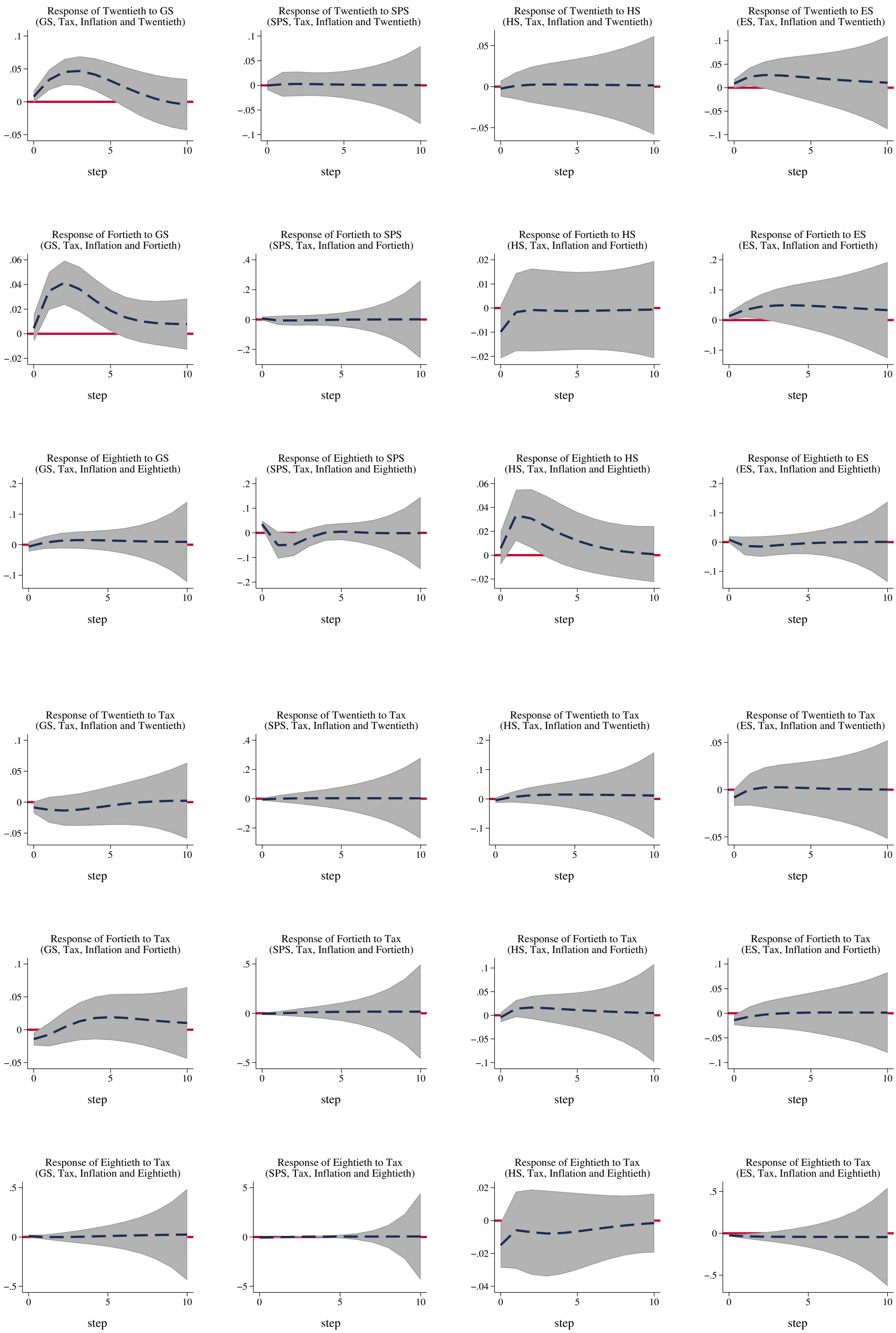
Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.65) Impulse Responses: Spending and Tax Shocks on the Tenth, Fiftieth and Ninetieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Figure (B.66) Impulse Responses: Spending and Tax Shocks on the Twentieth, Fortieth and Eightieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (B.610) Variance Decomposition: Gini, Tenth, Fiftieth and Ninetieth Percentiles

Gini Index																
Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Gini				SPS, Tax, Inflation and Gini				HS, Tax, Inflation and Gini				ES, Tax, Inflation and Gini			
Gini	GS	Tax	Inf	Gini	SPS	Tax	Inf	Gini	HS	Tax	Inf	Gini	ES	Tax	Inf	Gini
1	0.000	0.013	0.004	0.983	0.004	0.049	0.004	0.944	0.001	0.197	0.007	0.795	0.013	0.013	0.006	0.969
2	0.012	0.009	0.008	0.971	0.002	0.033	0.003	0.962	0.001	0.194	0.005	0.800	0.056	0.008	0.008	0.928
3	0.033	0.011	0.010	0.946	0.002	0.024	0.003	0.972	0.000	0.193	0.004	0.802	0.115	0.007	0.010	0.868
4	0.053	0.016	0.011	0.920	0.002	0.021	0.002	0.975	0.000	0.193	0.004	0.803	0.178	0.008	0.011	0.803
5	0.069	0.020	0.011	0.901	0.002	0.020	0.002	0.975	0.000	0.192	0.004	0.804	0.235	0.009	0.011	0.744

Tenth Percentile																
Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Tenth				SPS, Tax, Inflation and Tenth				HS, Tax, Inflation and Tenth				ES, Tax, Inflation and Tenth			
Tenth	GS	Tax	Inf	Tenth	SPS	Tax	Inf	Tenth	HS	Tax	Inf	Tenth	ES	Tax	Inf	Tenth
1	0.004	0.000	0.000	0.996	0.000	0.003	0.000	0.996	0.000	0.000	0.000	1.000	0.001	0.001	0.000	0.998
2	0.059	0.012	0.005	0.924	0.017	0.003	0.002	0.978	0.000	0.001	0.000	0.998	0.007	0.002	0.000	0.991
3	0.140	0.010	0.013	0.836	0.025	0.006	0.002	0.967	0.001	0.003	0.000	0.997	0.015	0.002	0.000	0.982
4	0.204	0.014	0.020	0.762	0.029	0.013	0.002	0.956	0.001	0.004	0.000	0.995	0.024	0.003	0.000	0.973
5	0.239	0.023	0.023	0.715	0.031	0.022	0.002	0.944	0.001	0.004	0.000	0.994	0.035	0.003	0.000	0.962

Fiftieth Percentile																
Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Fiftieth				SPS, Tax, Inflation and Fiftieth				HS, Tax, Inflation and Fiftieth				ES, Tax, Inflation and Fiftieth			
Fiftieth	GS	Tax	Inf	Fiftieth	SPS	Tax	Inf	Fiftieth	HS	Tax	Inf	Fiftieth	ES	Tax	Inf	Fiftieth
1	0.000	0.003	0.001	0.996	0.004	0.002	0.001	0.994	0.000	0.003	0.002	0.995	0.012	0.009	0.002	0.977
2	0.018	0.002	0.004	0.975	0.008	0.001	0.001	0.989	0.003	0.009	0.001	0.986	0.078	0.005	0.003	0.914
3	0.042	0.003	0.006	0.949	0.013	0.002	0.002	0.983	0.007	0.013	0.001	0.979	0.161	0.007	0.003	0.829
4	0.058	0.007	0.007	0.928	0.014	0.006	0.003	0.977	0.009	0.016	0.001	0.974	0.238	0.012	0.003	0.747
5	0.066	0.014	0.007	0.913	0.014	0.014	0.004	0.969	0.010	0.018	0.001	0.970	0.298	0.020	0.003	0.680

Ninetieth Percentile																
Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Ninetieth				SPS, Tax, Inflation and Ninetieth				HS, Tax, Inflation and Ninetieth				ES, Tax, Inflation and Ninetieth			
Ninetieth	GS	Tax	Inf	Ninetieth	SPS	Tax	Inf	Ninetieth	HS	Tax	Inf	Ninetieth	ES	Tax	Inf	Ninetieth
1	0.001	0.006	0.000	0.992	0.001	0.010	0.000	0.989	0.001	0.026	0.001	0.973	0.017	0.003	0.003	0.977
2	0.003	0.008	0.008	0.981	0.001	0.008	0.009	0.981	0.060	0.021	0.015	0.904	0.128	0.004	0.011	0.857
3	0.006	0.008	0.010	0.976	0.001	0.009	0.013	0.977	0.095	0.021	0.020	0.865	0.269	0.003	0.011	0.718
4	0.007	0.008	0.011	0.974	0.001	0.011	0.013	0.974	0.112	0.022	0.021	0.845	0.397	0.003	0.008	0.591
5	0.009	0.008	0.011	0.972	0.001	0.014	0.013	0.971	0.120	0.025	0.022	0.834	0.503	0.005	0.006	0.485

Table (B.611) Variance Decomposition: Twentieth, Fortieth and Eightieth Percentiles

Twentieth Percentile

Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Twentieth				SPS, Tax, Inflation and Twentieth				HS, Tax, Inflation and Twentieth				ES, Tax, Inflation and Twentieth			
Twentieth	GS	Tax	Inf	Twentieth	SPS	Tax	Inf	Twentieth	HS	Tax	Inf	Twentieth	ES	Tax	Inf	Twentieth
1	0.005	0.006	0.002	0.988	0.000	0.002	0.001	0.998	0.000	0.002	0.000	0.998	0.006	0.006	0.002	0.986
2	0.061	0.012	0.010	0.917	0.000	0.001	0.004	0.995	0.000	0.002	0.000	0.997	0.035	0.004	0.003	0.958
3	0.143	0.018	0.013	0.826	0.001	0.001	0.005	0.993	0.000	0.006	0.000	0.994	0.064	0.003	0.003	0.929
4	0.218	0.022	0.013	0.747	0.001	0.001	0.006	0.992	0.001	0.010	0.000	0.989	0.087	0.003	0.004	0.906
5	0.265	0.023	0.012	0.700	0.001	0.002	0.006	0.992	0.001	0.013	0.000	0.986	0.104	0.003	0.004	0.889

Fortieth Percentile

Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Fortieth				SPS, Tax, Inflation and Fortieth				HS, Tax, Inflation and Fortieth				ES, Tax, Inflation and Fortieth			
Fortieth	GS	Tax	Inf	Fortieth	SPS	Tax	Inf	Fortieth	HS	Tax	Inf	Fortieth	ES	Tax	Inf	Fortieth
1	0.001	0.013	0.001	0.984	0.003	0.002	0.001	0.995	0.006	0.001	0.001	0.991	0.010	0.012	0.001	0.976
2	0.054	0.011	0.007	0.928	0.003	0.001	0.002	0.994	0.004	0.010	0.015	0.971	0.049	0.009	0.001	0.942
3	0.111	0.010	0.011	0.868	0.003	0.002	0.003	0.992	0.004	0.018	0.025	0.952	0.092	0.007	0.001	0.900
4	0.148	0.015	0.012	0.824	0.003	0.004	0.004	0.989	0.004	0.025	0.032	0.940	0.131	0.006	0.002	0.861
5	0.165	0.025	0.013	0.797	0.003	0.007	0.005	0.985	0.003	0.029	0.036	0.932	0.165	0.005	0.002	0.828

Eightieth Percentile

Response variable and periods ahead	Impulse variable															
	GS, Tax, Inflation and Eightieth				SPS, Tax, Inflation and Eightieth				HS, Tax, Inflation and Eightieth				ES, Tax, Inflation and Eightieth			
Eightieth	GS	Tax	Inf	Eightieth	SPS	Tax	Inf	Eightieth	HS	Tax	Inf	Eightieth	ES	Tax	Inf	Eightieth
1	0.001	0.002	0.000	0.997	0.035	0.069	0.001	0.896	0.001	0.007	0.000	0.991	0.053	0.014	0.001	0.932
2	0.001	0.001	0.001	0.996	0.084	0.080	0.012	0.824	0.029	0.006	0.000	0.965	0.135	0.025	0.003	0.836
3	0.004	0.001	0.002	0.993	0.128	0.079	0.012	0.782	0.048	0.007	0.001	0.945	0.213	0.032	0.004	0.751
4	0.006	0.001	0.003	0.990	0.128	0.109	0.012	0.751	0.058	0.008	0.001	0.933	0.275	0.036	0.004	0.686
5	0.009	0.001	0.003	0.987	0.121	0.146	0.012	0.721	0.064	0.009	0.001	0.926	0.321	0.039	0.003	0.637

B.7 Brief Comparison between Middle- and High-Income Countries

Table (B.71) Panel VAR Results: Gini Index

Regressors	Regressands											
	GS, Tax, and Gini			SPS, Tax, and Gini			HS, Tax, and Gini			ES, Tax, and Gini		
	GS	Tax	Gini	SPS	Tax	Gini	HS	Tax	Gini	ES	Tax	Gini
L.GS	0.678***	0.041	-0.055**									
	(0.088)	(0.026)	(0.026)									
L.SPS				0.380***	0.228	0.022						
				(0.116)	(0.165)	(0.076)						
L.HS							0.645***	1.551***	-0.050			
							(0.134)	(0.440)	(0.138)			
L.ES										0.683***	0.909***	-0.250**
										(0.083)	(0.199)	(0.098)
L.Tax	-0.120	0.631***	-0.112	0.054	0.722***	0.043	-0.131***	1.035***	-0.044	-0.109*	0.833***	-0.022
	(0.186)	(0.099)	(0.080)	(0.087)	(0.098)	(0.067)	(0.050)	(0.205)	(0.067)	(0.058)	(0.185)	(0.063)
L.Gini	0.037	-0.066	0.846***	0.361**	-0.239	0.926***	-0.109*	0.377	0.812***	-0.173**	0.423	0.792***
	(0.257)	(0.139)	(0.080)	(0.168)	(0.184)	(0.134)	(0.061)	(0.277)	(0.093)	(0.072)	(0.268)	(0.081)
Observations	379	379	379	362	362	362	362	362	362	362	362	362
Countries	43	43	43	43	43	43	43	43	43	43	43	43
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.72) Panel VAR Results: Tenth Percentile

Regressors	Regressands											
	GS, Tax, and Tenth			SPS, Tax, and Tenth			HS, Tax, and Tenth			ES, Tax, and Tenth		
	GS	Tax	Tenth	SPS	Tax	Tenth	HS	Tax	Tenth	ES	Tax	Tenth
L.GS	0.869***	-0.095***	0.008***									
	(0.065)	(0.026)	(0.003)									
L.SPS				0.822***	-0.185*	-0.009						
				(0.129)	(0.097)	(0.019)						
L.HS							0.690***	0.188	-0.004			
							(0.193)	(0.130)	(0.016)			
L.ES										0.890***	0.344**	0.073**
										(0.159)	(0.175)	(0.031)
L.Tax	0.158	0.460***	-0.003	0.263**	0.760***	-0.021*	-0.132**	0.573***	0.002	-0.079*	0.672***	-0.006
	(0.160)	(0.091)	(0.011)	(0.104)	(0.083)	(0.012)	(0.056)	(0.072)	(0.012)	(0.042)	(0.087)	(0.015)
L.Tenth	0.250	-0.158	0.767***	0.263	0.995	0.720***	-0.396	0.316	0.821***	0.517	2.009***	0.821***
	(1.197)	(0.535)	(0.083)	(0.855)	(0.644)	(0.129)	(0.289)	(0.510)	(0.093)	(0.360)	(0.717)	(0.124)
Observations	379	379	379	362	362	362	362	362	362	362	362	362
Countries	43	43	43	43	43	43	43	43	43	43	43	43
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.73) Panel VAR Results: Fiftieth Percentile

Regressors	Regressands											
	GS, Tax, and Fiftieth			SPS, Tax, and Fiftieth			HS, Tax, and Fiftieth			ES, Tax, and Fiftieth		
	GS	Tax	Fiftieth	SPS	Tax	Fiftieth	HS	Tax	Fiftieth	ES	Tax	Fiftieth
L.GS	0.427***	-0.020	0.007***									
	(0.087)	(0.022)	(0.003)									
L.SPS				-0.079	-0.397	-0.004						
				(0.322)	(0.247)	(0.026)						
L.HS							0.410**	0.403**	0.014			
							(0.194)	(0.187)	(0.022)			
L.ES										0.811***	0.408***	0.023
										(0.091)	(0.132)	(0.015)
L.Tax	-0.491**	0.689***	-0.000	0.214	0.808***	0.005	-0.132***	0.678***	-0.004	-0.063**	0.662***	-0.008
	(0.244)	(0.077)	(0.008)	(0.131)	(0.118)	(0.011)	(0.043)	(0.064)	(0.008)	(0.027)	(0.064)	(0.007)
L.Fiftieth	-12.738***	3.041***	0.793***	-3.104	1.037	0.391**	-0.940**	1.365***	0.725***	0.087	0.255	0.767***
	(1.583)	(0.478)	(0.057)	(1.897)	(1.593)	(0.160)	(0.368)	(0.487)	(0.077)	(0.188)	(0.604)	(0.056)
Observations	379	379	379	362	362	362	362	362	362	362	362	362
Countries	43	43	43	43	43	43	43	43	43	43	43	43
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.74) Panel VAR Results: Ninetieth Percentile

Regressors	Regressands											
	GS, Tax, and Ninetieth			SPS, Tax, and Ninetieth			HS, Tax, and Ninetieth			ES, Tax, and Ninetieth		
	GS	Tax	Ninetieth	SPS	Tax	Ninetieth	HS	Tax	Ninetieth	ES	Tax	Ninetieth
L.GS	0.793***	-0.045*	-0.002									
	(0.128)	(0.026)	(0.004)									
L.SPS				0.503***	0.080	0.031						
				(0.180)	(0.111)	(0.021)						
L.HS							0.723***	0.602***	-0.029			
							(0.130)	(0.176)	(0.024)			
L.ES										0.693***	0.647***	0.074***
										(0.075)	(0.083)	(0.014)
L.Tax	0.094	0.631***	0.001	0.065	0.767***	0.010	-0.079*	0.732***	-0.028*	-0.031	0.600***	-0.012
	(0.140)	(0.098)	(0.016)	(0.160)	(0.090)	(0.019)	(0.048)	(0.108)	(0.016)	(0.022)	(0.065)	(0.013)
L.Ninetieth	-1.346	0.866	0.366**	3.518**	0.605	0.451***	-0.273	3.176***	-0.033	0.473*	0.844	0.340***
	(1.845)	(0.984)	(0.160)	(1.370)	(0.779)	(0.147)	(0.486)	(1.136)	(0.138)	(0.244)	(0.640)	(0.111)
Observations	379	379	379	362	362	362	362	362	362	362	362	362
Countries	43	43	43	43	43	43	43	43	43	43	43	43
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.75) Panel VAR Results: Twentieth Percentile

Regressors	Regressands											
	GS, Tax, and Twentieth			SPS, Tax, and Twentieth			HS, Tax, and Twentieth			ES, Tax, and Twentieth		
	GS	Tax	Twentieth	SPS	Tax	Twentieth	HS	Twentieth	Twentieth	ES	Tax	Twentieth
L.GS	0.889***	-0.052***	0.000									
	(0.073)	(0.020)	(0.003)									
L.SPS				0.595***	-0.057	-0.020						
				(0.117)	(0.102)	(0.013)						
L.HS							0.860***	0.236**	-0.016			
							(0.154)	(0.100)	(0.015)			
L.ES										0.887***	0.357***	0.040***
										(0.096)	(0.099)	(0.015)
L.Tax	0.043	0.625***	-0.007	0.131	0.739***	-0.007	-0.097**	0.588***	-0.018*	-0.022	0.609***	-0.023**
	(0.162)	(0.072)	(0.013)	(0.082)	(0.093)	(0.009)	(0.045)	(0.072)	(0.010)	(0.033)	(0.081)	(0.011)
L.Twentieth	0.058	0.058	0.695***	-0.542	2.537**	0.714***	-0.444	0.473	0.919***	-0.195	0.254	0.916***
	(1.681)	(0.670)	(0.105)	(0.963)	(1.108)	(0.148)	(0.404)	(0.680)	(0.105)	(0.365)	(0.846)	(0.119)
Observations	379	379	379	362	362	362	362	362	362	362	362	362
Countries	43	43	43	43	43	43	43	43	43	43	43	43
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.76) Panel VAR Results: Fortieth Percentile

Regressors	Regressands														
	GS, Tax, and Fortieth				SPS, Tax, and Fortieth				HS, Tax, and Fortieth				ES, Tax, and Fortieth		
	GS	Tax	Fortieth		SPS	Tax	Fortieth		HS	Tax	Fortieth		ES	Tax	Fortieth
L.GS	0.418***	-0.016	0.003												
	(0.081)	(0.020)	(0.003)												
L.SPS					0.213	-0.131	-0.030								
					(0.192)	(0.175)	(0.020)								
L.HS									0.742***	0.383***	-0.007				
									(0.167)	(0.135)	(0.015)				
L.ES													0.884***	0.366***	0.021
													(0.090)	(0.119)	(0.014)
L.Tax	-0.421*	0.727***	-0.014		0.175*	0.738***	0.009		-0.104**	0.641***	-0.010		-0.054*	0.671***	-0.012
	(0.249)	(0.077)	(0.008)		(0.094)	(0.104)	(0.011)		(0.042)	(0.061)	(0.007)		(0.028)	(0.069)	(0.008)
L.Fortieth	-12.276***	2.604***	0.790***		-2.872**	2.042	0.311*		-0.798**	1.266**	0.840***		-0.070	-0.308	0.837***
	(1.667)	(0.525)	(0.063)		(1.402)	(1.526)	(0.177)		(0.372)	(0.538)	(0.079)		(0.247)	(0.682)	(0.069)
Observations	379	379		362	362	362		362	362	362		362	362	362	362
Countries	43	43	43		43	43	43		43	43	43		43	43	43
Time FE	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.77) Panel VAR Results: Eightieth Percentile

Regressors	Regressands											
	GS, Tax, and Eightieth			SPS, Tax, and Eightieth			HS, Tax, and Eightieth			ES, Tax, and Eightieth		
	GS	Tax	Eightieth	SPS	Tax	Eightieth	HS	Tax	Eightieth	ES	Tax	Eightieth
L.GS	0.796***	-0.093**	0.004									
	(0.100)	(0.041)	(0.003)									
L.SPS				0.791***	0.211	0.041						
				(0.221)	(0.237)	(0.037)						
L.HS							0.895***	0.583***	-0.103***			
							(0.087)	(0.213)	(0.027)			
L.ES										0.944***	0.629***	0.016
										(0.148)	(0.227)	(0.028)
L.Tax	0.005	0.734***	-0.019	-0.062	0.782***	-0.018	-0.021	0.620***	-0.015	-0.008	0.748***	-0.016
	(0.140)	(0.142)	(0.015)	(0.103)	(0.122)	(0.018)	(0.027)	(0.071)	(0.010)	(0.036)	(0.094)	(0.011)
L.Eightieth	-1.019	0.472	-0.244	1.032	1.662	0.059	0.243	2.193**	-0.053	0.941*	1.718	0.035
	(2.800)	(2.104)	(0.235)	(1.304)	(1.684)	(0.285)	(0.385)	(1.031)	(0.145)	(0.544)	(1.388)	(0.183)
Observations	379	379	379	362	362	362	362	362	362	362	362	362
Countries	43	43	43	43	43	43	43	43	43	43	43	43
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table provides the parameter estimates obtained from regressing the column variables on the row variables. The parentheses contain the standard errors. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Table (B.78) Lag Order Test: Panel VAR Results - Gini, Tenth, Fiftieth and Ninetieth Percentiles

Gini Index												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-197.989	-39.524	-103.301	-228.069	-41.482	-116.714	-237.673	-51.085	-126.317	-295.272	-77.586	-165.357
2	-169.577	-42.805	-93.827	-182.854	-27.364	-90.058	-201.682	-46.193	-108.886	-241.186	-54.598	-129.830
3	-123.454	-28.375	-66.641	-151.389	-26.997	-77.152	-158.913	-34.521	-84.676	-203.574	-48.085	-110.778
4	-88.432	-25.046	-50.557	-123.152	-29.858	-67.474	-128.195	-34.902	-72.518	-154.072	-29.681	-79.835
Tenth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-284.433	-62.581	-151.870	-147.604	-23.212	-73.367	-237.052	-50.465	-125.697	-114.634	-21.340	-58.956
2	-260.703	-70.544	-147.078	-112.383	-19.089	-56.705	-203.642	-48.152	-110.846	-80.600	-18.404	-43.481
3	-218.771	-60.305	-124.083	-79.462	-17.266	-42.344	-155.901	-31.510	-81.664	-39.711	-8.613	-21.152
4	-167.762	-40.990	-92.012	-38.875	-7.777	-20.316	-121.928	-28.634	-66.250	.	.	.
Fiftieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-278.046	-56.194	-145.483	-115.836	-22.542	-60.158	-252.751	-66.164	-141.396	-246.391	-59.804	-135.036
2	-243.803	-53.644	-130.177	-72.065	-9.869	-34.946	-206.581	-51.091	-113.785	-215.392	-59.902	-122.595
3	-203.919	-45.453	-109.231	-32.818	-1.721	-14.259	-160.814	-36.422	-86.577	-159.234	-34.842	-84.997
4	-167.789	-41.016	-92.038	.	.	.	-127.654	-34.361	-71.977	-121.494	-28.200	-65.816
Ninetieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-248.361	-58.202	-134.736	-207.854	-52.365	-115.058	-250.095	-63.507	-138.739	-294.320	-76.635	-164.405
2	-219.955	-61.489	-125.267	-171.930	-47.539	-97.693	-215.789	-60.299	-122.993	-267.192	-80.605	-155.837
3	-178.784	-52.012	-103.034	-121.061	-27.767	-65.383	-174.166	-49.775	-99.929	-221.887	-66.397	-129.091
4	-136.955	-41.876	-80.143	-78.319	-16.123	-41.201	-125.454	-32.160	-69.776	-163.816	-39.424	-89.579

Table (B.79) Lag Order Test: Panel VAR Results - Twentieth, Fortieth and Eightieth Percentiles

Twentieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-205.848	-47.382	-111.160	-115.699	-22.405	-60.021	-279.846	-62.160	-149.931	-252.144	-65.557	-140.788
2	-159.652	-32.879	-83.902	-83.698	-21.503	-46.580	-243.355	-56.768	-132.000	-209.883	-54.394	-117.087
3	-122.449	-27.369	-65.636	-40.313	-9.215	-21.753	-206.253	-50.764	-113.457	-169.027	-44.635	-94.790
4	-82.949	-19.563	-45.074	.	.	.	-165.796	-41.405	-91.559	-119.268	-25.975	-63.591
Fortieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-281.982	-60.130	-149.419	-116.232	-22.938	-60.554	-282.455	-64.770	-152.541	-251.823	-65.235	-140.467
2	-244.836	-54.677	-131.211	-75.026	-12.830	-37.908	-246.264	-59.677	-134.909	-210.724	-55.235	-117.928
3	-211.702	-53.237	-117.015	-35.784	-4.686	-17.225	-207.043	-51.554	-114.247	-165.447	-41.056	-91.210
4	-164.369	-37.597	-88.619	.	.	.	-161.675	-37.284	-87.438	-115.731	-22.437	-60.053
Eightieth Percentile												
	GS			SPS			HS			ES		
Lag	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC	MBIC	MAIC	MQIC
1	-166.461	-39.689	-90.711	-112.275	-18.981	-56.597	-282.165	-64.480	-152.251	-119.684	-26.390	-64.006
2	-128.898	-33.819	-72.086	-71.790	-9.595	-34.672	-248.294	-61.707	-136.938	-81.669	-19.473	-44.550
3	-88.228	-24.842	-50.353	-32.743	-1.645	-14.184	-211.067	-55.577	-118.271	-43.668	-12.570	-25.108
4	-45.158	-13.465	-26.221	.	.	.	-171.598	-47.206	-97.361	.	.	.

Figure (B.71) Stability Condition: Gini Index

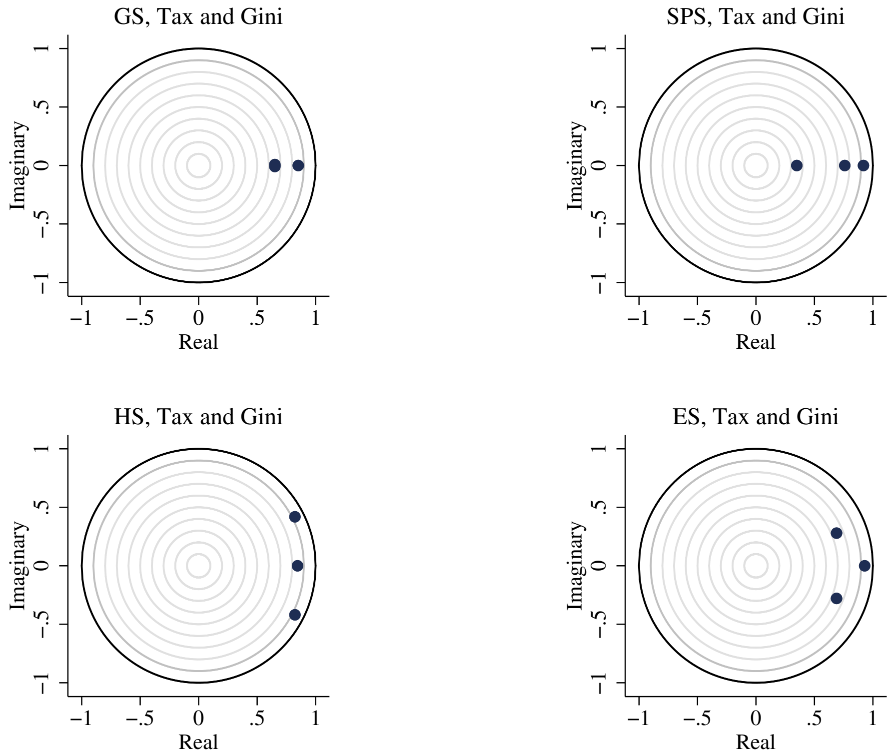


Figure (B.72) Stability Condition: Tenth, Fiftieth and Ninetieth Percentiles

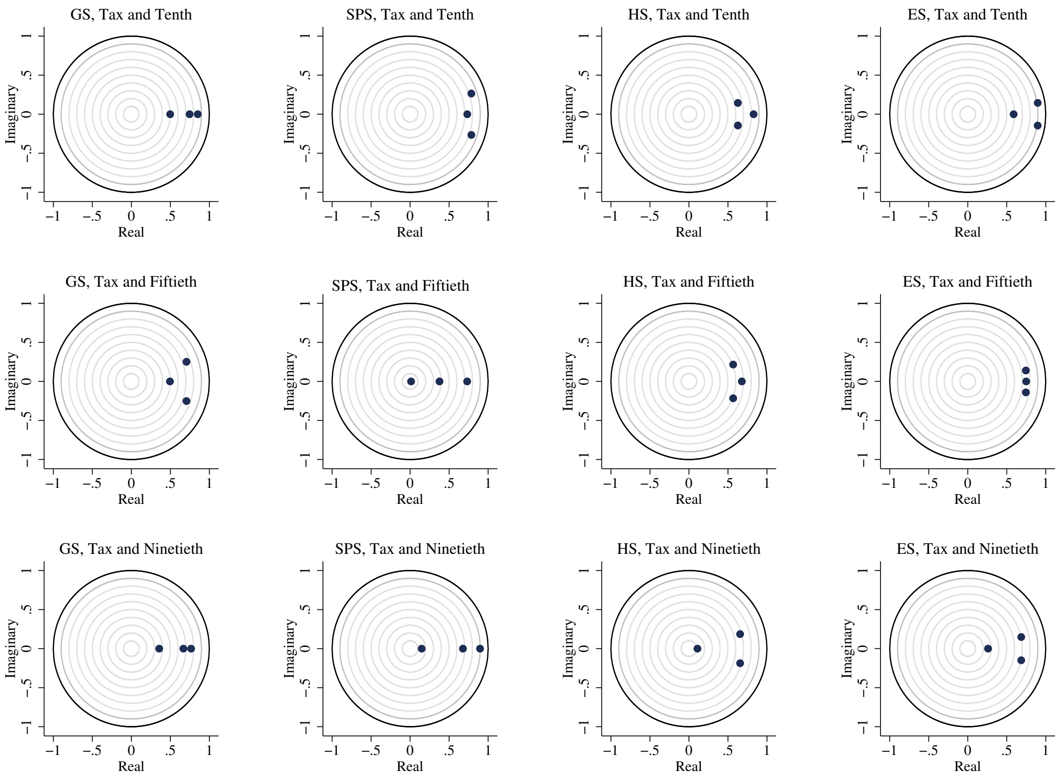


Figure (B.73) Stability Condition: Twentieth, Fortieth and Eightieth Percentiles

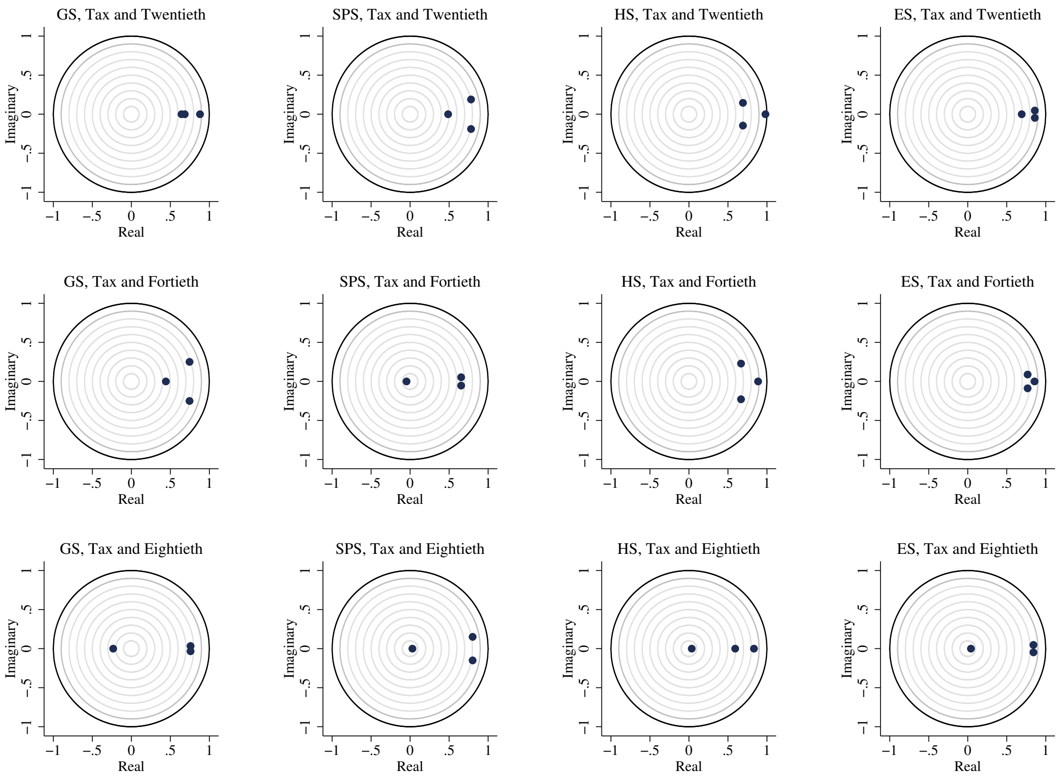
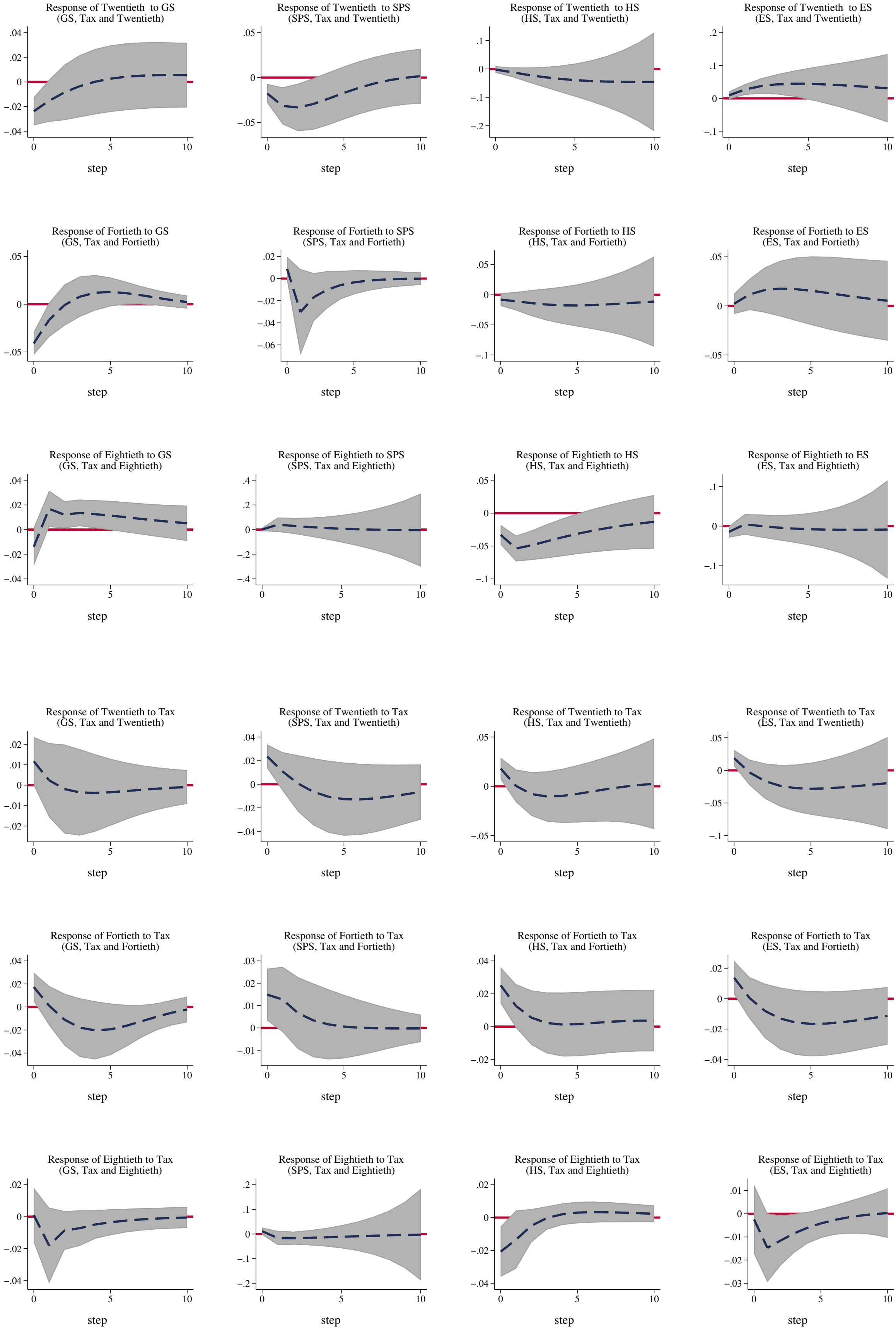


Figure (B.74) Impulse Responses: Spending and Tax Shocks on the Twentieth, Fortieth and Eightieth Percentiles



Note: The dashed blue lines denote the point estimates of the response of the relevant income distribution variable to the respective government spending shocks. The shaded regions represent the corresponding 90 percent confidence intervals.

Table (B.710) Variance Decomposition: Twentieth, Fortieth and Eightieth Percentiles

Twentieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Twentieth			SPS, Tax and Twentieth			HS, Tax and Twentieth			ES, Tax and Twentieth		
Twentieth	GS	Tax	Twentieth	SPS	Tax	Twentieth	HS	Tax	Twentieth	ES	Tax	Twentieth
1	0.028	0.007	0.965	0.020	0.035	0.945	0.000	0.018	0.982	0.005	0.019	0.977
2	0.027	0.005	0.968	0.053	0.027	0.919	0.004	0.010	0.986	0.023	0.010	0.966
3	0.025	0.004	0.970	0.082	0.023	0.895	0.012	0.008	0.980	0.045	0.013	0.942
4	0.024	0.004	0.972	0.102	0.022	0.876	0.023	0.008	0.968	0.065	0.020	0.915
5	0.023	0.005	0.972	0.114	0.025	0.861	0.037	0.009	0.954	0.084	0.027	0.889

Fortieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Fortieth			SPS, Tax and Fortieth			HS, Tax and Fortieth			ES, Tax and Fortieth		
Fortieth	**GS**	Tax	Fortieth	SPS	Tax	Fortieth	HS	Tax	Fortieth	ES	Tax	Fortieth
1	0.068	0.012	0.920	0.005	0.014	0.981	0.004	0.038	0.958	0.000	0.011	0.988
2	0.050	0.008	0.943	0.054	0.021	0.926	0.006	0.028	0.965	0.005	0.007	0.988
3	0.042	0.009	0.949	0.066	0.022	0.913	0.010	0.023	0.967	0.011	0.007	0.982
4	0.041	0.015	0.944	0.070	0.022	0.908	0.015	0.020	0.965	0.016	0.010	0.974
5	0.043	0.023	0.934	0.071	0.022	0.907	0.021	0.018	0.961	0.021	0.014	0.965

Eightieth Percentile												
Response variable and periods ahead	Impulse variable											
	GS, Tax and Eightieth			SPS, Tax and Eightieth			HS, Tax and Eightieth			ES, Tax and Eightieth		
Eightieth	**GS**	Tax	Eightieth	SPS	Tax	Eightieth	HS	Tax	Eightieth	ES	Tax	Eightieth
1	0.005	0.000	0.995	0.000	0.004	0.996	0.037	0.014	0.949	0.008	0.000	0.992
2	0.012	0.008	0.980	0.050	0.013	0.938	0.121	0.019	0.860	0.009	0.009	0.983
3	0.015	0.010	0.975	0.075	0.021	0.905	0.180	0.018	0.802	0.009	0.014	0.978
4	0.020	0.011	0.969	0.085	0.027	0.887	0.220	0.017	0.763	0.009	0.016	0.975
5	0.024	0.012	0.965	0.089	0.032	0.878	0.248	0.017	0.736	0.011	0.018	0.972

Chapter 3

Comparative Analysis Regarding the Effects of Commodity and Fiscal Policy Shocks Across Heterogeneous Households in Leading Middle-Income Countries

Abstract

This study is the first to employ the Bayesian DSGE method in examining the impact of commodity and fiscal policy shocks on household consumption, at an aggregate level, as well as between distributionally diverse households, within Brazil, Russia, India and South Africa (BRIS), on one hand, as well as Mexico, Indonesia, Nigeria and Turkey (MINT), on the other. Across BRIS and MINT, both Ricardian and non-Ricardian households reduce consumption in the aftermath of negative shocks on commodity production and prices. Consequently, the shocks lead to a decline in aggregate consumption, which is highest Nigeria and Russia. Nonetheless, the specific household that experiences greater consumption reduction varies by country as well as by commodity shock. Meanwhile, positive shocks on public transfers raise aggregate consumption across BRIS and MINT, as well as play a pivotal role in facilitating a redistribution pattern which, while associated with a fall in consumption for Ricardian households, results in a rise in consumption for their poor non-Ricardian counterparts, thereby reducing the consumption ratio between the former and the latter, with the reduction in BRIS and MINT being most prominent in South Africa and Nigeria respectively. Unlike positive transfer shocks however, negative tax shocks and positive debt shocks increase the consumption ratio across BRIS and MINT. As an additional contribution, this paper reveals that the consumption decline associated with the commodity shocks applies to both domestic and imported goods. Finally, by way of drawing comparisons between the results for BRIS and MINT, this research shows that the immediate drop in consumption within MINT tends to be larger, on average, compared to BRIS.

Keywords: commodity shocks, fiscal policy shocks, BRIS, MINT, consumption inequality, Bayesian DSGE

JEL codes: E62, H53, O15

3.1 Introduction

How differently do negative commodity[1] shocks influence household spending at an aggregate level, as well as between distributionally diverse households within Brazil, Russia, India and South Africa (BRIS)[2], on one hand as well as Mexico, Indonesia, Nigeria and Turkey (MINT), on the other? The relevance of this question derives from the recurrent commodity shocks that have been witnessed in recent years, which have also spurred debates on how such shocks impact consumption. For example, due to the 2008 global financial crisis, the demand for oil nose-dived thereby precipitating oil production declines as well as a 70% drop in oil prices between mid-2008 and early 2009 (ECB, 2012). Also, between mid-2014 and early 2015, global commodity prices plummeted by 38% with the price expectations for all nine of the World Bank's commodity price indices falling sharply (Saggu and Anukoonwattaka, 2015; Alsadiq et al., 2021).

Meanwhile, there have also been debates in the literature regarding the role of fiscal policy[3] in the presence of commodity shocks as they are traditionally viewed as an effective tool for influencing household spending. As noted by Danforth et al. (2016), fiscal policy could assist in stabilizing the economy during commodity price busts, nonetheless, IMF (2015*c*) demonstrates that the resulting fluctuations in government income could equally destabilize fiscal policy and subsequently limit its impact during such price slumps. In fact, some papers argue that the effects of commodity price fluctuations on economic activity tend to be exacerbated by fiscal policy (see, for example Riera-Crichton et al., 2015; Mendes and Pennings, 2020). Accordingly, it is crucial to understand how fiscal policy impacts on consumption expenditure, particularly during commodity shocks.

This study employs the Bayesian DSGE method in examining the impact of commodity and fiscal policy shocks on household consumption, at an aggregate level, as well as between distributionally diverse households, within two groups of countries: BRIS, on one hand, and MINT, on the other, over the period 2003Q2–2020Q4. These are highly relevant groups of countries, not only due to the relative dearth of empirical works on the overall impact of commodity and fiscal policy shocks on consumption in these countries, but also due to the potential distributional implications of commodity shocks within BRIS and MINT, given the fact that the GDP in these countries relies heavily on consumption expenditure, and as such, significant changes to consumption expenditure could in turn exhibit adverse impacts on the economy. Across BRIS and MINT, the average share of household spending within the GDP for the period between 2003 and 2020 lies above 50%, (see Figure 3.1) and over the years the average share across both

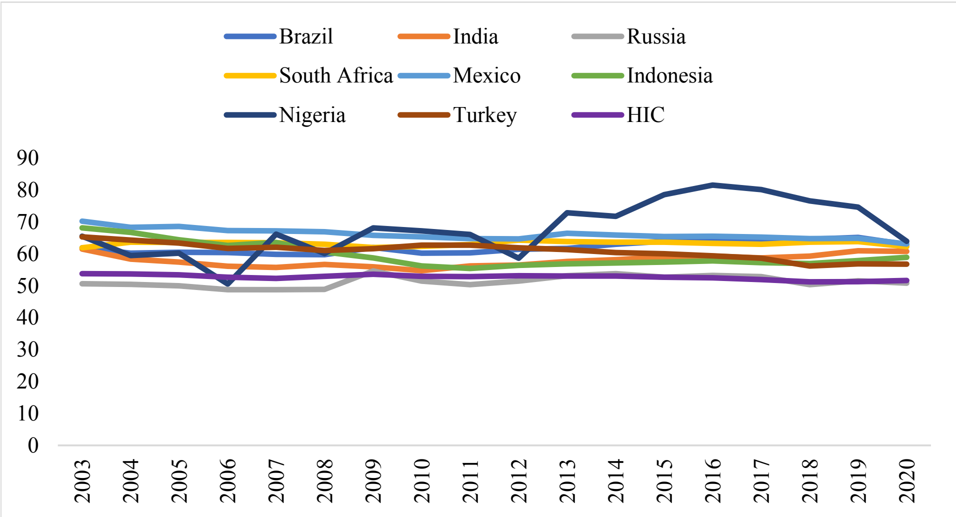
[1]By "commodity", this paper refers to primary commodities.

[2]Similar to this present research, there exists a number of papers that have also focused on BRIS (isolating the group from the broader category "BRICS"), albeit with research questions that are different from those addressed in this paper. Some of these studies are: IMF (2014*b*), UNCTAD (2015) and Loo and Iqbal (2019).

[3]Further discussion on fiscal policy in BRIS and MINT is provided in Appendix C.1.

groups of countries (with the exception of Russia) has generally exceeded the average for high income countries. Within BRIS, the highest average share is recorded in South Africa and Brazil (63.23% and 62.03% respectively); this is followed by India (at 58%); meanwhile, Russia has the lowest average share of household spending (at 51.33%)[4]. Within MINT, the highest average share is recorded in Nigeria (67.89%); this is followed by Mexico (at 66.14%); meanwhile, among the MINT, Turkey and Indonesia have the lowest average share of household spending (at 60.9% and 59.62% respectively).

Figure (3.1) Share of Consumption in GDP Between 2003 and 2020: BRIS and MINT

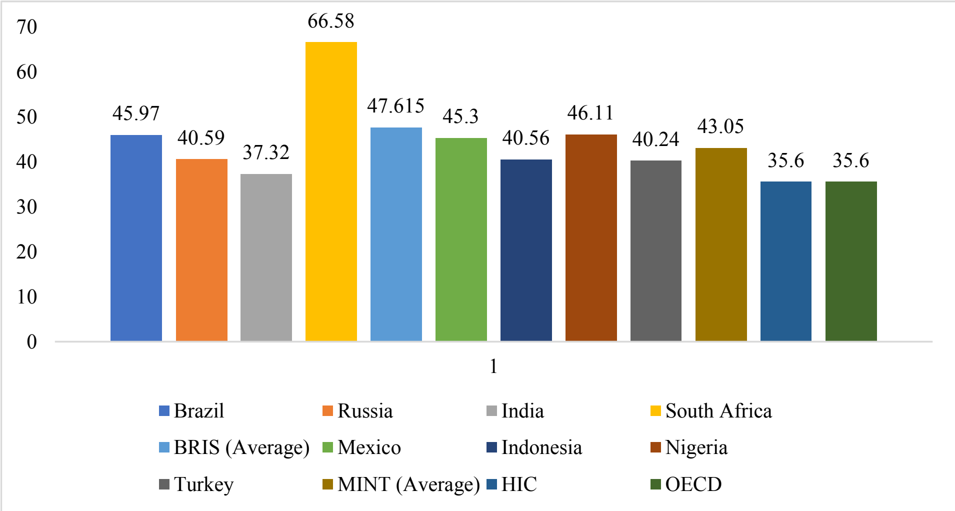


Note: Figure 3.1 is computed using data from the World Bank's World Development Indicators (WDI).

The relevance of studying the consumption effects of commodity shocks between heterogenous households within BRIS and MINT is further buttressed by the fact that the consumption Gini index within these countries is relatively high (see Figure 3.2). Across BRIS, the consumption Gini index is highest in South Africa, followed by Brazil and Russia, while India has the lowest consumption Gini index, which still exceeds the average for OECD and high-income countries. In MINT, the consumption Gini index for 2015 was highest in Nigeria (46.11%), followed by Mexico (45.3%) and Indonesia (40.56%), and finally Turkey (40.24%).

[4]This implies that the share of household spending within the GDP across BRIS was about 60% for the period between 2003 and 2020. Interestingly, Radulescu et al. (2014) show that at the time of their study, the shares of consumption expenditure within the GDP for Brazil and India were 80% and 50% respectively. However, the share ranged between 60% and 70% in the case of Russia.

Figure (3.2) Consumption Gini Index for 2015



Note: Figure 3.2 is computed using data from the Global Consumption and Income Project (GCIP).

In addition to being leading emerging economies with strong influence potential on the global economy, BRIS and MINT possess vibrant commodity exporting sectors, highlighting the relevance of this research to these groups of countries. Also, BRIS and MINT can be described as 'resource powers' due to their individual endowment, production and export of minerals and/or energy, upon which their economies and international standing are highly dependent (see, for example, Armijo, 2007; Abramova and Fituni, 2014; Durotoye, 2014; Adebayo et al., 2022). Further, BRIS and MINT are collectively endowed with a variety of resources such as: minerals, oil and natural gas. Nonetheless, these leading middle-income countries vary in the degree to which they are rich in these resources (WTO, 2022; Wang and Razzaq, 2022). For example, iron and steel are particularly abundant in Brazil, Russia, India, Indonesia and Turkey, respectively ranking as the 10th, 5th, 6th, 7th and 9th largest exporters of iron and steel in 2020 (WTO, 2022). Also, Korinek and Ramdoo (2017) in a report published by the OECD reveal that South Africa is rich in platinum and coal, ranking as the world's largest producer of platinum, and a major coal exporter. Additionally, Indonesia, Mexico and India possess vast agricultural wealth, ranking as the 6th, 8th and 9th largest exporters of agricultural products, respectively (WTO, 2022). Likewise, Nigeria's natural gas reserves is the largest in Africa, with the country ranking as the 5th largest exporter of liquefied natural gas (LNG) in 2018 (EIA, 2020). Also, Brazil and Russia are rich in petroleum products, with both countries respectively ranking 8th and 3rd largest producers of petroleum and other liquid fuels in the world (see, for example EIA, 2021*a*,*b*; WTO, 2022). This research identifies BRIS and MINT as commodity exporting countries following Mlachila and Ouedraogo (2017)[5], who equally identify BRIS and MINT as such, and provide

[5]Also, BRIS countries (i.e., while excluding China) have independently been identified as commodity-exporting in IMF (2015*b*), IMF (2021) and Alsadiq et al. (2021)

two criteria for identifying commodity-exporting countries: (i) the relevant countries were net exporters of a specific commodity in 1996, the base year for the United Nation's Comtrade dataset, which provides data on foreign trade; and (ii) during the base year, the relevant commodity accounted for not less than 10 percent of the country's exports.

The literature on commodity and fiscal policy shocks within emerging countries is scanty. Prior papers mostly focus on advanced economies, particularly the United States. Also, the few papers on emerging countries give less attention to BRIS and MINT and generally have a single-country focus without undertaking comparative analysis. However, the fact that BRIS provide a meaningful group of countries to analyse comparatively is underscored by the 2009 summit between Brazil, Russia, India and China (BRIC)[6] and the subsequent inclusion of South Africa in 2011, which has made this group of countries become highly integrated with each other (as well as with advanced countries), enabling them collaborate on trade and investment as well as brightening their opportunities of collectively becoming an emerging economic block which has been identified as a polycentric system of international relations (Wilson, 2015; Santiago, 2020; Mathur and Viswanathan, 2021) [7]. Similarly, the fact that MINT provide a meaningful group of countries to analyse comparatively is underscored by Durotoye (2014), OPEC (2014) and Adebayo et al. (2022) who note that MINT have the potential to form formidable economic power blocs, with precious opportunities to collaborate on economic development.

Also, the few existing studies on emerging countries often tend not to account for "hand-to-mouth" households (non-Ricardian households, henceforth), instead they generally consider only households having full access to the financial markets (Ricardian households, henceforth). As a corollary, prior papers mostly focus on the impact of commodity and fiscal policy shocks on consumption at an aggregate level, without evaluating results across distributionally diverse households. However, a common characteristic of BRIS and MINT is the presence of non-Ricardian households, as indicated by data from the World Bank's Global Financial Inclusion survey for 2017, which indicates that the share of individuals with no savings hovers around 50% for BRIS and MINT, on average. Additionally, existing studies on developing countries often focus on a closed economy as well as consider a single private sector, while ignoring the commodity sector.

The contributions of this study are as follows: First, using a DSGE model comprising three private sectors (non-tradable, tradable manufacturing and tradable commodity sectors) as well as an external sector,

[6]Along with BRIS, this paper does not study China (and by implication, the acronym: "BRICS") because commodity production activities in the country do not satisfactorily meet the criteria provided by Mlachila and Ouedraogo (2017), as discussed. Using 2011 data obtained from various sources, Wilson (2015) shows that resources accounted for only 3.1% of China's exports. However, the corresponding percentages in Brazil, Russia, India and South Africa are 30.4%, 71.8%, 22.7% and 37.9% respectively.

[7]Santiago (2020) discusses this point in a study published by the United Nations Industrial Development Organization (UNIDO).

this paper compares across BRIS and MINT[8], the impact of negative commodity shocks on household consumption at an aggregate level. The commodity shocks are unexpected changes in the production and price of commodities.

Second, this research accounts for three fiscal policy shocks, namely transfers, tax and debt shocks. While this study examines negative tax shocks, positive transfer and debt shocks are considered. Hence, three potentially expansionary fiscal policy shocks [9] are examined in the aftermath of the commodity shock. It is equally noteworthy that positive transfer shocks and positive debt shocks are respectively captured as sudden increases in government transfers and debts within the countries under study. Meanwhile, a negative tax shock is defined as an unanticipated fall in taxes within the countries under study. These shocks are reflected by the unanticipated rise in public transfers and debts as well as unexpected tax cuts witnessed in the wake of the Covid-19 pandemic across almost all countries as noted by the World Bank (2022). More specifically, this paper assesses the impact of these shocks on household consumption during negative commodity shocks. To my knowledge, this present paper is the first to conduct a comparative analysis across BRIS and MINT on the impact of commodity and fiscal policy shocks on household consumption.

Third, this study considers two distributionally diverse households: households that have full access to the financial markets (Ricardian households, henceforth) and households that do not (non-Ricardian households, henceforth).[10] Thereafter, the results are compared across BRIS and MINT. This contribution makes it possible to determine whether the commodity and fiscal policy shocks benefit or hurt one household more than the other.

Fourth, this paper examines how the consumption of domestic and foreign goods compare in the aftermath of the commodity and fiscal policy shocks, and subsequently compares results across BRIS and MINT. Again, this contribution allows for the determination of the category of goods that are more impacted by the commodity and fiscal policy shocks.

[8]In terms of fiscal policy and consumption Gini index, BRIS and MINT exhibit slightly different characteristics. Over the period 2003-2019, the average shares of tax, transfers, and debt within the GDP for BRIS was 23%, 5.9% and 48.3% respectively. Conversely, in MINT, these shares stood at 12%, 2.4% and 33.9% respectively. Furthermore, the average consumption Gini index in 2015 was 48 for BRIS, whereas it was 43 for MINT. Given these differences between BRIS and MINT, this study also compares results between these two groups of countries. Specifically while analysing the findings obtained for MINT, comparisons are consistently made with BRIS. A separate sub-section is also dedicated to rationalizing the results obtained (in light of existing realities within BRIS and MINT), and in this section, further comparisons are made between the findings for BRIS and MINT.

[9]The implementation of counter-cyclical expansionary fiscal policies in BRIS and MINT could be realized through the effective operation of automatic stabilizers, particularly during periods of economic growth. These stabilizers would imply increased tax revenues and reduced government spending during economic booms. Consequently, the resulting savings in tax revenue and reduced expenditures would create fiscal space for policymakers in BRIS and MINT to implement counter-cyclical expansionary fiscal policies, (which represent the focus of investigation in this study) in response to a recessionary commodity shock. Notably, supporting the feasibility of such countercyclical expansionary fiscal policies, Celasun et al. (2015), in a study published by the IMF in 2015, highlight the increasing adoption of less pro-cyclical fiscal policies by Brazil and Mexico.

[10]It is noteworthy that the shocks imposed on commodity price, commodity output, transfers, tax and debt are reflected in the error terms of the equations provided for each of these variables. Additionally, the standard error imposed on the error term is set to 0.1, thus implying a 10% shock. Further details are provided in Section 3.3.

For clarity, this paper defines a negative commodity production shock as an unanticipated drop in each country's commodity output (i.e., commodity exports), which could potentially be accompanied by recessionary impacts. Also, it is not assumed that the negative commodity production shock would necessarily be accompanied by any significant rise in prices, and thus be to the advantage of the commodity exporting country, as the commodity production shock occurs under circumstances such as one in which the relevant country is not large enough to influence prices in the global market. The commodity production decline may simply be due to a fall in demand or due to an internal crisis preventing the relevant country from reaching its potential commodity output production. In this regard, a case in point could be the nosedive in demand for oil which precipitated oil production declines during the 2008 global financial crisis (ECB, 2012). Another example can be seen in Nigeria's incessant inability to meet its oil production quota, as stipulated by the Organization of the Petroleum Exporting Countries (OPEC), due to oil theft and oil pipeline vandalism orchestrated by armed militants in the country (see, Gboyega et al., 2011; KPMG, 2022). The two examples cited involve a commodity export decline that is unaccompanied by a rise in prices. Similarly, a negative commodity price shock is identified as an unexpected decline in the average price at which the relevant country can export its primary commodities within the international market. In this regard, we can think of the 2014-2015 crash in the price of oil and other commodities. Between mid-2014 and early 2015, global commodity prices plummeted by 38% with price expectations for all nine of World Bank's commodity price indices falling (Saggu and Anukoonwattaka, 2015; Alsadiq et al., 2021). Likewise, the crude oil price slump witnessed during the global financial crisis represents another historic economic predicament which exemplifies the intended definition of commodity price shock within this current study. Due to the financial crisis, the demand for oil nose-dived, thereby precipitating a 70% drop in oil prices between mid-2008 and early 2009 (ECB, 2012). While commodity exporting countries may be unfavourably impacted by such a price decline, their commodity-importing counterparts may find the decline advantageous. However, the latter subject (i.e., potential gains to commodity importers) lies outside the scope of this research, which instead focuses on the commodity-exporting sectors of the countries under study. Equally notable is the fact that aggregate output within commodity sectors are considered as opposed to specific commodities within the sector.

This research finds that aggregate consumption drops across BRIS and MINT, in the aftermath of commodity production and price shocks, with the reductions being highest in Russia within BRIS, while the drop obtained for Nigeria is greater than that of Russia as well as the rest of MINT. Upon examining household-specific effects of the shock, this paper equally finds that, throughout BRIS and MINT, both Ricardian and non-Ricardian households cut consumption as a result of the commodity shocks, with the consumption decline of the former generally being most severe in Russia and Nigeria, and the latter in

South Africa and Indonesia within BRIS and MINT respectively. Nonetheless, the specific household that experiences greater consumption reduction varies by country as well as commodity shocks. Although positive transfer shocks often tend not to be persistent (similar to tax shocks), they however raise aggregate consumption across BRIS and MINT. Also, positive transfer shocks are crucial in facilitating a redistribution pattern which, while associated with a fall in consumption for Ricardian households, results in a rise in consumption for their poor non-Ricardian counterparts, thereby reducing the consumption ratio between the former and the latter, with the reduction in BRIS being most prominent in South Africa and least in India, meanwhile, it is most pronounced in Nigeria within MINT as well as for both groups of countries. Similarly, this research finds that negative tax shocks and positive debt shocks within BRIS and MINT mostly benefit Ricardian households while impacting adversely on their non-Ricardian counterparts, thereby increasing the consumption ratio between the two types of households. This is consistently the case for all of the countries under study, excluding South Africa. Likewise, the commodity shocks lower consumption expenditure on domestic and foreign goods, both at an aggregate level as well as for each household, with the decrease in foreign goods consumption being larger than the domestic ones. Once again, the finding obtained for South Africa is the only exception in this respect. Further, the findings for MINT are frequently consistent with BRIS. However, following the negative shock to commodity output and prices, the immediate drop in aggregate consumption as well as Ricardian and non-Ricardian consumption in MINTs tends to be larger, on average, compared to BRIS.

The rest of this paper is organized as follows: Section 3.2 reviews the related literature. Sections 3.3 and 3.4 outline the methodology. Section 3.5 presents the results. Section 3.6 summarizes and concludes.

3.2 Related Literature

Most of the studies examining the response of consumption expenditure to supply[11] and fiscal policy shocks have focused on advanced economies, particularly, the United States.

Based on the methods adopted, papers examining the response[12] of consumption to supply shocks may be classified into two broad categories. The first group of studies, which have been applied mostly to advanced countries, employ Vector Autoregressive (VAR) models in computing the orthogonalized impulse response of consumption to supply shocks, and the order in which variables are introduced into the VAR system determines their contemporaneous relationship. However, due to the limited capacity

[11] The studies I review are not limited to those that examine commodity shocks. Instead, I broaden the scope of the literature review by evaluating related papers, notably those that investigate not only commodity shocks but also other supply shocks.

[12] Papers are identified as having researched supply shocks if they examine shocks that could potentially result in a change in the supply and/or prices of goods and services (see, for example, Blinder and Rudd, 2013). Going by this, most papers examine recessionary shocks, technology shocks and price shocks.

of the VAR approach to account for heterogenous households (particularly non-Ricardian households), a second category of studies have adopted the simulation and estimation of Dynamic Stochastic General Equilibrium (DSGE) models, in which the impacts of supply shocks are estimated simultaneously, without any assumptions being made about how they influence consumption. While some of these studies are still based on representative households, more recent ones take heterogeneous agents into account, making them more suitable for studying consumption disparity issues. Nonetheless, the literature presents inconclusive findings regarding the response of consumption expenditure to supply shocks. For example, Kormilitsina (2016) adopt a VAR model and demonstrate that technology shocks have been found to exhibit positive impacts on consumption within the United States. Meanwhile, Furlanetto and Seneca (2012) find that a positive technology shock leads to a decline in consumption for poorer households (who live “hand to mouth”) and a rise for optimizing households. Also, McManus (2013)[13] shows that following recessionary shocks, credit constrained households tend to be adversely impacted, with rich households gaining at the expense of their poor counterparts through welfare redistributions from the latter to the former. Likewise, in a model calibrated for OECD countries such as Norway and the United States, Alberola and Benigno (2017) demonstrate that commodity price booms result in a rise in real income, thereby generating a spending effect which in turn results in increased consumer spending on both traded and non-traded goods.

As regards studies investigating the impact of fiscal policy on consumption, most papers tend to focus on government spending, while comparatively fewer studies examine public transfer, tax and debt. Most studies adopt the DSGE method, with relatively fewer employing the VAR approach, largely in studies examining advanced countries. Also, there exists a few other papers[14], focusing on developing countries, which have adopted fixed effects as well as difference-in-difference methods towards investigating the response of consumption to the contemporaneous effects of fiscal policy variables. A growing number of studies conclude that government transfer shocks boost consumer spending (see, for example, Forni et al., 2009; Rodríguez, 2018). Also, as regards papers analysing tax shocks, some of these studies find that lowering labour and consumption income tax tends to stimulate consumption (see, for example, Forni et al., 2009). Likewise, Shaheen (2019)[15], employs time-varying parameter vector autoregression (TVP-VAR) and demonstrates that consumption declines following a positive tax shock, mirroring the findings of Forni et al. (2009), as well as echoing those of Hayashida et al. (2017) and Hayashida et al. (2022) who employ DSGE methods. In contrast, Alves (2018) shows that a positive tax shock tends to impact consumption positively. However, Chu (2022) reaches a less straightforward finding, suggesting that a wage income

[13]The models employed in Furlanetto and Seneca (2012) and McManus (2013) are calibrated following closely that of Galí et al. (2007), who calibrate their model for the United States.

[14]Examples of such papers are provided in Table 3.1, the findings of papers examining developing countries are presented.

[15]Khan and Reza (2013), Rodríguez (2018) and Shaheen (2019) adopt the VAR methodology while other papers employ DSGE methods.

tax cut tends to lower consumption inequality for non-durable products, but increases same for durable goods. Moving on to the papers that consider debt shocks, Philippopoulos et al. (2017), in a New Keynesian DSGE model for two countries in a monetary union (such as Germany and Italy) demonstrate that both countries will experience welfare gains following an exogenous reduction in public debt. Meanwhile, Ferrara and Tirelli (2014) and Ferrara and Tirelli (2017), in a DSGE model simulated for the Euro Area, show that the low-income group tends to experience a rise in consumption when a debt consolidation programme is implemented through a reduction in public consumption along with targeted transfers or tax reductions. Turning to the studies that examine government spending shocks, this category of fiscal policy shocks has been found to exhibit mixed impacts on consumption for the United States as well as countries within the Euro Area. While some studies find evidence that government spending shocks have a positive impact on consumption (see, for example, Ercolani, 2007; Khan and Reza, 2013; Albonico et al., 2016; Palas, 2017; Rodríguez, 2018), other studies conclude that government spending shocks do not crowd in consumption expenditure (for example, Horvath, 2008; Ratto et al., 2009; Shaheen, 2019; Lorusso and Pieroni, 2019). Also, Coenen and Straub (2004) in a Bayesian DSGE estimation for the Euro Area, arrive at a less straightforward finding, which suggests that the presence of "hand-to-mouth" households amplifies the positive impacts of government spending shocks on consumption; however, the likelihood of aggregate consumption rising tends to be marginal due to the small share of "hand-to-mouth" households estimated for the Euro area as well as the high negative wealth effects associated with tax hikes required to fund government spending. Similar to Coenen and Straub (2004), a more nuanced conclusion is reported by Asimakopoulos et al. (2021) who analyse the effects of a government expenditure shocks within the United States and reveal that the ultimate impact of the shock on consumption depends on the productivity of the shock; while productive spending shocks boost consumption, the same is not true for unproductive shocks. As yet another less direct finding, Mayer et al. (2010) and Varthalitis (2019) demonstrate that a positive government spending shock leads to a drop in consumption for optimizing households and a rise for poorer households - in reverse of the findings of Furlanetto and Seneca (2012) for technology shocks.

It is noteworthy that the literature features some studies that show that government spending shocks enhance consumption in the presence of complementarity between public spending and private consumption (see, for example, Ercolani, 2007; Jacquinot et al., 2014; Fève and Sahuc, 2017). Conversely however, Aloui and Eyquem (2019) show that government spending could crowd out private consumption, albeit, not too considerably, even in the presence of complementarity between both. As evidenced thus far, the findings of existing papers on developed countries are mixed. The rest of this section focuses on studies that have examined emerging countries. Table 3.1 reports 18 such studies.

Table (3.1) Related Studies

Study	Methodology	Geographical and Time Coverage	Shock and/or Variable of Interest	Objectives and Findings
Ojeda-Joya et al. (2016)	Simulation and Bayesian DSGE Estimation	Colombia (Quarterly Data: 1996Q1 – 2011Q4)	Productivity shock (boom) in the commodity sector under alternative fiscal rules	Ricardian consumers see large welfare losses in the aftermath of countercyclical fiscal rules, whereas non-Ricardian consumers benefit from same.
Takyi and Leon-Gonzalez (2020)	Bayesian DSGE Estimation	Ghana (Quarterly Data: 1985Q1–2017Q4)	Government spending as well as consumption and labour income tax	Under flexible wage dynamics, government spending shocks boost consumption. However, the shock crowds out consumption when wages are sticky. Also, positive consumption and labour income tax shocks reduce consumption for both financially excluded and included households, with the reduction being greater for the former.
González et al. (2014)	DSGE Simulation	Calibrated for Colombia	Oil price shock under different fiscal rules	If Colombia adopts a Structural Surplus Rule towards saving oil earnings, (as opposed to procyclical rules during booms), non-Ricardian households would be able to smooth consumption.
Evans et al. (2019)	Bayesian DSGE Estimation	Nigeria (Annual Data: 1981-2017)	Government spending, transfers, public investment, consumption, capital and labour income tax.	Although government spending and transfers positively impact poor and rich households, the positive impacts are greater for the former; and the same is true for consumption, capital and labour income taxes. Meanwhile, rich households benefit more from public investments.
Lacina and Mthuli (2022)	DSGE Simulation	Ghana	Government investment spending	Government investment spending raises household income thereby leading to a wealth effect, which in turn results in an increase in household's private consumption.
Bazzi et al. (2015)	Difference-In-Difference Specification	Indonesia (2005–2007)	Unconditional cash transfer	Following a sudden negative change in (the timing of) cash transfers, households cut down on consumption. Each person loses about USD 1.35 a month owing to late disbursements.

Table (3.1) Continued: Related Studies

Study	Methodology	Geographical and Time Coverage	Shock and/or Variable of Interest	Objectives and Findings
El-Khalifi et al. (2022)	DSGE Simulation	Calibrated for Morocco	A variety of fiscal policy variables including: consumption tax, employer's social security contributions, labour income payroll tax, capital income tax , transfers, public investment and government consumption	Total welfare rises when public investment and transfers increase as well as when government consumption falls. With the exception of capital income tax, an increase in tax rates generally enhances overall welfare, measured by households' utility. Nonetheless, active households typically experience a welfare decline even with such welfare improvements.
Sennoga and Balma (2022)	DSGE Simulation	Calibrated for Africa	COVID-19 pandemic (modelled as a supply shock)	In the absence of corrective measures, the COVID-19 pandemic decreases consumption for savers and non-savers, with the decrease being more acute for the former.
Pontes (2021)	DSGE Simulation	Calibrated for Brazil	COVID-19 pandemic (modelled as a supply shock)	A supply shock, such as the Covid-19 outbreak causes a drop in consumption for both Ricardian and non-Ricardian households.
Andreyev (2020)	Bayesian DSGE Estimation	Russia (Quarterly data: 2006-2016)	Oil price shock	An oil price shock leads to a rise in export revenues, thereby increasing income, which in turn boosts household consumption (although non-Ricardian households are not considered).
Liu and Ou (2019)	Bayesian DSGE Estimation	China (Quarterly data: 2004Q1 and 2016Q4)	Government spending shock	Housing consumption drops in the aftermath of a government spending shock, with the shock exhibiting no notable impact on housing prices.
Bambale and Funtua (2019)	DSGE Simulation	Calibrated for Nigeria	Shocks on government investment, transfers and public consumption	Although households' consumption responds positively to government investment, transfers and public consumption, however, the highest positive effects in the short run arise from government transfers followed by government investment, while government consumption is associated with the least positive impact on households' consumption.

Table (3.1) Continued: Related Studies

Study	Methodology	Geographical and Time Coverage	Shock and/or Variable of Interest	Objectives and Findings
Nana Davies (2020)	Bayesian DSGE Estimation	Cameroon (Annual data: 1979 – 2016)	Government spending shock	In the presence of Ricardian and non-Ricardian agents, consumption rises in response to a government spending shock, with the consumption of both agents initially rising above the non-stochastic steady state level.
Kitano and Takaku (2021)	DSGE Simulation	Calibrated for: Azerbaijan, Indonesia, Kazakhstan, Malaysia, Mongolia	Commodity price shock	Both consumption and investment rise in the aftermath of a positive commodity price shock, subsequently resulting in a negative trade balance.
Zhang et al. (2022)	Bayesian DSGE	China (Quarterly data: 1996 – 2019)	Oil price shock and productivity shock	Households witness a drop in consumption when there exist persistent upward movements in oil prices. Nonetheless, consumption rises in the aftermath of positive productivity shocks
Herrera (2008)	Fixed effects panel regression	Panel of developed and developing countries (Annual data: 1960 – 2005)	Public expenditure	Consumption volatility rises as public expenditure increases.
Skoufias et al. (2008)	Difference-In-Difference Estimator	Mexico (2003 and 2004)	Monthly in-kind and cash transfers	Food consumption as well as overall consumption rise in response to monthly in-kind and cash transfers within two years of disbursement
Angelucci et al. (2012)	Difference-In-Difference Approach	Mexico (Uses data collected in 2004 on households observed in 2002 and 2003 surveys)	Conditional cash transfer programme	The conditional cash transfer programme is associated with increased consumption of durable and non-durable goods

Table 3.1 reports the findings of 18 empirical studies regarding the response of consumption expenditure to supply and fiscal policy shocks. The studies cover a time period from 1960 to 2019, overall. The studies generally have a single country focus, with only two exceptions, the first being Sennoga and Balma (2022) who conduct a DSGE simulation using calibrated values derived from data averages for African countries. The second is Kitano and Takaku (2021), who equally simulate a DSGE model using calibrations derived from the data averages for five developing countries. As such, both studies, (similar to those with a single country focus), do not conduct a comparative analysis (across the countries in their sample), such as this present study. Also, DSGE simulation tends to be the most common method utilized (as employed by fourteen of the papers). As regards findings, the studies arrive at mixed results. While some studies show that supply and fiscal policy shocks boost consumption, others reveal they do not. More importantly, the literature review above, reveals that only a handful of papers consider any of the BRIS or MINT countries.

Perhaps, the research papers that come closest to this current study are those of Ojeda-Joya et al. (2016) and Takyi and Leon-Gonzalez (2020). This present research however differs from that of Ojeda-Joya et al. (2016) in four key aspects. First, the research question addressed in Ojeda-Joya et al. (2016) is different from that of this present study. While Ojeda-Joya et al. (2016) examine how different fiscal rules on public transfers impact heterogeneous households during commodity price shocks in Colombia, this present paper investigates the effects of commodity and fiscal policy shocks on heterogeneous households across BRIS and MINT. Second, this current study analyses the distributional impacts for tax and debt shocks, meanwhile, Ojeda-Joya et al. (2016) do not account for both. Third, unlike the present research, Ojeda-Joya et al. (2016) focus on commodity productivity shock without giving any consideration to commodity price shocks. Fourth, in a bid to compare consumption expenditure changes across households, this present study examines the impact of the commodity and fiscal policy shocks on households' consumption, as well as the consumption ratio between Ricardian and non-Ricardian households. Ojeda-Joya et al. (2016) however do not consider the consumption ratio between both households.

Similarly, there exist three fundamental differences between the present study and that of Takyi and Leon-Gonzalez (2020). First, unlike the current research, Takyi and Leon-Gonzalez (2020) do not investigate the impact of any commodity shocks, they instead examine the effects of fiscal policy shocks on consumption spending within heterogeneous households in Ghana. Second, Takyi and Leon-Gonzalez (2020) do not consider the effects of the fiscal policy shocks on the consumption ratio between Ricardian and non-Ricardian households. This present study, on the other hand, accounts for the consumption ratio between both households, thus providing a more comprehensive understanding of the impact of these shocks on households in middle-income countries. Third, unlike this current research, Takyi and Leon-Gonzalez (2020) do not exmine public transfers and debt shocks among their fiscal policy shocks.

3.3 Method and Data

This study adopts the Bayesian DSGE model of Ojeda-Joya et al. (2016) in comparing the consumption effects of commodity and fiscal policy shocks, in BRIS and MINT over the period 2003Q2–2020Q4[16]

The model is an extended version of the model adopted by Acosta et al. (2009). Specifically, the model of Ojeda-Joya et al. (2016) improves upon that of Acosta et al. (2009) in three key aspects. First, while Acosta et al. (2009) account for two sectors – households and firms – Ojeda-Joya et al. (2016), account for three sectors, by introducing the government. Second, in capturing the firm sector, Acosta et al. (2009), only consider non-tradable and tradable manufacturing sectors. While accounting for both sectors, Ojeda-Joya et al. (2016) go further to account for the tradable commodity sector. Third, Ojeda-Joya et al. (2016) account for the presence of two households in the economy: Ricardian households, who have access to financial assets, and non-Ricardian households who do not.

The equations associated with households, firms, fiscal authorities, aggregations as well as the external sector are provided below.

3.3.1 Households

Households are broadly classified into two: Ricardian and non-Ricardian. Ricardian (R) households, who account for a fraction z of all households, have access to the labour market and the financial market, where they purchase government debt bonds as well as company shares for the next period. Hence, Ricardian households earn income from the labour market as well as the financial market. On the other hand, $1 - z$ of all households are non-Ricardian (NR). While they possess access to the labour market, the same is not true for the financial market. Accordingly, non-Ricardian (NR) households earn their entire income from the labor market alone.

Utility function

For time period t, a household's utility is reflected by its Cobb-Douglas preferences on the consumption index C_t and work effort L_t.

$$u(C_t^h, L_t^h) = \frac{[(C_t^h)^{(1-\omega)} - (1 - L_t^h)^{\omega}]^{1-\gamma} - 1}{1 - \gamma} \tag{3.1}$$

[16]I adopt the timeframe such that each variable has the same number of observations across all countries under study. As a corollary, the timeframe available for the country with the least number of observations would necessary determine the time-frame for the rest of the countries under study. Specifically, the country with the least number of observations was Russia, with data spanning from 2003Q2 to 2020Q4, the same timeframe adopted across all countries in this research.

In equation (3.1), h represents Ricardian (R) and non-Ricardian (NR) households; while ω denotes the weight of leisure, and takes the values of zero or one. Likewise, the inverse of the intertemporal elasticity of substitution is captured by γ, and assumed to be greater than zero. C is the consumption index, comprising non-tradable (C_N^h) and tradable goods (C_T^h). Tradable goods consumed by households comprise locally produced manufactures (C_M^h) as well as imports (C_F^h).

While commodities are also produced within the tradable sector, they are not factored into households' tradable consumption as all locally produced commodities are assumed to be exported. Households maximize:

$$E_o \left\{ \sum_{t=0}^{\infty} exp[\sum_{\tau=0}^{t-1} \beta_\tau] u(C_t^h, L_h^t) \right\} \tag{3.2}$$

where the intertemporal discount factor is captured by $\beta_t = -\kappa log(1 + C_t^{(1-\omega)}(1 - L_t)^{\omega})$; and is determined endogenously towards enabling the existence of a stable solution to the model as demonstrated by Schmitt-Grohé and Uribe (2003).

Budget Constraint

Both Ricardian and non-Ricardian households share identical utility functions, however, the same is not the case for their budget constraints.

Ricardian Households

Ricardian households have the budget constraint provided in equation (3.3):

$$P_t C_t^R + \nu_{M,t}\chi_{M,t+1} + \nu_{E,t}\chi_{E,t+1} \leq (\nu_{M,t} + d_{M,t})\chi_{M,t} + (\nu_{E,t} + d_{E,t})\chi_{E,t} + w_t L_t^R - B_t + \frac{1}{1+r} B_{t+1} + Tr_t \tag{3.3}$$

The consumer price index is denoted by P_t and accounts for the prices prevailing in the tradable ($P_{CT,t}$) and non-tradable ($P_{N,t}$) sectors. Both $\chi_{M,t+1}$ and $\chi_{E,t+1}$ respectively, account for households' purchases of shares in manufacturing and commodity firms during time period t. These shares are priced at $\nu_{M,t}$ and $\nu_{E,t}$ per unit, and pay dividends of $d_{M,t}$ and $d_{E,t}$ per share, respectively. Wage, represented by w_t, is paid in units of the goods manufactured. B_t representing risk-free bonds, is employed in conducting international financial transactions. In this context, r represents the international interest rate, which is assumed to be constant. Transfers provided to households by the government are denoted by Tr_t.

Non-Ricardian Households

The budget constraint facing non-Ricardian households is given as:

$$P_t C_t^{NR} = W_t L_t^{NR} + Tr_t \tag{3.4}$$

3.3.2 Firms

Firms operate in perfectly competitive markets and belong to either the tradable or non-tradable sector (N). The tradable sector comprises two sub-sectors: tradable manufacturing (M), and tradable commodity sector (E). Firms in the non-tradable sector are assumed to rely only on labour for production.

In the tradable sector, capital accumulation is given as: $K_{j,t+1} - K_{j,t} = I_{j,t} - \delta_j K_{j,t}$ where, j captures the specific tradable sector, (i.e., either the tradable manufacturing (M) sector or the tradable commodity (E) sector). Also, capital, investment and depreciation rate are respectively denoted as: K, I and δ. It is assumed that no expenses are involved in converting a manufacturing good to a domestic investment good. Installation costs defined as $\frac{\phi_j}{2}\left(\frac{I_{j,t}}{K_{j,t}} - \delta_j\right)^2 K_{j,t}$, are incurred on capital, with the costs assumed to be proportional to the capital stock. Wages across sectors are uniform as workers can move freely between sectors. The aggregation of labour employment across sectors yields the overall labour demand.

Tradable commodity sector

It is assumed that all investment $(I_{E,t})$ in this sector come from abroad $(I_{EF,t})$. Also, the production function of tradable commodity firms: $Y_{E,t}$ is given as: $Y_{E,t} = exp(a_{E,t})K_{E,t}^{\alpha_e}L_{E,t}^{1-\alpha_e}$, where $a_{E,t}$ is an exogenous stochastic process associated with productivity, and is defined as $a_{E,t} = \overline{a}_E + \varrho_e a_{E,t-1} + \varepsilon_{e,t}$, with $\varepsilon_{e,t}$ being white noise[17]. P_E captures commodity prices. Also, output produced is assumed to be taxed at a rate of τ_e. Similar to the tradable manufacturing sector, the present value of dividends is maximized within the tradable commodity sector, as provided below:

$$E_t \sum_{s=t}^{\infty} exp(\beta_s^{s-t}) \left(\frac{\lambda_{C,t+1}}{\lambda_{C,t}} \frac{P_t}{P_s}\right) d_{E,t} \tag{3.5}$$

$$d_{E,t} = (1-\tau_e)P_{E,S}Y_{E,S} - P_{F,S}\left(I_{E,S} + \frac{\phi_e}{2}\left(\frac{I_{E,S}}{K_{E,S}} - \delta_e\right)^2 K_{E,S}\right) - w_S L_{E,S} \tag{3.6}$$

[17]Shocks are captured by the error terms of the equations specified for each of the impulse variables. Further, the standard errors of the error terms are fixed at 0.1, representing a 10% shock.

As this paper does not examine the response of consumption to shocks in the tradable manufacturing and non-tradable sectors, less details are provided regarding both sectors. Nonetheless, it is noteworthy that the production function of the tradable manufacturing firms mirrors that of the tradable commodity firms, such that, the production function of tradable manufacturing firms: $Y_{M,t}$ is given as: $Y_{M,t} = exp(a_{M,t})K_{M,t}^{\alpha_m}L_{M,t}^{1-\alpha_m}$, where $a_{M,t}$ is an exogenous stochastic process associated with productivity. Also, tradable manufacturing firms utilize domestic and imported investment goods, respectively denoted as I_H and I_{MF}, with both summing up to the overall investment good within the manufacturing sector (I_M). Likewise, the production function of non-tradable firms, $Y_{N,t}$ is given as: $Y_{N,t} = exp(a_{N,t})L_{N,t}$. Where $a_{N,t}$ is an exogenous stochastic process related to the productivity of the non-tradable sector. Goods produced in the non-tradable and tradable manufacturing sectors are equally subject to a tax rate of τ_n and τ_m.

3.3.3 Fiscal Policy

The government generates revenue (T) through taxes (τ_i) paid by firms. As such, government revenue is defined as:

$$T_t = \tau_m Y_{M,t} + \tau_n P_{N,t} Y_{N,t} + \tau_e P_{E,t} Y_{E,t} \tag{3.7}$$

Transfers (Tr) paid out of tax income, are distributed to all households, both Ricardian and non-Ricardian. Additionally, the government faces a constraint that is captured by equation (3.8):

$$B_{G,t} = B_{G,t-1}(1+r) + Tr_t - T_t \tag{3.8}$$

The government debt at the end of period t is denoted by $B_{G,t}$. Similar to Garcia et al. (2011), government transfers are determined by the fiscal rule outlined in equation (3.9):

$$Tr_t = \overline{T} - (1+r+\mu)B_{G,t-1} + \varphi(T_t - \overline{T}) + \varepsilon_{T,t} \tag{3.9}$$

where $\overline{T}$ and μ represent the government's steady-state income and targeted debt level respectively. Also, r and φ respectively capture the international interest rate and the procyclicality of transfers. Meanwhile, the white noise process in the fiscal rule is denoted by $\varepsilon_{T,t}$[18].

[18] In evaluating the impact of tax and debt shocks on consumption, the tax and debt equations are modified, one after the other, to feature white noise processes. Meanwhile, a white noise process has been included in the equation for public transfers, thus implying that the fiscal policy set-up presented above shows how transfer shocks are captured, which nonetheless, is similar to how tax and debt shocks are subsequently measured in the present study.

3.3.4 Aggregations and the foreign sector

The model accounts for two[19] key aggregations: aggregate output within the tradable manufacturing sector and aggregate output across all sectors. Within the tradable manufacturing sector, aggregate output ($Y_{M,t}$) is defined as: $Y_{M,t} = C_{M,t} + I_{M,t} + X_{M,t}$. In this specification, $X_{M,t}$ captures exported domestic manufactures and is given as: $X_{M,t} = e_t^{\xi} Y_{F,t}$, where ξ and F, t respectively represent the elasticity of exports to the real exchange rate e_t as well as world's total output less that of the domestic country. Meanwhile the exchange rate is defined as: $e_t = P_{F,t}/P_t$ where $P_{F,t}$ represents the price level of a basket of imported consumer goods and P_t, the domestic consumer price index. Also, aggregate output across all sectors (in units of manufacturing good) is given as: $Y_t = Y_{M,t} + P_{N,t}Y_{N,t} + P_{E,t}Y_{E,t}$.

As regards the foreign sector, the current account balance is defined as:

$$CA_t = -r(B_t + B_{G,t}) + X_{M,t} - P_{F,t}(C_{F,t} + I_{E,t} + I_{MF,t}) + P_{E,t}Y_{E,t} \tag{3.10}$$

3.4 Bayesian estimation and calibration

Using quarterly data spanning over the period 2003Q2 – 2020Q4, this paper adopts the Bayesian DSGE model of Ojeda-Joya et al. (2016) in comparing the consumption effects of commodity and fiscal policy shocks, in BRIS and MINT. The observable variables[20] utilized are: real GDP growth rate, inflation, investment (growth rate) and current account balance (as a percentage of the GDP). In the dataset, this research avoids missing observations and ensures the same number of observations (i.e., 71 observations) for all variables as well as for all countries under study. Data for all variables are obtained from the OECD database, with the exception of Nigeria where quarterly data are interpolated from their annual counterparts using the Chow and Lin (1971) interpolation method, based on data from the World Bank's World Development Indicators (WDI).

Table 3.2 provides the priors employed. The priors for the parameters are determined following Ojeda-Joya et al. (2016) and Acosta et al. (2009), as presented in their respective models calibrated for middle income countries similar to those considered in this present study. As such, the steady state value of employment within the manufacturing sector is calibrated as 0.2. Likewise, the weight of leisure in

[19] Aggregate output within the tradable commodity sector is not considered since all goods produced within this sector are exported. Similarly, within the non-tradable sector, it is assumed that all goods produced would be consumed, and hence, no aggregation equations are provided for this sector.

[20] In their Bayesian DSGE model, Ojeda-Joya et al. (2016) equally employ four observables: total real GDP, real exchange rate, real mining GDP and real central government debt.

the utility function (ω) is set as 0.3 Additionally, the annual rate of depreciation within the manufacturing sector (δ_m) is assumed to be 3%.

Table (3.2) Prior Distribution for Selected Parameters

No	Notation	Economic Interpretation	Distribution	Mean	SD
Structural Parameters					
1	ρ_c	Elasticity of substitution for share of non-tradable goods in total consumption	Gamma	0.4	0.2
2	γ_c	Share of non-tradable goods in total consumption	Beta	0.5	0.2
3	γ	Inverse of intertemporal elasticity of substitution	Gamma	2	0.6
4	ϕ_e	Installation cost of capital for the commodities sector	Gamma	2.2	0.8
5	ξ	Elasticity of exports to the real exchange rate	Gamma	1.1	0.6
6	γ_i	Domestic investment goods share in the manufacturing sector investment	Beta	0.5	0.2
7	ω	Weight of leisure in the utility function	Beta	0.3	0.1
8	z	Proportion of Ricardian households		0.5	0.2
9	φ	Degree of counter- or procyclicality of the government transfers	Beta	1	0.5
10	α_m	Share of capital in the Cobb–Douglas production function for the manufacturing sector	Beta	0.33	0.1

Table (3.2) Continued: Prior Distribution for Selected Parameters

No	Notation	Economic Interpretation	Distribution	Mean	SD
Structural Parameters					
11	α_e	Share of capital in the Cobb–Douglas production function for the commodities sector	Beta	0.8	0.1
12	ϱ_m	Persistence parameter for the exogenous stochastic process "$a_{M,t}$"	Beta	0.7	0.1
13	ϱ_n	Persistence parameter for the exogenous stochastic process "$a_{N,t}$"	Beta	0.7	0.1
14	ϱ_e	Persistence parameter for the exogenous stochastic process "$a_{E,t}$"	Beta	0.7	0.1
15	$\varepsilon_{e,t}$	White noise process associated with "$a_{N,t}$"	Inv. Gamma	0.1	10
16	$\varepsilon_{p,t}$	White noise process associated with price index for the commodities sector	Inv. Gamma	0.1	10
17	$\varepsilon_{T,t}$	White noise process associated with "$a_{E,t}$"	Inv. Gamma	0.1	10

Likewise, the elasticity of substitution between domestic and foreign investment (ρ_i) is calibrated as 0.2. For the manufacturing sector, the share of capital in the production function (α_m) is calibrated as 0.33; meanwhile, the corresponding parameter for the commodity sector is calibrated as 0.9. Also, the depreciation rate (δ_m) for the commodities sector is set to ensure that the steady-state real wage is uniform for all sectors. Meanwhile, installation cost of capital for the manufacturing sector (ϕ_m) is assumed to have a mean of 2.2.

Also, the steady state participation of non-tradable goods in total consumption (γ_c) is assumed to be 0.5 while the share of domestic goods in tradable consumption (γ_m) is set at 0.4. Meanwhile, the elasticity of substitution between tradable and non-tradable consumption (ρ_c) is calibrated at 0.4. Additionally, the inverse of the intertemporal elasticity of substitution (γ) is fixed at 2. Further, the prior mean for the proportion of non-Ricardian households ($1 - z$) is calibrated as 0.5.

3.5 Analysis and Results

3.5.1 Commodity and Fiscal Policy Shocks Across BRIS

Table (3.3) Posterior Distribution Estimates for Model Parameters – BRIS

		Brazil		Russia		India		South Africa	
No	Notation	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Structural Parameters									
1	ρ_c	0.948	0.067	0.500	0.068	0.966	0.074	0.083	0.028
2	γ_c	0.611	0.027	0.556	0.016	0.731	0.018	0.284	0.021
3	γ	3.416	0.202	1.570	0.090	1.350	0.240	2.260	0.237
4	ϕ_e	2.793	0.192	1.645	0.124	1.510	0.183	2.281	0.145
5	ξ	0.408	0.148	0.920	0.197	0.425	0.188	1.220	0.184
6	γ_i	0.114	0.056	0.460	0.045	0.462	0.050	0.696	0.019
7	ω	0.423	0.020	0.181	0.046	0.309	0.021	0.406	0.017
8	z	0.991	0.006	0.921	0.029	0.880	0.039	0.828	0.051
9	φ	0.712	0.181	1.337	0.172	1.334	0.129	1.796	0.106
10	α	0.311	0.008	0.279	0.023	0.363	0.023	0.270	0.008
11	α_e	0.896	0.004	0.912	0.003	0.908	0.003	0.926	0.004
12	ϱ_m	0.888	0.007	0.867	0.017	0.885	0.009	0.667	0.023
13	ϱ_n	0.995	0.001	0.991	0.003	0.992	0.003	0.990	0.003
14	ϱ_e	0.489	0.013	0.972	0.013	0.539	0.021	0.519	0.025
15	$\varepsilon_{e,t}$	0.075	0.008	0.024	0.004	0.063	0.018	0.056	0.007
16	$\varepsilon_{p,t}$	0.022	0.003	0.038	0.006	0.037	0.005	0.041	0.006
17	$\varepsilon_{T,t}$	0.043	0.013	0.053	0.020	0.041	0.011	0.051	0.019
18	$\varepsilon_{n,t}$	0.105	0.011	0.151	0.015	0.099	0.009	0.118	0.015
19	$\varepsilon_{m,t}$	0.025	0.002	0.022	0.002	0.060	0.005	0.033	0.003
Acceptance rate of MCMC		29.87%		45.5%		25.63%		29.66%	

Table 3.3 illustrates the mean and standard deviation of the posterior distribution obtained for the parameters, across BRIS, over the period 2003Q2 – 2020Q4 (i.e., 71 observations).

Posterior Estimates

Across BRIS, there exists significant heterogeneity for the estimates associated with the share of non-tradable goods in consumption. Interestingly, the parameter is estimated to range from 0.284 in South Africa, through 0.556 and 0.611 in Russia and Brazil respectively, to 0.731 in India. Also, the elasticity of substitution associated with the share of non-tradable goods in consumption reveals further heterogeneity. At 0.966 and 0.948, India and Brazil respectively have the highest elasticity of substitution estimates; while Russia and South Africa have estimates of 0.5 and 0.083, respectively. Also, the parameter estimates for capital output ratio within the manufacturing sector are reasonably comparable across BRIS, ranging between 0.3 and 0.4. The same is true for the capital output ratio associated with the commodity sector, estimated at about 0.9 for BRIS. Likewise, the estimate associated with the inverse of intertemporal elasticity of substitution parameter is estimated at 3.416 and 2.26 for Brazil and South Africa. However, the parameter estimate is found to be 1.57 in Russia and 1.35 in India.

As regards the parameter associated with the degree to which transfers are procyclical, the highest estimate is obtained for South Africa at 1.796; followed by Russia and India with estimates of 1.337 and 1.334 respectively, indicating greater procyclicality of government transfers as compared to Brazil, where the estimate is lowest, at 0.712, but nonetheless, consistent with the analogous estimate for Colombia given in Ojeda-Joya et al. (2016), which is 0.81. These results represent another important illustration of heterogeneity observed for BRIS. Similarly, the elasticity of exports to real exchange rate is estimated to be relatively higher in South Africa (1.22) and Russia (0.92) by comparison with Brazil (0.408) and India (at 0.425). At 0.32, the equivalent estimate in the case of Colombia (as documented in Ojeda-Joya et al., 2016), lies closer to the results for Brazil and India. Meanwhile, capital installation cost within the commodities sector is relatively similar across the countries examined, tightly clustered between 2 and 3. Interestingly, in Ojeda-Joya et al. (2016), the estimate obtained for capital installation cost within Colombia's commodities sector is 2.85, similar to the findings of this paper. With respect to the estimated share of domestic investment in manufacturing sector investment, South Africa comes first, with 0.696, followed by India and Russia, at 0.46, and Brazil, at 0.114. Meanwhile, the analogous estimate obtained for Colombia in Ojeda-Joya et al. (2016) is 0.55, relatively similar to the estimates obtained for Russia, India and South Africa.

Shock Process Parameters

The mean estimate for the standard deviation of the shock associated with the production function of the commodity sector ranges from 0.024 in Russia, through 0.06 in India and South Africa, to 0.075 in Brazil – however these values are less than the analogous estimate of 0.09 in Colombia reported in Ojeda-Joya et al. (2016). Likewise, the estimated means of the standard deviation associated with government transfer shocks are tightly clustered between 0.04 and 0.05, below the corresponding estimate of 0.1 which Ojeda-Joya et al. (2016) document for Colombia. At 0.151, Russia records the highest mean estimate for the standard deviation of production shocks within the non-tradable sector; translating to about five times the corresponding estimate for Colombia, provided by Ojeda-Joya et al. (2016). Meanwhile, the analogous estimate for the manufacturing sector is highest in India, at 0.059, almost thrice that of Colombia as reported in Ojeda-Joya et al. (2016). However, across BRIS, the mean estimate for the standard deviation of commodity price shocks is tightly clustered between 0.02 and 0.04, similar to the estimate of 0.03, which Ojeda-Joya et al. (2016) obtain for Colombia.

Basic Statistics Obtained from the MH-MCMC Bayesian Estimation

In Table 3.3, the acceptance rate of the Markov Chain is provided. As several studies within the Bayesian estimation literature recommend the acceptance rate ranges between 20% and 50%[21], the acceptance rates presented in Table 3.3 are reliable.

Baseline impulse response analysis

In this section, this paper examines the impacts of commodity and fiscal policy shocks on aggregate consumption as well as the consumption of Ricardian and non-Ricardian households within BRIS.

a) Commodity Production shock and Consumption

Figures 3.3-3.5 reveal the impact of a commodity production shock on aggregate consumption as well as the consumption of Ricardian and non-Ricardian households within BRIS. [22] All variables are expressed in terms of their percentage deviation from their steady-state.

In the aftermath of a commodity production shock, aggregate consumption drops on impact for BRIS. The decline is highest in Russia (1.259%) and lowest in Brazil (0.180%), while India and South Africa fall in between (at 0.518% and 0.443% respectively). Also, across all countries, a commodity production shock reduces consumption for both households. This result mirrors that of Ojeda-Joya et al. (2016) who show that Ricardian and non-Ricardian households in Colombia witness a consumption rise during a positive

[21] See, for example Koop and Tobias (2006) as well as Herbst and Schorfheide (2015).

[22] A summary of the main results have also been provided in Tables 3.5-3.6 and Appendix Tables C.31-C.36.

commodity production shock. On impact, the decline in Ricardian consumption varies from 0.177% in Brazil, through 0.318% and 0.49% in South Africa and India respectively, to 1.317% in Russia; where Ricardian consumption becomes lowest in the thirty second quarter at 2.64%. Compared to their Ricardian counterparts, the non-Ricardian households experience greater decline in consumption for BRIS, except Russia. Specifically, non-Ricardian households in South Africa and India witness the highest consumption decline on impact, at 1.037% and 0.729% respectively. Meanwhile, non-Ricardian consumers in Russia and Brazil witness, on impact, a consumption decline of 0.646% and 0.577%, respectively. Relative to their counterparts in Russia, India and South Africa, the Ricardian and non-Ricardian households in Brazil thus experience relatively lower consumption decline. In Brazil, South Africa and India, the decline in consumption is relatively higher for non-Ricardian households (compared to their Ricardian counterparts) with the immediate decrease in non-Ricardian consumption being thrice more than that of Ricardian consumption in Brazil and South Africa and one and a half times in India. As regards Russia, the negative impact of the shock exhibits a comparatively greater reduction in Ricardian households' consumption (compared to non-Ricardian households), with the decrease in Ricardian consumption, on impact, being twice that of non-Ricardian ones.

b) Commodity Price shock and Consumption

Figures 3.6-3.8 present impulse responses showing the impact of a commodity price shock on consumption at an aggregate level as well as for both households within BRIS.

Across BRIS, household consumption declines immediately after the commodity price shock. Again, the decline is highest in Russia (0.971%) and lowest in Brazil (0.272%), while South Africa and India fall in between (at 0.799% and 0.683% respectively). Similar to the results obtained for commodity production shocks, both households equally experience a decrease in consumption following the shock. The immediate consumption decline for Ricardian households is lowest in Brazil, at 0.272% but highest in Russia, at 0.989%; while the percentages fall in between for India and South Africa at 0.698% and 0.766%, respectively. On impact, the consumption decline for non-Ricardian households ranges from 0.303% in Brazil, through 0.575% and 0.776% in India and Russia, respectively, to 0.955% in South Africa, where non-Ricardian consumption, in the eight quarter, drops further to 1.5% at its trough. Again, the consumption decline among Brazilian households, both Ricardian and non-Ricardian, is much less in comparison to Russia, India and South Africa. Meanwhile, South Africa's Ricardian and non-Ricardian consumers are most impacted by the commodity price shock. As before, the decline in consumption is relatively higher for non-Ricardian households (compared to their Ricardian counterparts) in Brazil and South Africa. However, in Russia and India, the negative impact of the shock exhibits a comparatively greater reduction in Ricardian households' consumption (compared to non-Ricardian households), with the immediate decrease in Ricardian consumption being almost one and a half times that of non-Ricardian ones.

c) Government Transfer Shock and Consumption

Appendix Figures C.41–C.43 show the effect of the government transfer shock on aggregate consumption as well as the consumption of Ricardian and non-Ricardian households within BRIS. Following the transfer shock, aggregate consumption rises on impact for BRIS. The rise varies from 0.244% in South Africa, through 0.038% and 0.008% in India and Russia respectively, to 0.002% in Brazil. It however, is noteworthy that the transfer shocks occasionally tend not to be persistent, sometimes fading away after the first quarter. Also, on impact, the redistribution pattern associated with the shock tends to bring about a consumption decline for Ricardian households, while resulting in a consumption rise for their non-Ricardian counterparts, thereby reducing the consumption ratio between Ricardian and non-Ricardian households (see Appendix Figure C.44). Specifically, the rise in non-Ricardian consumption, on impact, varies from 2.186% and 2.8% in India and Brazil, respectively, to 3.197% and 3.405% in Russia and South Africa, respectively. Nonetheless, the rise in non-Ricardian consumption is only witnessed as the shock occurs across BRIS. Meanwhile, Ricardian consumers in South Africa see the greatest consumption decline, on impact; at 0.359%, followed by Russia and India at 0.263% and 0.226% respectively; while the lowest consumption decline is reported in Brazil, at 0.02%. Hence, as non-Ricardian households in South Africa benefit the most from the transfer shock, their Ricardian counterparts witness the highest consumption decline among BRIS. As a corollary, the fall in the consumption ratio, on impact, is highest in South Africa at 3.764%, and this is followed by Russia and Brazil at 3.460% and 2.82% respectively, while the consumption ratio declines by 2.412% in India. Nonetheless, across BRIS, the drop in the consumption ratio is limited to the quarter during which the shock occurs.

d) Tax Shock and Consumption

Appendix Figures C.51–C.53 illustrate how consumers in BRIS, both Ricardian and non-Ricardian, adjust their spending patterns in response to a negative tax shock. Across BRIS, consumption expenditure declines immediately after the tax shock. The decline is highest in South Africa (0.434%) and lowest in Brazil (0.002%), while India and Russia fall in between (at 0.05% and 0.013% respectively). Also, as a result of the shock, the consumption ratio between Ricardian and non-Ricardian households rises, as non-Ricardian households cut consumption while Ricardian households raise same (see Appendix Figure C.54). In particular, both the immediate and maximum increases in Ricardian consumption is greatest in South Africa, at 0.645%. In contrast, the Ricardian consumption rise in Brazil is fairly modest at 0.014%, on impact, smaller than the increases in Russia and India, at 0.351% and 0.305%, respectively. Meanwhile, non-Ricardian consumers in South Africa report the greatest instantaneous decrease in consumption (6.079%), followed by those in Russia (4.233%) and India (2.933%), and then Brazil (1.99%). Since non-Ricardian households in South Africa experience the greatest fall in consumption, while their Ricardian counterparts benefit most from the shock, South Africa has the highest rise in consumption ratio, at 6.724%, on impact, which is seven times that of Brazil, twice that of India, and around 1.5 times that of Russia.

e) Government Debt Shock and Consumption

Appendix Figures C.61-C.63 depict the impact of the positive debt shock on aggregate consumption as well as the consumption of both Ricardian and non-Ricardian households in BRIS. As the debt shock occurs across BRIS, aggregate consumption rises, albeit marginally. Also, In Brazil, Russia, and India, estimates for the effects of debt shocks are similar in sign to estimates for those of negative tax shocks, but considerably less in magnitude. On impact, a positive shock to government debt causes Ricardian and non-Ricardian consumption to rise and fall respectively, thereby resulting in the ratio of Ricardian to non-Ricardian consumption rising in these countries (Appendix Figure C.64). In South Africa, however, the government debt shock results in an instantaneous increase in spending by both households, with Ricardian consumers seeing a slightly greater rise, hence increasing the consumption ratio.

Consumption of Foreign and Domestic Goods

Appendices C.7–C.11 reveal the impact of commodity and fiscal policy shocks on aggregate consumption as well as Ricardian and non-Ricardian households' consumption of domestic goods on one hand and foreign goods on another hand.

a) Commodity Production Shock

Following the commodity production shock, consumption expenditure on domestic goods falls on impact in all countries except South Africa, where domestic goods consumption rises by 0.074%. Meanwhile, aggregate consumption of foreign goods falls across BRIS. Similar to results observed for the overall consumption, both households see a fall in consumption, with non-Ricardian households in Brazil, India, and South Africa experiencing larger decline than their Ricardian counterparts. Nonetheless, the negative consequences of the shock reveal a substantially higher decline in consumption among Ricardian households in Russia (compared to non-Ricardian households).

Across BRIS, a negative commodity production shock reduces non-Ricardian households' consumption of both foreign and domestic goods. Meanwhile, the shock results in a greater decline in non-Ricardian consumption of foreign goods in comparison to domestic ones. In South Africa, the immediate decline in non-Ricardian households' consumption of foreign goods is thrice more than domestic goods. Similarly, non-Ricardian consumers in Russia and India witness an immediate drop in foreign goods consumption that is almost twice more than domestic goods. With respect to Brazil, the instant fall in non-Ricardian consumption of imported goods is almost one and a half times that of domestic ones. Ricardian households also see a decline in imported consumption following the negative commodity production shock. On impact, the shock decreases Ricardian households' imports in India, Russia, South Africa and Brazil by 2.826%, 2.35%, 0.973% and 0.855%, respectively. Ricardian households in Brazil, Russia and India equally reduce domestic goods consumption following the negative commodity production shock. However, the on-impact decrease in foreign consumption is about twice more than domestic goods consumption in Brazil and India, and almost one and a half times in Russia. In contrast to the other emerging economies, the negative commodity production shock elevates domestic goods consumption of South African Ricardian households by 0.199%, on impact.

b) Commodity Price Shock

Appendix Figures C.81–C.82 indicate that aggregate consumption of both domestic and foreign goods falls across BRIS, immediately after the commodity price shock.

A negative commodity price shock reduces non-Ricardian households' consumption of both foreign and domestic goods across BRIS. Meanwhile, the shock results in a greater decline in non-Ricardian consumption of foreign goods in comparison to domestic ones. In South Africa, the on-impact decline in non-Ricardian households' consumption of foreign goods is eight times more than that of domestic goods, about twice in Russia and India and almost one and a half times in Brazil. Ricardian households also experience a reduction in both domestic and foreign goods consumed, following the negative commodity price shock. Remarkably, the decrease in foreign consumption again exceeds domestic consumption across BRIS.

c) Transfer shock

Consumption expenditure on domestic goods rises immediately after the transfer shock, across BRIS. Meanwhile, aggregate consumption of foreign goods falls throughout BRIS, except in South Africa, where it rises by 0.113% (Appendix Figures C.91–C.92).

Throughout BRIS, non-Ricardian households' consumption of both foreign and local commodities is enhanced by a positive government transfer shock. Meanwhile, the shock boosts non-Ricardian consumption of domestic products by a greater magnitude, compared to imports. Conversely, following the transfer shock, Ricardian consumers cut down on both domestic and foreign goods. Meanwhile, the consumption of imported goods drops more than that of local goods, across BRIS. The immediate fall in South Africa's consumption of foreign goods is twice the decline in its consumption of domestic goods; in India and Russia it is a little over 1.5 times greater; and in Brazil, the decline in foreign goods consumption is marginally greater than the drop in the consumption of domestic goods.

d) Tax shock

Immediately after the tax shock, overall consumer spending on domestic goods drops sharply throughout BRIS. Nonetheless, in Brazil, Russia and India households spend more on foreign products following the shock, while those in South Africa cut down on same (Appendix Figures C.101-C.102).

Examining the household-specific effect of the shock reveals that it has an adverse impact on non-Ricardian consumption of both domestic and imported goods, with domestic commodities being worse affected compared to imports.

In contrast, Ricardian consumers increase their purchases of both foreign and domestic products after the tax shock, with the increase in foreign products surpassing that of domestic ones. The increase in Ricardian foreign goods consumption is roughly double that of local goods in South Africa; in India and Russia, it is approximately 1.6 times greater; and in Brazil, the rise in foreign goods consumption is only marginally higher than that of domestic goods.

e) Debt shock

Immediately after the debt shock, households in BRIS increase spending on domestic goods. In contrast, the consumption of foreign products decreases in BRIS, with the exception of South Africa, where it increases by 0.001%. (Appendix Figures C.111-C.112).

Nonetheless, the positive debt shock exhibits a negative effect on non-Ricardian foreign goods consumption. Also, within BRIS, the shock often has a negative impact on non-Ricardian domestic goods consumption, with the exception of South Africa.

Meanwhile, the shock generally induces Ricardian households in BRIS to cut down on foreign products, again, with the exception of South Africa. However, the shock has a positive effect on the consumption of domestic goods by Ricardian households throughout BRIS.

3.5.2 Commodity and Fiscal Policy Shocks Across MINT

Using data spanning over the period 2003Q2 to 2020Q4 for each of the MINT countries, the posterior distributions for the parameters are computed and the mean and standard deviation obtained are presented in Table 3.4.

Table (3.4) Posterior Distribution Estimates for Model Parameters – MINT

		Mexico		Indonesia		Nigeria		Turkey	
No	Notation	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Structural Parameters									
1	ρ_c	0.791	0.154	0.414	0.050	1.579	0.116	0.609	0.028
2	γ_c	0.641	0.125	0.591	0.018	0.507	0.020	0.592	0.029
3	γ	1.573	0.480	0.721	0.063	1.846	0.099	2.819	0.123
4	ϕ_e	3.211	0.570	4.036	0.189	1.568	0.091	3.476	0.086
5	ξ	0.669	0.381	1.538	0.157	2.840	0.101	1.371	0.150
6	γ_i	0.633	0.201	0.431	0.032	0.853	0.032	0.783	0.028
7	ω	0.229	0.081	0.222	0.012	0.177	0.034	0.269	0.024
8	z	0.774	0.095	0.896	0.032	0.440	0.013	0.845	0.036
9	φ	0.801	0.163	1.423	0.132	1.006	0.021	0.903	0.035
10	α	0.410	0.051	0.317	0.007	0.443	0.009	0.329	0.018
11	α_e	0.936	0.009	0.891	0.003	0.867	0.002	0.891	0.006
12	ϱ_m	0.758	0.065	0.911	0.007	0.990	0.002	0.886	0.004
13	ϱ_n	0.994	0.002	0.931	0.005	0.995	0.001	0.982	0.007
14	ϱ_e	0.436	0.061	0.615	0.012	0.800	0.007	0.778	0.014
15	$\varepsilon_{e,t}$	0.122	0.033	0.029	0.005	0.048	0.011	0.053	0.017
16	$\varepsilon_{p,t}$	0.036	0.008	0.022	0.003	0.054	0.010	0.052	0.010
17	$\varepsilon_{T,t}$	0.063	0.033	0.044	0.011	0.354	0.044	0.025	0.006
18	$\varepsilon_{n,t}$	0.063	0.010	0.149	0.016	0.076	0.008	0.165	0.020
19	$\varepsilon_{m,t}$	0.028	0.004	0.017	0.002	0.055	0.006	0.044	0.005
Acceptance rate of MCMC		30.52%		26.11%		42.32%		37.66%	

Posterior Estimates

Similar to Brazil and Russia, the consumption share of non-tradable goods in the MINTs is tightly concentrated between 0.5 and 0.6. Consistent with earlier findings, the elasticity of substitution for non-tradable commodities in consumption varies across the MINT economies. Nigeria has the highest estimated elasticity of substitution at 1.579, which is four times that of Indonesia, nearly two and a half times that of Turkey, and twice that of Mexico.

In addition, the parameter estimates for the capital output ratio in the manufacturing sector for the MINTs lie between 0.3 and 0.4 – similar to the findings for BRIS. The estimated capital output ratio for the commodities sector in MINTs is about 0.9, which is in line with the results for Brazil, Russia, India and South Africa. Estimates for Turkey's inverse intertemporal elasticity of substitution parameter is 2.819, which is 1.5 times the estimate for Nigeria, 2 times that of Mexico, and 4 times that of Indonesia; nonetheless, these values are all within the same range as those found for BRIS.

For the MINTs, there is a considerable clustering around a value of one for the parameter associated with the degree to which transfers are pro-cyclical, showing a high degree of pro-cyclicality. Also, the elasticity of exports to the actual exchange rate, for the MINTs tends to be comparatively greater than estimates obtained for BRIS. The highest estimate is in Nigeria (2.84), followed by Indonesia (1.538), Turkey (1.371), and Mexico (0.669). In the commodity sector, capital installation costs are largely comparable across the MINTs. It is smallest in Nigeria (1.568) and greatest in Indonesia (4.036). Meanwhile, it is 3.211 in Mexico and 3.476 in Turkey.

Among MINT, there exist notable disparities in the elasticity of substitution corresponding to the proportion of locally produced commodities within overall tradable goods consumption – as with BRIS. Nigeria's parameter estimate of 0.201 is the lowest, followed by Indonesia's estimate of 0.367. In contrast, estimates for Turkey and Mexico are higher and more comparable, at 0.725 and 0.768 respectively.

Remarkably, the MINTs have, on average, higher estimates for the proportion of domestic investment within total manufacturing sector investment, with Nigeria having the highest estimate at 0.853, followed by Turkey and Mexico at 0.783 and 0.633, respectively, and Indonesia with a value of 0.431.

Shock Process Parameters

The mean estimates and standard deviation of the exogenous shock processes are shown in Table 3.4. From 0.017 in Indonesia, to 0.028 and 0.044 in Mexico and Turkey respectively, and finally to 0.055 in Nigeria, the MINTs have a significantly lower mean estimate for the standard deviation of the shock associated with the production function of the commodity sector. Within the MINTs, the estimated means of the standard deviation associated with government transfer shocks show a greater degree of heterogeneity relative to the results obtained for BRIS, with Nigeria recording the highest estimate at 0.354 and Turkey recording the lowest estimate at 0.025; Mexico and Indonesia fall in between at 0.063 and 0.044, respectively.

The mean estimate of the standard deviation of non-tradable output shock within MINTs is close to that of BRIS, mostly falling between 0.1 and 0.2. However, in MINTs, the equivalent estimate for the tradable sector is often lower. Also, MINTs have higher mean estimates of the standard deviation of commodity price shocks.

Basic Statistics Obtained from the MH-MCMC Bayesian Estimation

The acceptance rate of the Markov Chain is shown in Table 3.4. For all the MINTs, the acceptance rates fall within the range of 20% and 50%, confirming they are reliable.

Baseline impulse response analysis

In this section, this paper analyses the changes in aggregate consumption as well as the consumption patterns of Ricardian and non-Ricardian households, in the aftermath of commodity and fiscal policy shocks within MINT.

a) Commodity Production shock

In the aftermath of a commodity production shock, aggregate consumption drops on impact throughout MINT. On average, the decline across MINT exceeds that of BRIS in the aftermath of the same shock. Specifically, the consumption decrease is particularly high in Nigeria at 9.049%. Meanwhile, consumption declines in Turkey, Indonesia and Mexico by 2.721%, 0.492% and 0.385% respectively (Figure 3.9).

Also, Ricardian and non-Ricardian households react similarly to a commodity production shock, across the MINTs (Figures 3.10-3.11), with both households reducing consumption. On average, the immediate decline in Ricardian consumption is greater in MINTs compared to BRIS, ranging from 0.059% in Mexico to 0.496% in Indonesia and 2.993% in Turkey, with the largest decline occurring in Nigeria at 16.237%, which is twelve times higher than the highest among BRIS.

In Indonesia, Nigeria, and Turkey, Ricardian consumers experience a sharper fall in consumption compared to their non-Ricardian counterparts, with the immediate decline in non-Ricardian consumption being marginally larger than the Ricardian one in Indonesia, but twice as high in Turkey and five times as large in Nigeria. Meanwhile, the opposite is true for Mexico; non-Ricardian households' consumption drops instantly by around twenty times more than Ricardian households' in the aftermath of the shock.

More specifically, the greatest on-impact consumption decline is seen among non-Ricardian consumers in Nigeria and Mexico (3% and 1.389% respectively). Meanwhile, non-Ricardian consumers in Turkey and Indonesia respectively see a 1.373% and 0.453% drop in consumption, as the shock takes effect. As before, MINTs, on average experience a greater drop in non-Ricardian consumption following the shock, in comparison to BRIS.

b) Commodity Price shock

Figure 3.12 indicates that within MINT, household consumption declines immediately after the commodity price shock occurs. On impact, MINT households, on average, cut consumption by a relatively larger percentage compared to BRIS. Similar to the findings for the commodity production shock, the instantaneous decrease in consumption is highest in Nigeria (10%), while the consumption cuts in Turkey, Indonesia and Mexico are relatively lower (at 2.894%, 0.818% and 0.514% respectively).

Likewise, Figures 3.13 - 3.14 illustrate the impulse responses of Ricardian and non-Ricardian consumption within the MINTs, after a commodity price shock. The shock causes both consumers to reduce consumption – similar to the result obtained for commodity production shocks. In comparison to BRIS, the on-impact decrease in Ricardian consumption is larger, on average, in MINTs. At 0.493%, the immediate decrease in Ricardian consumption within Mexico is lowest among the MINTs; while Nigeria's is the highest, at 17.944%. Meanwhile, the decline for Indonesia and Turkey falls in between, at 0.858% and 3.211%, respectively.

Again, on average, MINTs record a greater drop in non-Ricardian consumption in comparison to BRIS. On impact, reductions in consumption for non-Ricardian households vary from 0.49% in Indonesia, through 0.58% and 1.39% in Mexico and Turkey, respectively, to 3.32% in Nigeria. As before, in Indonesia, Nigeria, and Turkey, Ricardian households experience a larger decline in consumption (relative to their non-Ricardian counterparts). In Indonesia and Turkey, the instantaneous decline in consumption among Ricardian households is double that of non-Ricardian households; whereas in Nigeria, it is five times greater. However, the shock results in a larger decrease in consumption among non-Ricardian households in Mexico.

c) Government Transfer Shock

Following the transfer shock, consumption expenditure rises on impact for MINT. The immediate rise is highest in Nigeria at 4.398%; meanwhile, the rise is relatively lower in the rest of the MINTs, ranging between 0.041% and 0.074% (Appendix Figure C.47).

Appendix Figures C.48-C.49 present the changes in Ricardian and non-Ricardian households' consumption patterns in MINT economies after the government transfer shock. The redistribution pattern associated with the shock tends to reduce the consumption ratio, by decreasing the consumption of Ricardian households and increasing the consumption of their non-Ricardian counterparts – similar to the results obtained for BRIS. On impact, Turkey and Mexico see an increase in non-Ricardian consumption of 1.445% and 1.901% respectively, while Indonesia experiences a rise of 2.788%, and Nigeria witnesses an increase of 14.045%, more than four times the highest among BRIS.

Compared to BRIS, MINTs record a larger decrease in Ricardian consumption, on impact. The reduction in Ricardian consumption is highest in Nigeria, at 7.046%; followed by Mexico, at 0.514%; thereafter Indonesia, at 0.289%; and lowest in Turkey, at 0.208%. Among the MINTs, non-Ricardian households in Nigeria also profit the most from the transfer shock. Consequently, Nigeria records the highest consumption ratio fall (21.091%) on impact, followed by Indonesia (3.077%), Mexico (2.415%) and finally Turkey (1.652%) (Appendix Figure C.410).

d) Government Tax Shock

Across MINT, consumer expenditure drops immediately after the tax shock, with Nigeria recording the highest decline, at 4.368%, while the decrease is relatively lower in the rest of the MINTs, ranging between 0.05% and 0.131% (Appendix Figure C.57).

Appendix Figures C.58-C.59 show how the government tax shock influences the spending behaviour of Ricardian and non-Ricardian consumers in MINT. Consistent with the findings for BRIS, the distributional pattern accompanying the shock increases the consumption ratio by raising Ricardian households' consumption and lowering that of their non-Ricardian counterparts (Appendix Figure C.510). As the shock occurs, non-Ricardian consumption drops by 1.31% in Turkey, 3.325% in Mexico, 3.917% in Indonesia, and a relatively higher 14.114% in Nigeria, more than twice the highest in BRIS. Upon comparing between BRIS and MINT, it becomes evident that the latter, on average, show greater instantaneous rise in Ricardian consumption in the aftermath of the shock, with a 7.185% increase in Nigeria's Ricardian consumption being the highest, followed by 0.861% in Mexico, 0.416% in Indonesia and 0.188% in Turkey. Non-Ricardian Nigerian households are equally the most adversely impacted by the tax shock, among MINT. As a result, the consumption ratio increases the most in Nigeria (21.299%), next in Indonesia (4.332%), then in Mexico (4.185%), and lastly in Turkey (1.498%).

e) Government Debt Shock

As a result of the debt shock, consumer spending increases throughout MINT, albeit modestly, with the highest increase occurring in Nigeria (Appendix Figure C.67). Generally, the shock-induced redistribution patterns result in a higher consumption ratio, as seen in Appendix Figure C.610. Similar to the findings for Brazil, Russia, India, the increase in the consumption ratio obtained for Mexico, Indonesia, and Turkey is the consequence of the shock increasing the consumption of Ricardian households and lowering that of their non-Ricardian counterparts (Appendix Figure C.68-C.69). Although in Nigeria, consumption increases for both Ricardian and non-Ricardian households, that of the former tends to be higher, thereby leading to a rise in the consumption ratio.

Consumption of Foreign and Domestic Goods

Appendix C.7-C.11 reveal the impact of commodity and fiscal policy shocks on aggregate consumption as well as Ricardian and non-Ricardian households' consumption of domestic goods on one hand and foreign goods on another hand.

a) Commodity Production Shock

As in Brazil, Russia and India; MINT experience a decline in aggregate consumer spending on local and imported commodities immediately after the commodity output shock (Appendix Figures C.77-C.78). However, on average, MINT households see a larger decline in consumption than their BRIS counterparts.

Likewise, non-Ricardian households' demand for both imported and local commodities falls in response to the negative commodity output shock throughout MINT (Appendix Figures C.79-C.710). Notable however is the fact the decline in consumption of foreign goods by non-Ricardian households is greater than that of domestic goods. In Turkey, non-Ricardian households see an instantaneous fall in consumption of foreign items that is over four times greater than that of local goods. In a similar vein, non-Ricardian consumers in Mexico and Indonesia instantly reduce their purchases of foreign items by almost twice as much as they reduce their purchases of domestic goods. Meanwhile, the immediate drop in non-Ricardian consumption of imported goods is just slightly higher than that of local goods in the case of Nigeria.

As with BRIS, the negative commodity output shock equally causes a drop in imports among Ricardian households in MINT. Also, Ricardian households in Indonesia, Nigeria, and Turkey equally make similar cuts to domestic goods consumption, in the aftermath of the shock (Appendix Figures C.711-C.712). Meanwhile, the on-impact reduction in foreign goods consumption among Ricardian households is nearly twice as large as that of domestic goods in Indonesia and Turkey, and only marginal in the case of Nigeria.

In contrast to Indonesia, Nigeria and Turkey, the negative commodity production shock elevates domestic goods consumption of Mexican Ricardian households by 0.062%, on impact.

b) Commodity Price Shock

In the aftermath of the commodity price shock, aggregate consumer spending on domestic and foreign products declines on impact throughout MINT – similar to the findings observed for BRIS (Appendix Figures C.87-C.88). On average, MINT households see a greater fall in consumption than BRIS.

Comparing results between households, this study finds that, in MINT as a whole, non-Ricardian households lower spending on both imported and local items, in response to the negative commodity price shock. Meanwhile, the decrease in imports is larger than that of domestic commodities (Appendix Figures C.89-C.810). In Turkey, non-Ricardian households witness an instantaneous fall in consumption of foreign items that is over four times greater than that of local goods. Meanwhile, in Mexico and Indonesia, non-Ricardian consumers' spending on foreign commodities falls by almost twice as much as domestic products. With respect to Nigeria, the immediate drop in non-Ricardian consumption of imported items is just slightly higher than that of local goods.

Turning to the Ricardian households, this paper finds that immediately after the negative commodity price shock, there occurs, across MINT, a drop in Ricardian consumption of both domestic and imported goods, mirroring the findings for BRIS (Appendix Figures C.811-C.812). Nonetheless, the decline in foreign goods consumption is around two and a half times more than domestic goods consumption in Mexico, twice greater in Turkey, one and half times greater in Indonesia, and only marginal in the case of Nigeria.

c) Transfer shocks

Similar to the findings for BRIS, domestic consumption spending increases across MINT following the transfer shock. On average, however, MINT households see a more sizable increase in domestic goods consumption compared to BRIS (Appendix Figure C.97). Additionally, the total consumption of imported products generally rises in the aftermath of the shock, and this is the case across MINT, with the exception of Turkey, where foreign goods consumption decreases by 0.082% (Appendix Figures C.98).

Analysing the results for both households, this paper finds that the positive government transfer shock raises non-Ricardian households' consumption of both imported and domestic goods, with the increase in domestic goods consumption being larger than that of foreign goods (Appendix Figures C.99-C.910). In the case of Ricardian consumers, the results reveal that the transfer shock reduces their consumption of both domestic and foreign commodities, with the decline in imported items exceeding that of local commodities

– similar to the results obtained for BRIS (Appendix Figures C.911-C.912). In Turkey, the initial drop in Ricardian consumption of foreign products is around four times that of domestic goods; however, in Mexico, Indonesia, and Nigeria, the drop in consumption of foreign goods is only marginally more than domestic goods.

d) Tax shock

Following a tax shock, MINT countries, like BRIS, see a decline in spending on domestic products (Appendix Figure C.107). However, domestic goods consumption falls more sharply among MINT households than BRIS households. Similarly, in MINT, with the exception of Turkey, total consumption of foreign items equally decreases (Appendix Figure C.108).

Examining the household-specific impact of the shock, this study finds that throughout MINT, the negative tax shock induces non-Ricardian households to cut down on both foreign and domestic goods consumption (Appendix Figures C.109-C.1010). In contrast, Ricardian consumers increase consumption of both categories of goods, comparable to the findings reported for the BRIS countries (Appendix Figures C.1011-C.1012). For Ricardian households in Turkey, the immediate rise in foreign goods consumption is about four times the decline in its consumption of domestic goods; however, in Mexico, Indonesia and Nigeria, the increase in foreign goods consumption is marginally greater than domestic goods.

e) Debt shock

In the aftermath of the debt shock, consumption spending on domestic goods increases throughout MINT, echoing the findings for BRIS (Appendix Figure C.117). In Mexico, Indonesia and Nigeria, aggregate consumption of foreign goods rises as well in response to the shock. However, in Turkey, foreign goods consumption decreases by 0.001% (Appendix Figure C.118).

Upon comparing results between MINT households, it becomes apparent that the debt shock always raises non-Ricardian domestic goods consumption, however, the same is not true for foreign products, with the exception of Nigeria, where non-Ricardian households equally raise domestic goods consumption by 0.015% (Appendix Figures C.119-C.1110). In contrast, Ricardian consumers in MINT mostly increase consumption of both domestic and foreign products, with the exception of Turkey, where foreign goods consumption decreases by 0.001% (Appendix Figures C.1111-C.1112).

3.5.3 Discussion of Results

In this section, this paper rationalizes the results obtained (in light of existing realities within BRIS and MINT), and provides further comparisons between the findings obtained for both groups of countries.

Considering the generally procyclical fiscal policies adopted by BRIS and MINT, the finding of this paper regarding the procyclical nature of transfers is unsurprising. For example, a study published by the IMF in 2015 (Celasun et al., 2015) shows that fiscal policy has been procyclical in leading Latin American countries[23], on average, with Brazil's policies gradually becoming less procyclical (particularly since 2008), underscoring the fact that the procyclicality paramater is lowest in Brazil (relative to the rest of the BRIS) in this present research. Likewise, existing studies reveal that Fiscal policy in Russia is procyclical, with most regional governments having little choice in its development and implementation (see, for example, Platonov, 2012; Lavrov et al., 2001). In the case of India, not only has public spending been pro-cyclical, developmental expenditures (social spending) have in fact been more pro-cyclical than non-developmental ones (see, for example, Mohanty and Mishra, 2017). Similarly, a paper published by the World Bank in 2019 (Amra et al., 2019) reveals that the South African government although aims at countercyclical fiscal policies, there often exists a mismatch between its goal and the policies that ultimately get implemented, which have often been procyclical, and caused in part by commodity booms.

Celasun et al. (2015) equally reveal that fiscal policy in Mexico – similar to Brazil – has been procyclical but shows a pronounced trajectory towards countercyclicality. This finding is noteworthy for two reasons. First, it undercores the findings of Ahmad et al. (2021) revealing that some middle-income countries are recording successes in lowering fiscal procyclicality. Second, it yet again lends credence to another related result of this present study, which confirms that the procyclicality parameter is lowest in Mexico (relative to the rest of the MINT). Meanwhile, Nizar (2011) found that fiscal policy in Indonesia tends to be procyclical, particularly when expenditures are grouped. Also, the Central Bank of Nigeria in a 2015 report CBN (2015) acknowledges the lingering presence of procyclical budget implementations, particularly vis-à-vis public expenditures, which have generally risen during oil price booms (especially between 2010 and 2014) and vice versa (see, also IMF, 2016). This echoes the submission of Konuki and Villafuerte (2016) suggesting that fiscal policy in Nigeria was largely procyclical between 2000 and 2014. Over the years, fiscal policy procyclicality has also been documented for Turkey, including in 2020, during the Covid-19 pandemic. The Turkish government equally implements procyclical fiscal policies during booms in order to boost demand, thereby contributing to a positive output gap, and potential inflationary pressures (see, IMF, 2018).

Likewise, the negative impact of the commodity shocks on consumption across BRIS and MINT is expected as they are commodity exporting countries, although to differing degrees. For example, Badeeb et al. (2023) demonstrate that the BRIS economies depend on natural resources, and the higher the dependence, the more severe the effect of commodity shocks on economic activity[24], and by implication,

[23] IMF (2020) also reveals that since 2010, public spending in states such as Espírito Santo has either fallen or expanded marginally, owing to oil price shocks.

[24] In this regard, Celasun et al. (2015) also show that Brazil's economy slows following a slump in metal prices.

on economic agents. As Russia is the most dependent on commodities among BRIS, it unsurprisingly experiences the largest fall in consumption among this group.

MINT are also commodity exporting countries, and by the same token, it is unsurprising that household spending in MINT is impaired by negative commodity shocks. For example, IMF (2015*a*) shows that lower commodity revenues in Indonesia have a direct dampening effect on consumer spending. Also, Duclaud and García (2011) show that oil price declines have the tendency to impede economic activities within Mexico, given the resulting slump in oil earnings, upon which government revenue, and by implication, the rest of the economy depends. Meanwhile, the IMF (2016) shows that oil price fluctuations in the years prior to the 2000s had significant macroeconomic implications for economic agents in Nigeria, causing the country's economy to decline by as much as 10% in the early to mid-1980s. This also mirrors the conclusions of Sala-i Martin and Subramanian (2013) for Nigeria and Mlachila and Ouedraogo (2017) for a sample of commodity-exporting countries including Turkey. As discussed previously, heavy reliance on commodities has been linked to greater losses in the aftermath of unfavourable commodity shocks. Hence, since Nigeria is the most dependent on commodities within the MINT, it sees the largest consumption decrease among this group.

Equally expected is the dampening impact of transfer shocks on the consumption ratio, as reported previously. For example, Ivins (2013) in a report published by Oxfam, shows that since the early 2000s, policymakers in BRIS have intensified efforts towards distributing conditional cash transfers, which account for approximately 58% of poor households' income in South Africa and about 15% in Brazil. Meanwhile, such transfers have boosted household income within BRIS, as evidenced, for example, by the Bolsa Familia in Brazil. Households in India and Russia[25] have equally benefited from food programs, means-tested cash transfers and means-tested child support.

The fact that transfer shocks lower the consumption ratio within MINT is equally in tandem with data and empirical evidence within these economies. For example, Bastian et al. (2017) show how transfers in Nigeria have had highly remarkable distributional impacts particularly in terms of boosting consumer spending in northwest Nigeria, immediately after disbursement. Likewise, Lambert and Park (2019) illustrate that inequality declined in Mexico between 2004 and 2016, with the target cash transfers (Prospera) playing a significant role in the decrease. In 2016, transfers contributed to two-thirds of the decrease in the Gini coefficient. Similarly, Hill (2021) demonstrates that transfers in Indonesia have exhibited favourable distributional effects, albeit only modestly, due in part to the country's large population and the complexities of targeting. This is consistent with the preceding finding that the decline in the consumption ratio is not

[25] Also, Ivins (2013) demonstrates how Russia's social insurance system has narrowed urban-rural inequalities. Meanwhile, Azevedo et al. (2014) note that 20 percent of the reduction in inequality within Brazil can be attributed to transfers.

only low within Indonesia, but lowest among MINT. Also, Tamkoc and Torul (2020) demonstrate how a decline in consumption inequality was witnessed in Turkey between 2002 and 2016, the same period the country witnessed significant rise in social benefits.

Meanwhile, the rise in consumption ratio following a tax shock which this study finds for BRIS may be ascribed to the structure of the tax systems within these countries. For example, various OECD reports (OECD, 2010, 2011) demonstrate that the prevailing tax systems in BRIS has not succeeded in achieving desirable distributional goals owing to tax evasion and administrative bottlenecks. Also, Ivins (2013), in a study examining BRIS, notes that despite being highly progressive, personal income taxes contribute relatively little to taxation revenue within emerging countries (in comparison to the OECD countries); meanwhile, regressive taxes account for a significantly greater share of tax income for most emerging countries. The existing tax structure in MINT may also be responsible for the poor distributional impacts of tax within these countries. For example, Flores-Macías (2018) in a study on Mexico and other Latin American countries shows that since the 1980s, the tax base in Latin America has largely been broadened through regressive Value Added Tax (VAT). Also, Alm (2019) shows how Indonesia's tax system exacerbates existing horizontal inequities particularly between wage earners and their self-employed counterparts. In their study on Nigeria, Pitigala and Hoppe (2011) uncover the prevalence of multiple taxation as well as how regressive taxes place a greater burden on small agricultural traders in comparison with larger ones. Additionally, Egbon and Mgbame (2015) show that personal income taxes (which are traditionally progressive) tend to be more pro-rich than pro-poor in Nigeria. Likewise, Burcu (2019) shows how all taxes in Turkey have been regressive since 1990, including the tax policy adopted during the global financial crisis.

Further, the redistributive theory may provide some insight towards understanding the rise in the consumption ratio observed in the aftermath of a positive debt shock within BRIS and MINT. Specifically, the theory suggests that rising public debts predominantly held in the form of government bonds could impact adversely on the distribution of income. This is because the wealthy would expectedly be able to afford and purchase most of the bonds while the same would not be true for the less advantaged, thereby contributing towards widening the gap between both income groups. In this regard, Dash (2019) shows that the amount of bond issuance has increased significantly within BRIS bond markets, thereby contributing markedly towards public debts. Also, Jeanneau and Pérez Verdia (2005) reveal that in a bid to reduce reliance on foreign loans, policymakers in Mexico have taken steps towards pursuing domestically sourced funds, which have resulted in a rapid and significant expansion of the bond market since the 1990s. Likewise, the ADB (2020) notes that in an effort to finance fiscal stimulus measures, policymakers have prioritized the sale of government bonds, which overtime have dominated the Indonesian bond market, accounting for almost 90% of the entire stock of the Indonesian bond market, and consequently resulting in a significant expansion of the country's bond market. Likewise, World Bank (2012) shows that until 2010, the Turkish bond market mostly featured public bonds. Although the volume of government bond issuance has declined over the years, their importance in financing government programs remains evident. For example, Saritas (2020) shows that in 2016 public bonds accounted for over 50 percent of pension funds. Meanwhile, Amos et al. (2011) equally reveal how government bonds began dominating the Nigerian bond market in 1997.

Equally expected is the finding that commodity shocks exhibit a greater decline in foreign goods by comparison to domestic ones for most of BRIS and MINT. As the negative commodity shock occurs, the affected country witnesses a currency depreciation, raising importation costs and subsequently resulting in a reduction in imports as well as making domestic goods a more attractive alternative. For example, the decline in foreign goods consumption is found to be acute in Nigeria, and this is unsurprising because Nigeria's economy is particularly reliant on commodity exports, and as such the value of the country's currency is equally highly sensitive to commodity shocks. In this regard, IMF (2016) documents that during the oil price crash of the 1980s, Nigeria's economy contracted by 10 percent, and the country's currency witnessed a significant depreciation which averaged 28 percent annually between 1980–1987.

Table (3.5) Impact of Commodity Shocks on Consumption (BRIS and MINT)

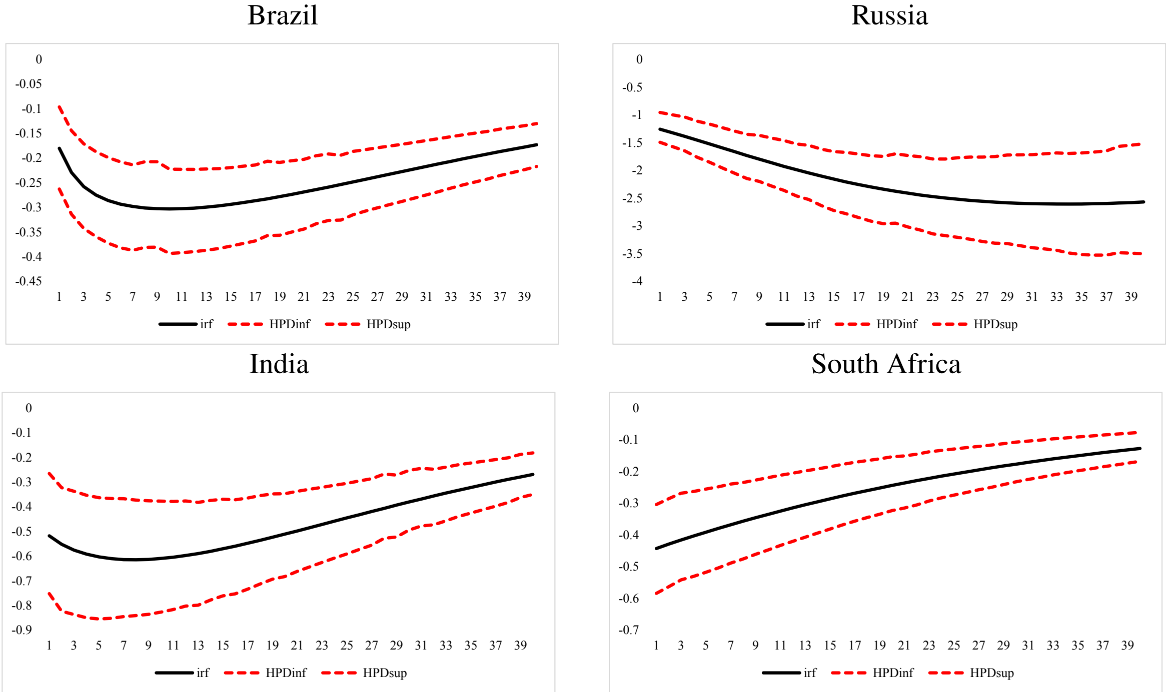
	Commodity Production Shock (Point of impact)			Commodity Price Shock (Point of impact)		
	Overall Consumption Ricardian	Overall Consumption non-Ricardian	Aggregate Consumption	Overall Consumption Ricardian	Overall Consumption non-Ricardian	Aggregate Consumption
Brazil	(-)	(-)	(-)	(-)	(-)	(-)
Russia	(- - - -)	(- -)	(- - - -)	(- - - -)	(- - -)	(- - - -)
India	(- - -)	(- - -)	(- - -)	(- -)	(- -)	(- -)
South Africa	(- -)	(- - - -)	(- -)	(- - -)	(- - - -)	(- - -)
Mexico	(-)	(- - -)	(-)	(-)	(- -)	(-)
Indonesia	(- -)	(-)	(- -)	(- -)	(-)	(- -)
Nigeria	(- - - -)	(- - - -)	(- - - -)	(- - - -)	(- - - -)	(- - - -)
Turkey	(- - -)	(- -)	(- - -)	(- - -)	(- - -)	(- - -)

Note: Variables are expressed as percent deviation from their initial steady-state values. The positive (negative) signs are used to compare across countries, the degree to which the relevant response variable is impacted positively (negatively). Hence, in a column, the country with the highest number of positive (negative) signs is most impacted positively (negatively.)

Table (3.6) Household Worse Impacted by Commodity Shock (BRIS and MINT)

Countries	Commodity production shock		Commodity price shock	
	Ricardian	Non-Ricardian	Ricardian	Non-Ricardian
Brazil		Worse impacted		Worse impacted
Russia	Worse impacted		Worse impacted	
India		Worse impacted	Worse impacted	
South Africa		Worse impacted		Worse impacted
Mexico		Worse Impacted		Worse Impacted
Indonesia	Worse Impacted		Worse Impacted	
Nigeria	Worse Impacted		Worse Impacted	
Turkey	Worse Impacted		Worse Impacted	

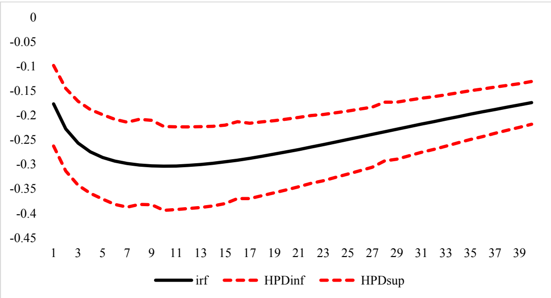
Figure (3.3) Impact of Commodity Production Shock on Aggregate Consumption - BRIS



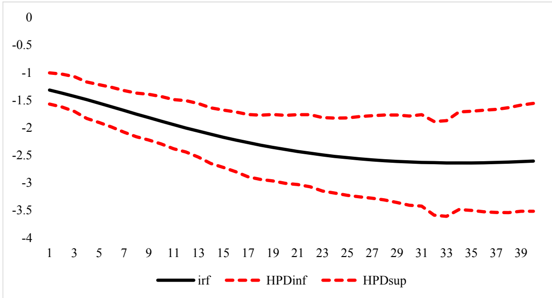
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.4) Impact of Commodity Production Shock on Ricardian Consumption - BRIS

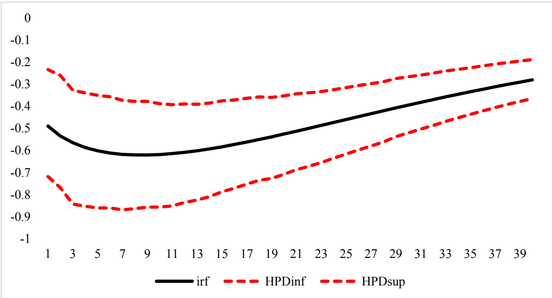
Brazil



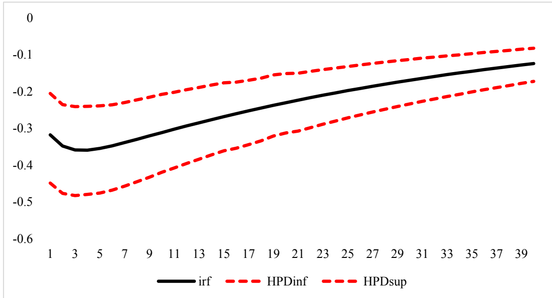
Russia



India



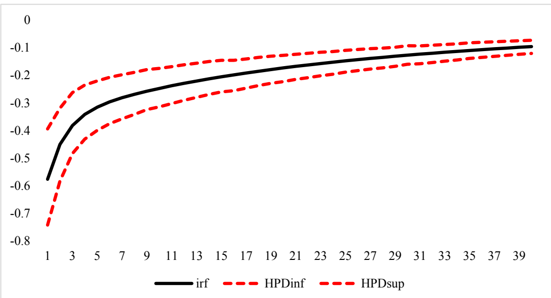
South Africa



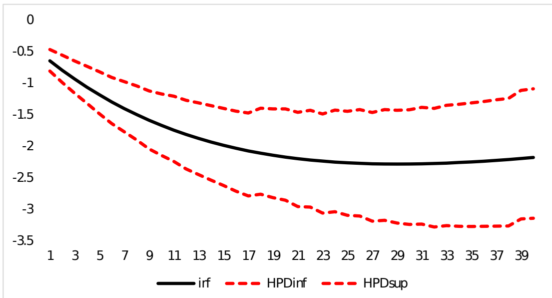
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.5) Impact of Commodity Production Shock on Non-Ricardian Consumption - BRIS

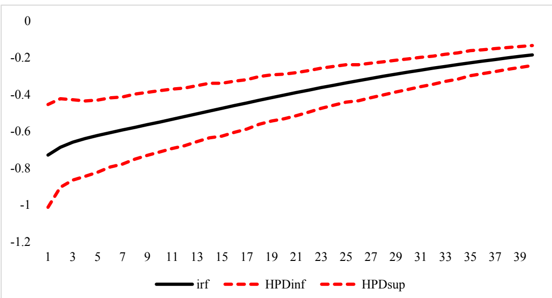
Brazil



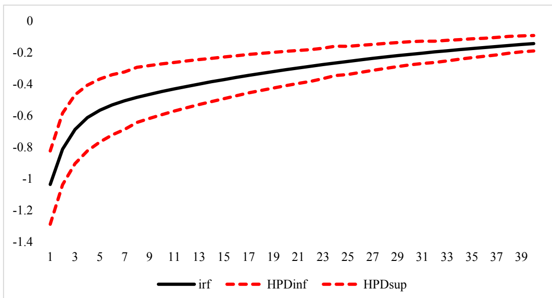
Russia



India



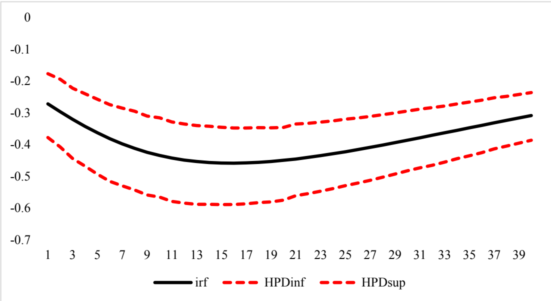
South Africa



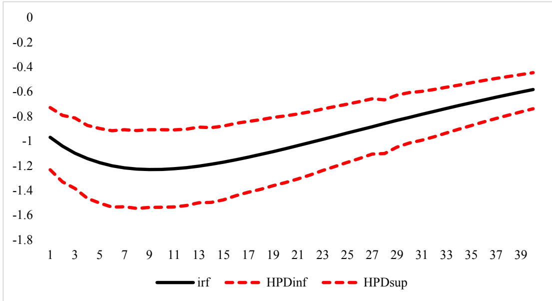
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.6) Impact of Commodity Price Shock on Aggregate Consumption - BRIS

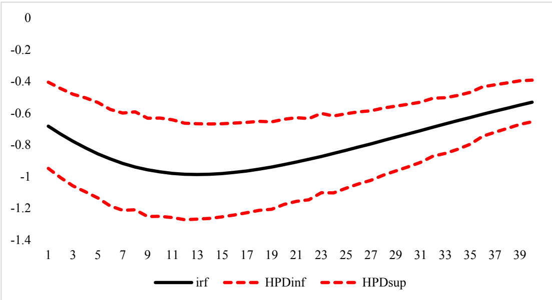
Brazil



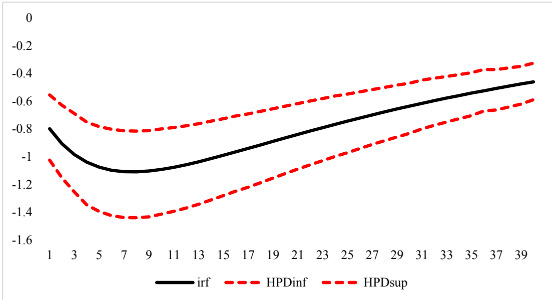
Russia



India



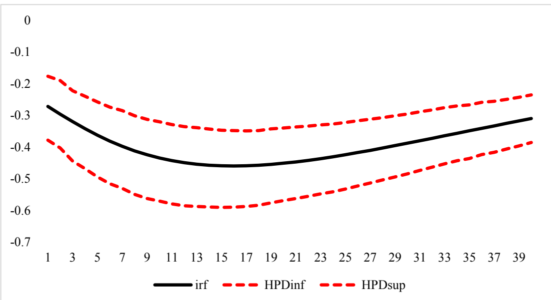
South Africa



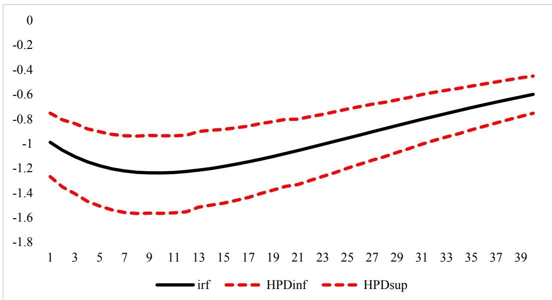
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.7) Impact of Commodity Price Shock on Ricardian Consumption - BRIS

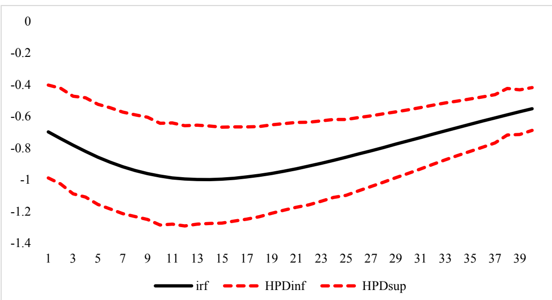
Brazil



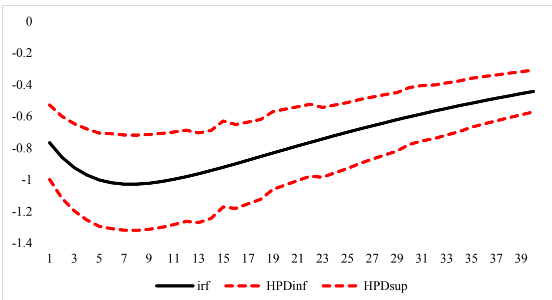
Russia



India



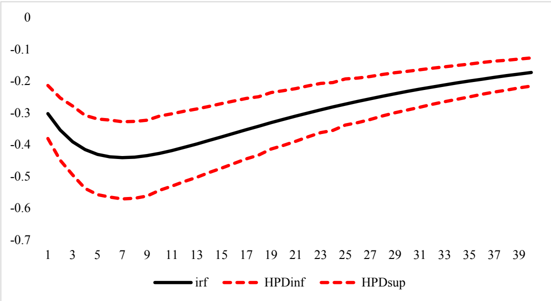
South Africa



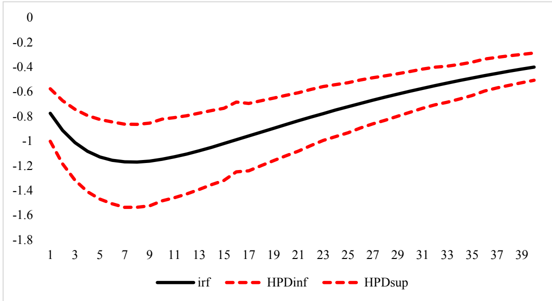
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.8) Impact of Commodity Price Shock on Non-Ricardian Consumption - BRIS

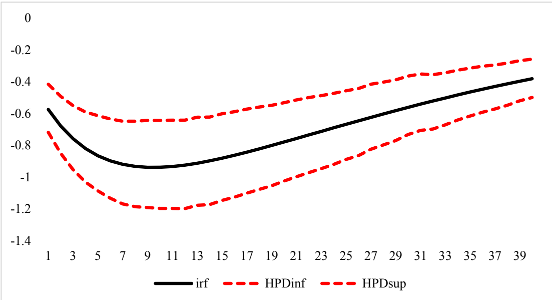
Brazil



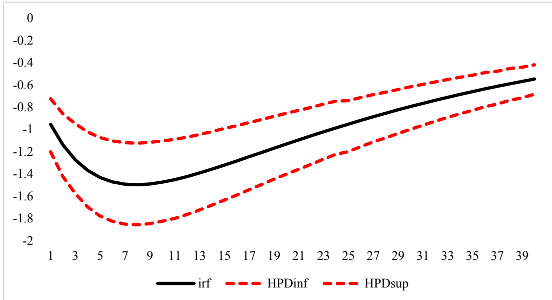
Russia



India



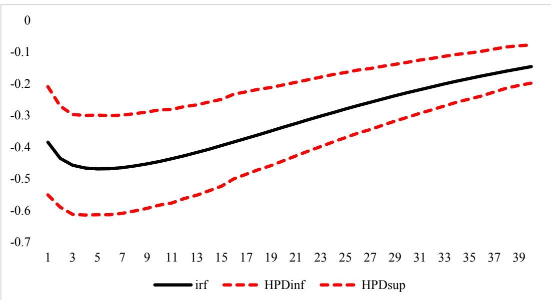
South Africa



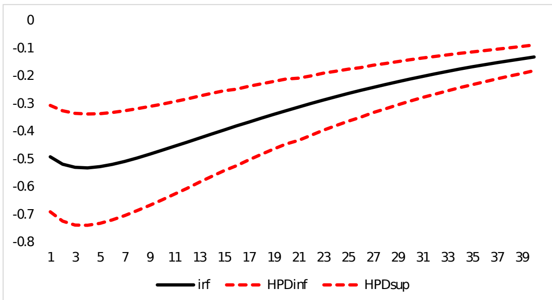
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.9) Impact of Commodity Production Shock on Aggregate Consumption - MINT

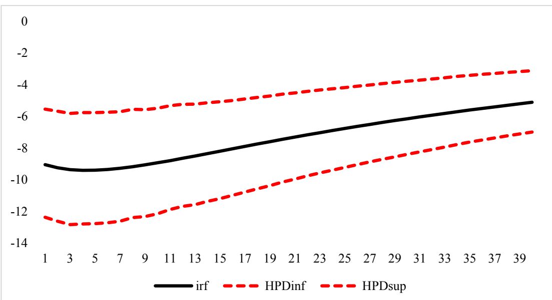
Mexico



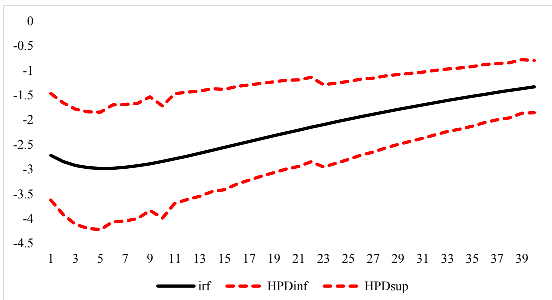
Indonesia



Nigeria

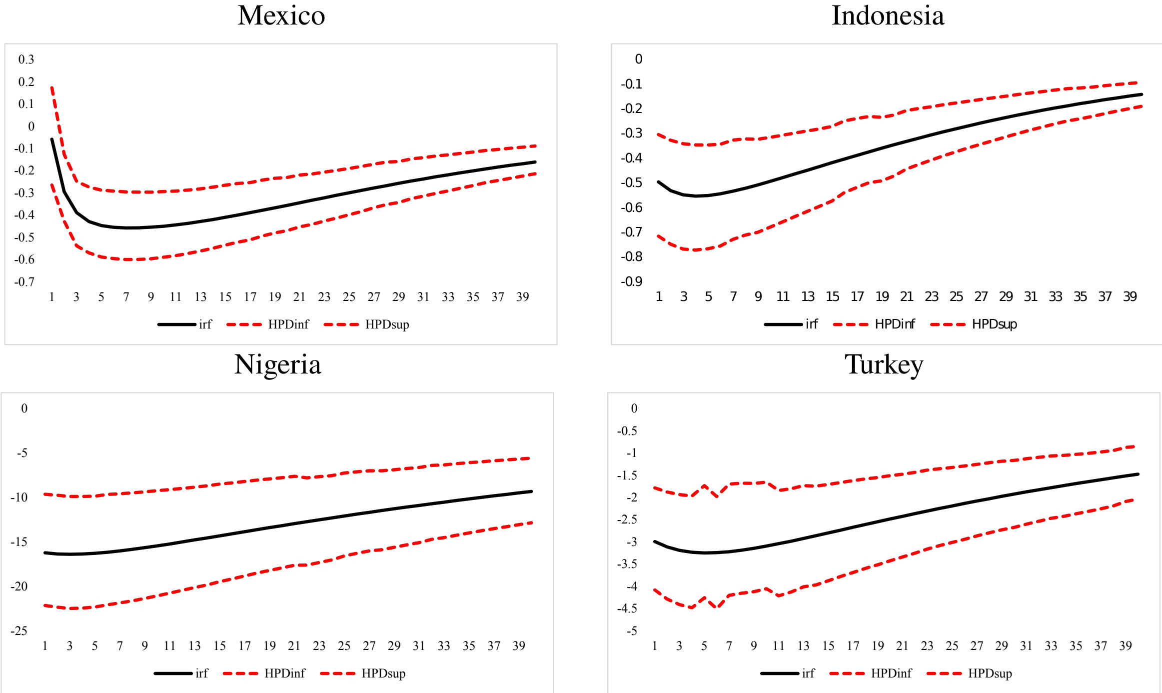


Turkey



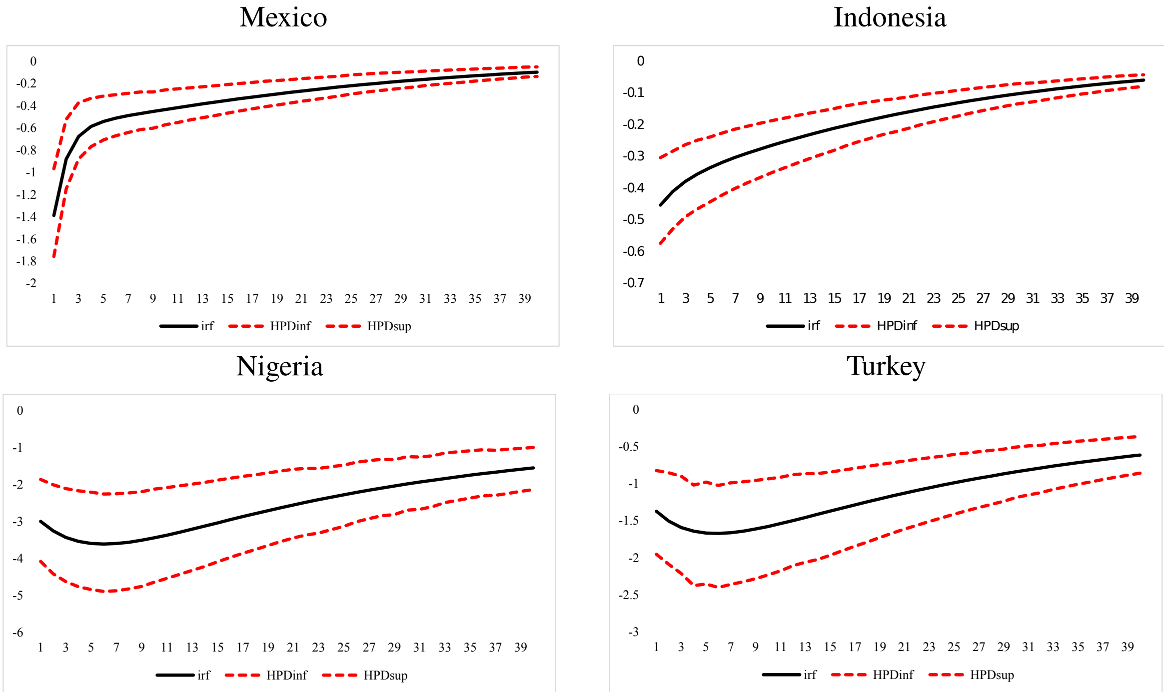
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.10) Impact of Commodity Production Shock on Ricardian Consumption - MINT



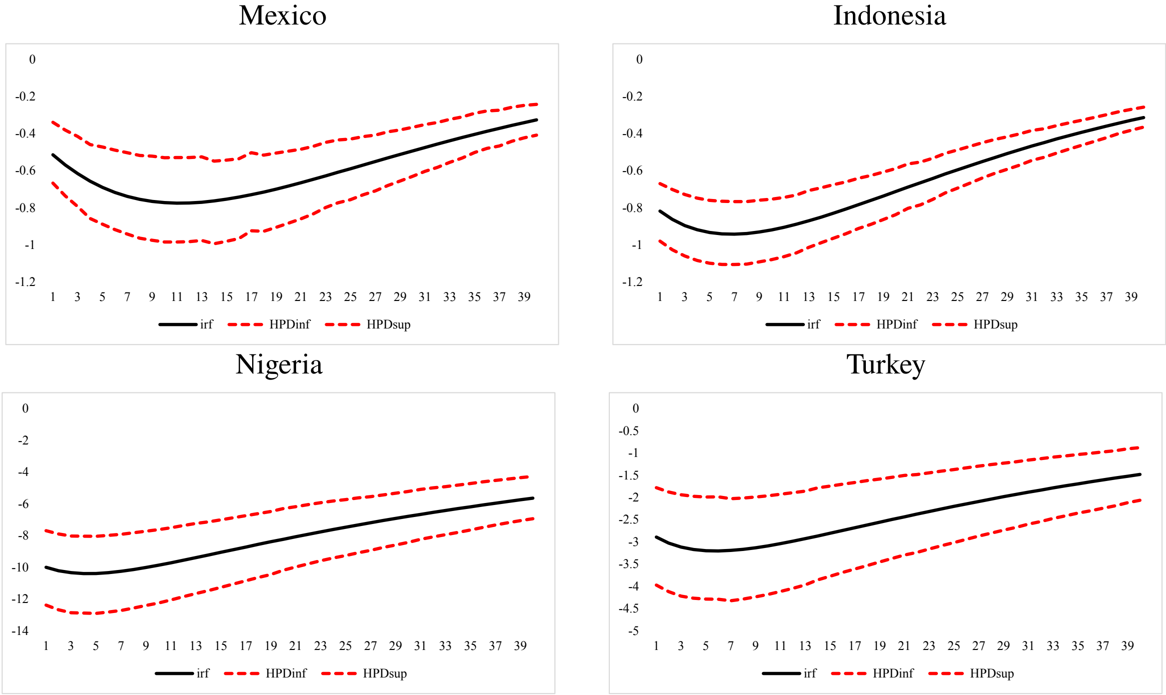
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.11) Impact of Commodity Production Shock on Non-Ricardian Consumption - MINT



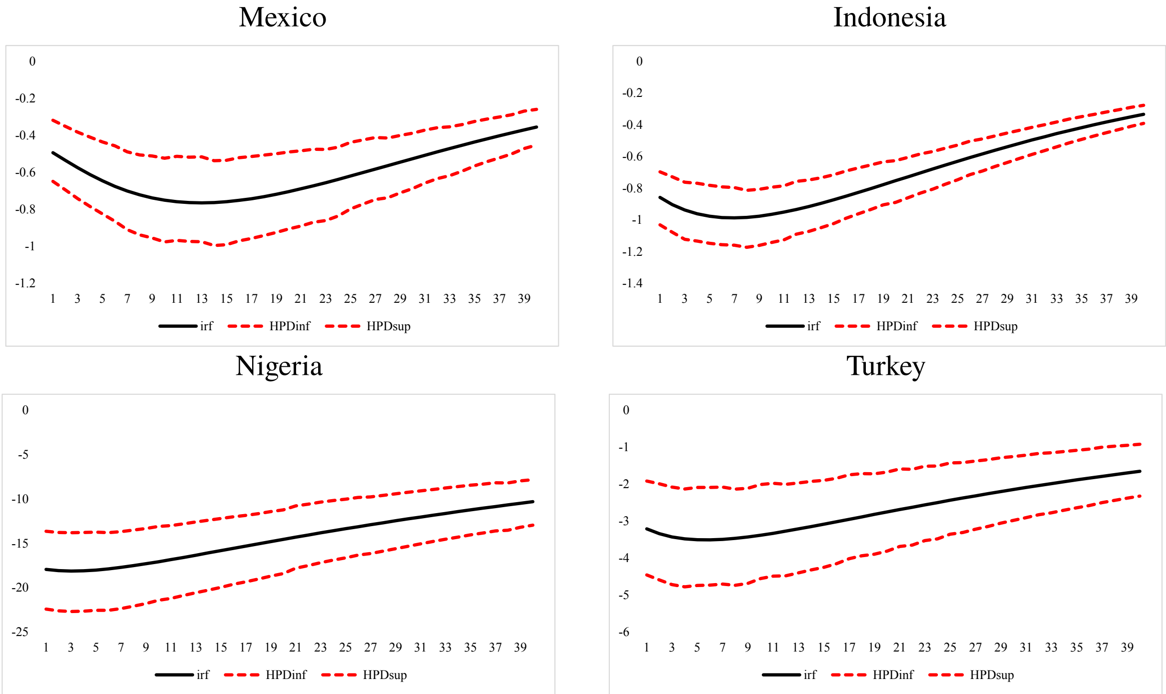
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.12) Impact of Commodity Price Shock on Aggregate Consumption - MINT



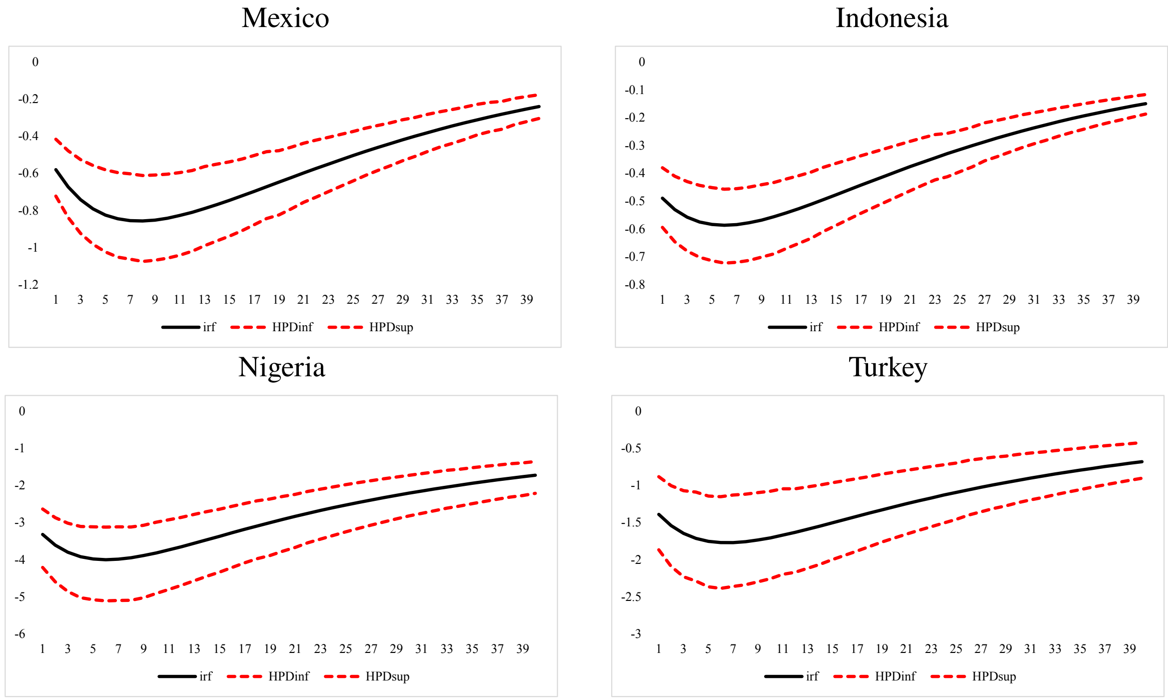
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.13) Impact of Commodity Price Shock on Ricardian Consumption - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (3.14) Impact of Commodity Price Shock on Non-Ricardian Consumption - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

3.6 Concluding Discussion

This study fits the DSGE model of Ojeda-Joya et al. (2016) to data and compares the effects of commodity and fiscal policy shocks on consumption across the leading emerging countries: Brazil, Russia, India and South Africa (BRIS), on one hand, as well as Mexico, Indonesia, Nigeria and Turkey (MINT), on the other, for the period ranging from 2003Q2 – 2020Q4. In particular, this paper assesses the consumption effects of a negative tax shock as well as positive transfer and debt shocks. Additionally, this research compares the impact of the commodity and fiscal policy shocks on the consumption of domestic goods, as against foreign ones. Further, the results obtained for BRIS are compared against the corresponding ones for MINT.

This paper finds that households in BRIS and MINT cut consumption in the aftermath of commodity production and price shocks, with the cuts in BRIS being highest in Russia, meanwhile, the consumption decline obtained for Nigeria exceeds that of Russia as well as the rest of the MINT. Also, across BRIS and MINT, negative commodity production and price shocks are associated with a reduction in the overall consumption of Ricardian and non-Ricardian households, with the consumption decline of the former generally being most severe in Russia and Nigeria, and the latter in South Africa and Indonesia within

BRIS and MINT respectively. Nonetheless, the specific household that experiences greater consumption reduction varies by country as well as by commodity shock. In Brazil, South Africa and Mexico, the adverse effects of both shocks are larger on non-Ricardian consumers. However, the reverse is the case for Russia, Indonesia, Nigeria and Turkey, with Ricardian consumers being more severely affected by the shocks. Meanwhile, in this regard, mixed findings are obtained for India; while non-Ricardian consumers are more acutely impacted by commodity production shocks, their Ricardian counterparts are hit harder by commodity price shocks.

Further, positive transfer shocks, although not always persistent, tend to raise aggregate consumption across BRIS and MINT, and more importantly, play a pivotal role in allowing for a redistribution pattern which albeit is associated with a consumption decline for Ricardian households, allows for a consumption rise for their non-Ricardian counterparts, thereby reducing the consumption ratio between the former and the latter, with South Africa, relative to the rest of BRIS, recording the most pronounced reduction, which however is less than that of Nigeria where the highest drop in the consumption ratio is obtained.

This research also investigates the consumption effects of tax and debt shocks. In this regard, a negative tax shock is found to benefit the Ricardian households, across BRIS and MINT, while impacting adversely on their non-Ricardian counterparts, thereby raising the consumption ratio between both households. Also, in Brazil, Russia, India, Mexico, Indonesia and Turkey, debt shocks exhibit the same impact as negative tax shocks. Specifically, the estimates associated with the effects of debt shocks are similar in sign to those of negative tax shocks, with the former being less in magnitude. In South Africa and Nigeria, however, the government debt shock results in an instantaneous increase in spending by both households, with Ricardian consumers seeing a slightly greater rise, hence still increasing the consumption ratio, as with the rest of the countries under study.

Additionally, this research contributes by contrasting how the commodity and fiscal policy shocks affect the demand for local and foreign goods. Specifically, the commodity production and price shocks lower consumption expenditure on domestic and foreign goods, both at an aggregate level as well as for each household, with the decrease in foreign goods consumption being larger than the domestic ones. This is consistently the case for all countries except South Africa, where domestic goods consumption rises as the commodity production shock occurs. Upon comparing results between BRIS and MINT, it becomes evident that the results between both groups are often consistent with each other, nonetheless, the consumption decline for MINT, on average, exceeds that of BRIS, in the aftermath of the commodity shocks.

Taking the empirical results as a guide for macroeconomic policies, the most vital implication of this study is that due to the significant reliance on commodities in BRIS and MINT, households in these countries are exposed to commodity shocks, which tend to dampen consumption for both poor and non-poor consumers. Nonetheless, during commodity shocks, government transfers help to boost household spending as well as narrow the consumption ratio between households. Since such distributional gains are not observed for debt funded spending and negative taxes; public transfers thus stand out as a more viable option to adopt, when sudden fiscal policies have to be implemented towards addressing the consumption effects of negative commodity shocks within BRIS and MINT.

In a bid to ensure all countries under study have equal numbers of observations, the timeframe studied in this research is limited to the period between 2003Q2 and 2020Q4. As such, subsequent papers within this area may examine the consumption effects of commodity shocks over a longer timespan as the necessary data become available. Additionally, further research could evaluate the effects of other shocks that could potentially impact consumption (e.g., fiscal policy tools such as public investment and consumption tax) during commodity shocks. Finally, while this paper focuses on BRIS and MINT, future studies may examine the consumption effects of commodity shocks within other emerging countries.

Appendix C

Appendix to Chapter 3

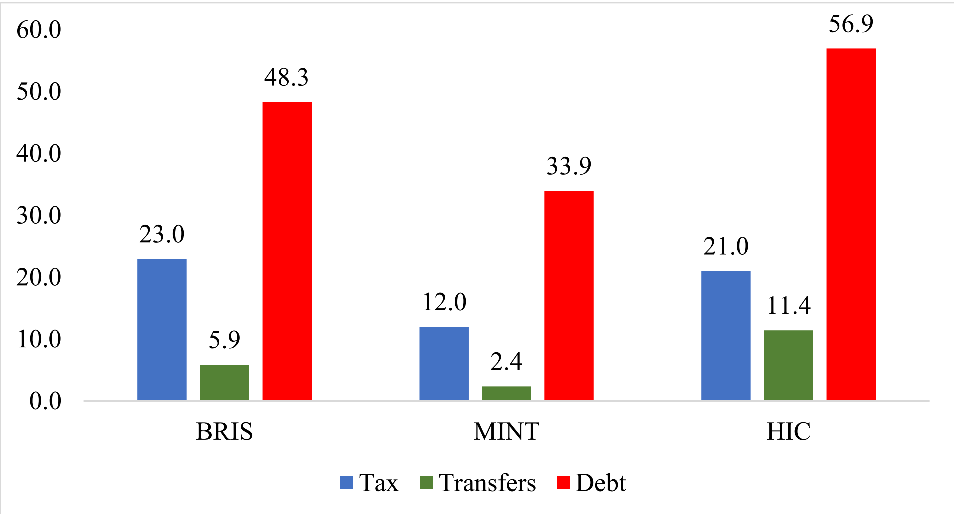
C.1 Transfer, Tax and Debt in BRIS and MINT

In terms of government transfers, Figure C.11 reveals that in high-income countries, transfers accounted for about 11% of GDP on average between 2003 to 2017, whereas in the case of BRIS and MINT, this proportion averaged about 6% and 2% respectively. Echoing these statistics, Ivins (2013) in a report published by Oxfam, shows that in India, social protection as a percentage of the GDP is three to four times lower than the OECD average, and around three-quarters lower in Russia and Brazil.

Meanwhile, Figure C.11 illustrates that the average tax ratio in BRIS is relatively comparable to that of high-income countries, mirroring the conclusions of Ivins (2013). Nonetheless, the average tax ratio in MINT falls significantly below that of high-income countries.

Further, Figure C.11 reveals that public debt is lower in BRIS and MINT compared to high-income countries. Specifically, between 2003 and 2019, the share of public debt within the GDP averaged 57% in high income countries, 48% in BRIS and 34% in MINT.

Figure (C.11) Tax, Transfers and Debt as a Percentage of GDP: BRIS, MINT and HIC



Note: Data on Transfers are obtained from the Statistics on Public Expenditures for Economic Development (SPEED) Database. Data on Taxes are sourced from the UNU-WIDER Government Revenue Dataset. Data on Debt are retrieved from the October 2022 vintage of the IMF's World Economic Outlook (WEO) Database. Transfers comprise social protection programmes that focus on a variety of areas such as unemployment, disability, sickness, old age and social exclusion. Tax covers all taxes collected, including resource-based taxes. Debt captures all liabilities requiring interest and/or principal payments from the debtor to the creditor at a future date. The plots for Tax and Debt rely on data spanning from 2003 to 2019, while that of Transfers is created with data over the period 2003 to 2017, based on available data.

C.2 Additional Technical Information

Overall consumption index

The overall consumption index (C_t^h) is given as

$$C_t^h = [(\gamma_c)^{\frac{1}{\rho_c}}(C_{N,t}^h)^{\frac{\rho_c-1}{\rho_c}} + (1-\gamma_c)^{\frac{1}{\rho_c}}(C_{T,t}^h)^{\frac{\rho_c-1}{\rho_c}}]^{\frac{\rho_c}{\rho_c-1}} \tag{C.1}$$

where the share of non-tradable goods in total consumption is captured by γ_c and the corresponding elasticity of substitution is denoted by ρ_c.

Consumption of tradable goods index

Similarly, the index for the consumption of tradable goods is defined as

$$C_{T,t}^h = [(\gamma_m)^{\frac{1}{\rho_m}}(C_{M,t}^h)^{\frac{\rho_m-1}{\rho_m}} + (1-\gamma_m)^{\frac{1}{\rho_m}}(C_{F,t}^h)^{\frac{\rho_m-1}{\rho_m}}]^{\frac{\rho_m}{\rho_m-1}} \tag{C.2}$$

The share of domestic goods in the consumption of tradable goods is captured by γ_m and the corresponding elasticity of substitution is denoted by ρ_m.

Average level of consumption and labour supply

The average level of consumption (C_t) (within the economy) is given as are $C_t = zC_t^R + (1-z)C_N^{NR}$ Also, the average level of labour supply (L_t) is defined as $L_t = zL_t^R + (1-z)L_t^{NR}$

Consumer price index

P_t denoting the overall consumer price index is defined as:$[(\gamma_c)(P_{N,t})^{1-\rho_c} + (1-\gamma_c)(P_{CT,t})^{1-\rho_c}]^{\frac{1}{1-\rho_c}}$ meanwhile $P_{CT,t} = [\gamma_m + (1-\gamma_m)(P_{F,t})^{1-\rho_m}]^{\frac{1}{1-\rho_m}}$

Composite investment good

$I_{M,t}$, representing the composite investment good is defined as: $I_{M,t} = [(\gamma_i)^{\frac{1}{\rho_i}}(I_{H,t})^{\frac{\rho_i-1}{\rho_i}} + (1-\gamma_i)^{\frac{1}{\rho_i}}(I_{MF,t})^{\frac{\rho_i-1}{\rho_i}}]^{\frac{\rho_i}{\rho_i-1}}$

where the share of domestic investment in manufacturing sector investment is denoted by γ_i, and the associated elasticity of substitution is captured by ρ_i.

Optimality conditions for ricardian Households

Upon maximizing equation (3.1) subject to the constraint highlighted in equation (3.3), the below optimality conditions are arrived at with respect to bonds, shares in manufacturing and commodity firms, labor supply and consumption, respectively:

$$1 = exp(\beta_t)E_t\left[\frac{\lambda_{C,t+1}}{\lambda_{C,t}}(1+r)\frac{P_t}{P_{t+1}}\right] \tag{C.3}$$

$$\nu_{M,t} = exp(\beta_t)E_t\left[\frac{\lambda_{C,t+1}}{\lambda_{C,t}}(\nu_{M,t+1}+d_{M,t+1})\frac{P_t}{P_{t+1}}\right] \tag{C.4}$$

$$\nu_{E,t} = exp(\beta_t)E_t\left[\frac{\lambda_{C,t+1}}{\lambda_{C,t}}(\nu_{E,t+1}+d_{E,t+1})\frac{P_t}{P_{t+1}}\right] \tag{C.5}$$

$$\frac{\omega}{1-\omega}\frac{C_t^R}{1-L_R^t} = \frac{w_t}{P_t} \tag{C.6}$$

$$\frac{C_{N,t}^R}{C_{T,t}^R} = \frac{\gamma_c}{1-\gamma_c}\left(\frac{P_{N,t}}{P_{CT,t}}\right)^{-\rho c}, \frac{C_{M,t}^R}{C_{F,t}^R} = \frac{\gamma_m}{1-\gamma_m}\left(\frac{1}{P_{F,t}}\right)^{-\rho_m} \tag{C.7}$$

where, $\lambda_{C,t}$ captures the marginal utility of consumption. Specifically, $\lambda_{C,t} = (1-\omega)(C_t^R)^{(\gamma-1)(\omega-1)-1}(1-L_t^R)^{\omega(1-\gamma)}$. The price of imports within the domestic market is denoted by $P_{F,t}$, with the price of local manufactures serving as the unit (i.e., numeraire) in which $P_{F,t}$ is measured.

Optimality conditions for non-ricardian Households

Upon maximizing equation (3.1) subject to the constraint highlighted in equation (3.4), the below optimality conditions are arrived at with respect to labour supply and consumption, respectively:

$$\frac{\omega}{1-\omega}\frac{C_t^{NR}}{1-L_{NR}^t} = \frac{w_t}{P_t} \tag{C.8}$$

$$\frac{C_{N,t}^{NR}}{C_{T,t}^{NR}} = \frac{\gamma_c}{1-\gamma_c}\left(\frac{P_{N,t}}{P_{CT,t}}\right)^{-\rho c}, \frac{C_{M,t}^{NR}}{C_{F,t}^{NR}} = \frac{\gamma_m}{1-\gamma_m}\left(\frac{1}{P_{F,t}}\right)^{-\rho_m} \tag{C.9}$$

Optimality conditions within the tradable manufacturing sector

In equations (C.10)-(C.13), the optimality conditions with respect to capital, investment, labor demand and the investment composition respectively are presented.

$$E_t exp(\beta_{t+1}) \left(\frac{\lambda_{C,t+1}}{\lambda_{C,t}} \frac{P_t}{P_{t+1}}\right) \times \Bigg[P_{IM,t+1} \left(\phi_m \left(\frac{I_{M,t+1}}{K_{M,t+1}} - \delta_m\right) \frac{I_{M,t+1}}{K_{M,t+1}} - \frac{\phi_m}{2} \left(\frac{I_{M,t+1}}{K_{M,t+1}} - \delta_m\right)^2\right) + \alpha_m \frac{(1-\tau_m)Y_{M,t+1}}{K_{M,t+1}} + \lambda_{IM,t+1}(1-\delta_m) = \lambda_{IM,t} \quad \text{(C.10)}$$

$$P_{IM,t+1} \left(1 + \phi_m \left(\frac{I_{M,t}}{K_{M,t}} - \delta_m\right)\right) = \lambda_{IM,t} \quad \text{(C.11)}$$

$$(1-\alpha_m)(1-\tau_m)\frac{Y_{M,t}}{L_{M,t}} = w_t \quad \text{(C.12)}$$

$$\frac{I_{H,t}}{I_{MF,t}} = \frac{\gamma_i}{1-\gamma i} \left(\frac{1}{P_{F,t}}\right)^{-\rho_i} \quad \text{(C.13)}$$

In the tradable manufacturing sector, the shadow price of a unit of capital is represented by λ_{IM}.

Optimality conditions within the tradable commodity sector

Upon maximizing equation (3.5), the below optimality conditions with respect to capital, investment and labour demand, respectively are arrived at:

$$E_t exp(\beta_{t+1}) \left(\frac{\lambda_{C,t+1}}{\lambda_{C,t}} \frac{P_t}{P_{t+1}}\right) \Bigg[P_{F,t+1} \left(\phi_e \left(\frac{I_{E,t+1}}{K_{E,t+1}} - \delta_e\right) \frac{I_{E,t+1}}{K_{E,t+1}} - \frac{\phi_e}{2} \left(\frac{I_{E,t+1}}{K_{E,t+1}} - \delta_e\right)^2\right) + \alpha_e P_{E,t+1} \frac{(1-\tau_e)Y_{E,t+1}}{K_{E,t+1}} + \lambda_{IE,t+1}(1-\delta_e) = \lambda_{IE,t} \quad \text{(C.14)}$$

$$P_{F,t} \left(1 + \phi_e \left(\frac{I_{E,t}}{K_{E,t}} - \delta_e\right)\right) = \lambda_{IE,t} \quad \text{(C.15)}$$

$$(1-\alpha_e)(1-\tau_e)\frac{Y_{E,t}}{L_{E,t}} = \frac{w_t}{P_{E,t}} \quad \text{(C.16)}$$

The shadow price of a unit of capital within the tradable commodity sector is denoted by λ_{IE}.

C.3 Summary of Results: Fiscal Policy Shock, Foreign and Domestic Goods Consumption

Table (C.31) BRIS and MINT - Ricardian vs non-Ricardian -Aggregate Consumption - Transfer Shock

	Transfer Shock (Point of Impact)			
	Overall Consumption Ricardian	Overall Consumption non-Ricardian	Aggregate Consumption	Consumption Ratio
Brazil	(-)	(+ +)	(+)	(- -)
Russia	(- - -)	(+ + +)	(+ +)	(- - -)
India	(- -)	(+)	(+ + +)	(-)
South Africa	(- - - -)	(+ + + +)	(+ + + +)	(- - - -)
Mexico	(- - -)	(+ +)	(+ + +)	(- -)
Indonesia	(- -)	(+ + +)	(+)	(- - -)
Nigeria	(- - - -)	(+ + + +)	(+ + + +)	(- - - -)
Turkey	(-)	(+ +)	(+ +)	(-)

Note: Variables are expressed as percent deviation from their initial steady-state values. The positive (negative) signs are used to compare across countries, the degree to which the relevant response variable is impacted positively (negatively). Hence, in a column, the country with the highest number of positive (negative) signs is most impacted positively (negatively).

Table (C.32) BRIS and MINT - Ricardian vs non-Ricardian -Aggregate Consumption - Tax Shock

	Tax Shock (Point of Impact)			
	Overall Consumption Ricardian	Overall Consumption non-Ricardian	Aggregate Consumption	Consumption Ratio
Brazil	(+)	(-)	(-)	(+)
Russia	(+ + +)	(- - -)	(- -)	(+ + +)
India	(+ +)	(- -)	(- - -)	(+ +)
South Africa	(+ + + +)	(- - - -)	(- - - -)	(+ + + +)
Mexico	(+ + +)	(- -)	(- - -)	(+ +)
Indonesia	(+ +)	(- - -)	(- -)	(+ + +)
Nigeria	(+ + + +)	(- - - -)	(- - - -)	(+ + + +)
Turkey	(+)	(-)	(-)	(+)

Note: Variables are expressed as percent deviation from their initial steady-state values. The positive (negative) signs are used to compare across countries, the degree to which the relevant response variable is impacted positively (negatively). Hence, in a column, the country with the highest number of positive (negative) signs is most impacted positively (negatively).

Table (C.33) BRIS and MINT - Ricardian vs non-Ricardian -Aggregate Consumption - Debt Shock

	Debt Shock (Point of Impact)			
	Overall Consumption Ricardian	Overall Consumption non-Ricardian	Aggregate Consumption	Consumption Ratio
Brazil	(+)	(-)	(+)	(+)
Russia	(+ +)	(- - -)	(+ +)	(+ + +)
India	(+ + +)	(- -)	(+ + +)	(+ +)
South Africa	(+ + + +)	(+)	(+ + + +)	(+ + + +)
Mexico	(+ + +)	(- -)	(+ + +)	(+ + +)
Indonesia	(+)	(-)	(+)	(+)
Nigeria	(+ + + +)	(+)	(+ + + +)	(+ + + +)
Turkey	(+ +)	(- - -)	(+ +)	(+ +)

Note: Variables are expressed as percent deviation from their initial steady-state values. The positive (negative) signs are used to compare across countries, the degree to which the relevant response variable is impacted positively (negatively). Hence, in a column, the country with the highest number of positive (negative) signs is most impacted positively (negatively).

Table (C.34) BRIS and MINT - Foreign and Domestic Goods - Commodity Production Shock

	Negative Commodity Production shock (Point of impact)			
	Domestic goods Consumption by Ricardian	Domestic goods Consumption by non-Ricardian	Foreign goods Consumption by Ricardian	Foreign goods Consumption by non-Ricardian
Brazil	(-)	(- -)	(-)	(-)
Russia	(- - -)	(- - -)	(- - -)	(- -)
India	(- -)	(- - - -)	(- - - -)	(- - - -)
South Africa	(+)	(-)	(- -)	(- - -)
Mexico	(+)	(- - -)	(- -)	(- -)
Indonesia	(-)	(-)	(-)	(-)
Nigeria	(- - -)	(- - - -)	(- - - -)	(- - - -)
Turkey	(- -)	(- -)	(- - -)	(- - -)

Note: Variables are expressed as percent deviation from their initial steady-state values. The positive (negative) signs are used to compare across countries, the degree to which the relevant response variable is impacted positively (negatively). Hence, in a column, the country with the highest number of positive (negative) signs is most impacted positively (negatively).

Table (C.35) BRIS and MINT - Foreign and Domestic Goods - Commodity Price Shock

	Negative Commodity Price shock (Point of impact)			
	Domestic goods Consumption by Ricardian	Domestic goods Consumption by non-Ricardian	Foreign goods Consumption by Ricardian	Foreign goods Consumption by non-Ricardian
Brazil	(- -)	(- -)	(-)	(-)
Russia	(- - -)	(- - -)	(- - -)	(- - -)
India	(- - - -)	(- - - -)	(- - - -)	(- - - -)
South Africa	(-)	(-)	(- -)	(- -)
Mexico	(-)	(-)	(-)	(- -)
Indonesia	(- -)	(- - -)	(- -)	(-)
Nigeria	(- - - -)	(- - - -)	(- - - -)	(- - - -)
Turkey	(- - -)	(- - -)	(- - -)	(- - -)

Note: Variables are expressed as percent deviation from their initial steady-state values. The positive (negative) signs are used to compare across countries, the degree to which the relevant response variable is impacted positively (negatively). Hence, in a column, the country with the highest number of positive (negative) signs is most impacted positively (negatively).

Table (C.36) BRIS and MINT - Commodity Shocks

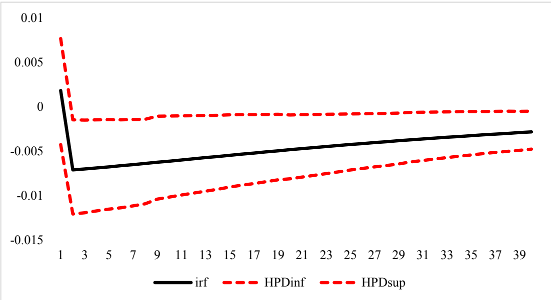
Countries	Negative Commodity Production shock (Point of impact)			Negative Commodity Price shock (Point of impact)		
	Overall Consumption by Ricardian	Overall Consumption by non-Ricardian	Aggregate Consumption	Overall Consumption by Ricardian	Overall Consumption by non-Ricardian	Aggregate Consumption
BRIS	(-)	(-)	(-)	(-)	(-)	(-)
MINT	(- -)	(- -)	(- -)	(- -)	(- -)	(- -)

Note: Variables are expressed as percent deviation from their initial steady-state values. The negative signs are used to compare between BRIS and MINT, the degree to which the relevant response variable is impacted negatively. Hence, in a column, the group of country with the highest number of negative signs is most impacted negatively.

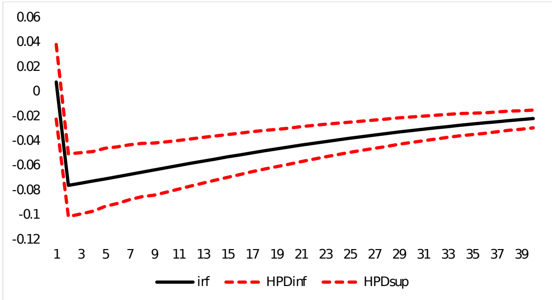
C.4 Transfer Shock on Consumption and Consumption Ratio – BRIS and MINT

Figure (C.41) Impact of Transfer Shock on Aggregate Consumption - BRIS

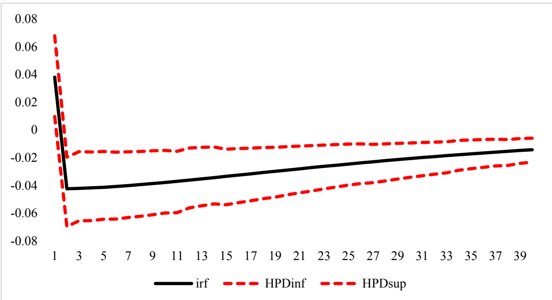
Brazil



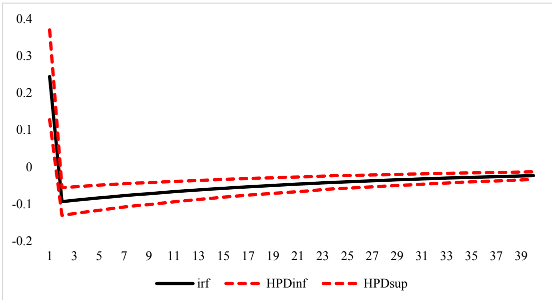
Russia



India



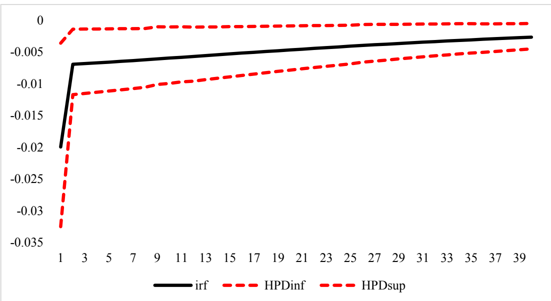
South Africa



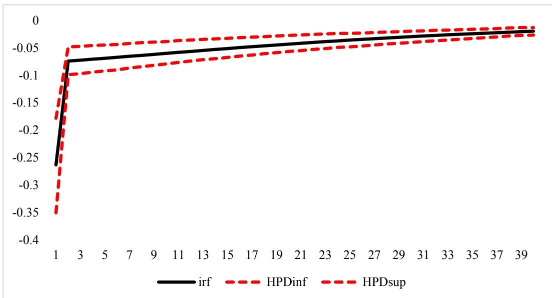
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.42) Impact of Transfer Shock on Ricardian Consumption - BRIS

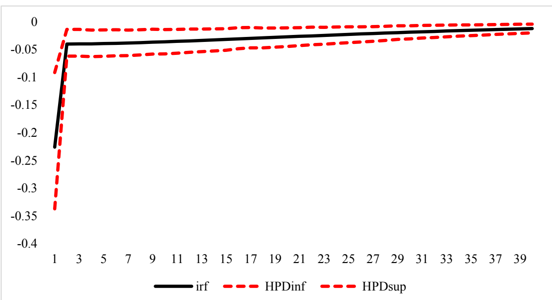
Brazil



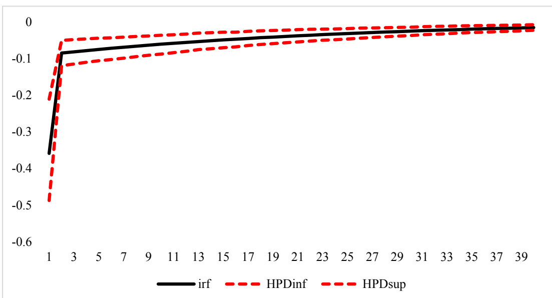
Russia



India



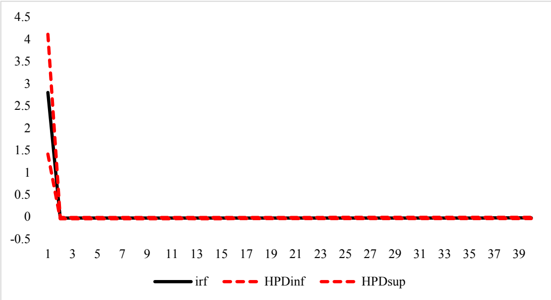
South Africa



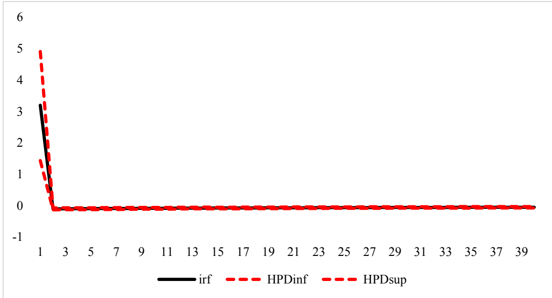
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.43) Impact of Transfer Shock on Non-Ricardian Consumption - BRIS

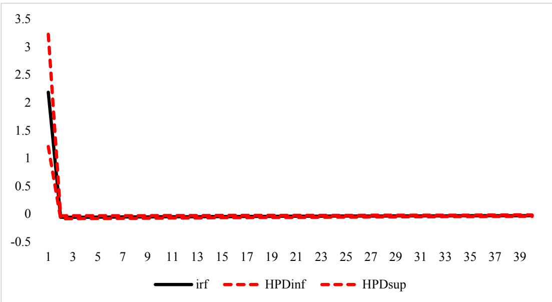
Brazil



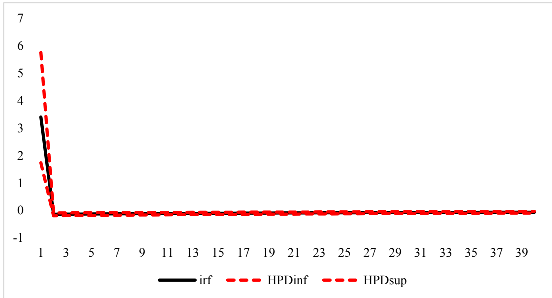
Russia



India



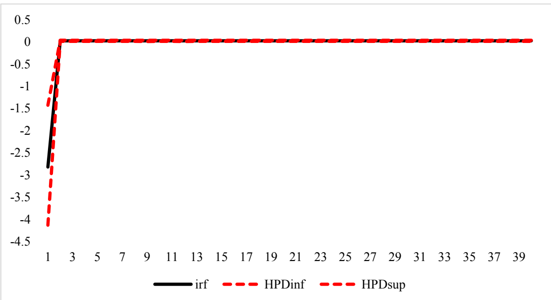
South Africa



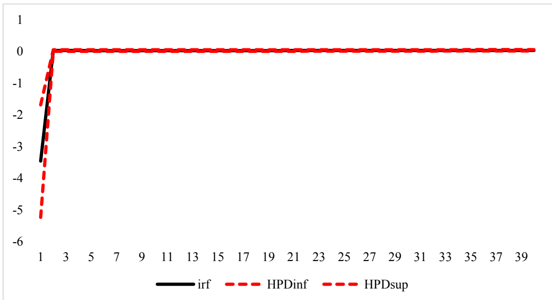
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.44) Impact of Transfer Shock on the Consumption Ratio - BRIS

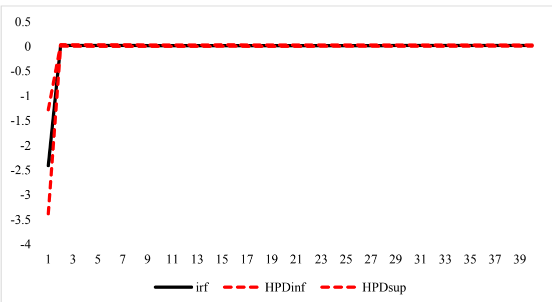
Brazil



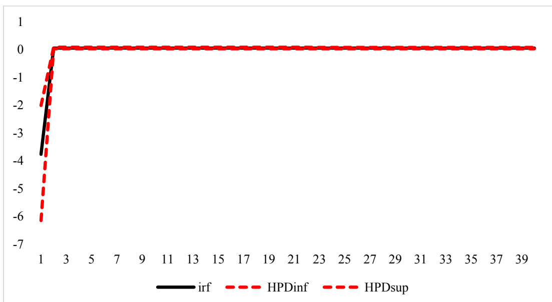
Russia



India



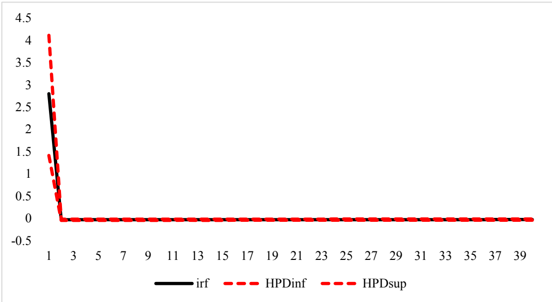
South Africa



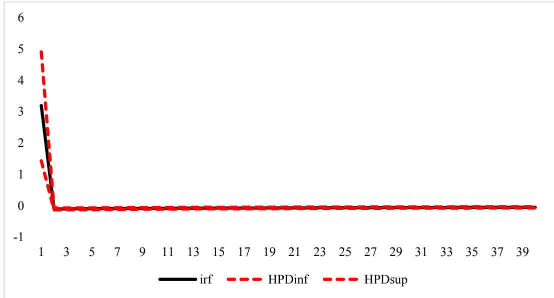
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.45) Impact of Transfer Shock on Non-Ricardian Consumption - BRIS

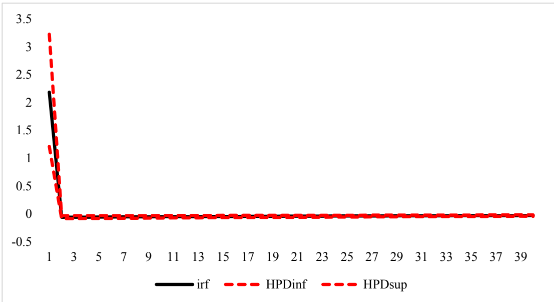
Brazil



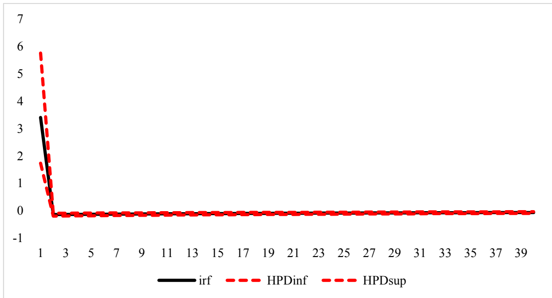
Russia



India



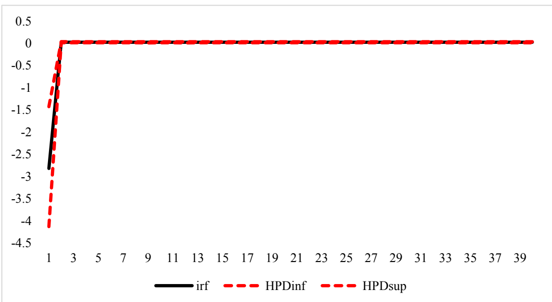
South Africa



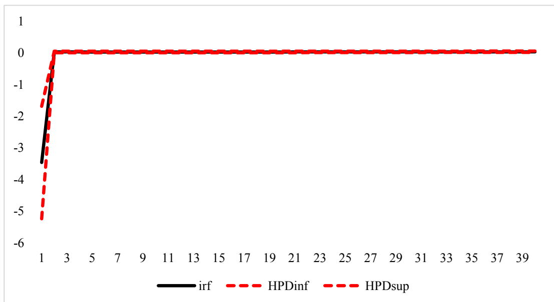
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.46) Impact of Transfer Shock on the Consumption Ratio - BRIS

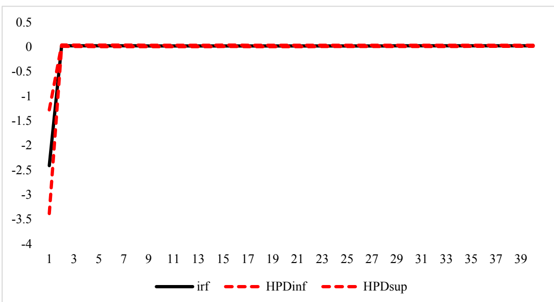
Brazil



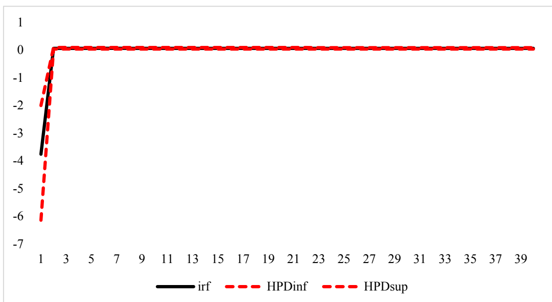
Russia



India

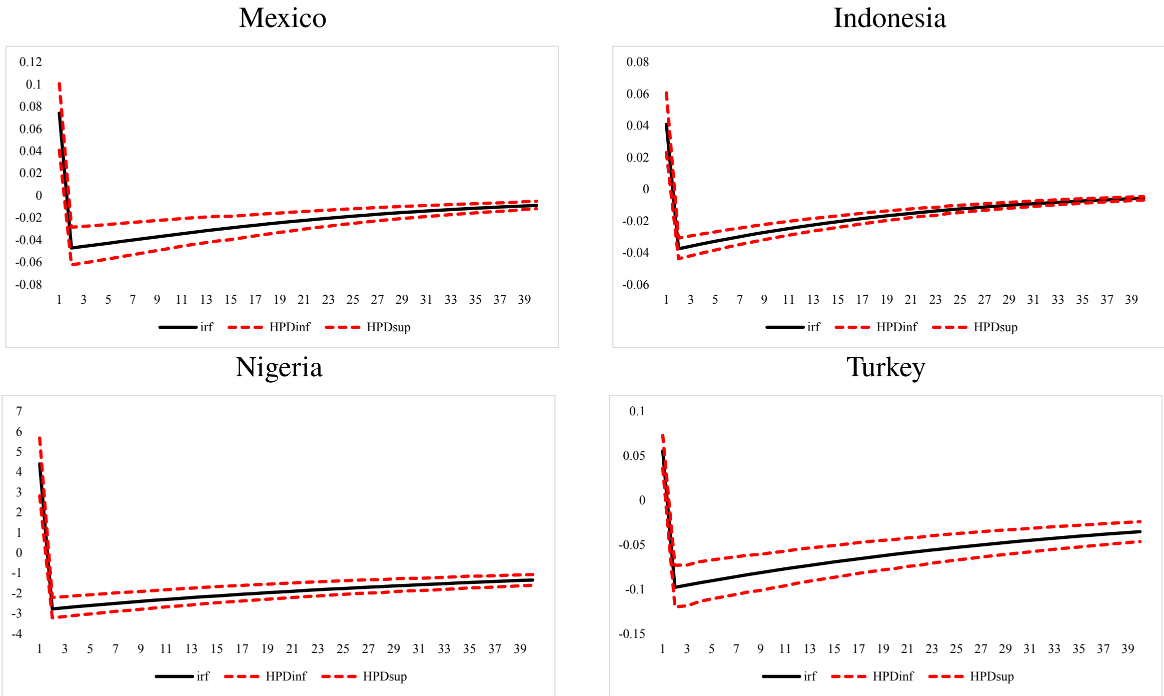


South Africa



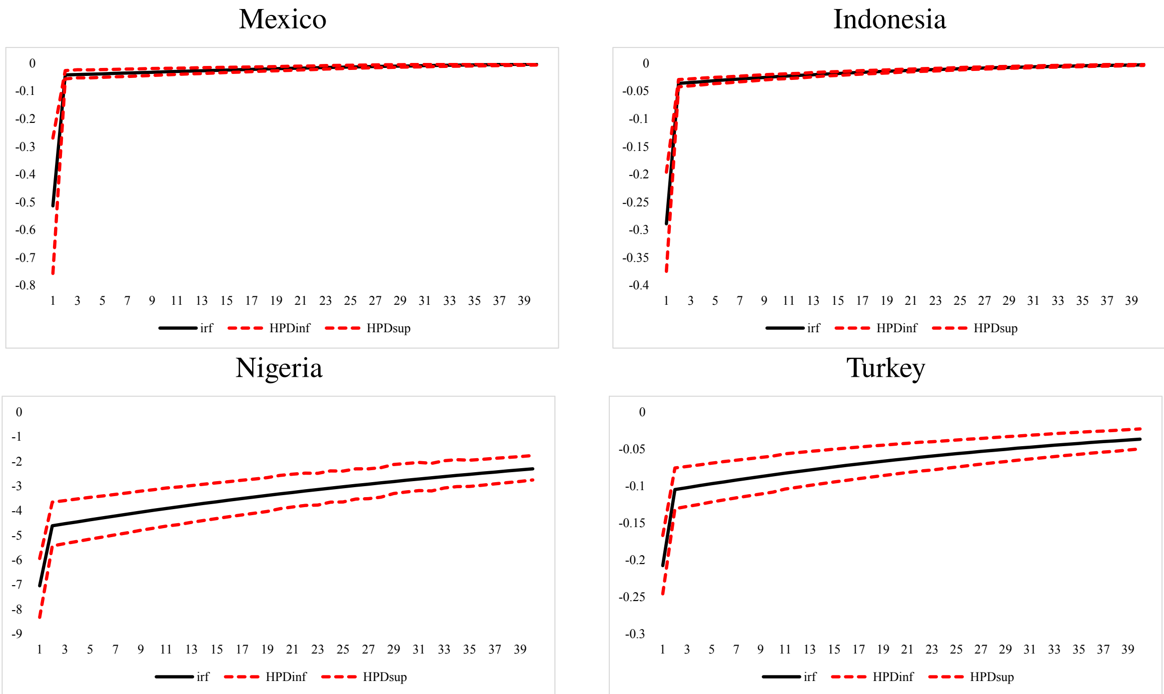
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.47) Impact of Transfer Shock on Aggregate Consumption - MINT



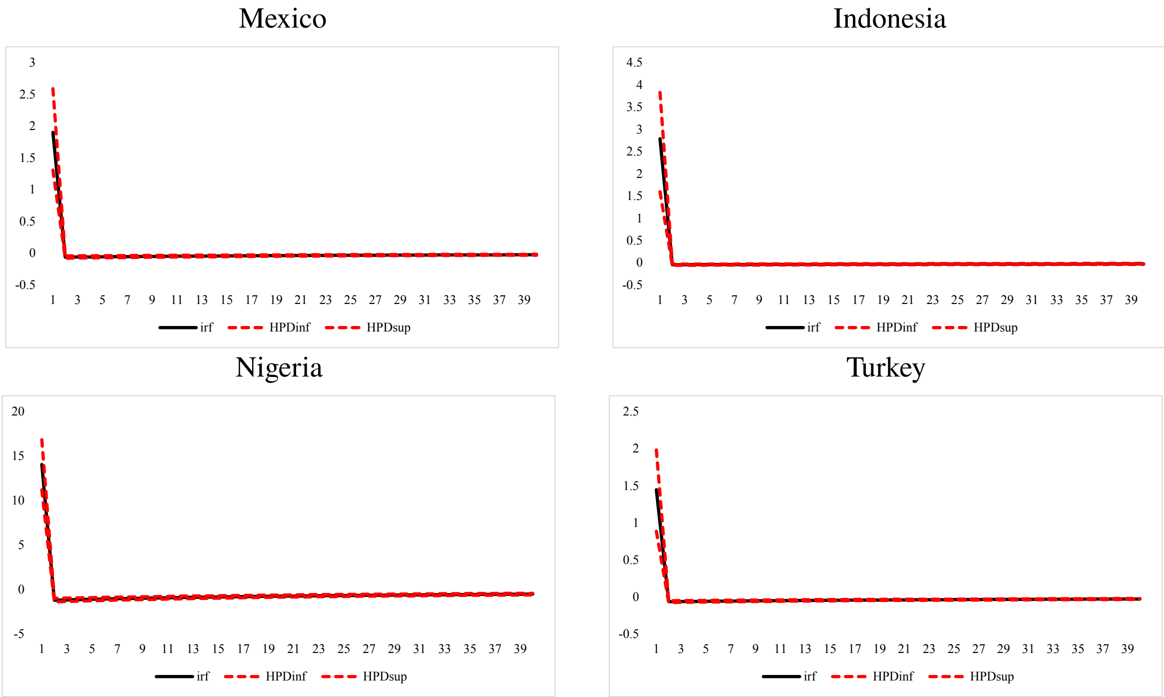
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.48) Impact of Transfer Shock on Ricardian Consumption - MINT



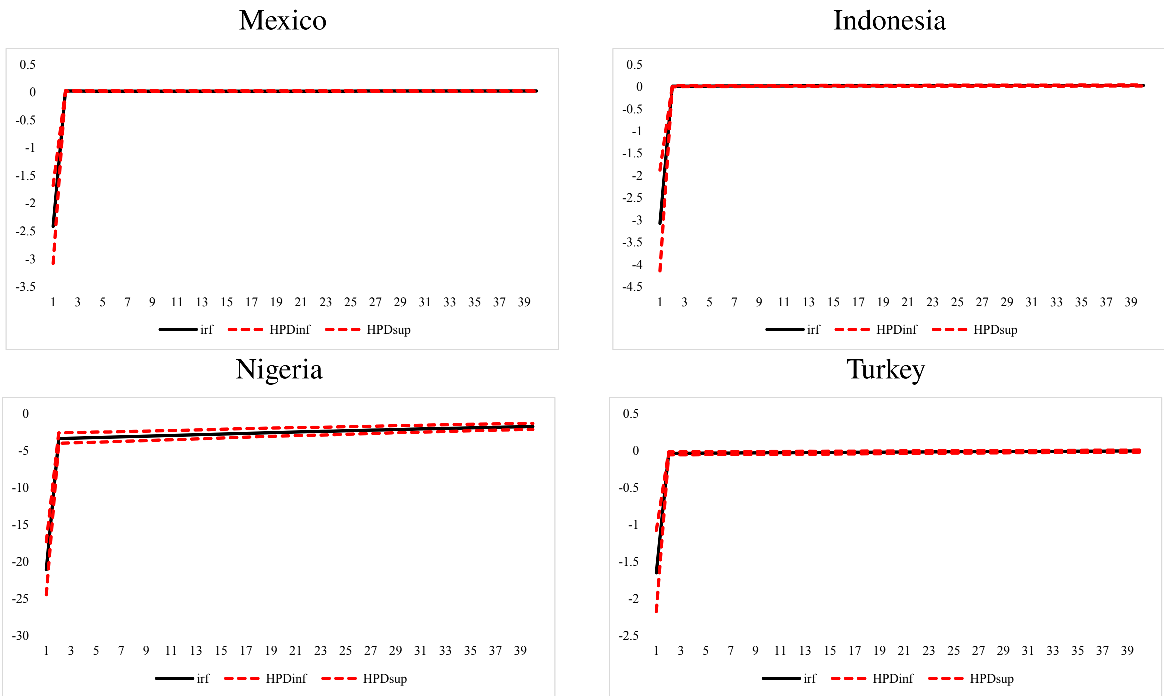
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.49) Impact of Transfer Shock on Non-Ricardian Consumption - MINT



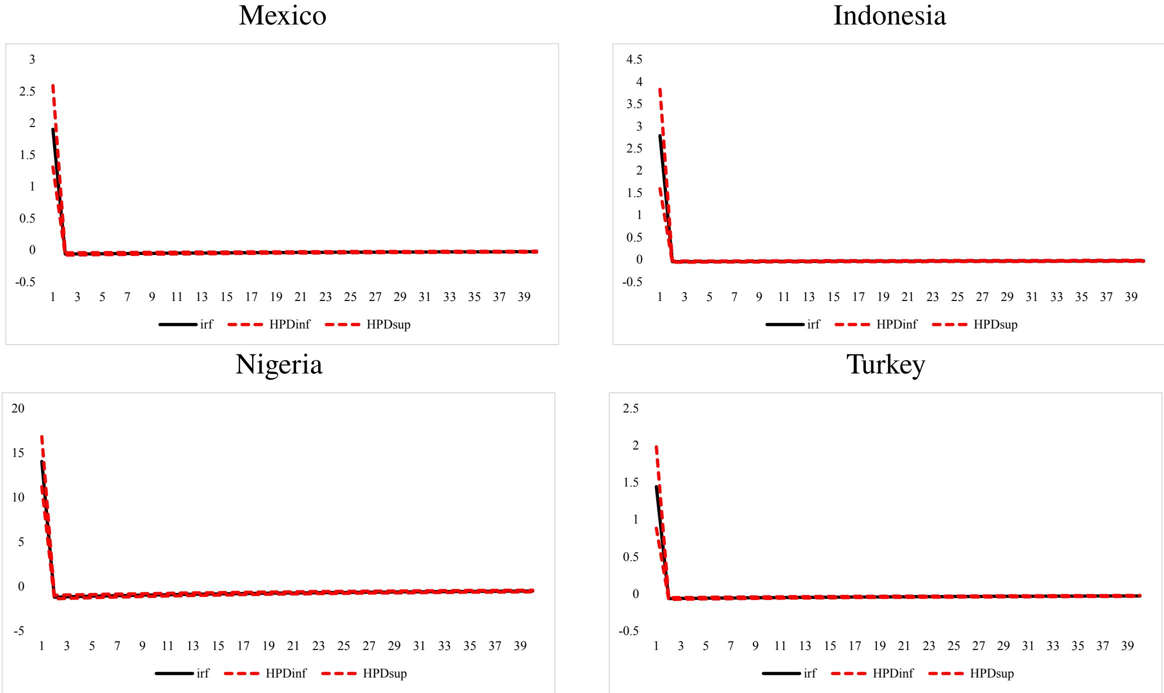
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.410) Impact of Transfer Shock on the Consumption Ratio - MINT



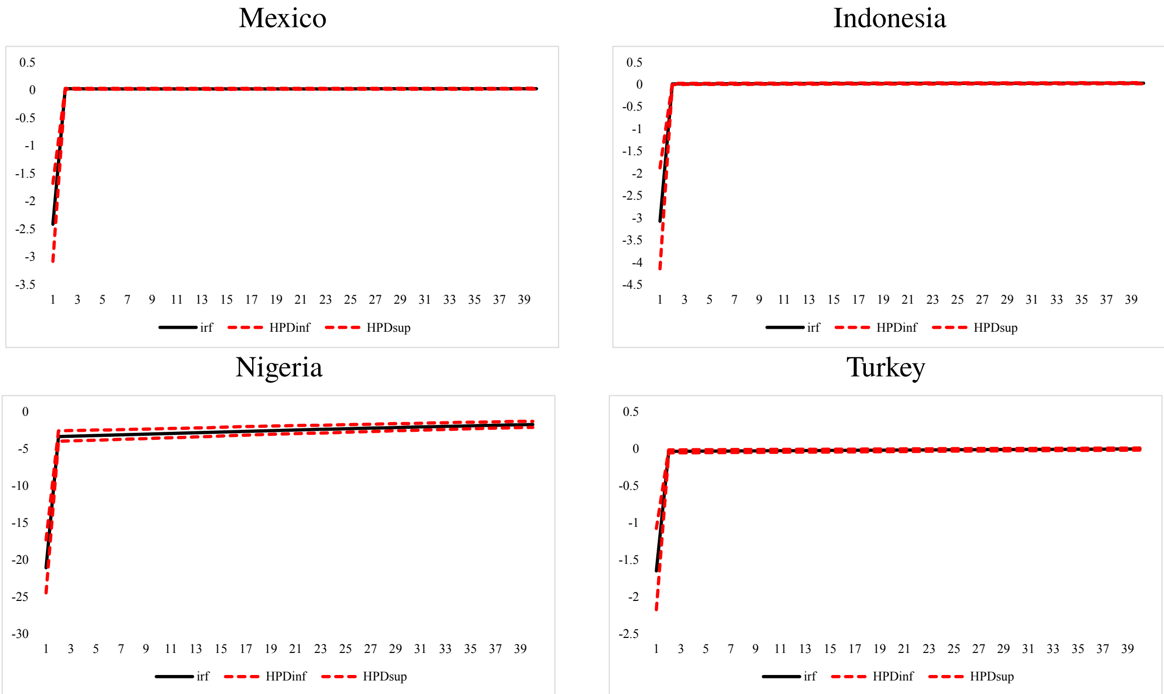
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.411) Impact of Transfer Shock on Non-Ricardian Consumption - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.412) Impact of Transfer Shock on the Consumption Ratio - MINT

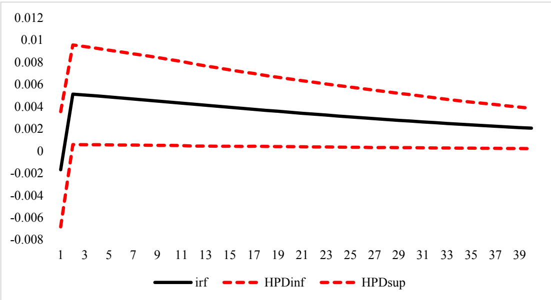


Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

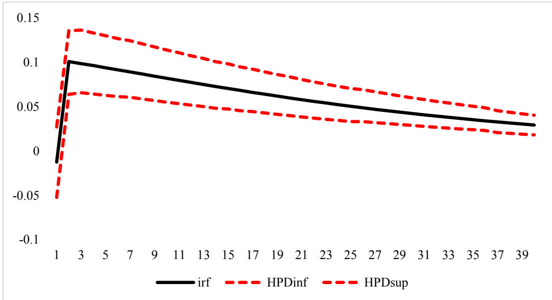
C.5 Tax Shock on Consumption and Consumption Ratio – BRIS and MINT

Figure (C.51) Impact of Tax Shock on Aggregate Consumption - BRIS

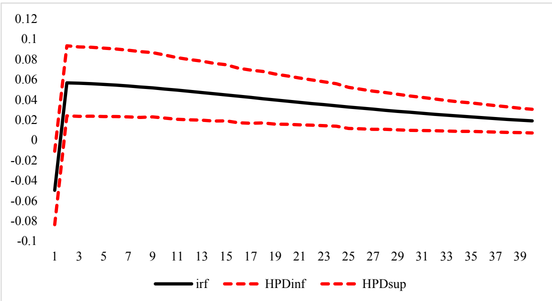
Brazil



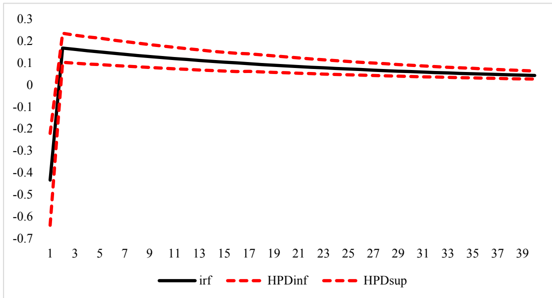
Russia



India



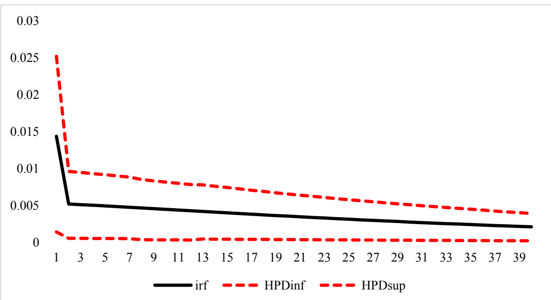
South Africa



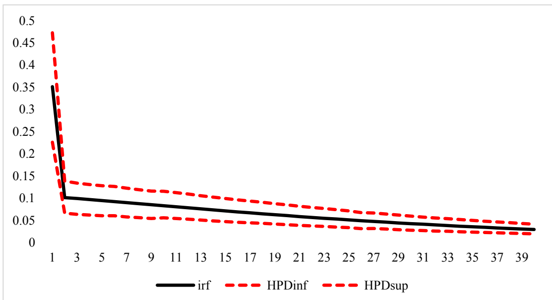
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.52) Impact of Tax Shock on Ricardian Consumption - BRIS

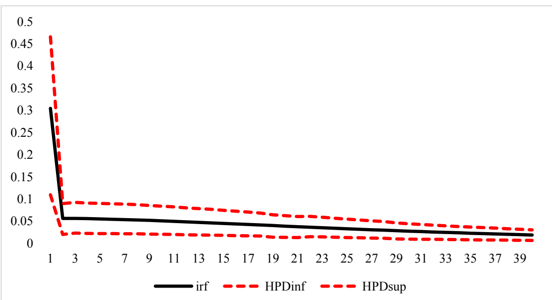
Brazil



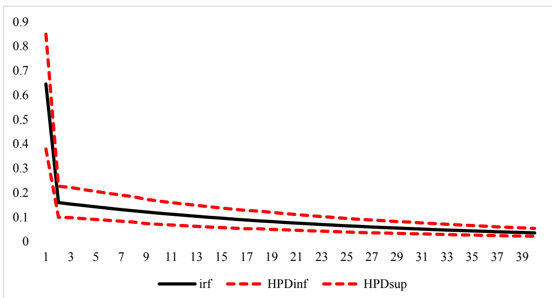
Russia



India

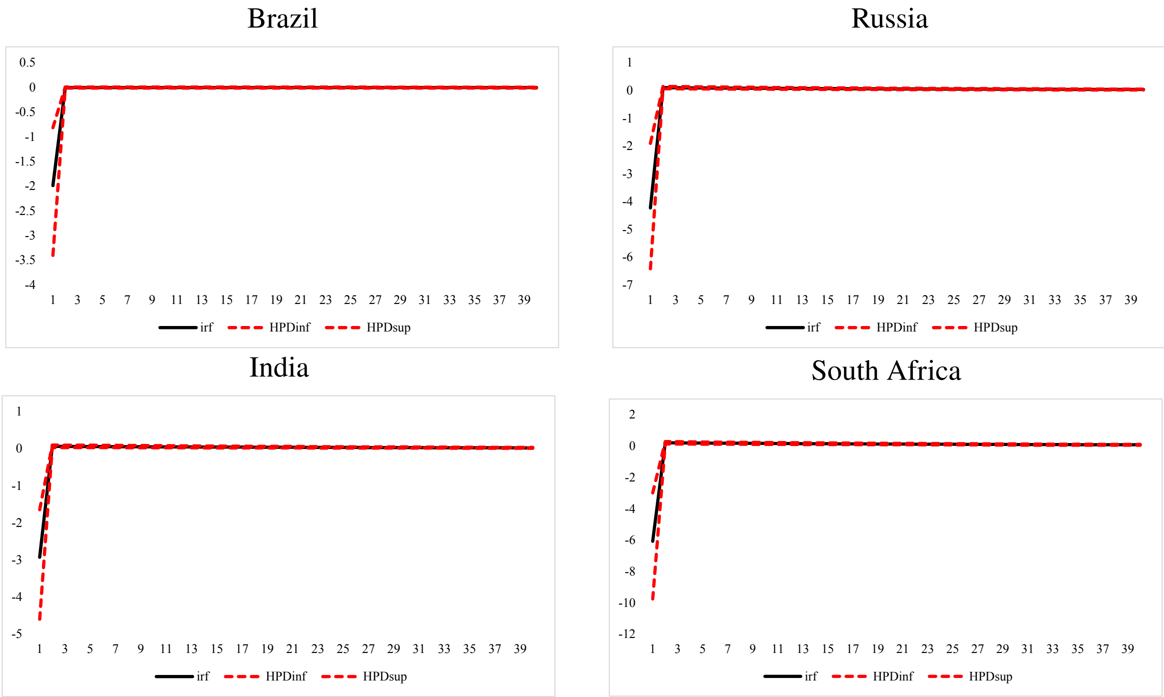


South Africa



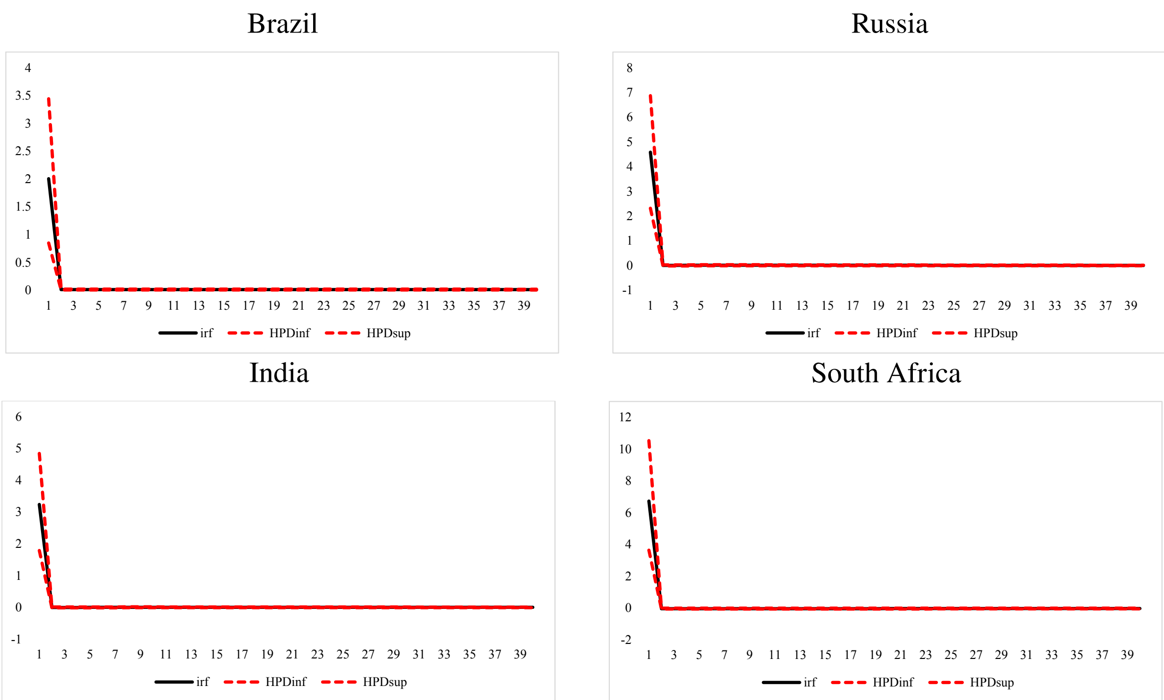
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.53) Impact of Tax Shock on Non-Ricardian Consumption - BRIS



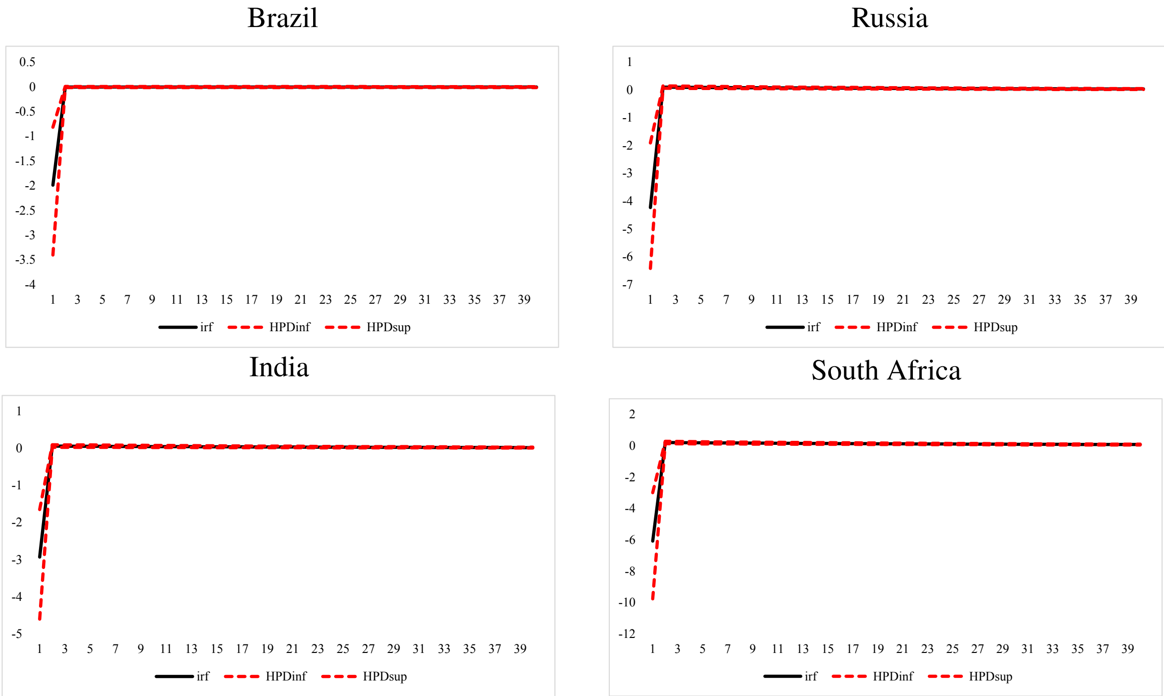
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.54) Impact of Tax Shock on the Consumption Ratio - BRIS



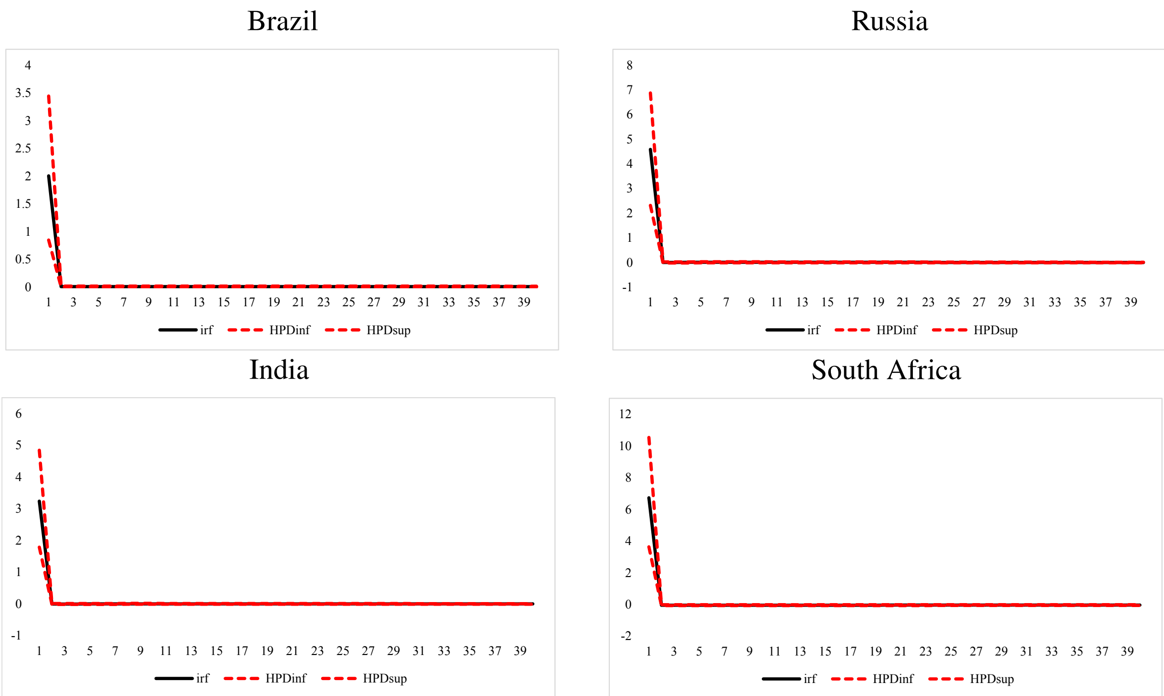
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.55) Impact of Tax Shock on Non-Ricardian Consumption - BRIS



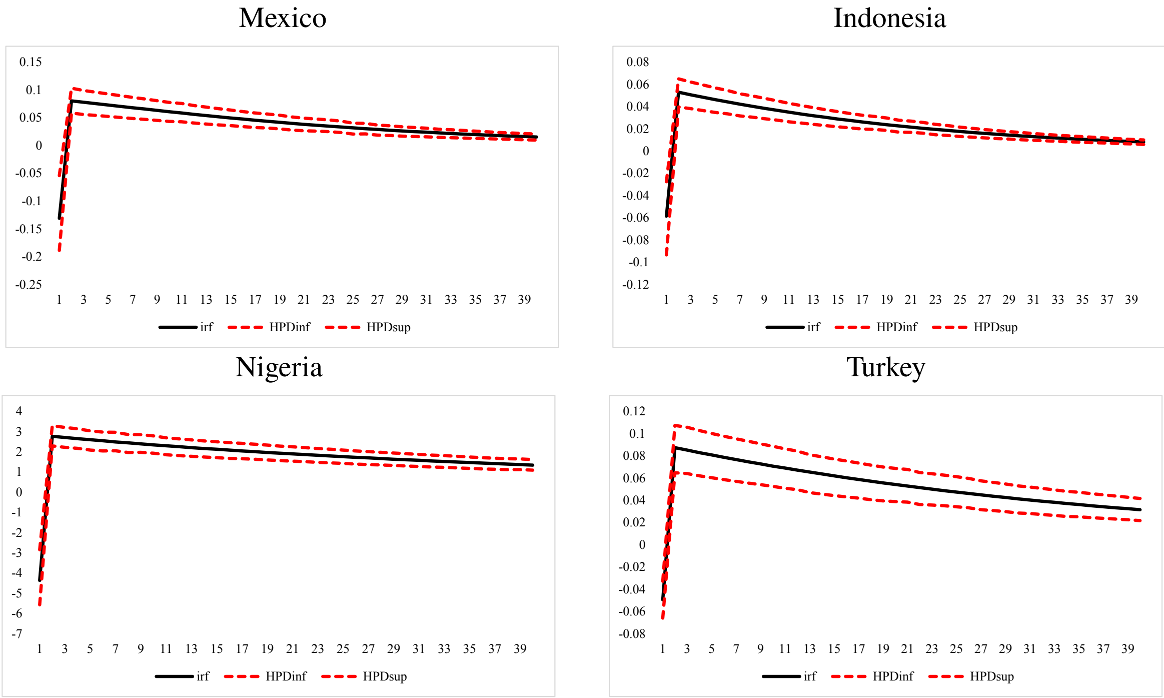
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.56) Impact of Tax Shock on the Consumption Ratio - BRIS



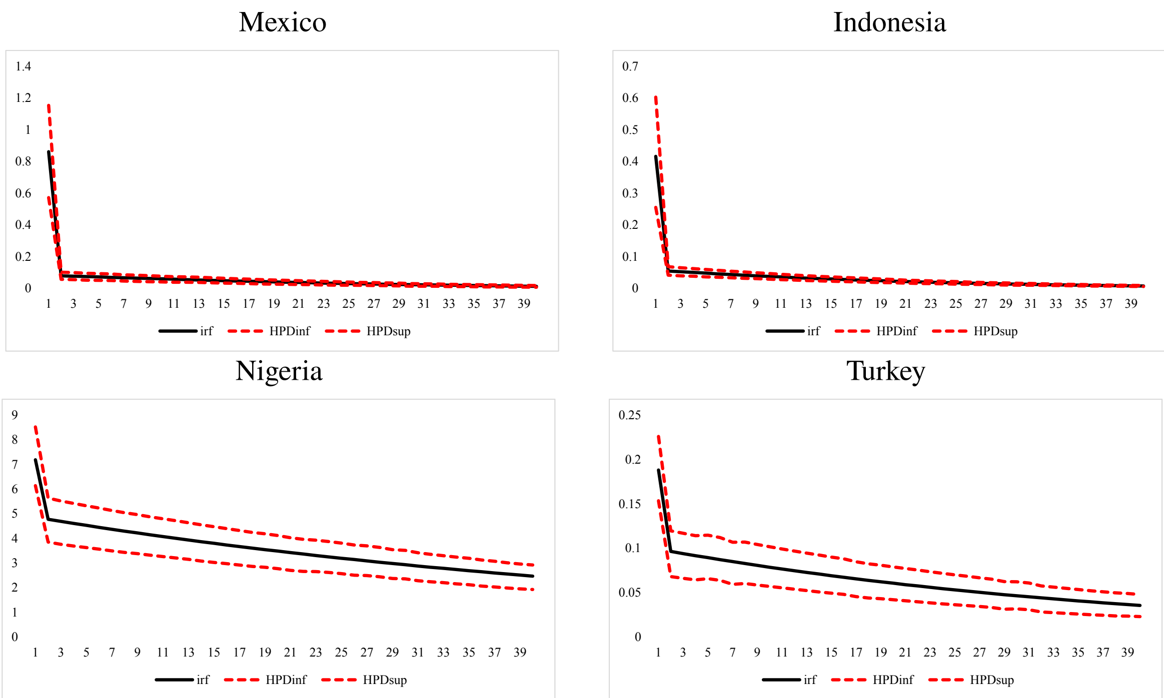
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.57) Impact of Tax Shock on Aggregate Consumption - MINT



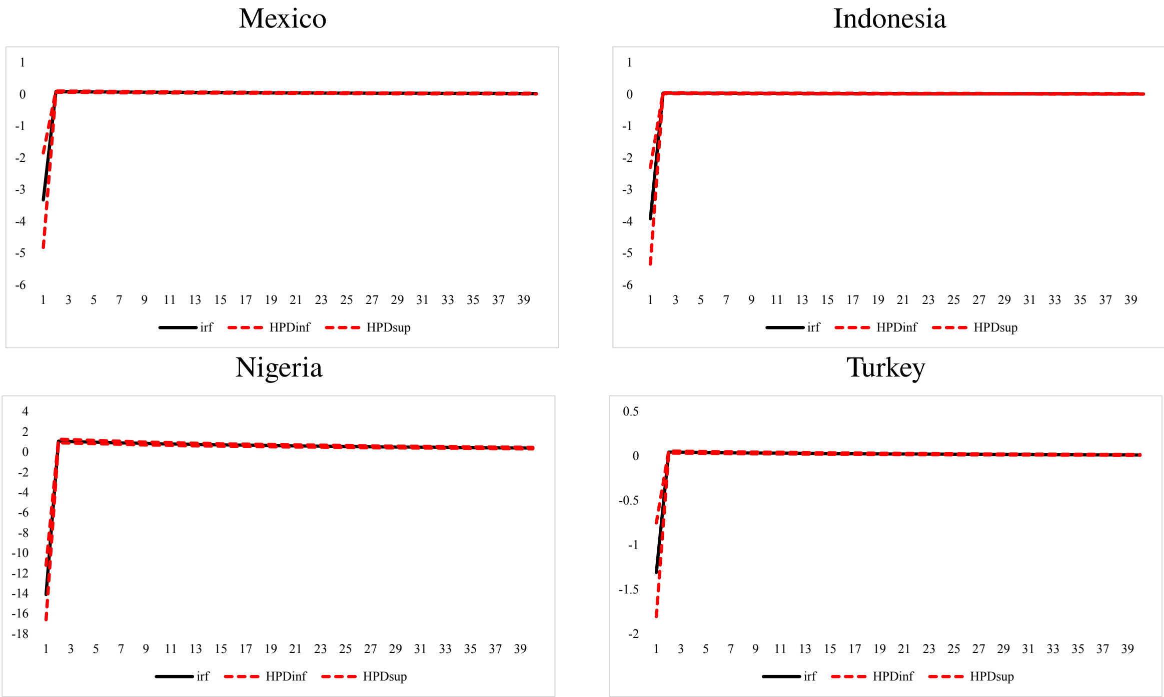
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.58) Impact of Tax Shock on Ricardian Consumption - MINT



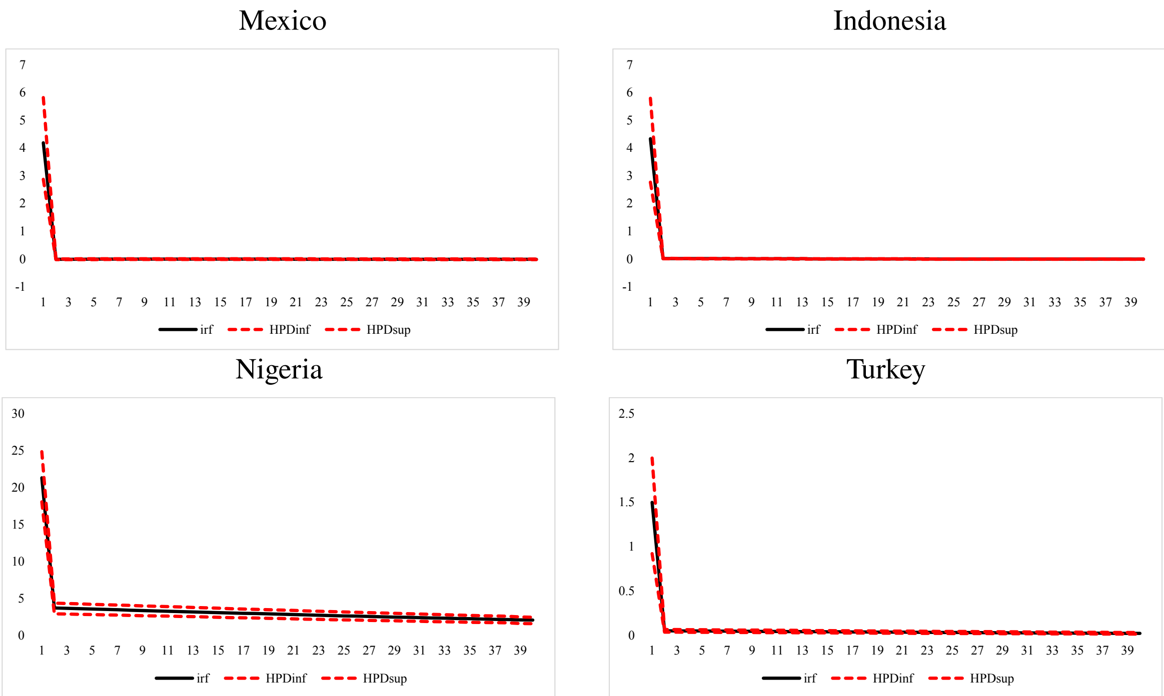
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.59) Impact of Tax Shock on Non-Ricardian Consumption - MINT



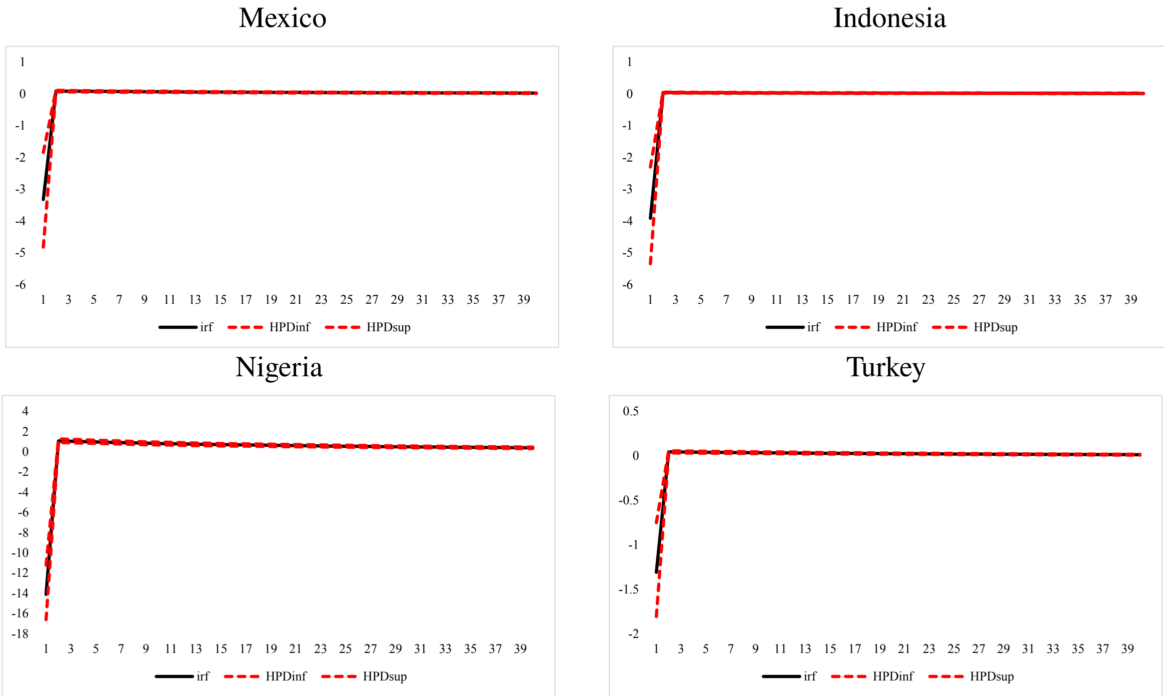
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.510) Impact of Tax Shock on the Consumption Ratio - MINT



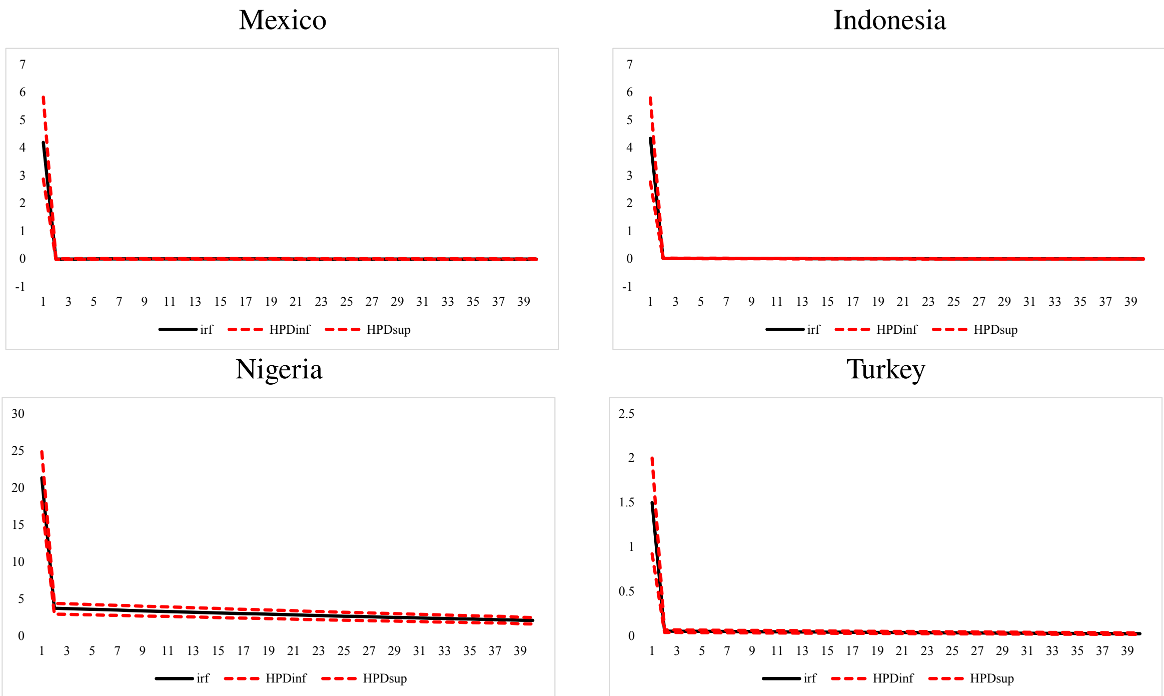
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.511) Impact of Tax Shock on Non-Ricardian Consumption - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.512) Impact of Tax Shock on the Consumption Ratio - MINT

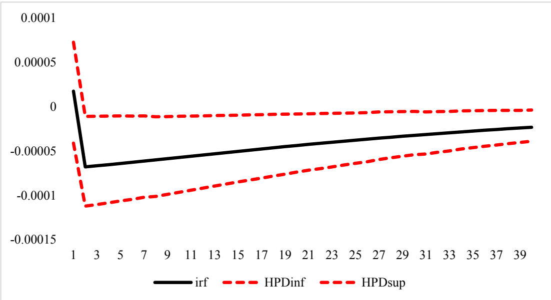


Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

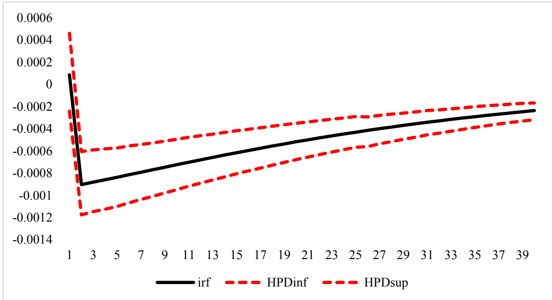
C.6 Debt Shock on Consumption and Consumption Ratio – BRIS and MINT

Figure (C.61) Impact of Debt Shock on Aggregate Consumption - BRIS

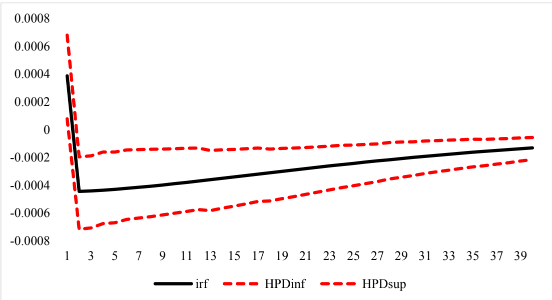
Brazil



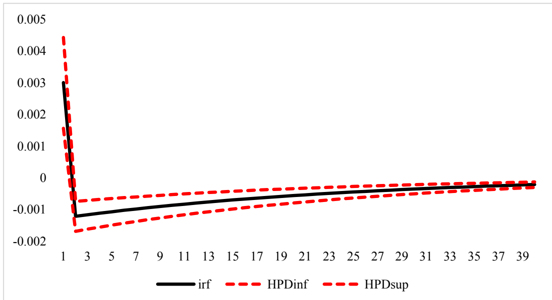
Russia



India



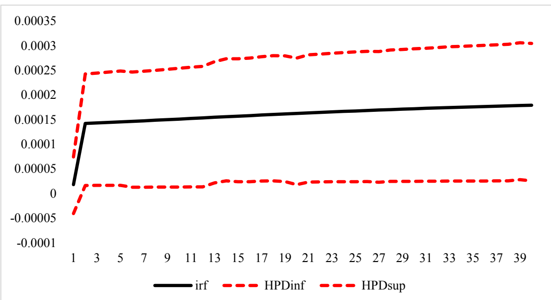
South Africa



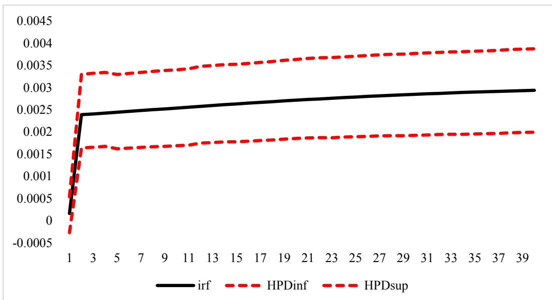
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.62) Impact of Debt Shock on Ricardian Consumption - BRIS

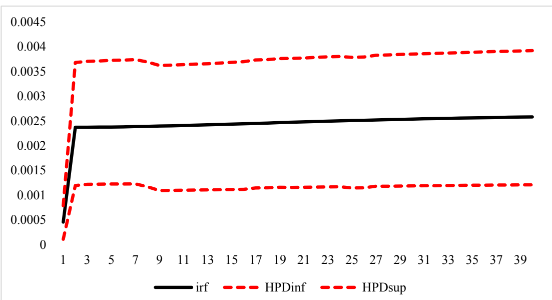
Brazil



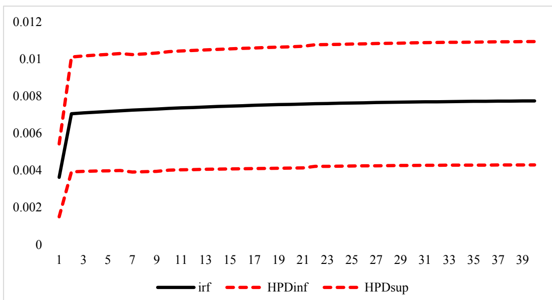
Russia



India



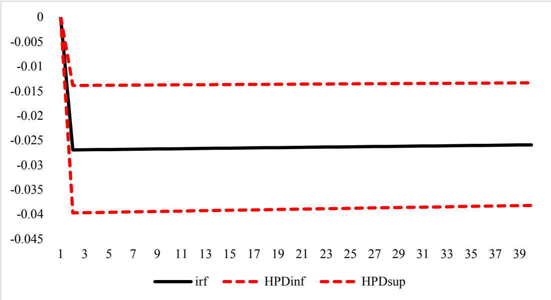
South Africa



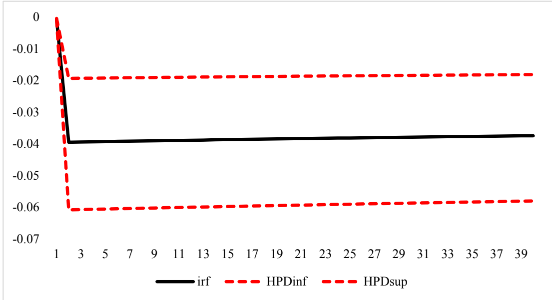
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.63) Impact of Debt Shock on Non-Ricardian Consumption - BRIS

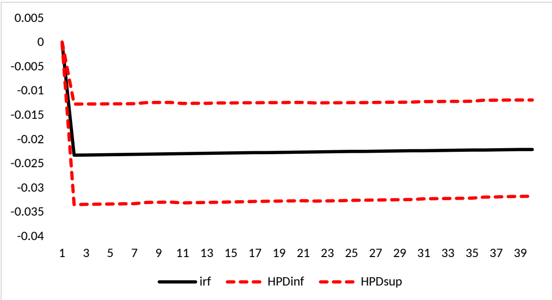
Brazil



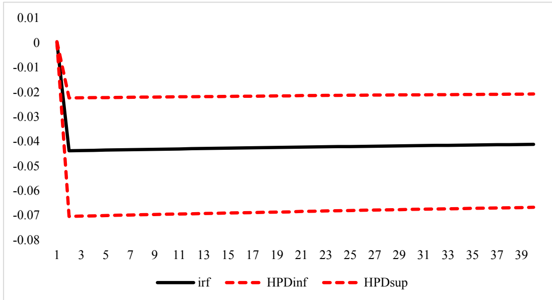
Russia



India



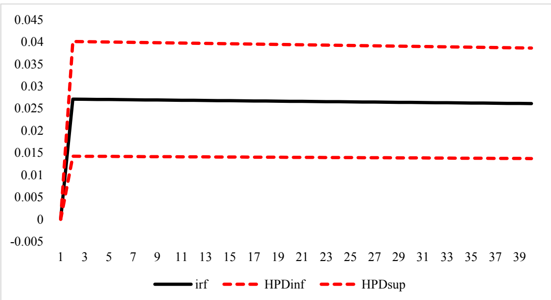
South Africa



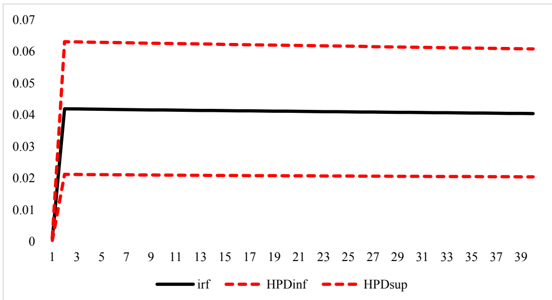
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.64) Impact of Debt Shock on the Consumption Ratio - BRIS

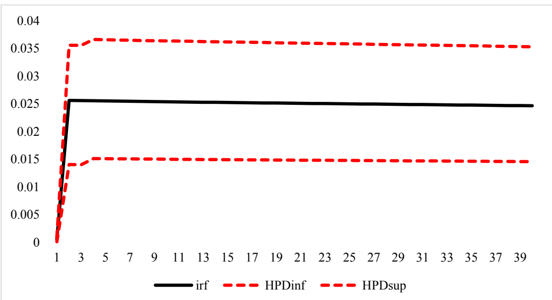
Brazil



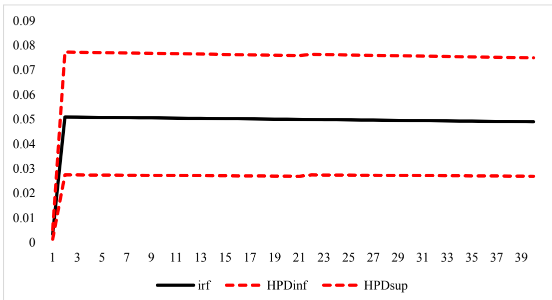
Russia



India



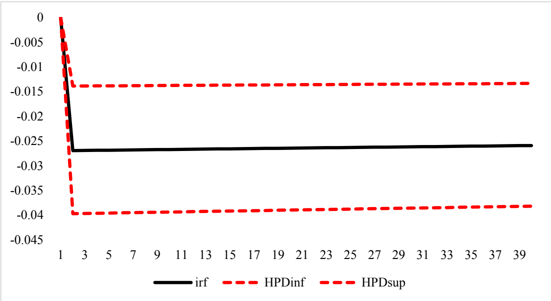
South Africa



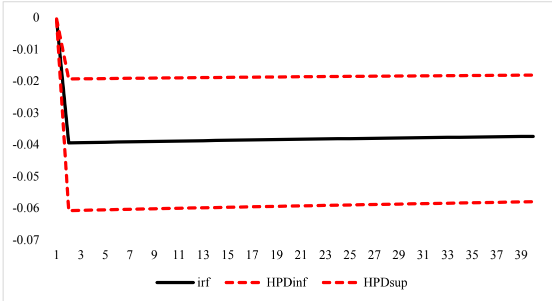
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.65) Impact of Debt Shock on Non-Ricardian Consumption - BRIS

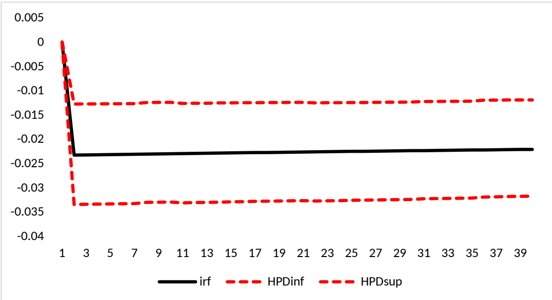
Brazil



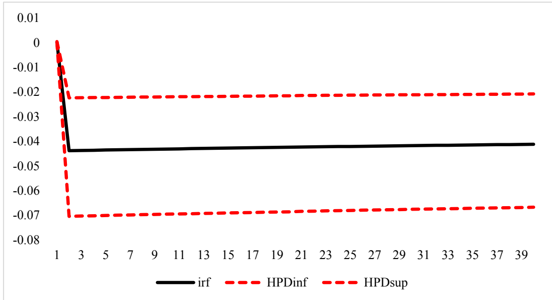
Russia



India



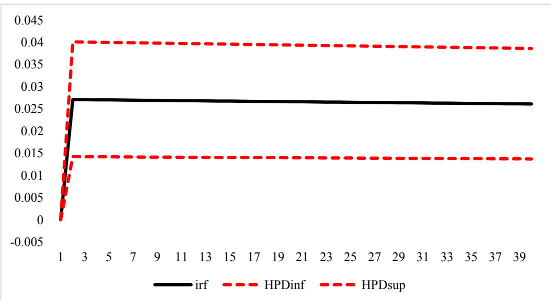
South Africa



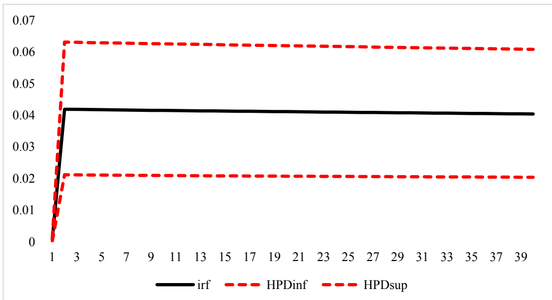
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.66) Impact of Debt Shock on the Consumption Ratio - BRIS

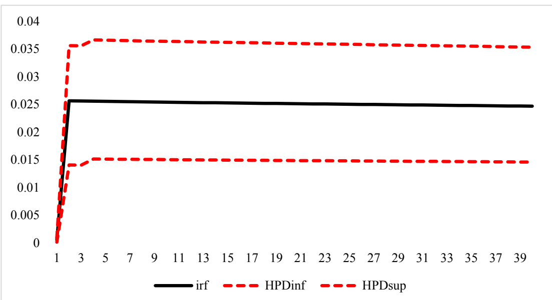
Brazil



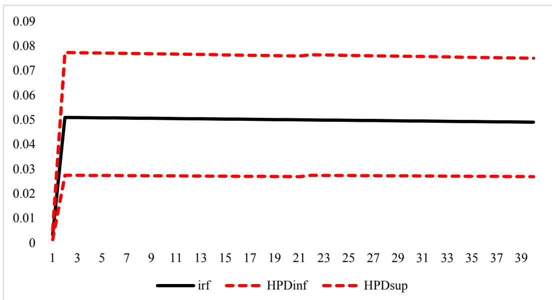
Russia



India

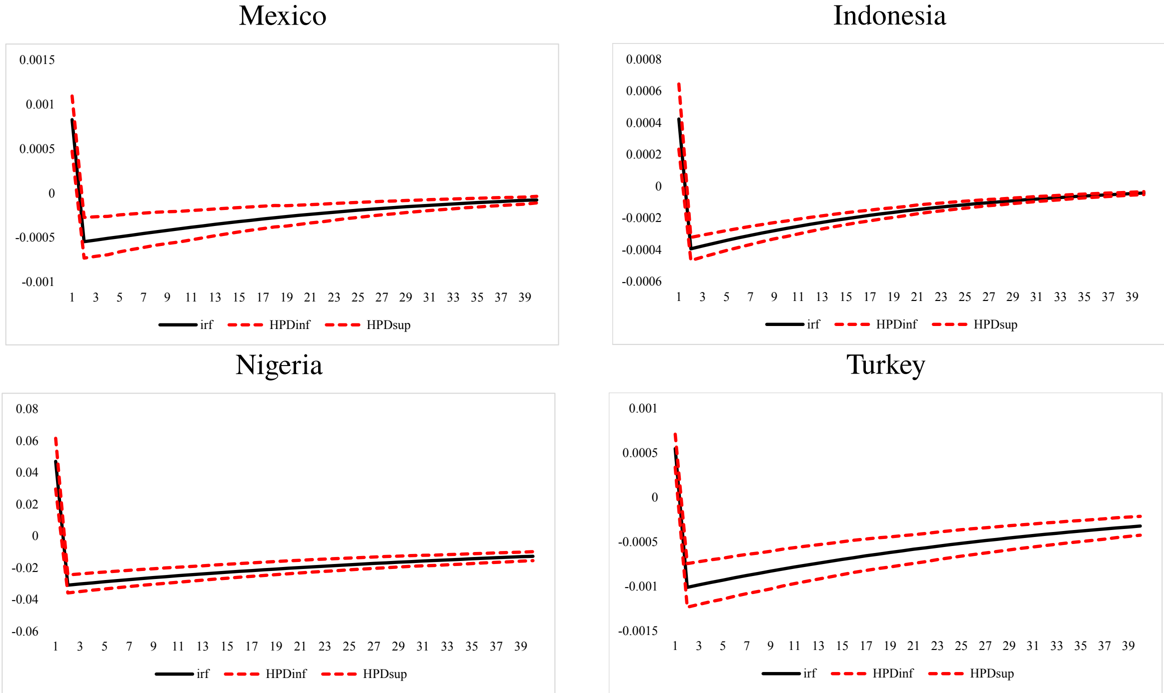


South Africa



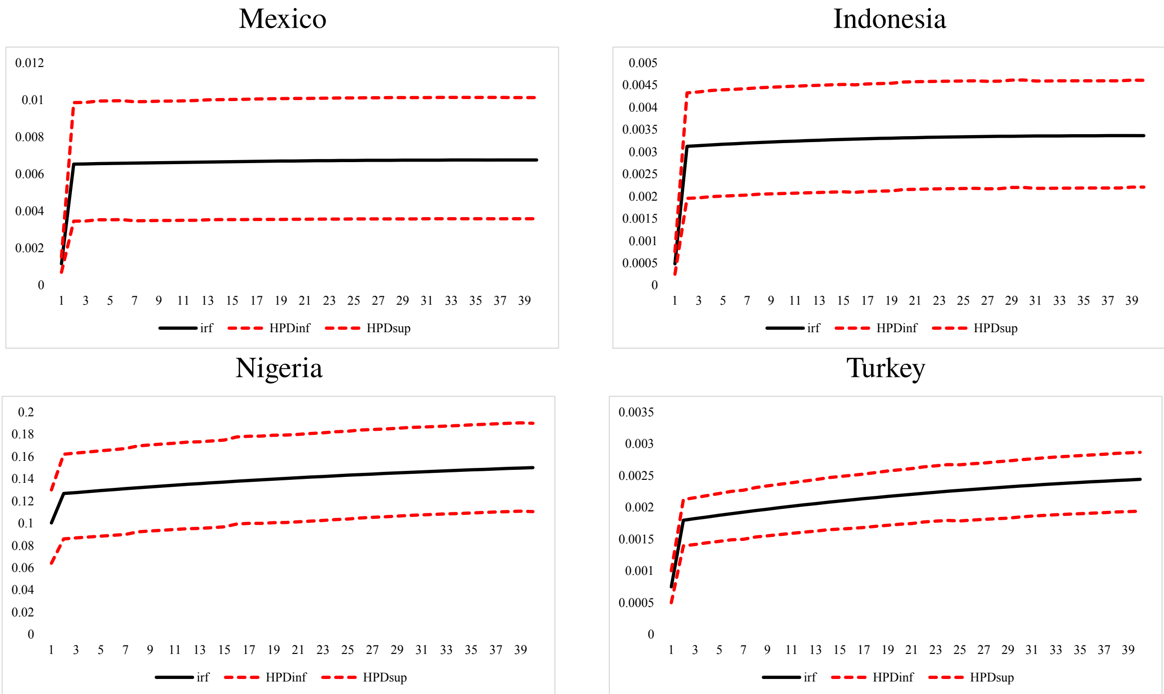
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.67) Impact of Debt Shock on Aggregate Consumption - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

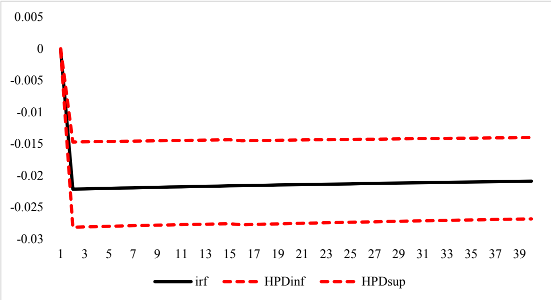
Figure (C.68) Impact of Debt Shock on Ricardian Consumption - MINT



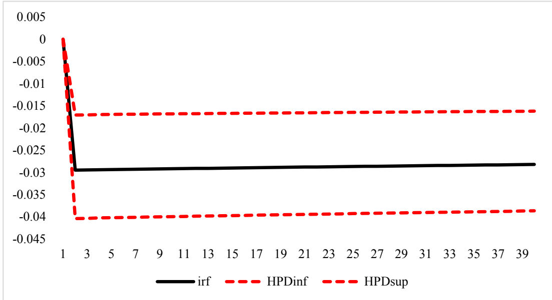
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.69) Impact of Debt Shock on Non-Ricardian Consumption - MINT

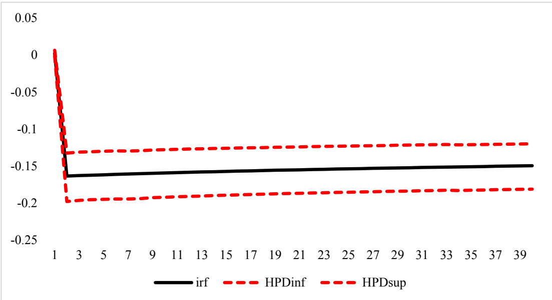
Mexico



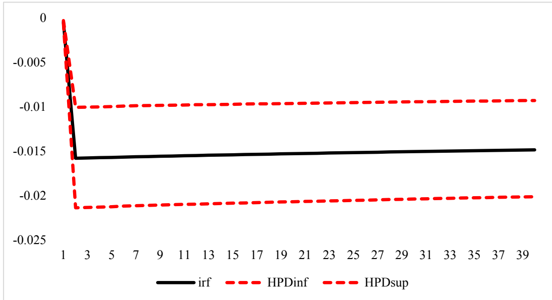
Indonesia



Nigeria



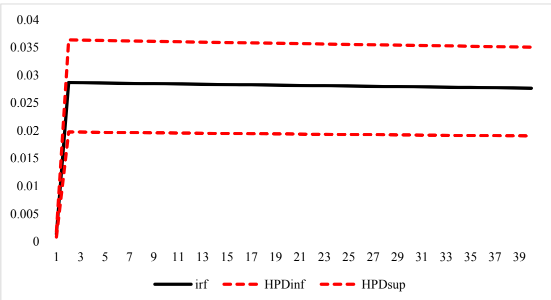
Turkey



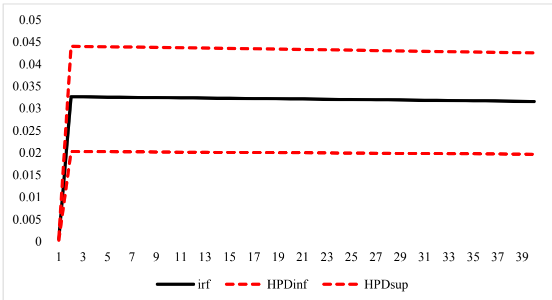
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.610) Impact of Debt Shock on the Consumption Ratio - MINT

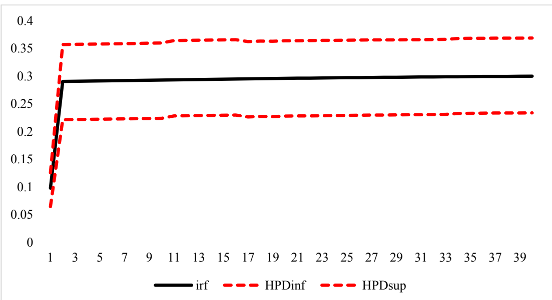
Mexico



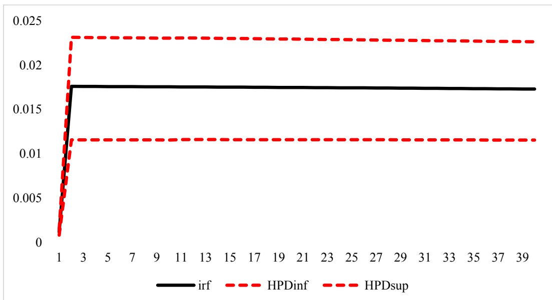
Indonesia



Nigeria

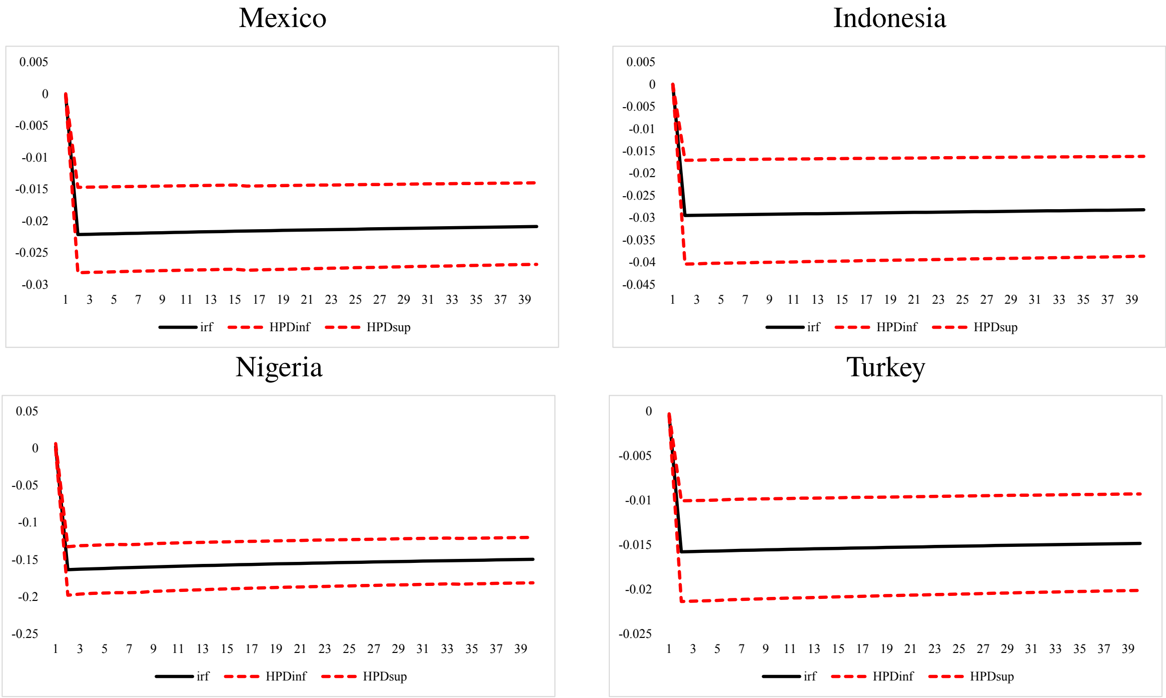


Turkey



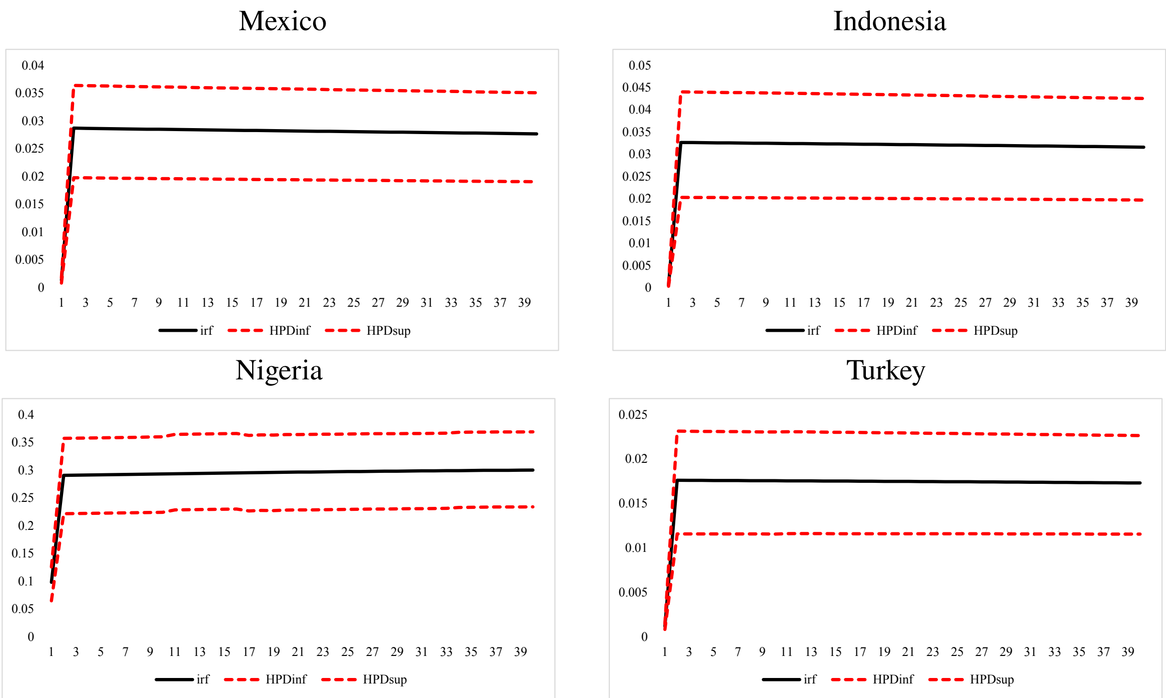
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.611) Impact of Debt Shock on Non-Ricardian Consumption - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

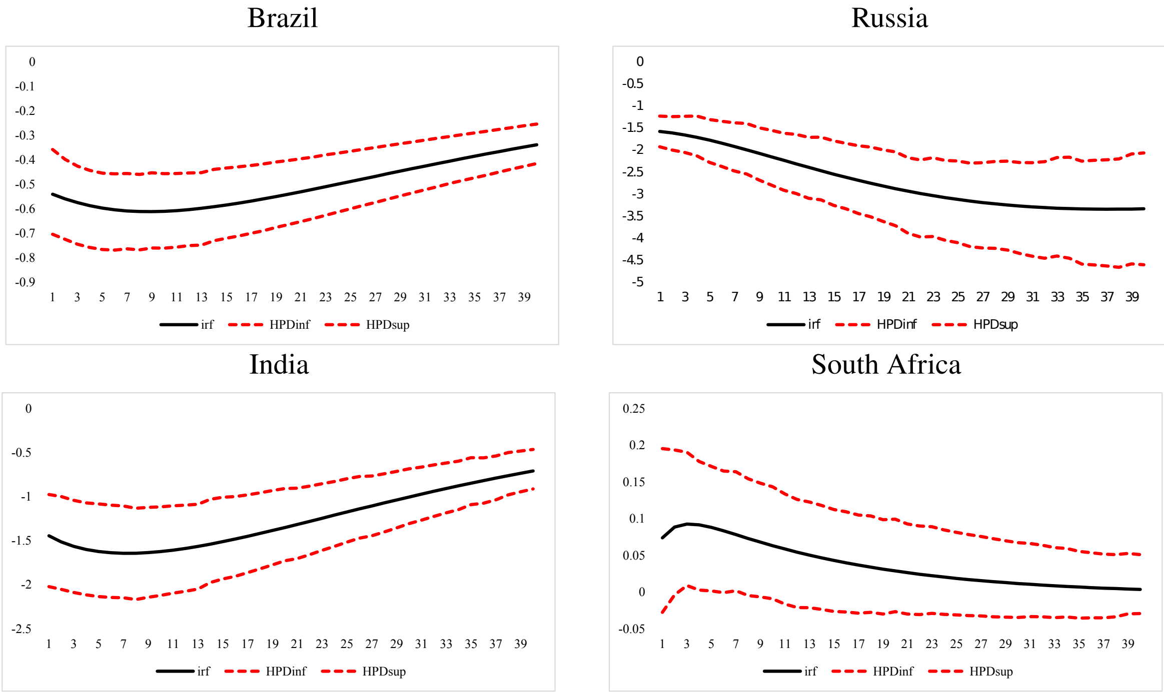
Figure (C.612) Impact of Debt Shock on the Consumption Ratio - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

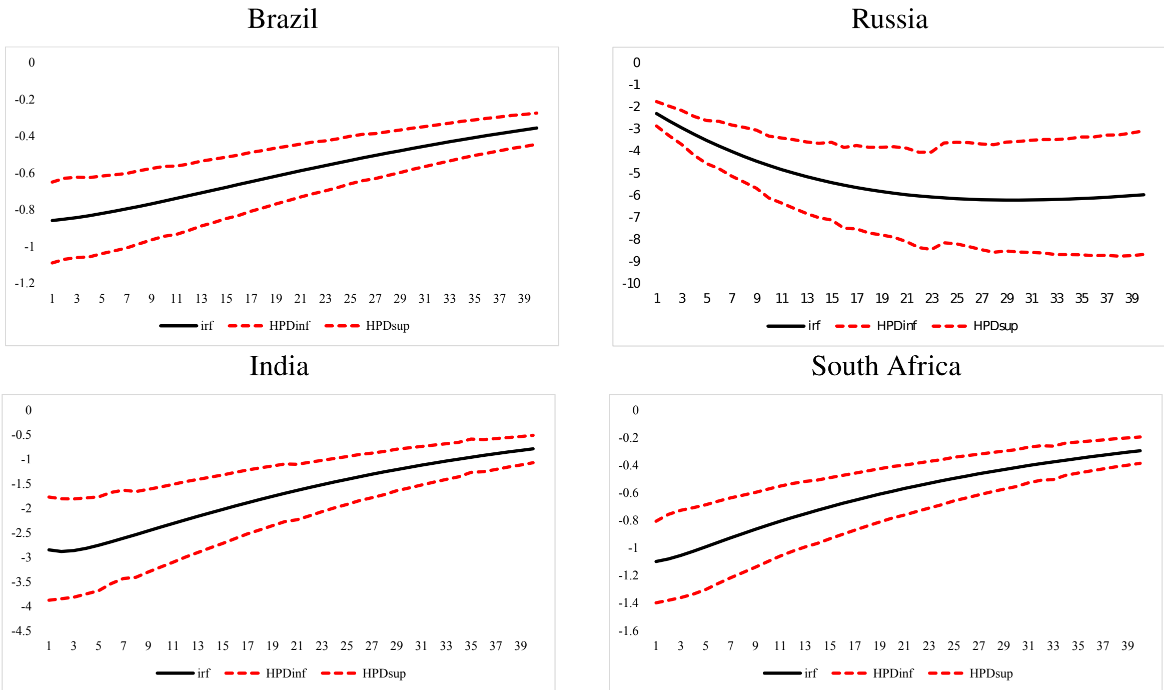
C.7 Commodity Production Shock on Domestic and Foreign Goods – BRIS and MINT

Figure (C.71) Impact of Commodity Production Shock on Overall Consumption of Domestic Goods - BRIS



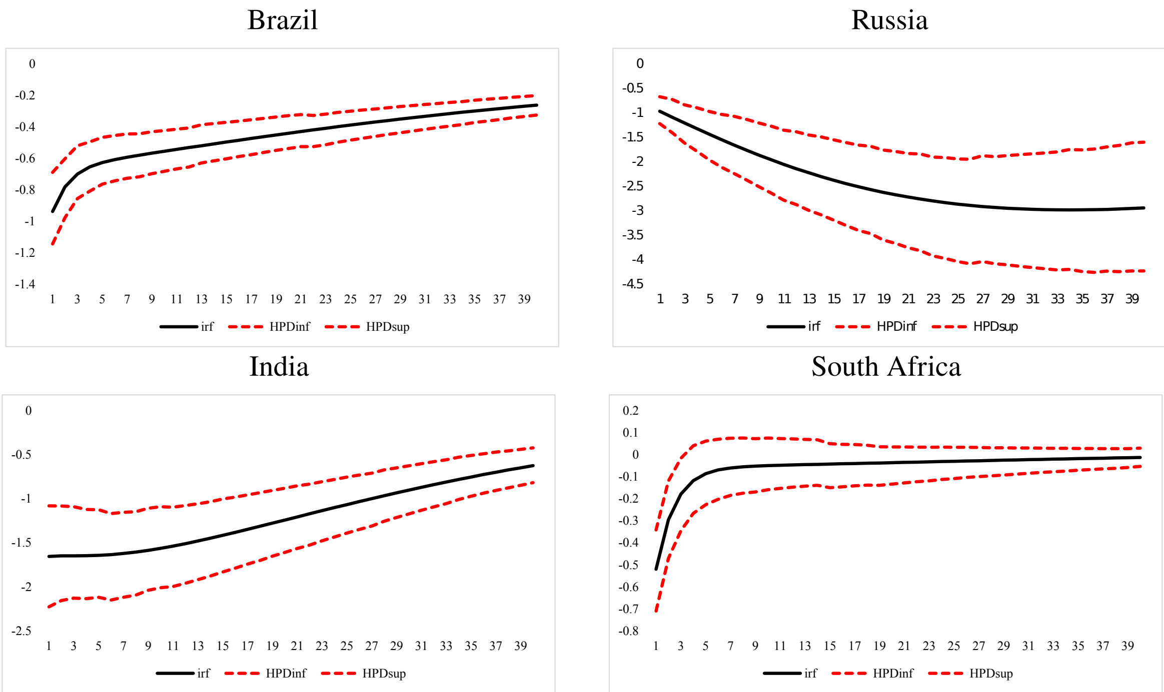
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.72) Impact of Commodity Production Shock on Overall Consumption of Foreign Goods - BRIS



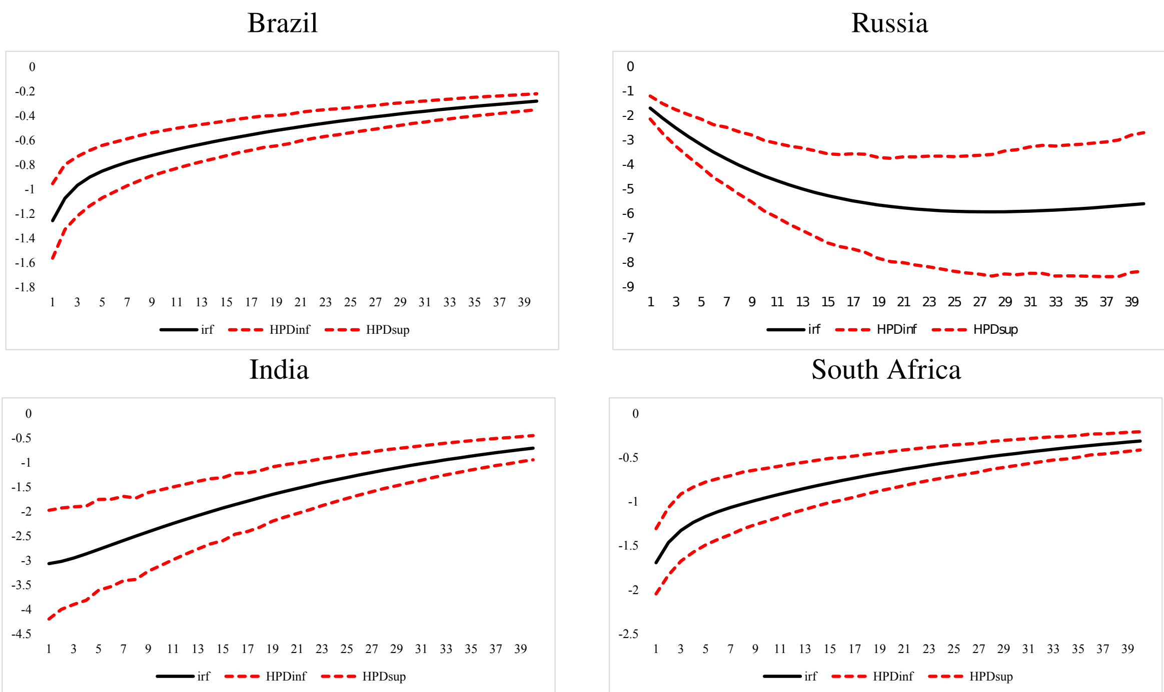
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.73) Impact of Commodity Production Shock on Non-Ricardian Consumption of Domestic Goods - BRIS



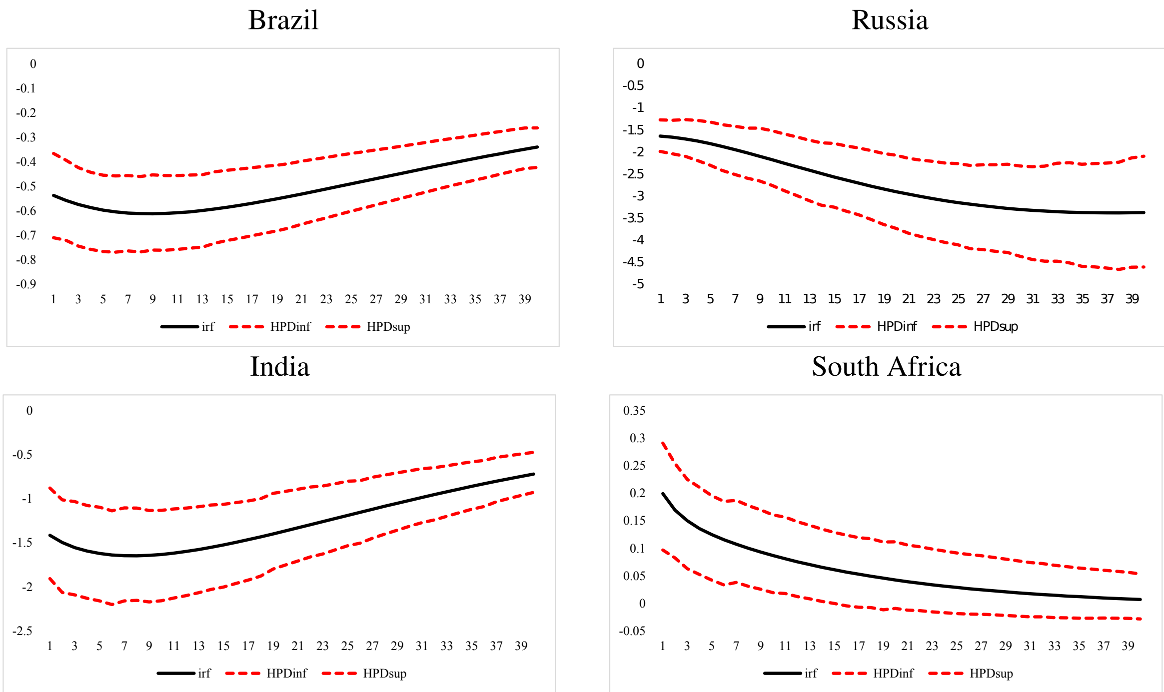
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.74) Impact of Commodity Production Shock on Non-Ricardian Consumption of Foreign Goods - BRIS



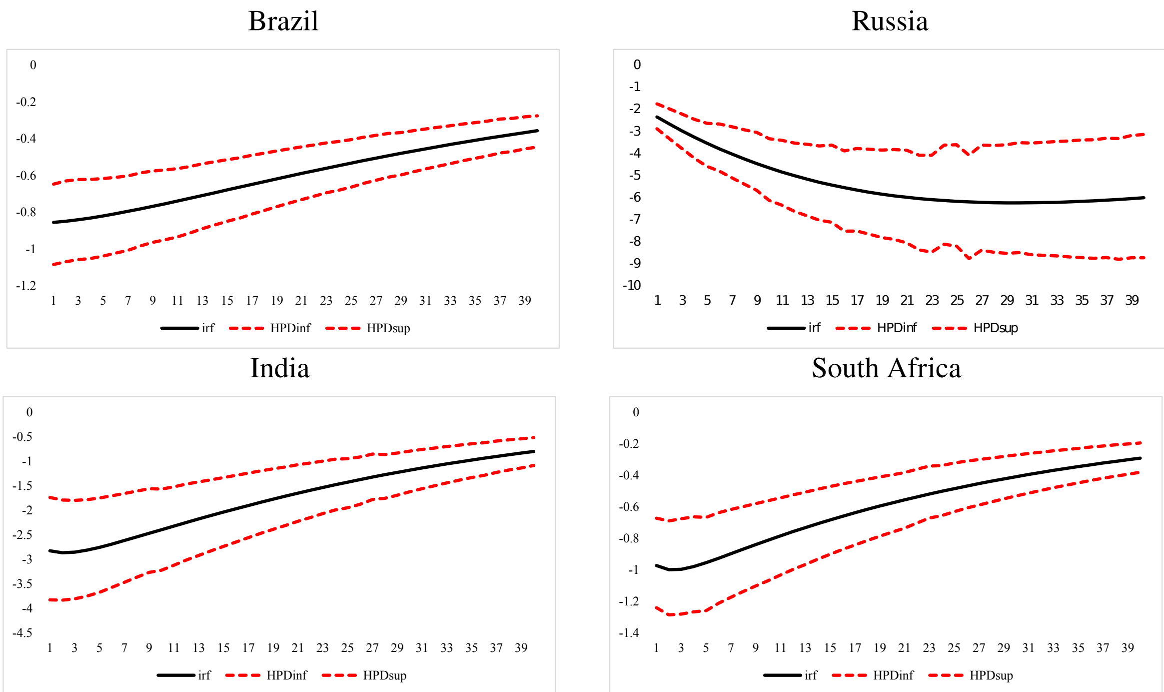
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.75) Impact of Commodity Production Shock on Ricardian Consumption of Domestic Goods - BRIS



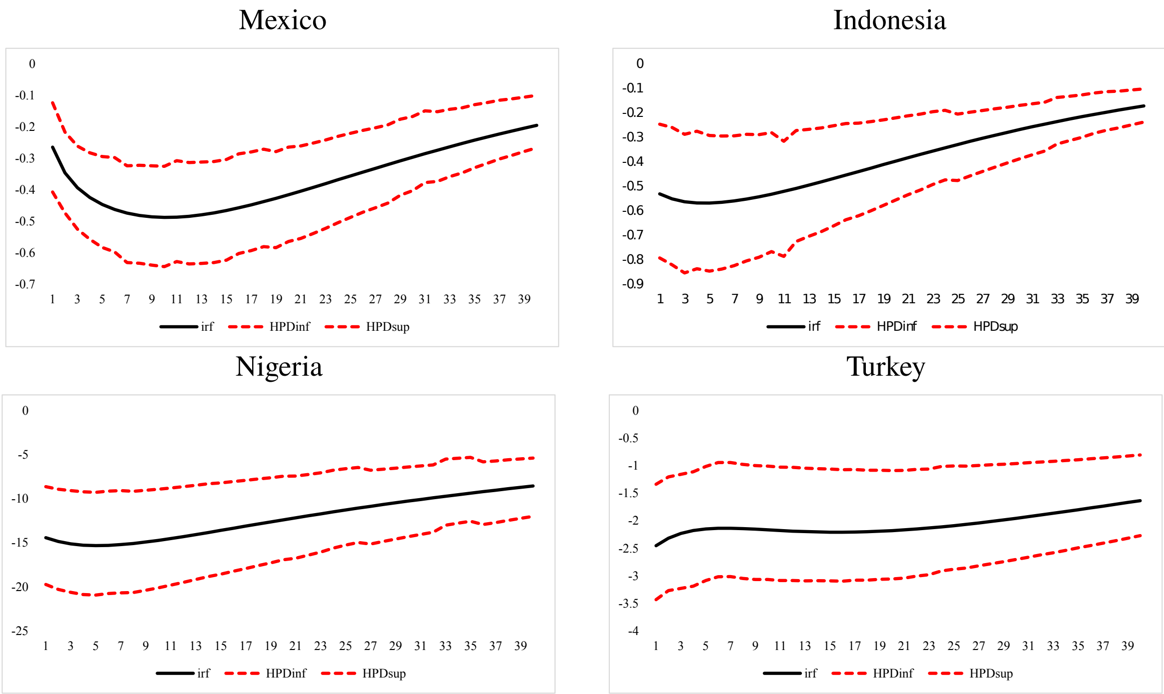
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.76) Impact of Commodity Production Shock on Ricardian Consumption of Foreign Goods - BRIS



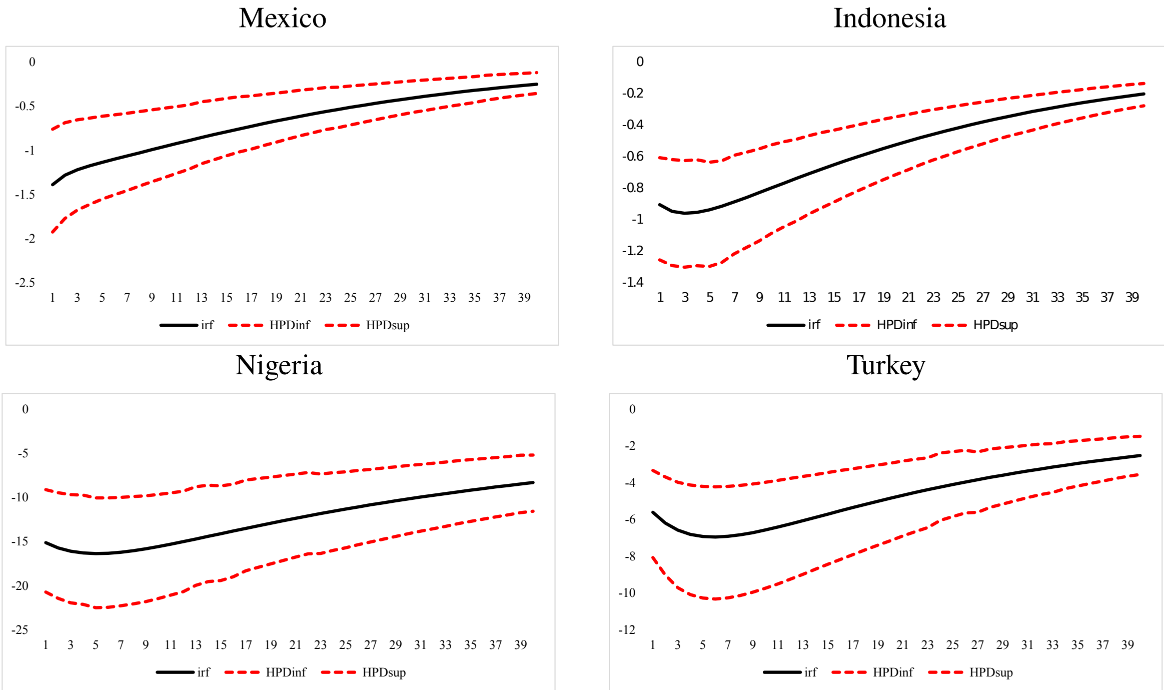
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.77) Impact of Commodity Production Shock on Overall Consumption of Domestic Goods - MINT



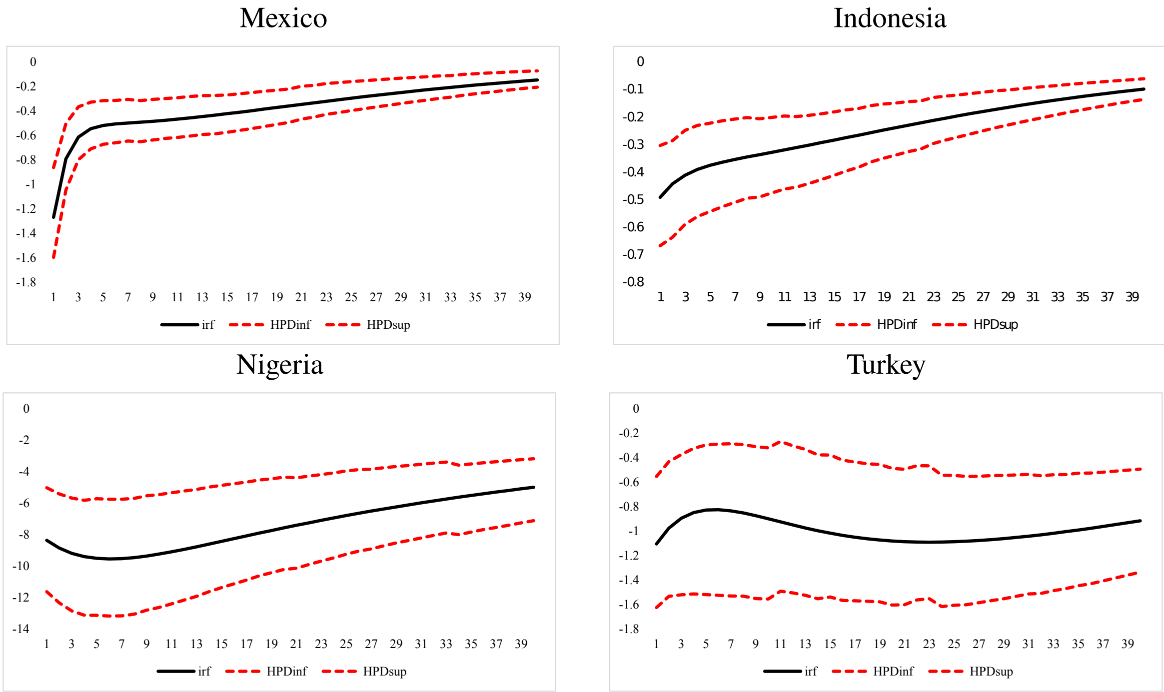
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.78) Impact of Commodity Production Shock on Overall Consumption of Foreign Goods - MINT



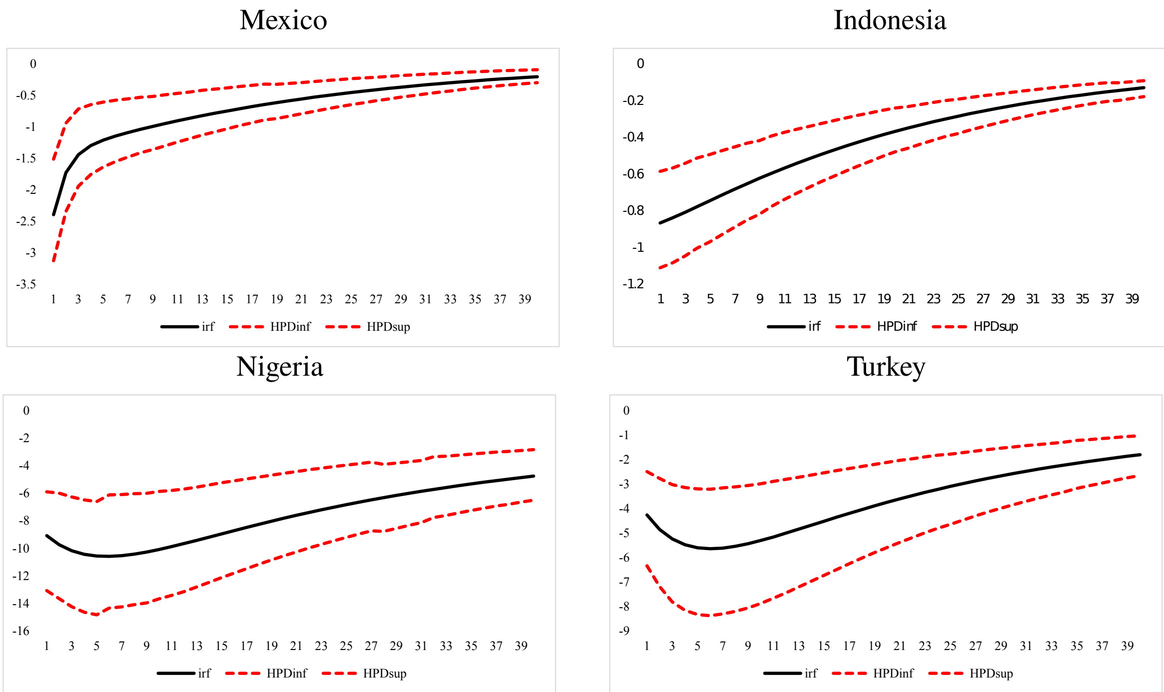
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.79) Impact of Commodity Production Shock on Non-Ricardian Consumption of Domestic Goods - MINT



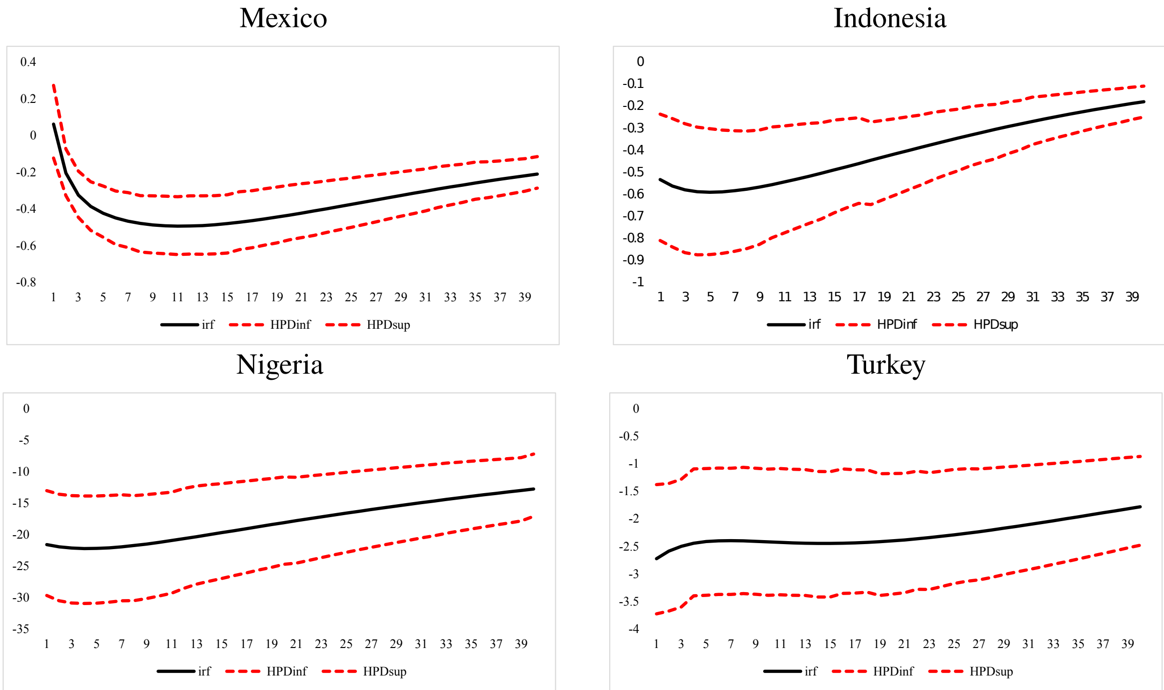
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.710) Impact of Commodity Production Shock on Non-Ricardian Consumption of Foreign Goods - MINT



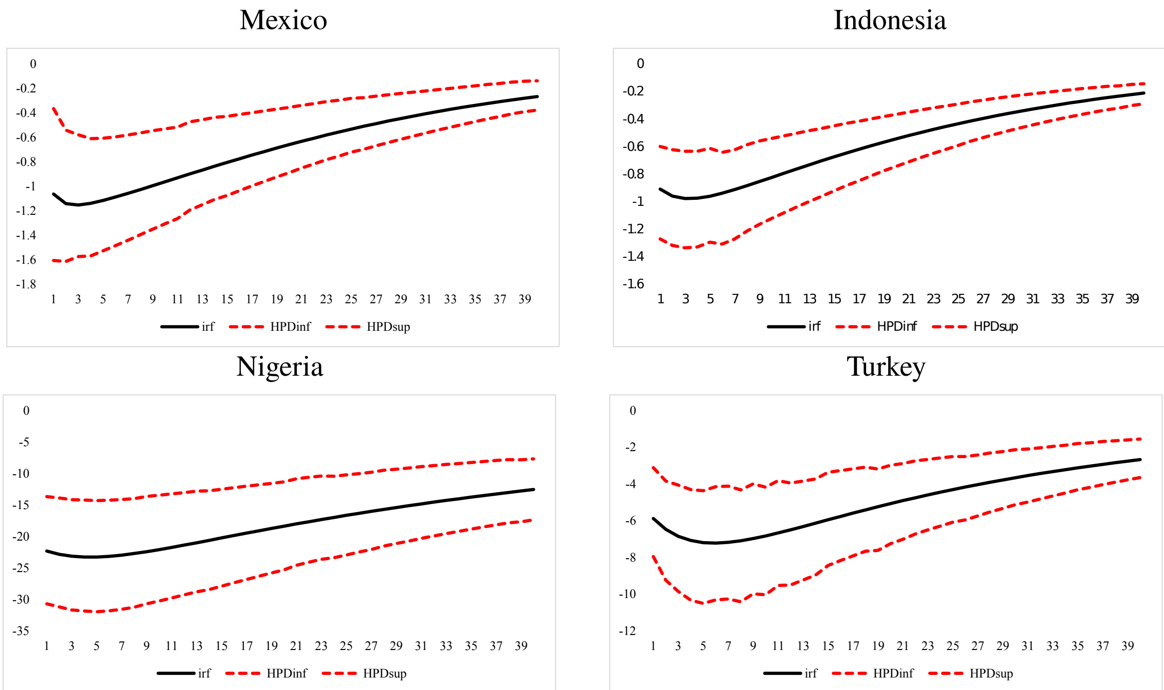
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.711) Impact of Commodity Production Shock on Ricardian Consumption of Domestic Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

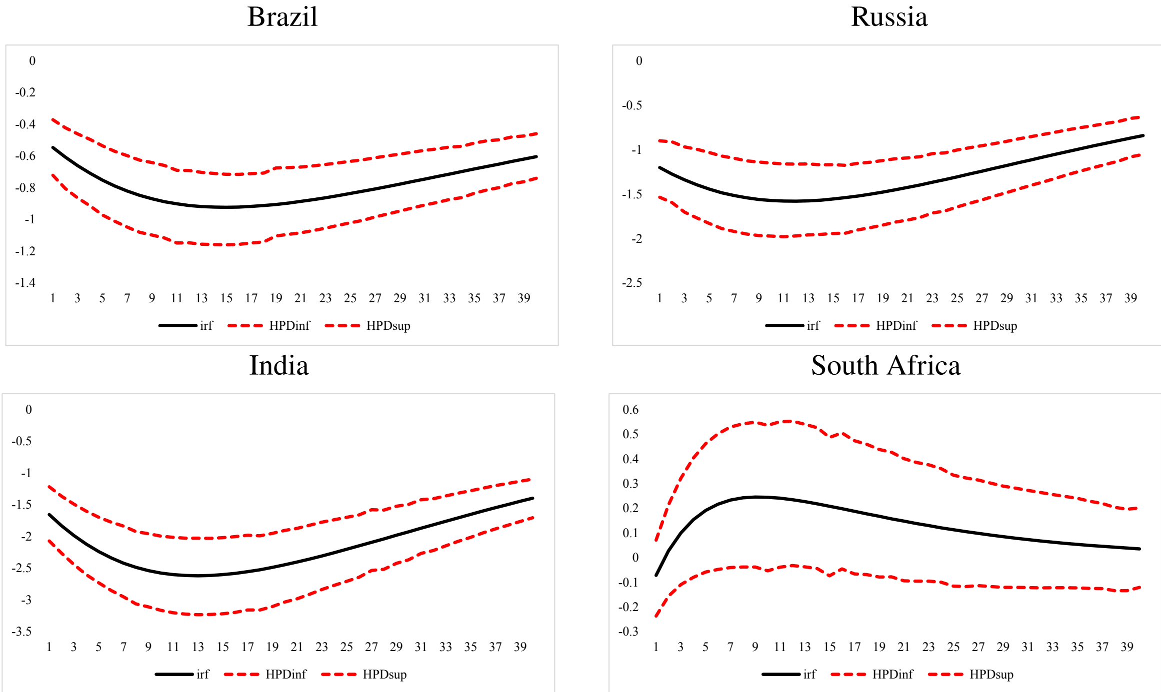
Figure (C.712) Impact of Commodity Production Shock on Ricardian Consumption of Foreign Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

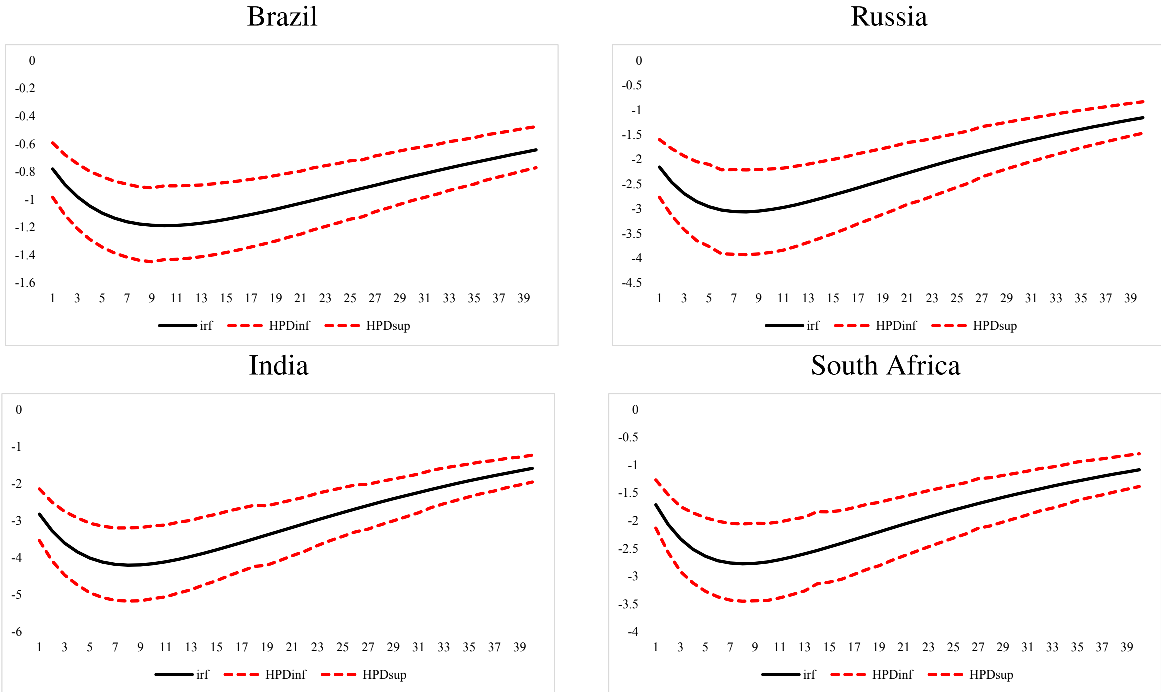
C.8 Commodity Price Shock on Domestic and Foreign Goods – BRIS and MINT

Figure (C.81) Impact of Commodity Price Shock on Overall Consumption of Domestic Goods - BRIS



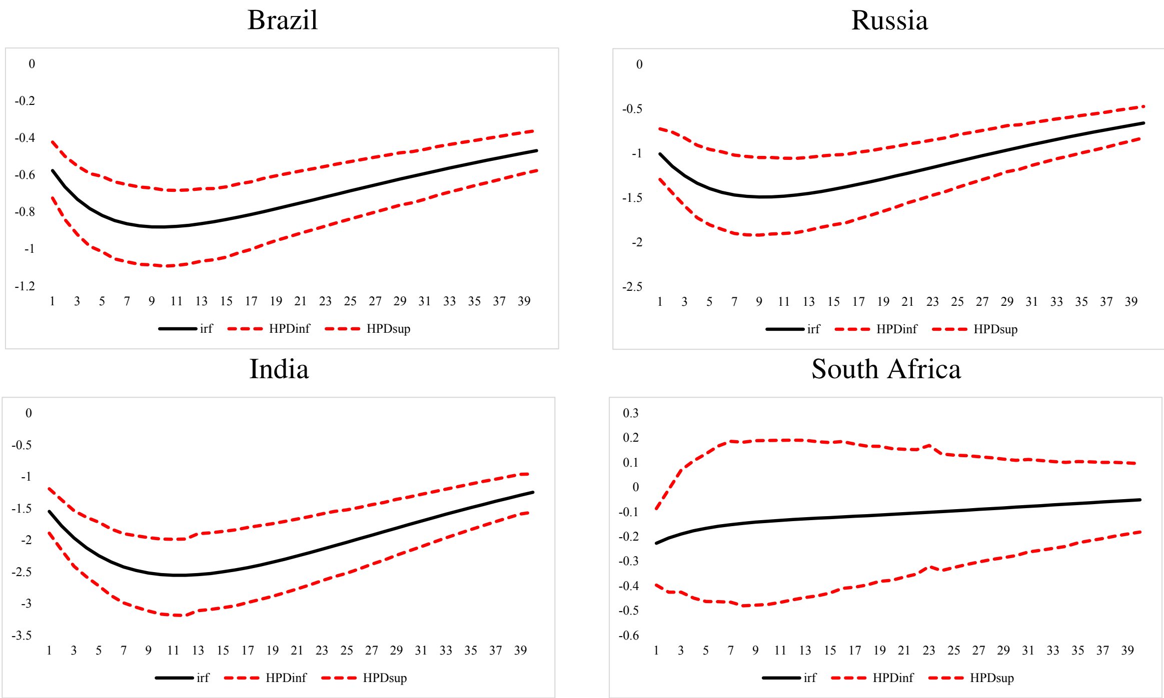
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.82) Impact of Commodity Price Shock on Overall Consumption of Foreign Goods - BRIS



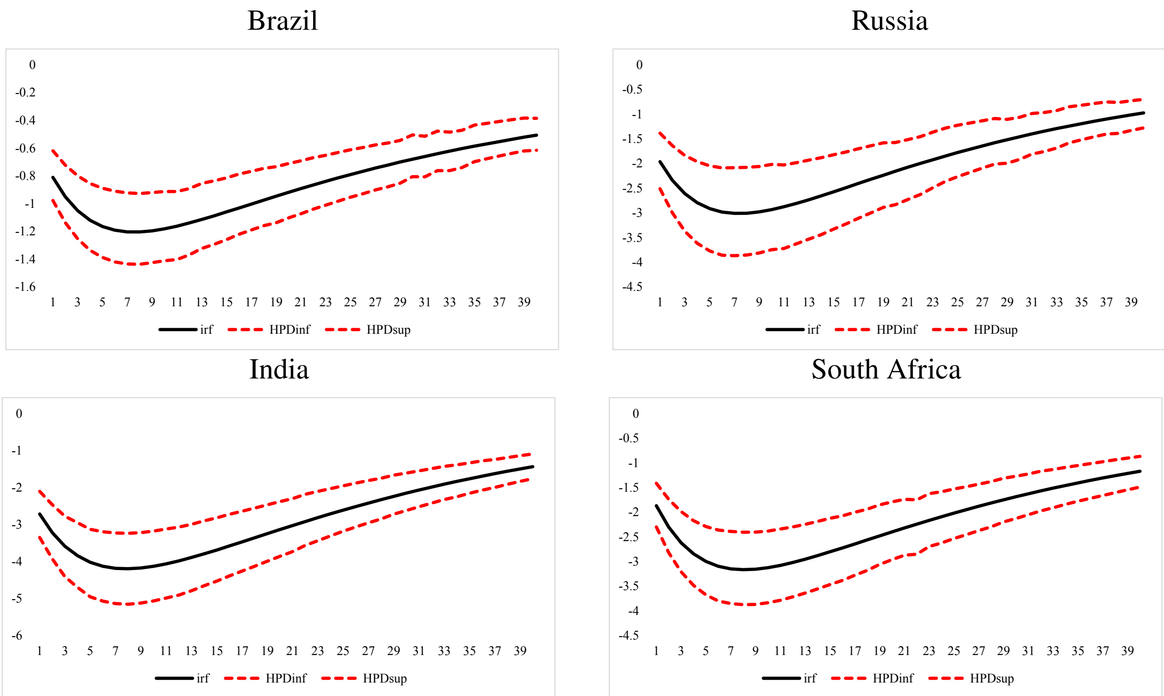
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.83) Impact of Commodity Price Shock on Non-Ricardian Consumption of Domestic Goods - BRIS



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

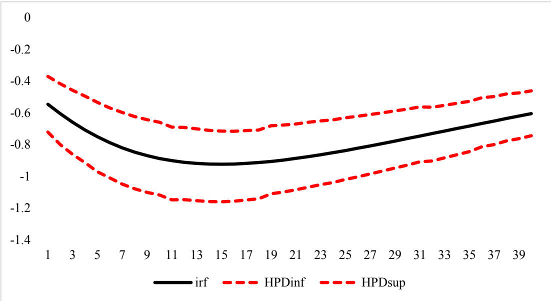
Figure (C.84) Impact of Commodity Price Shock on Non-Ricardian Consumption of Foreign Goods - BRIS



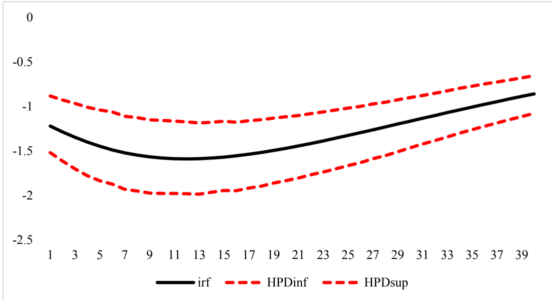
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.85) Impact of Commodity Price Shock on Ricardian Consumption of Domestic Goods - BRIS

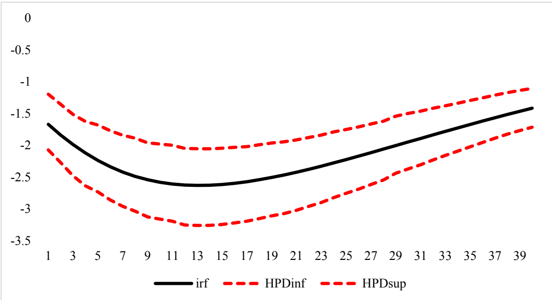
Brazil



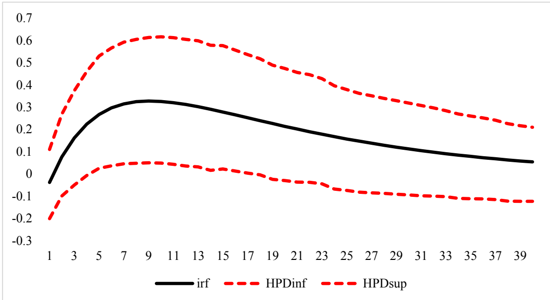
Russia



India



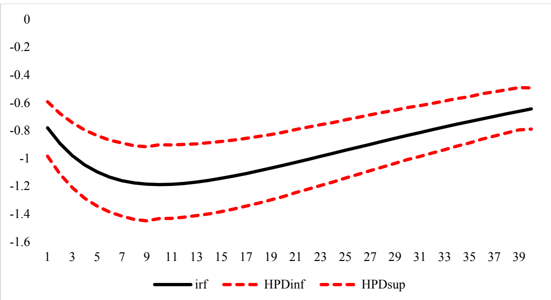
South Africa



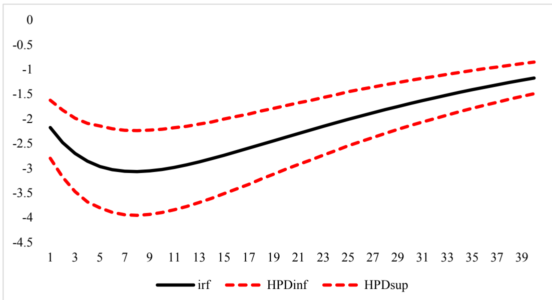
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.86) Impact of Commodity Price Shock on Ricardian Consumption of Foreign Goods - BRIS

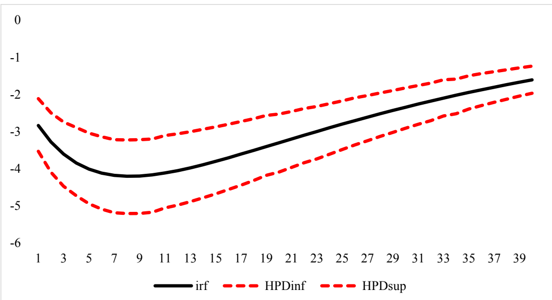
Brazil



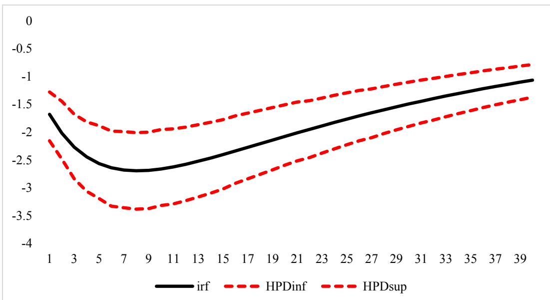
Russia



India

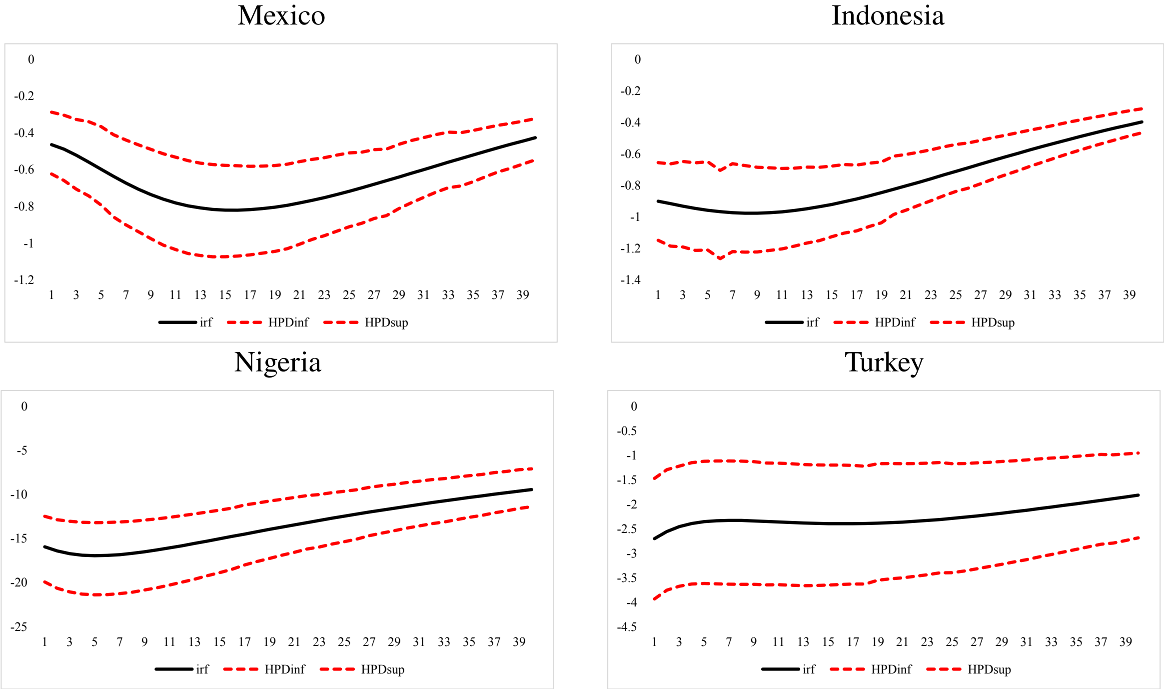


South Africa



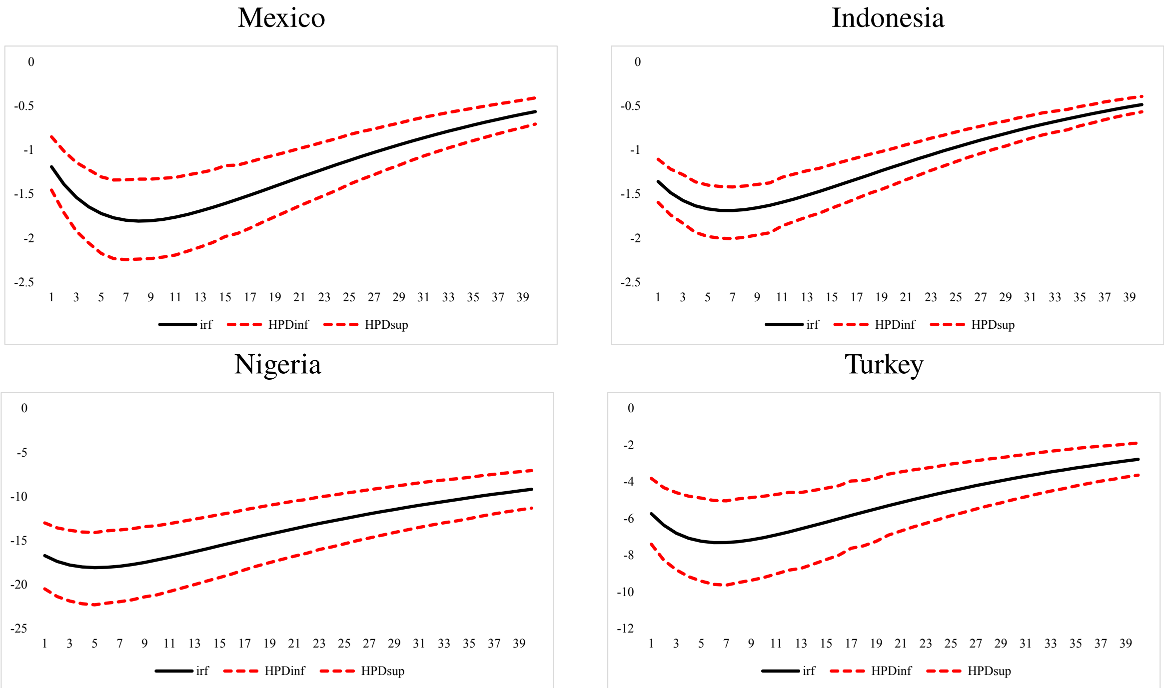
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.87) Impact of Commodity Price Shock on Overall Consumption of Domestic Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

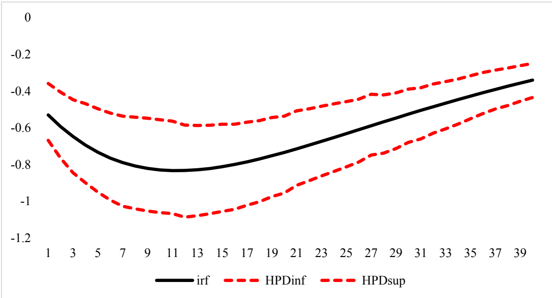
Figure (C.88) Impact of Commodity Price Shock on Overall Consumption of Foreign Goods - MINT



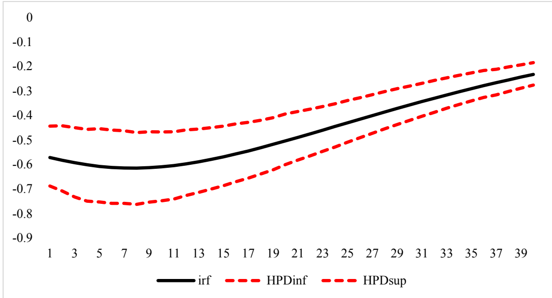
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.89) Impact of Commodity Price Shock on Non-Ricardian Consumption of Domestic Goods - MINT

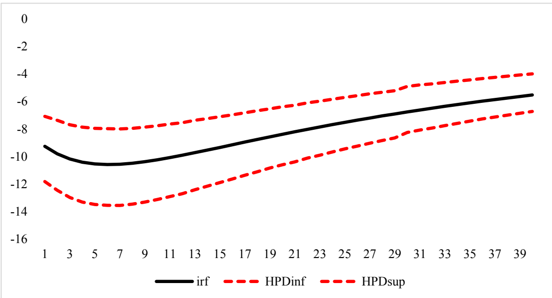
Mexico



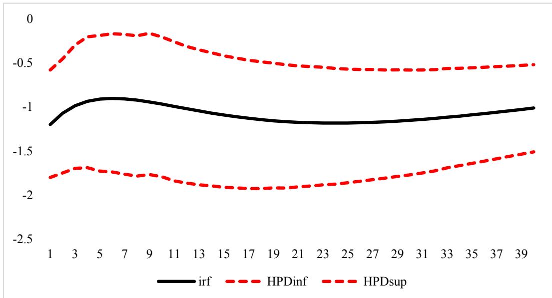
Indonesia



Nigeria



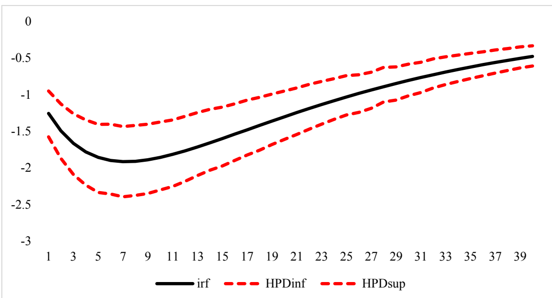
Turkey



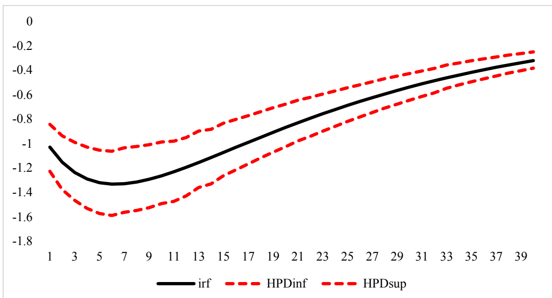
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.810) Impact of Commodity Price Shock on Non-Ricardian Consumption of Foreign Goods - MINT

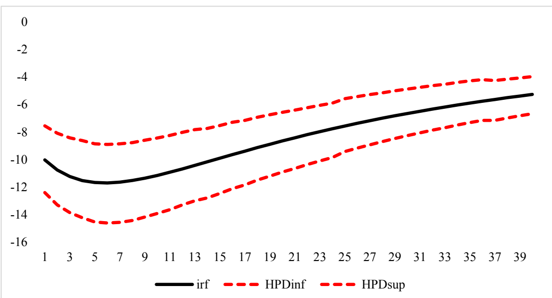
Mexico



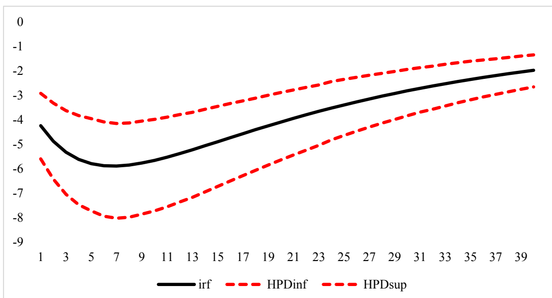
Indonesia



Nigeria



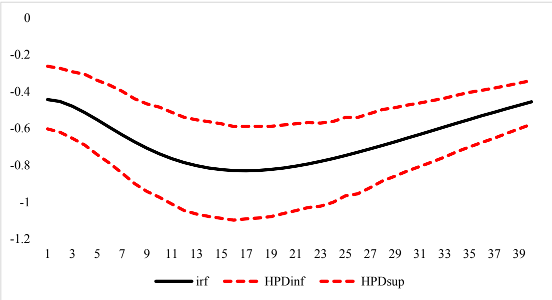
Turkey



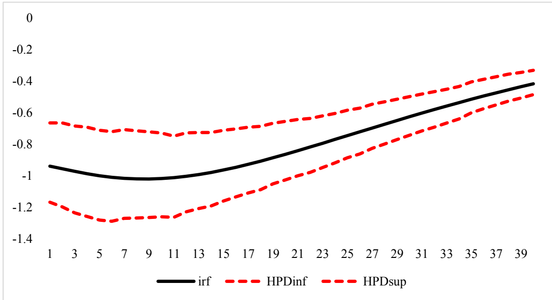
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.811) Impact of Commodity Price Shock on Ricardian Consumption of Domestic Goods - MINT

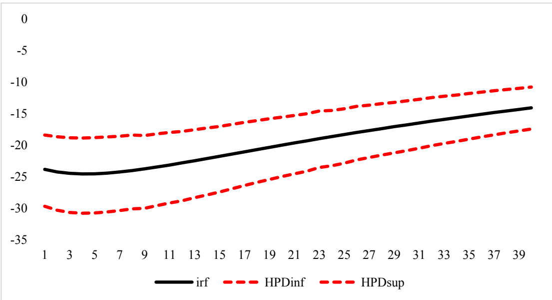
Mexico



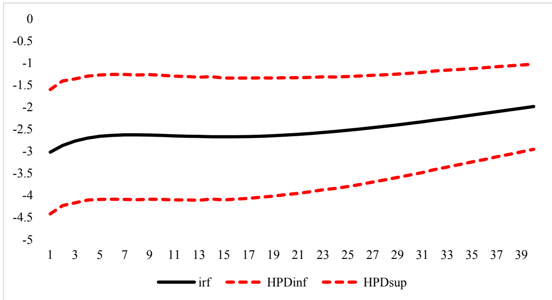
Indonesia



Nigeria



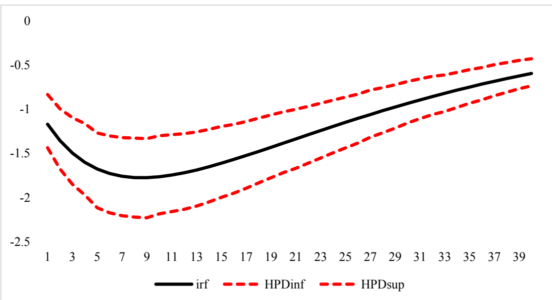
Turkey



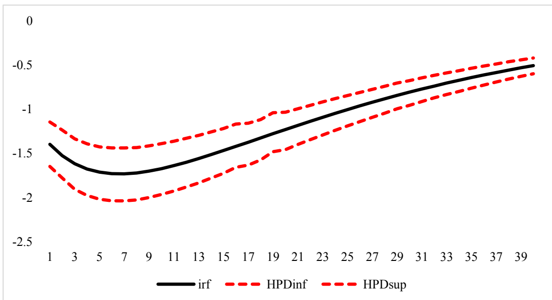
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.812) Impact of Commodity Price Shock on Ricardian Consumption of Foreign Goods - MINT

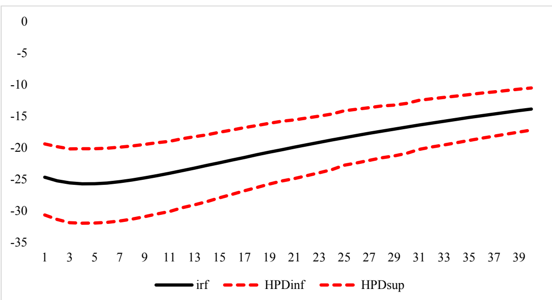
Mexico



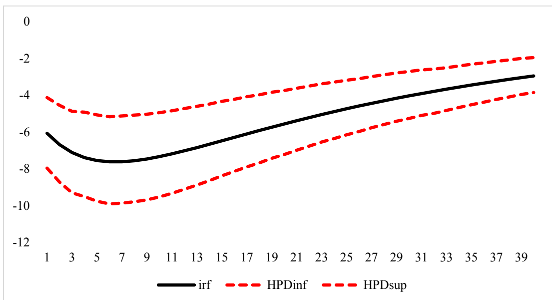
Indonesia



Nigeria



Turkey

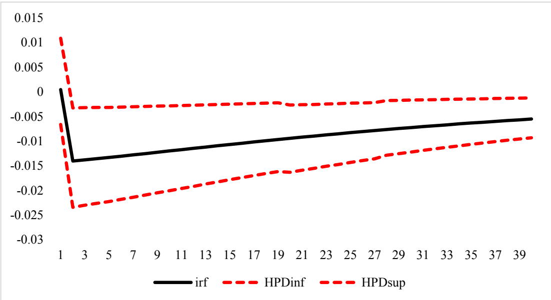


Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

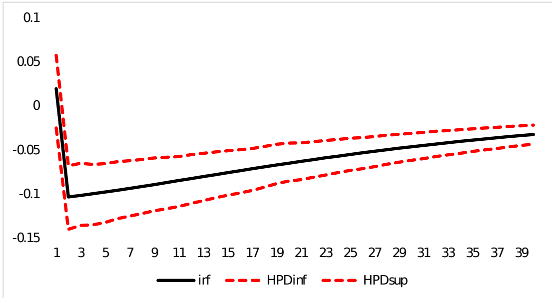
C.9 Transfer Shock on Domestic and Foreign Goods – BRIS and MINT

Figure (C.91) Impact of Transfer Shock on Overall Consumption of Domestic Goods - BRIS

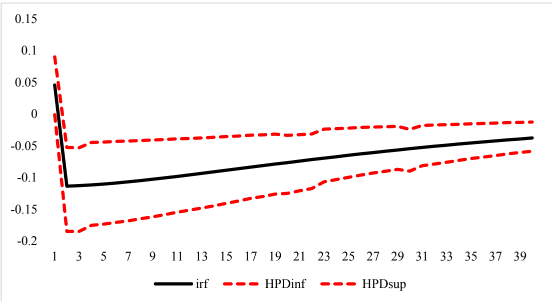
Brazil



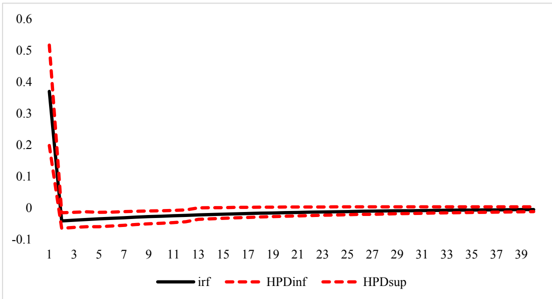
Russia



India



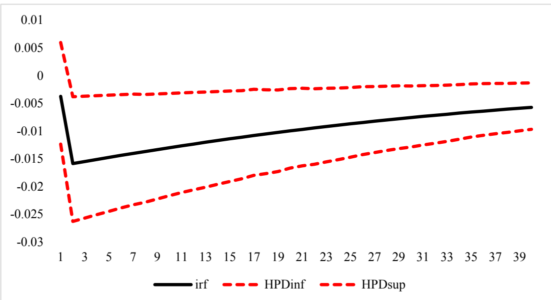
South Africa



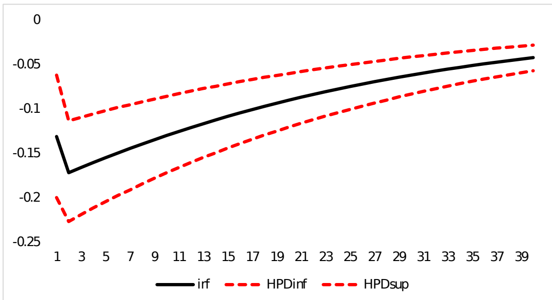
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.92) Impact of Transfer Shock on Overall Consumption of Foreign Goods - BRIS

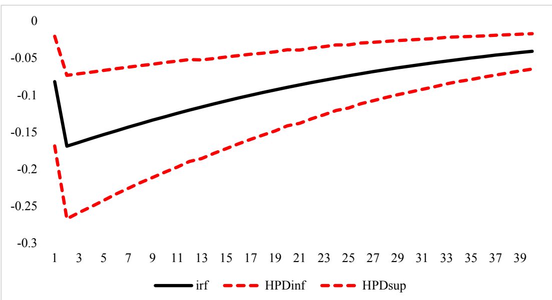
Brazil



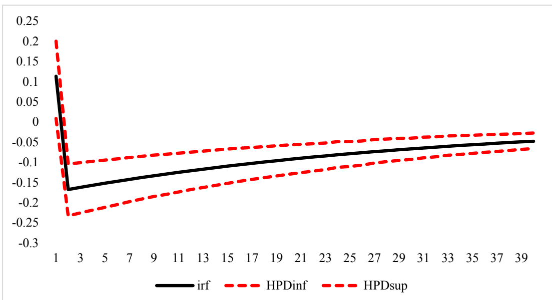
Russia



India



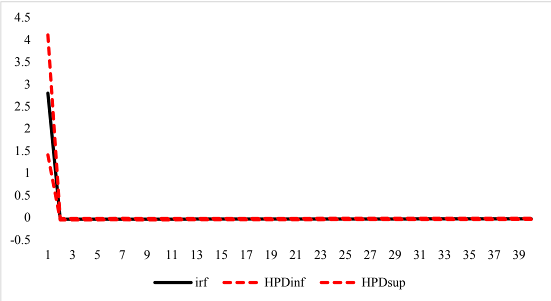
South Africa



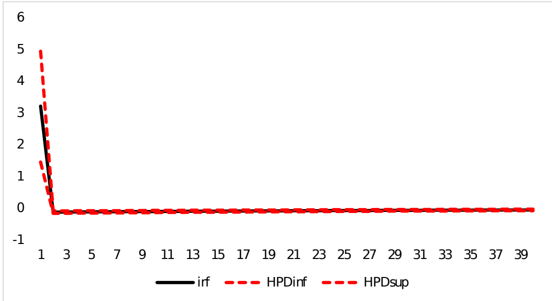
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.93) Impact of Transfer Shock on Non-Ricardian Consumption of Domestic Goods - BRIS

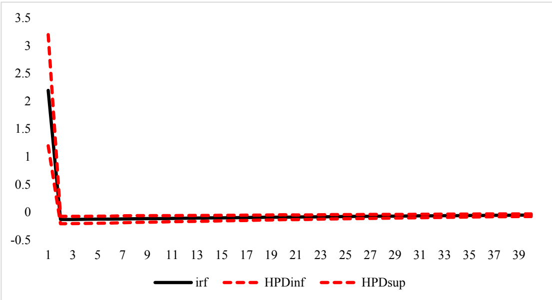
Brazil



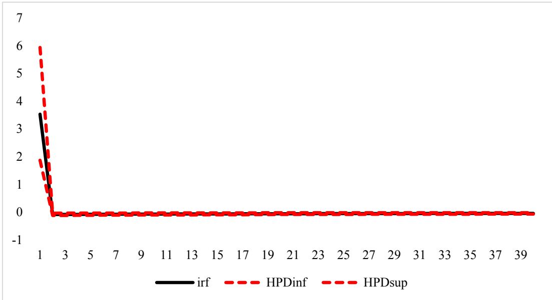
Russia



India



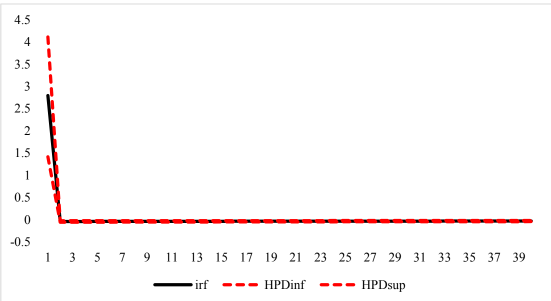
South Africa



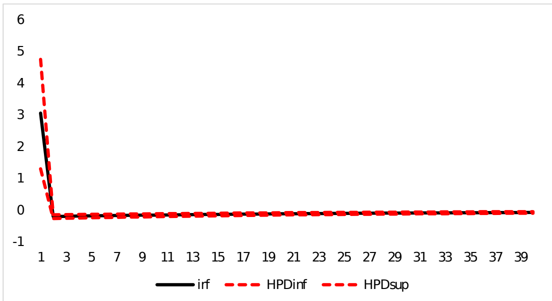
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.94) Impact of Transfer Shock on Non-Ricardian Consumption of Foreign Goods - BRIS

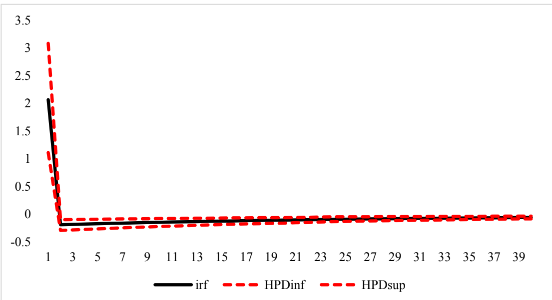
Brazil



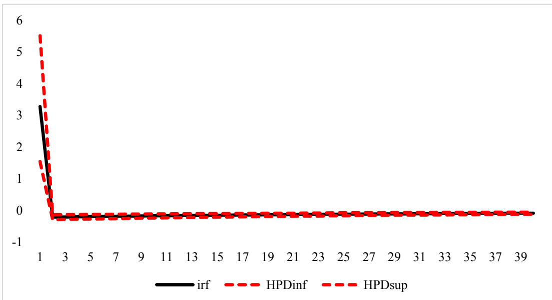
Russia



India



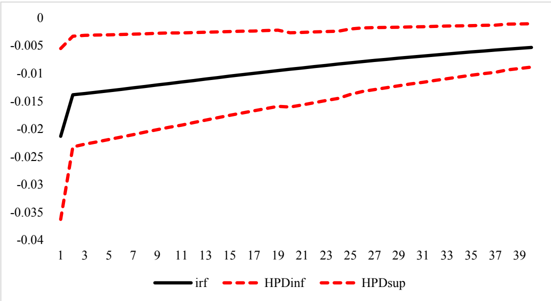
South Africa



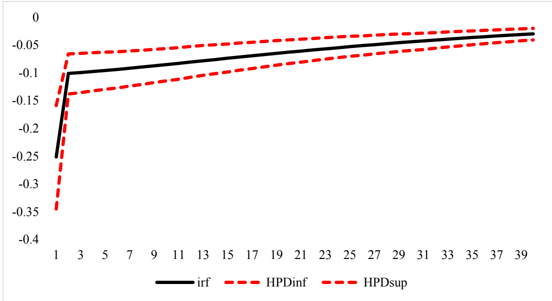
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.95) Impact of Transfer Shock on Ricardian Consumption of Domestic Goods - BRIS

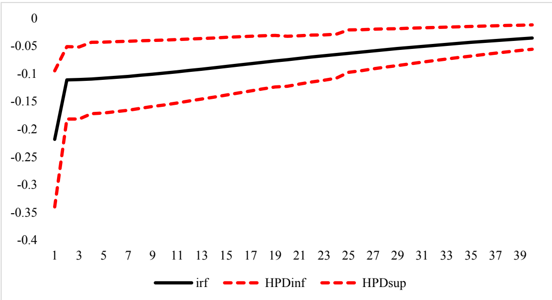
Brazil



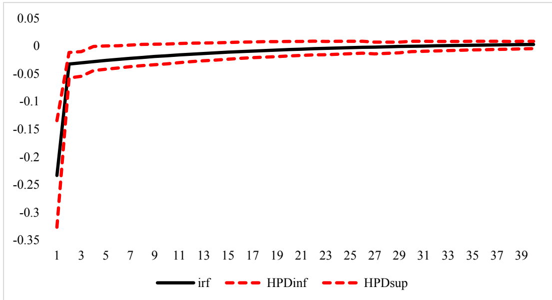
Russia



India



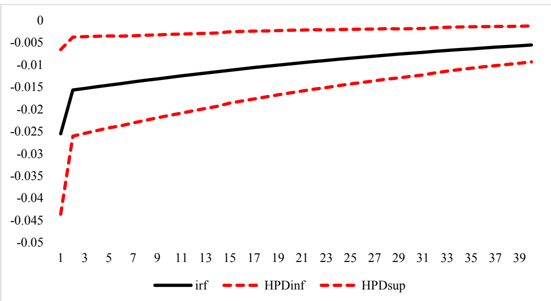
South Africa



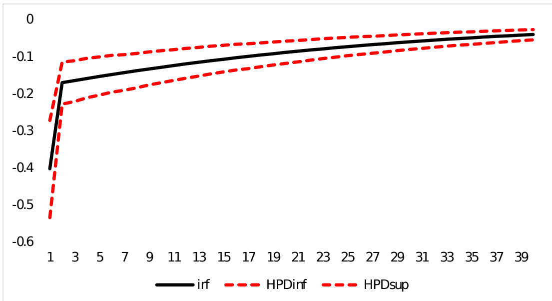
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.96) Impact of Transfer Shock on Ricardian Consumption of Foreign Goods - BRIS

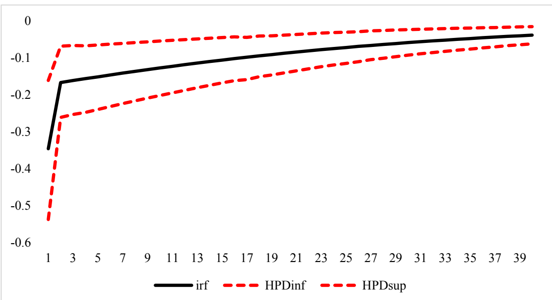
Brazil



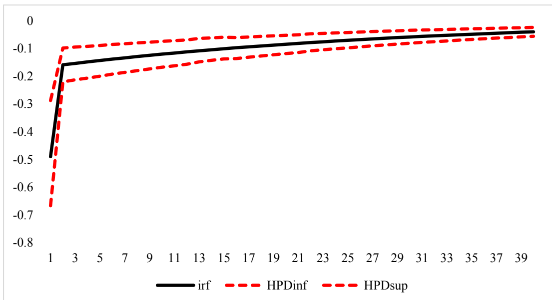
Russia



India



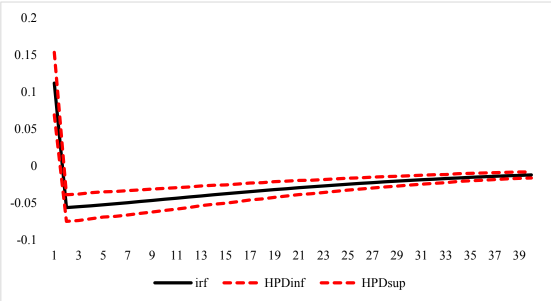
South Africa



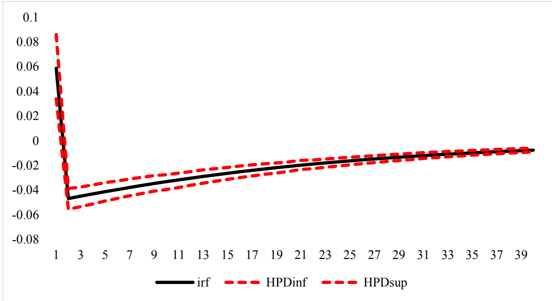
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.97) Impact of Transfer Shock on Overall Consumption of Domestic Goods - MINT

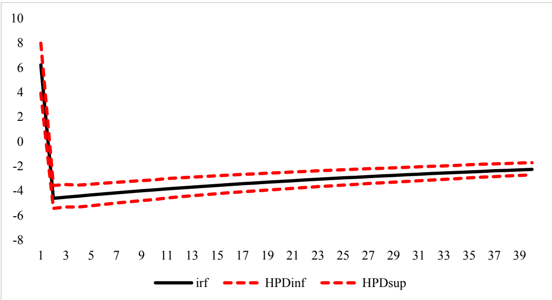
Mexico



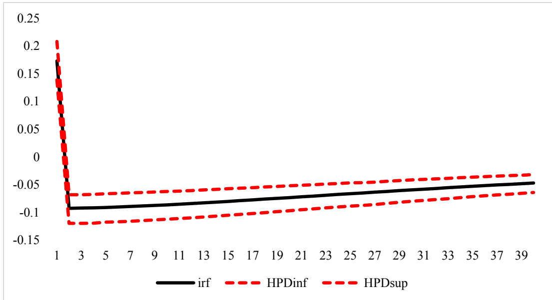
Indonesia



Nigeria



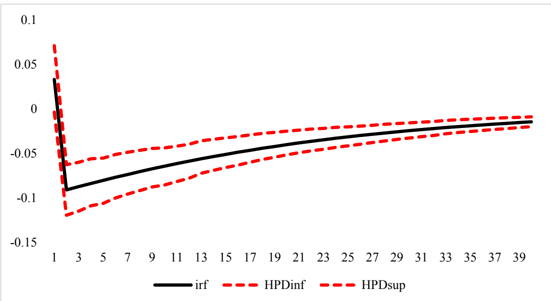
Turkey



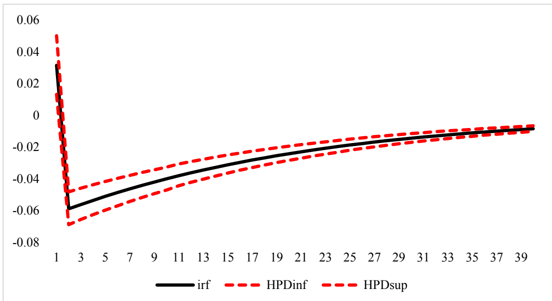
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.98) Impact of Transfer Shock on Overall Consumption of Foreign Goods - MINT

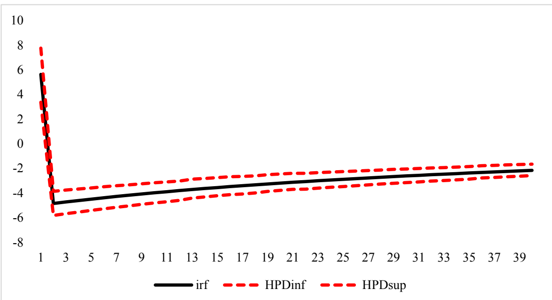
Mexico



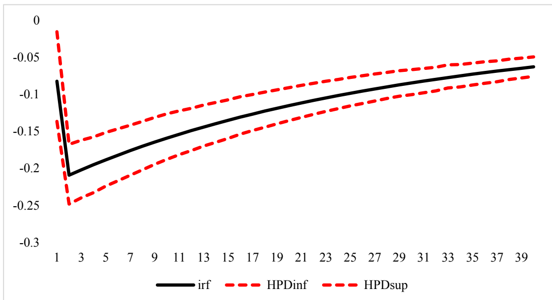
Indonesia



Nigeria

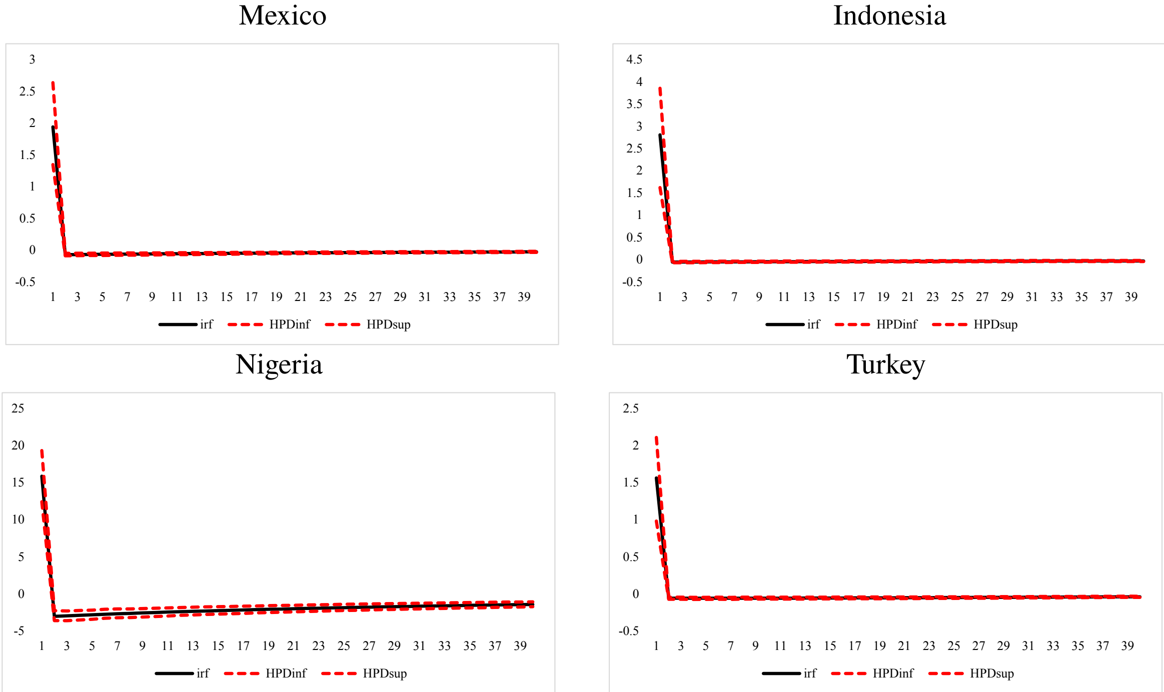


Turkey



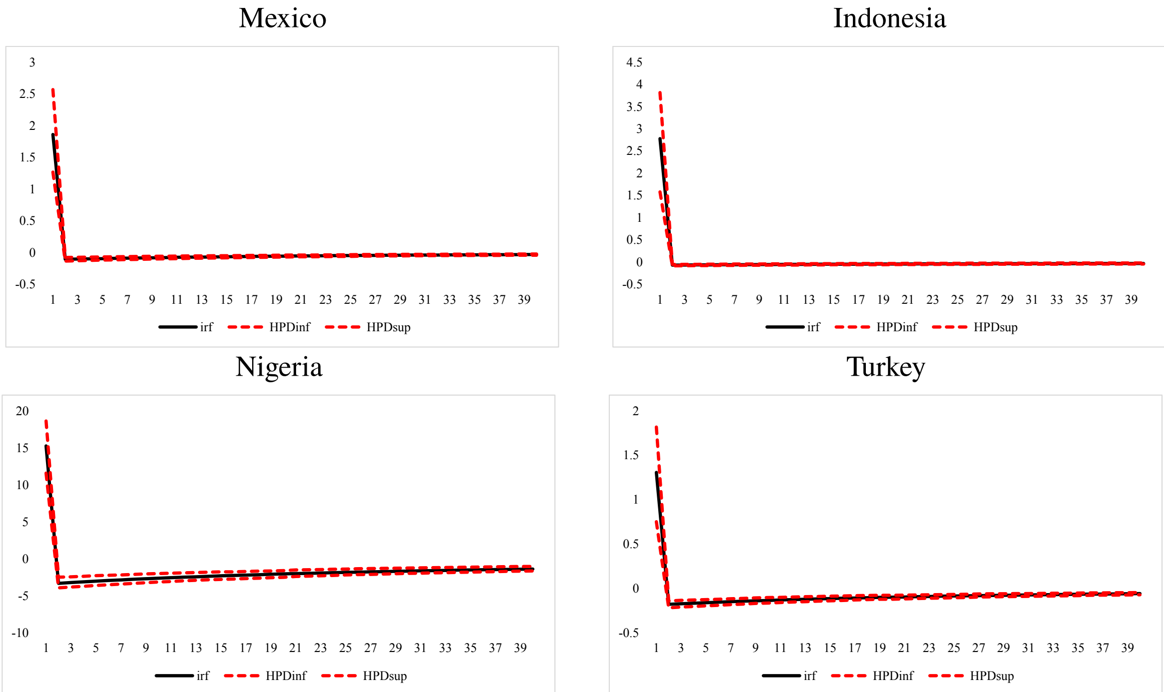
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.99) Impact of Transfer Shock on Non-Ricardian Consumption of Domestic Goods - MINT



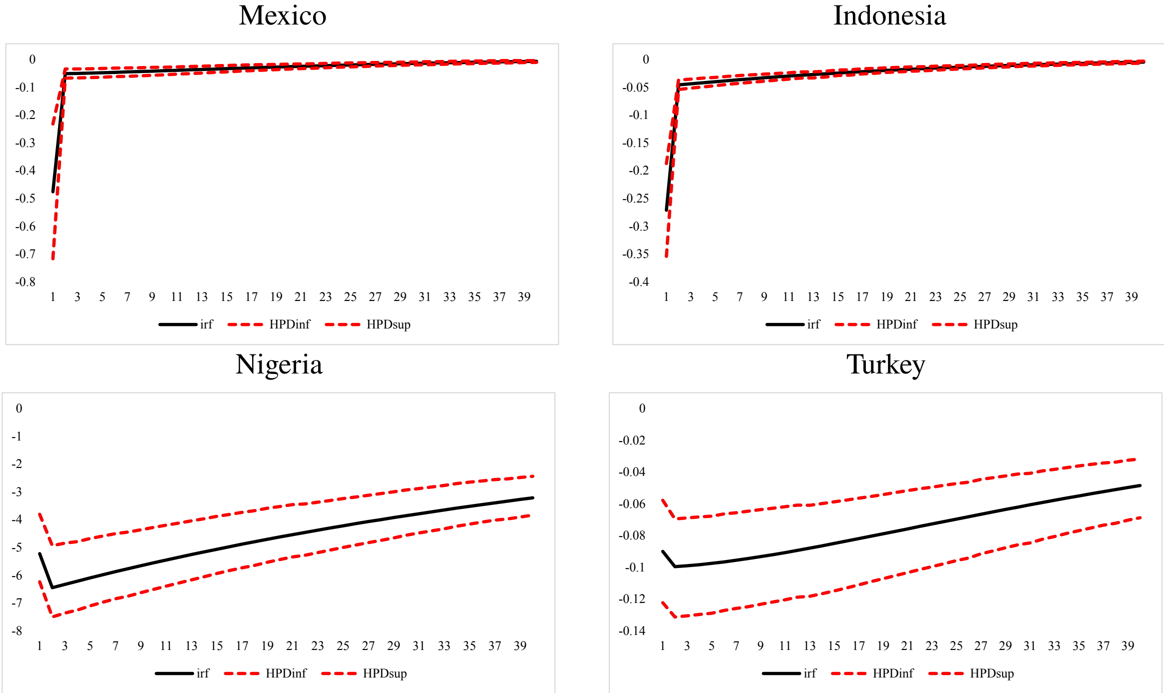
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.910) Impact of Transfer Shock on Non-Ricardian Consumption of Foreign Goods - MINT



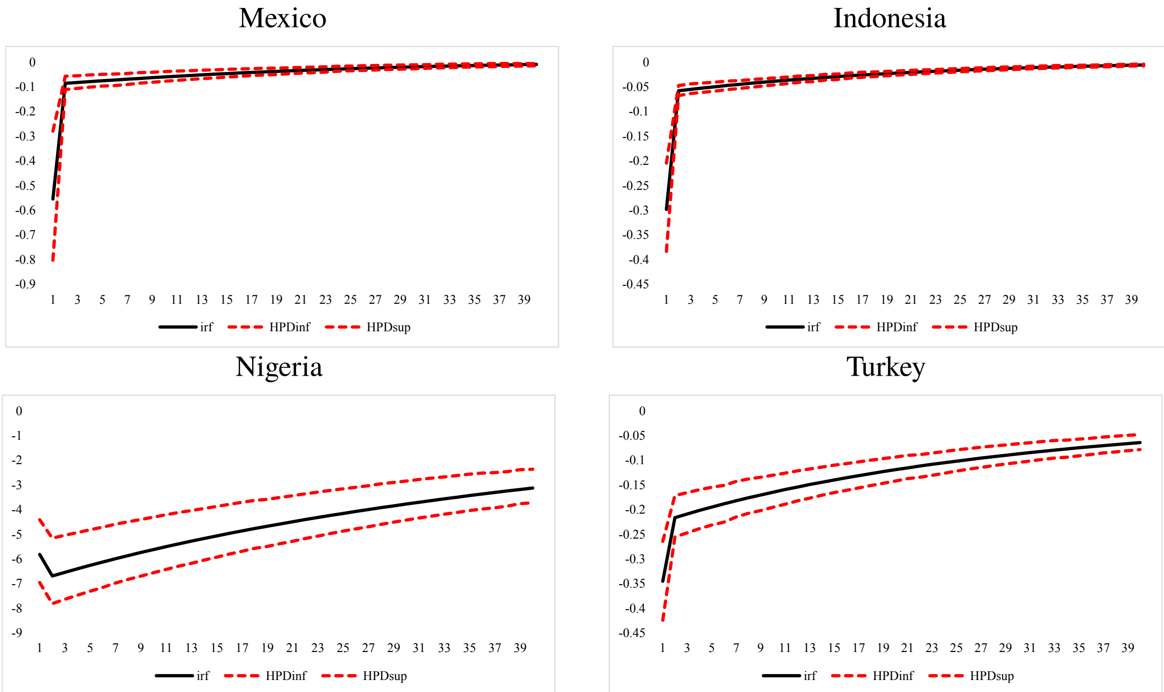
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.911) Impact of Transfer Shock on Ricardian Consumption of Domestic Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

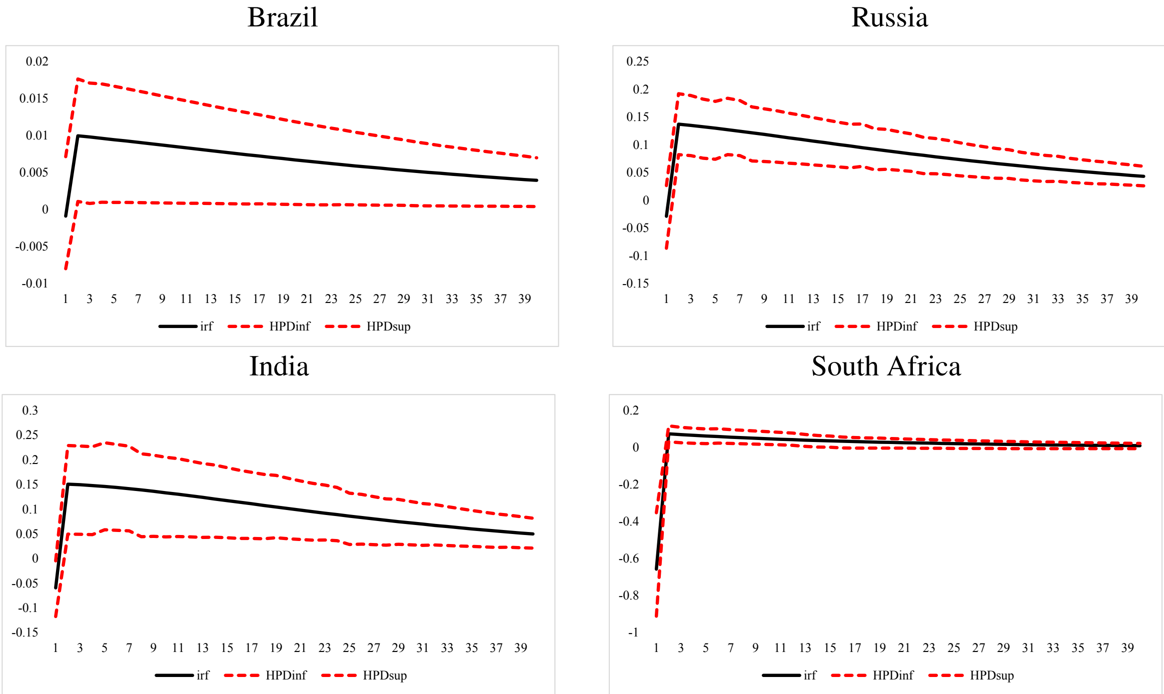
Figure (C.912) Impact of Transfer Shock on Ricardian Consumption of Foreign Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

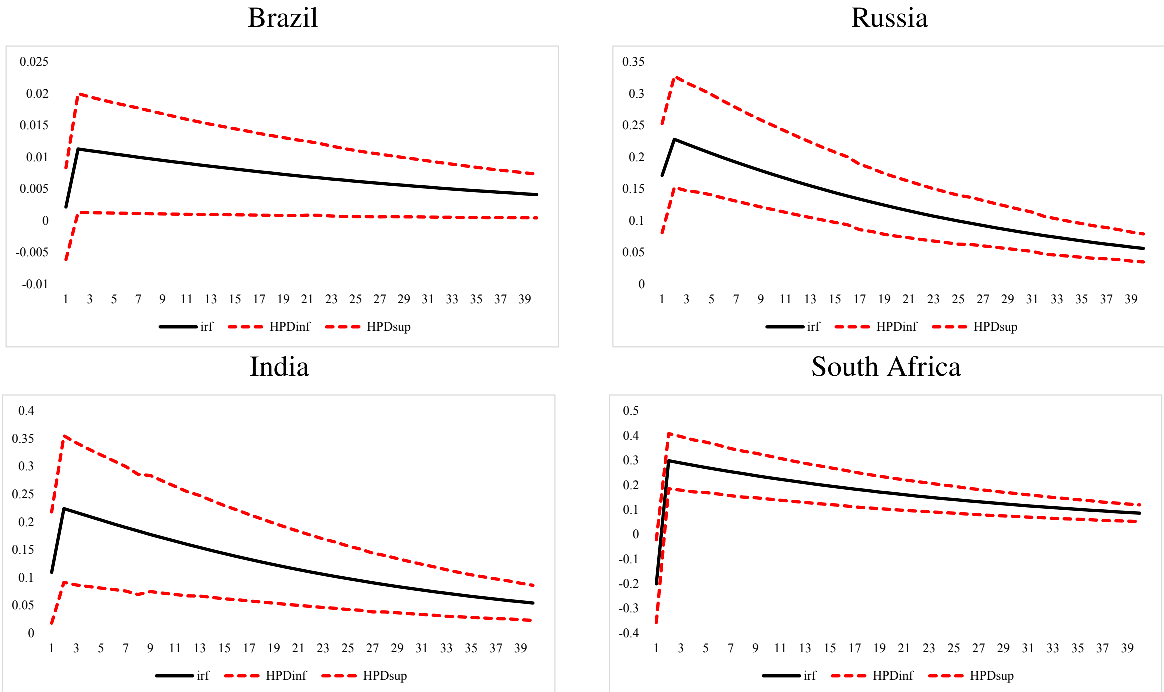
C.10 Tax Shock on Domestic and Foreign Goods – BRIS and MINT

Figure (C.101) Impact of Tax Shock on Overall Consumption of Domestic Goods - BRIS



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

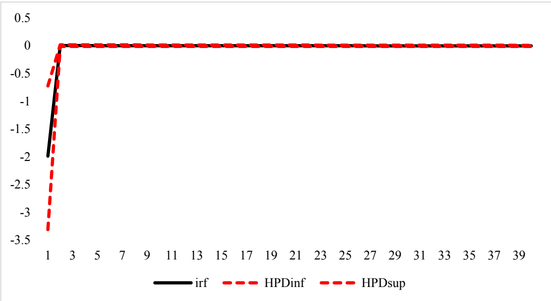
Figure (C.102) Impact of Tax Shock on Overall Consumption of Foreign Goods - BRIS



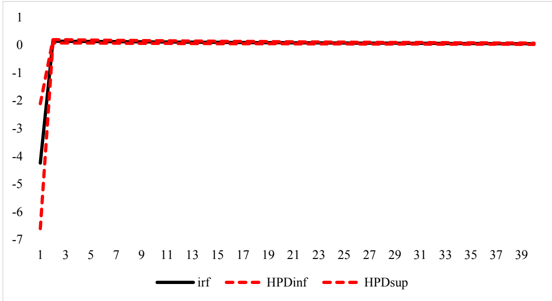
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.103) Impact of Tax Shock on Non-Ricardian Consumption of Domestic Goods - BRIS

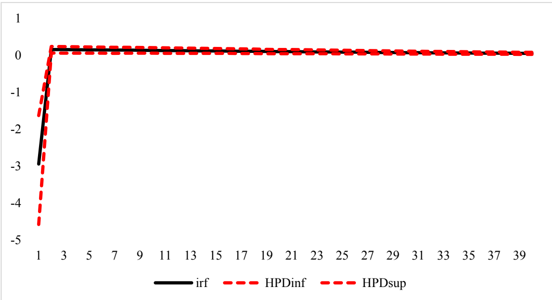
Brazil



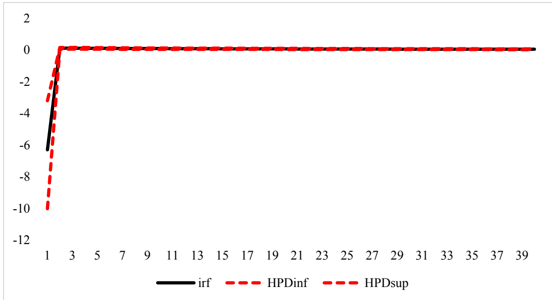
Russia



India



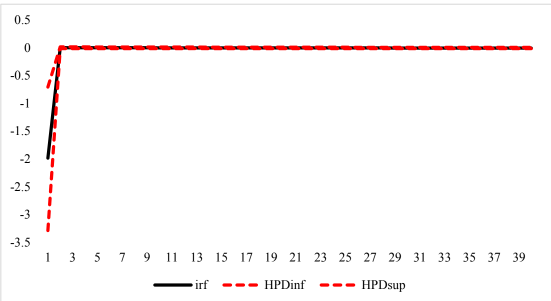
South Africa



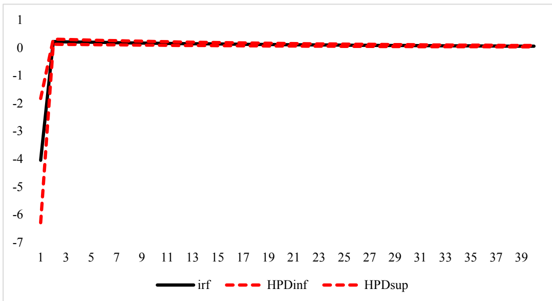
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.104) Impact of Tax Shock on Non-Ricardian Consumption of Foreign Goods - BRIS

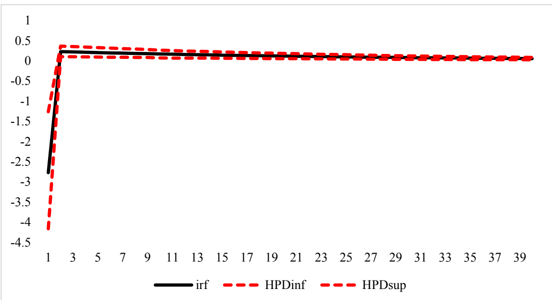
Brazil



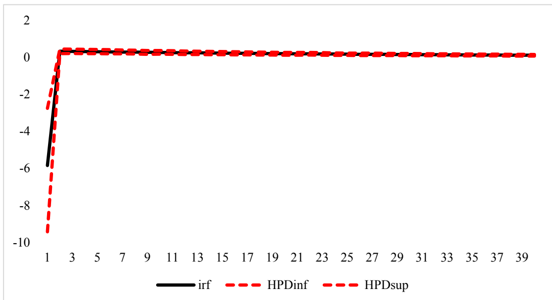
Russia



India

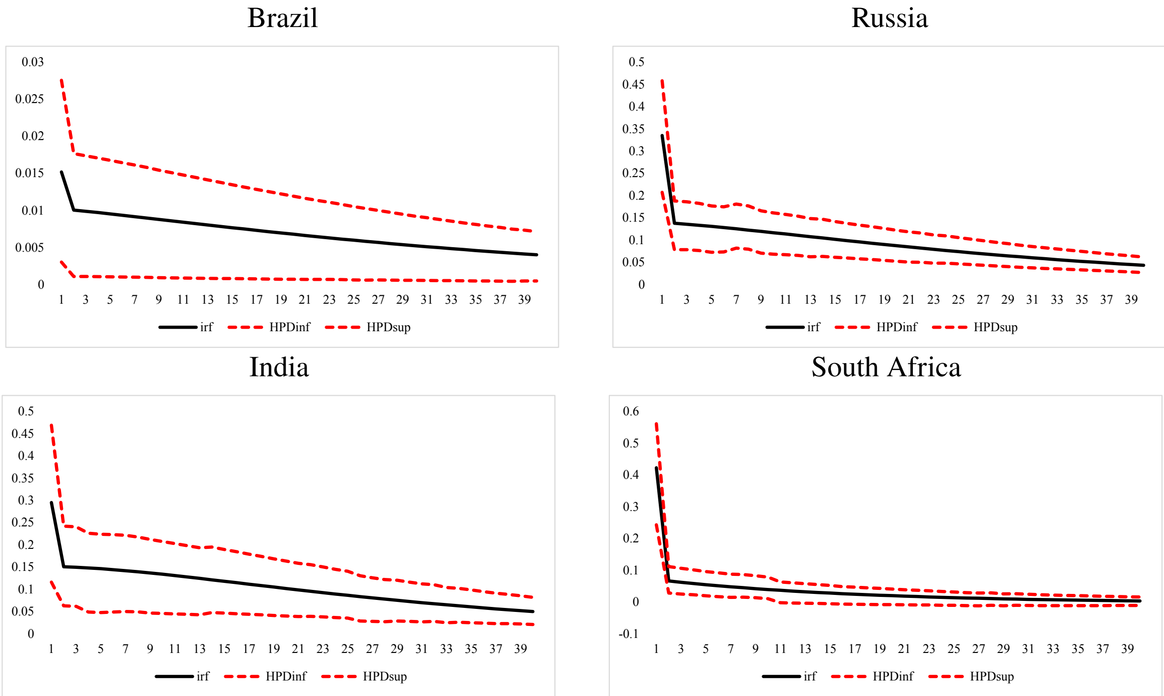


South Africa



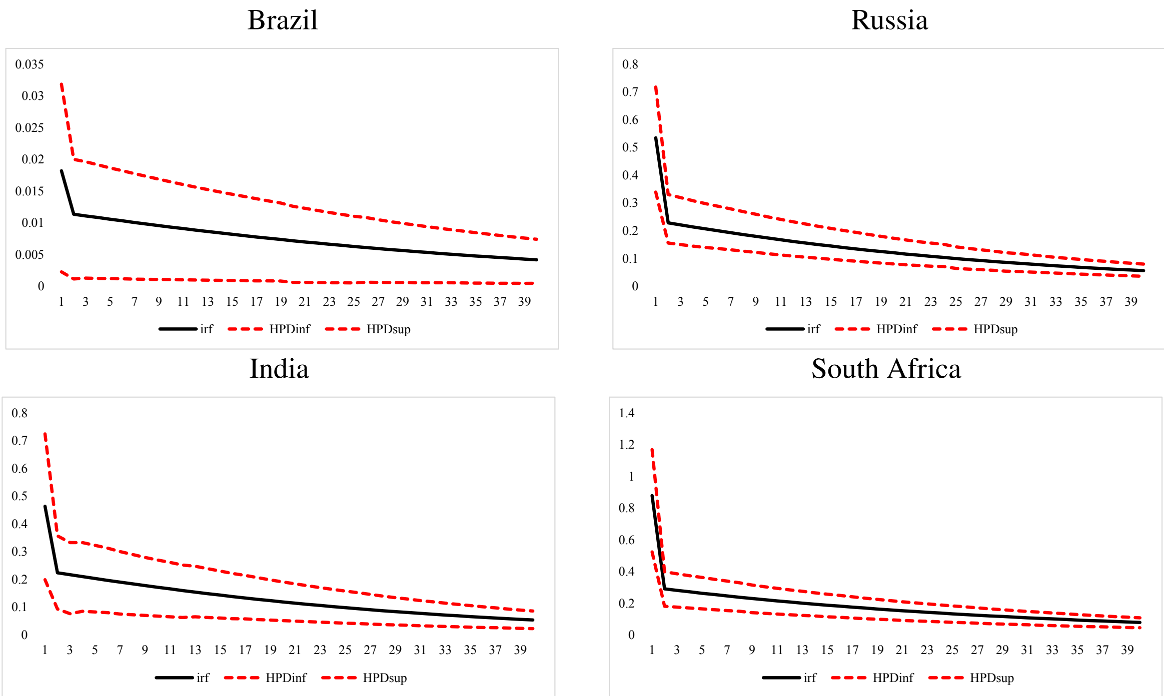
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.105) Impact of Tax Shock on Ricardian Consumption of Domestic Goods - BRIS



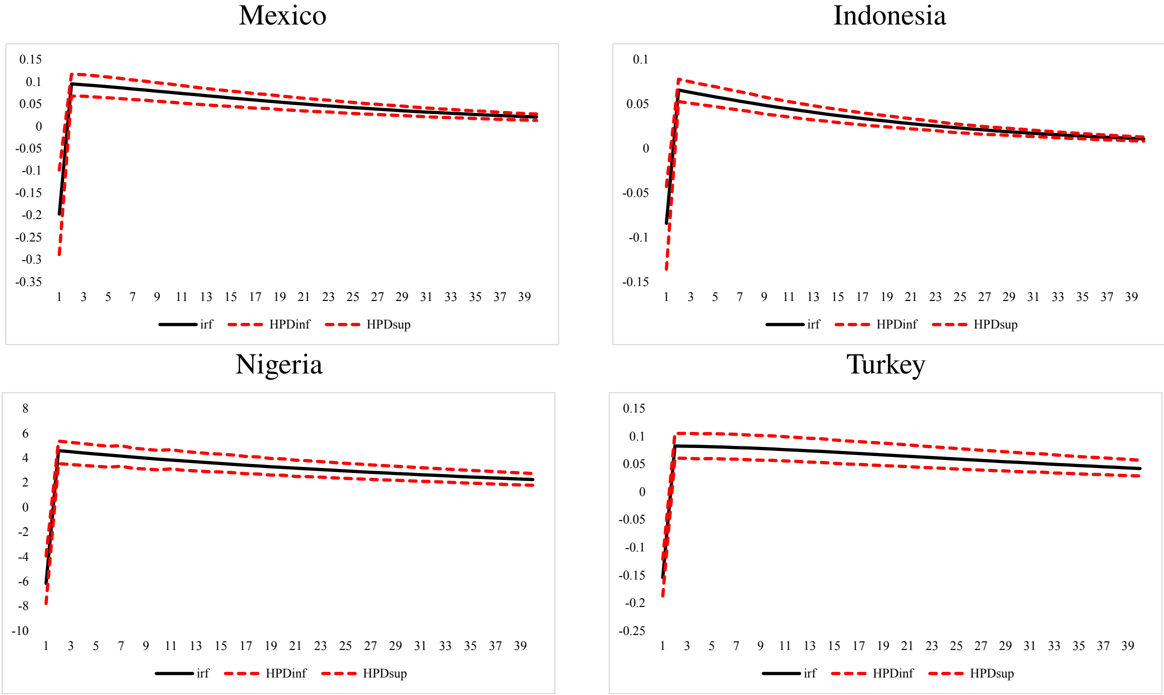
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.106) Impact of Tax Shock on Ricardian Consumption of Foreign Goods - BRIS



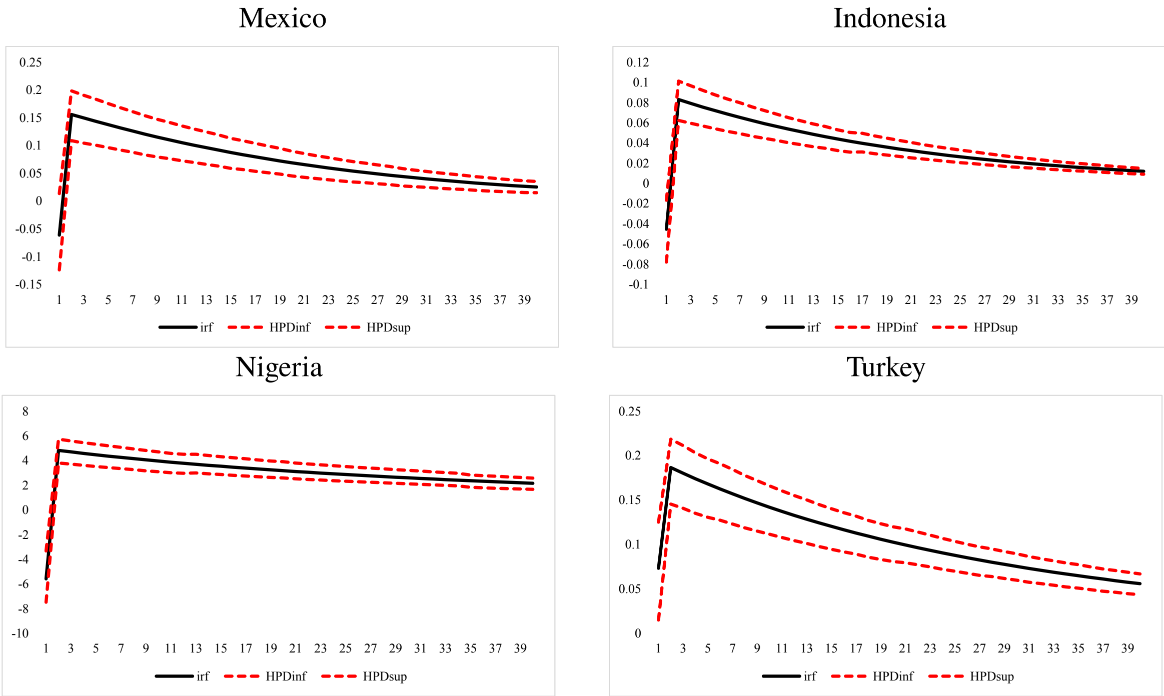
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.107) Impact of Tax Shock on Overall Consumption of Domestic Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

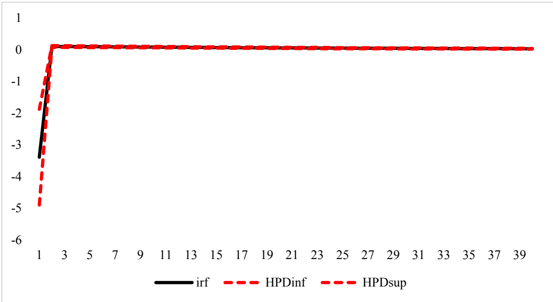
Figure (C.108) Impact of Tax Shock on Overall Consumption of Foreign Goods - MINT



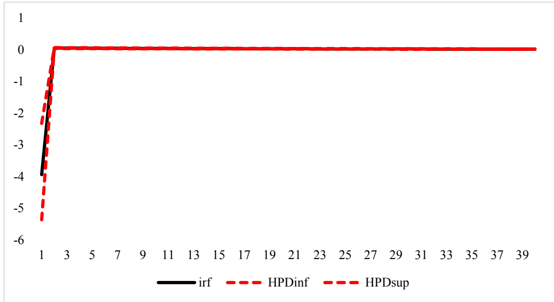
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.109) Impact of Tax Shock on Non-Ricardian Consumption of Domestic Goods - MINT

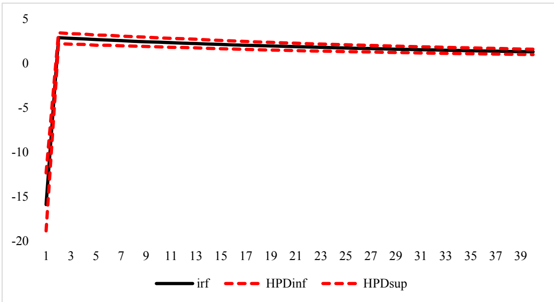
Mexico



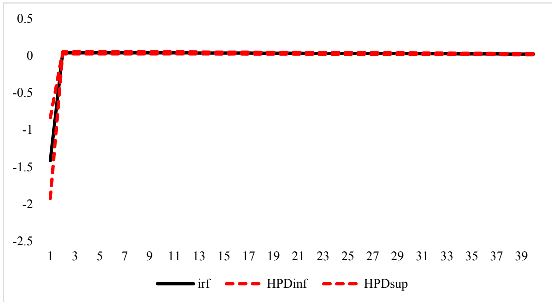
Indonesia



Nigeria



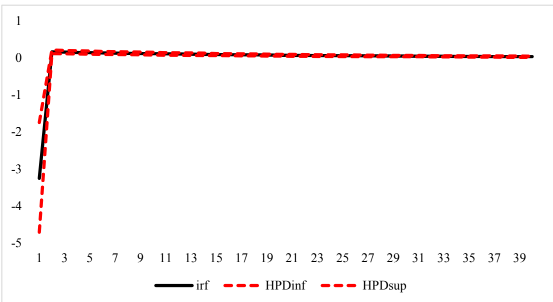
Turkey



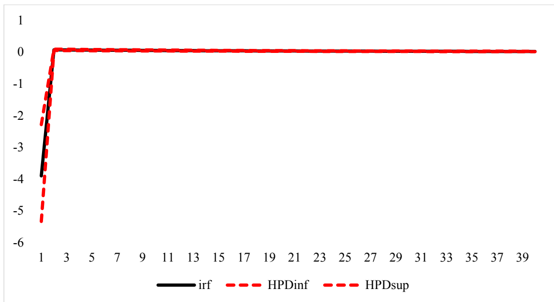
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.1010) Impact of Tax Shock on Non-Ricardian Consumption of Foreign Goods - MINT

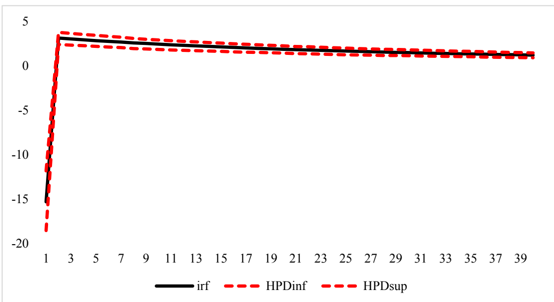
Mexico



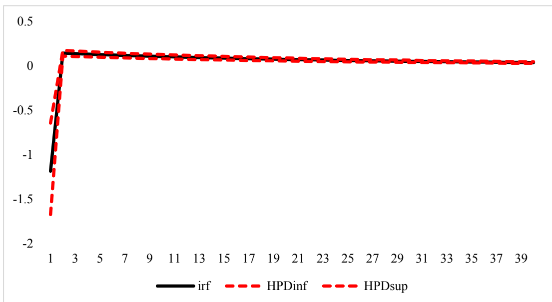
Indonesia



Nigeria

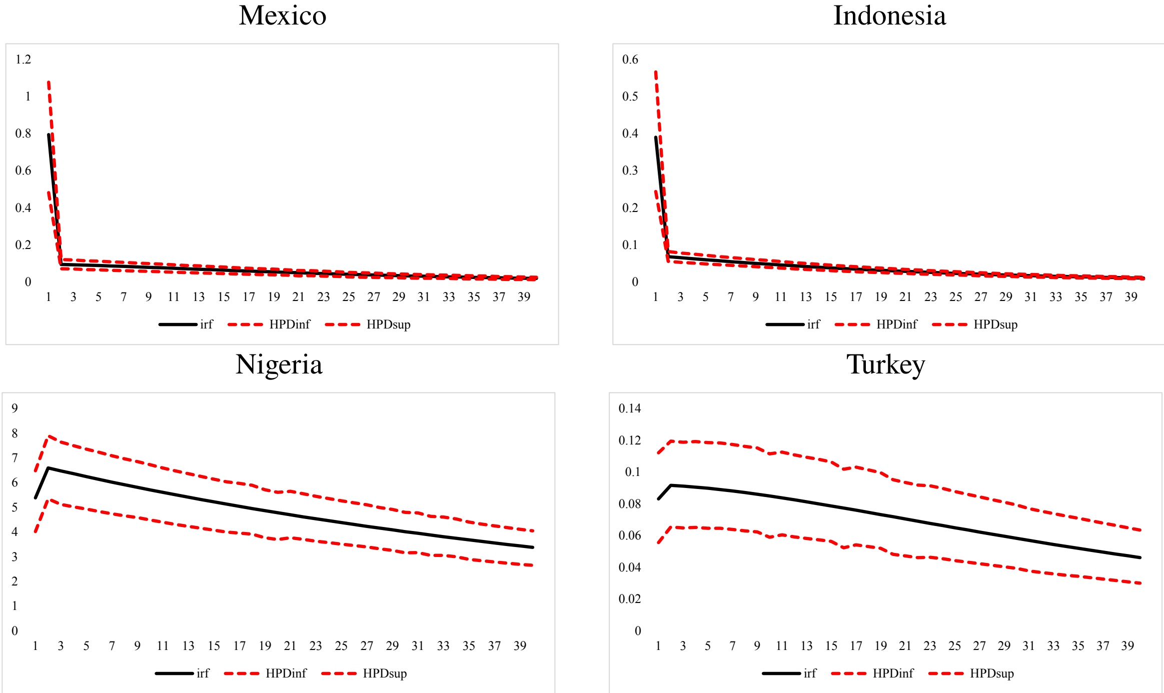


Turkey



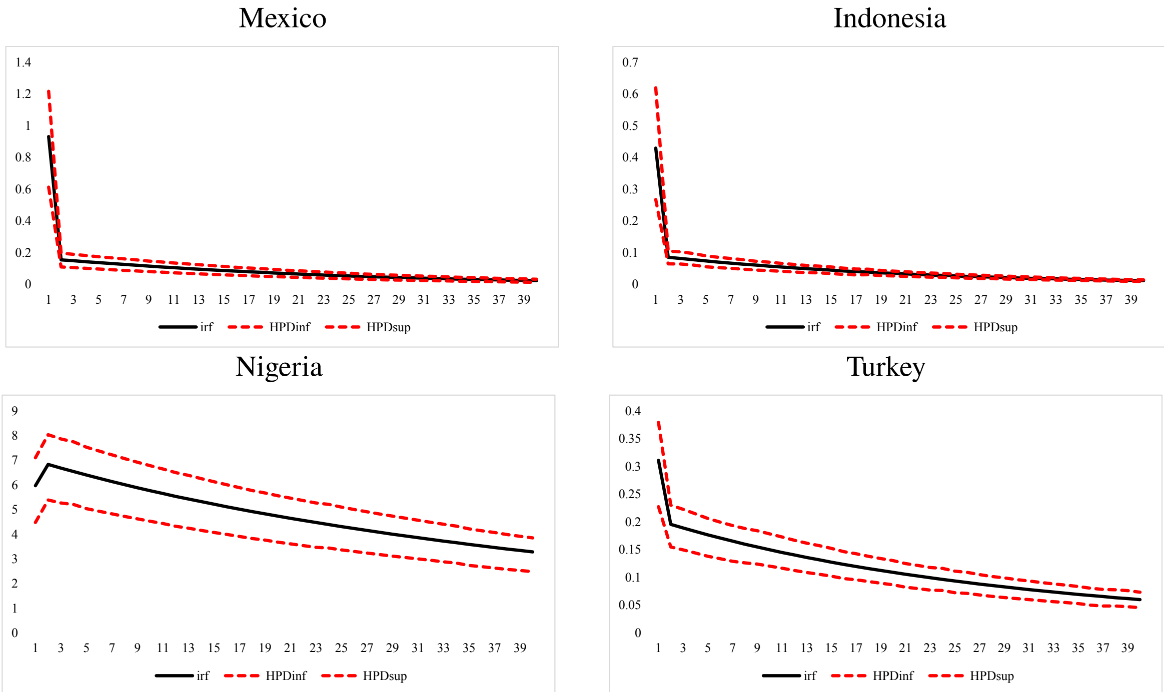
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.1011) Impact of Tax Shock on Ricardian Consumption of Domestic Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.1012) Impact of Tax Shock on Ricardian Consumption of Foreign Goods - MINT

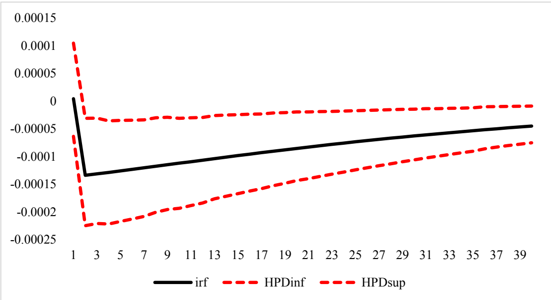


Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

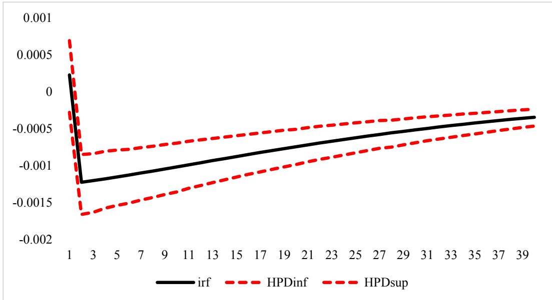
C.11 Debt Shock on Domestic and Foreign Goods – BRIS and MINT

Figure (C.111) Impact of Debt Shock on Overall Consumption of Domestic Goods - BRIS

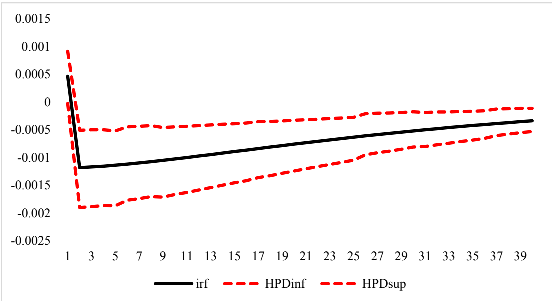
Brazil



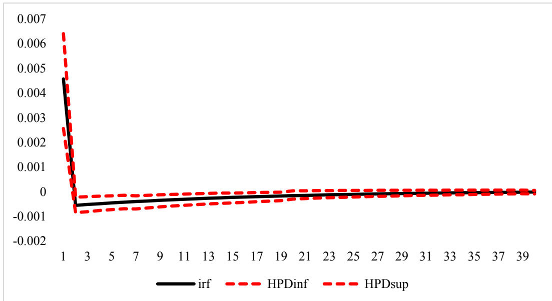
Russia



India



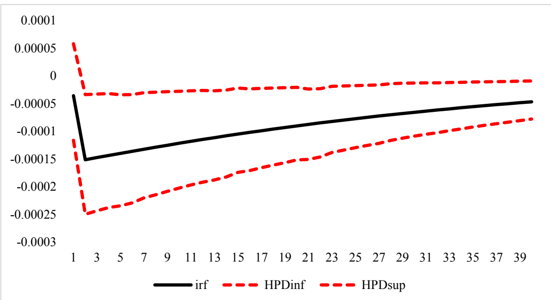
South Africa



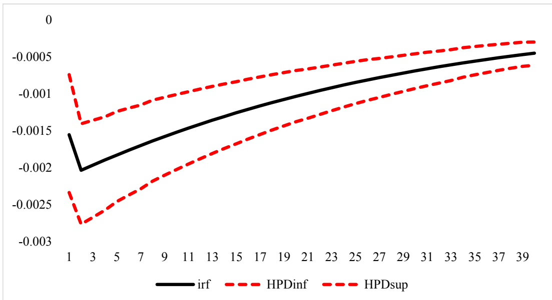
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.112) Impact of Debt Shock on Overall Consumption of Foreign Goods - BRIS

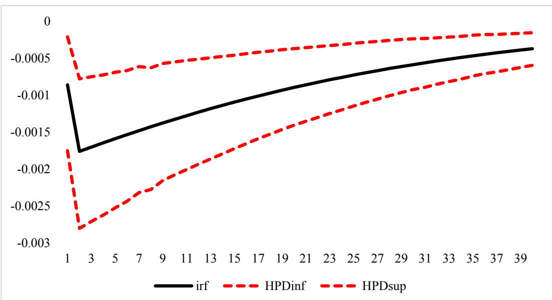
Brazil



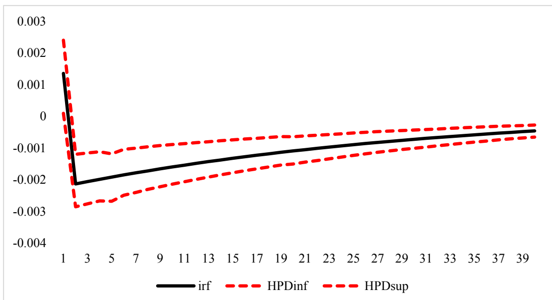
Russia



India



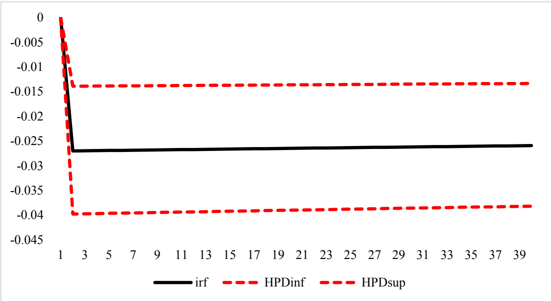
South Africa



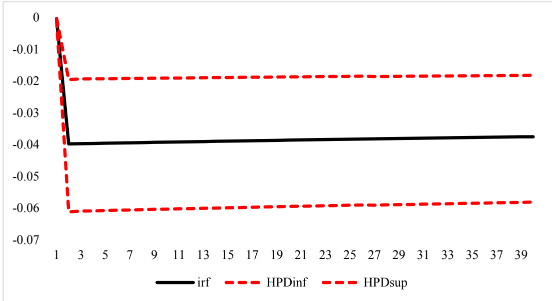
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.113) Impact of Debt Shock on Non-Ricardian Consumption of Domestic Goods - BRIS

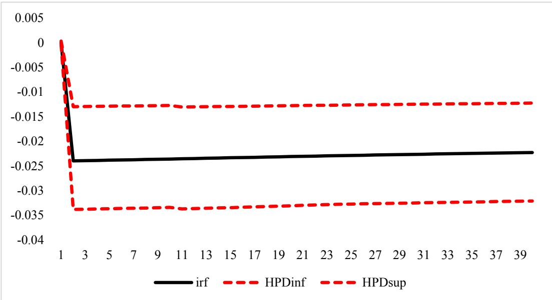
Brazil



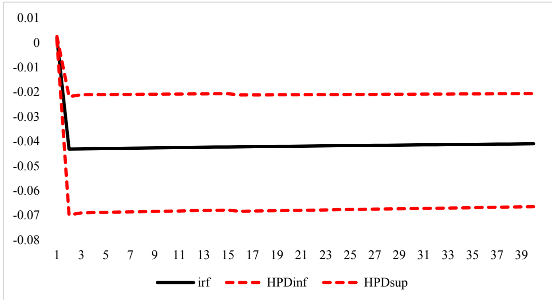
Russia



India



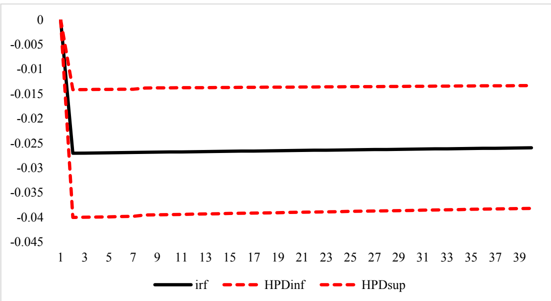
South Africa



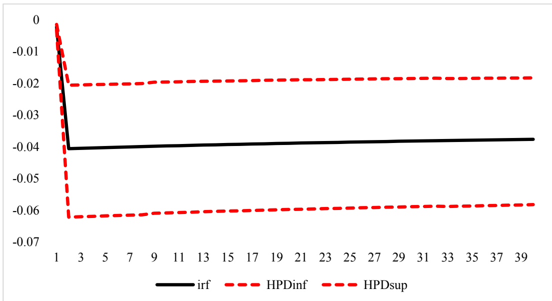
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.114) Impact of Debt Shock on Non-Ricardian Consumption of Foreign Goods - BRIS

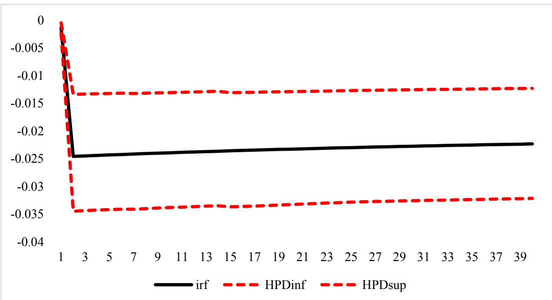
Brazil



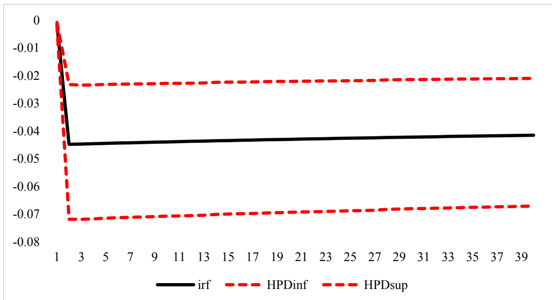
Russia



India



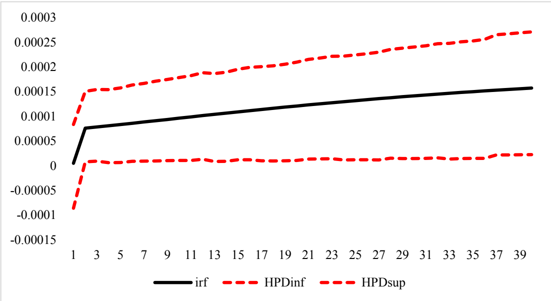
South Africa



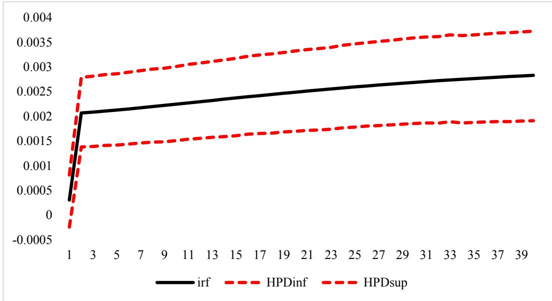
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.115) Impact of Debt Shock on Ricardian Consumption of Domestic Goods - BRIS

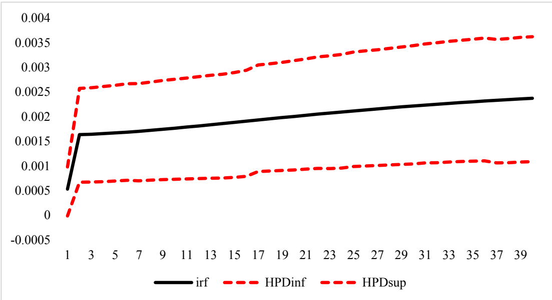
Brazil



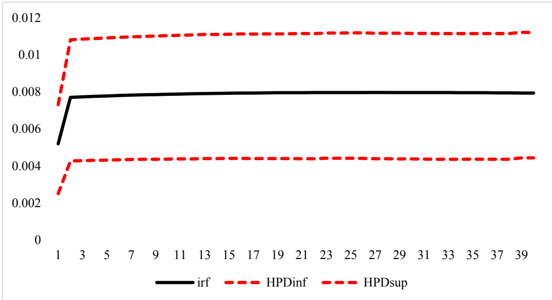
Russia



India



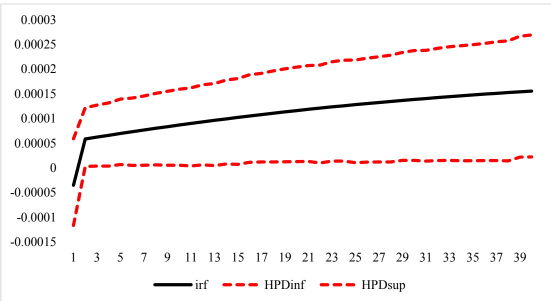
South Africa



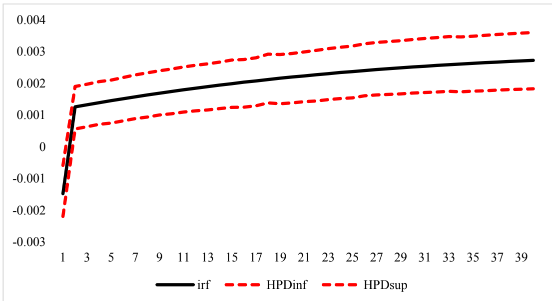
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.116) Impact of Debt Shock on Ricardian Consumption of Foreign Goods - BRIS

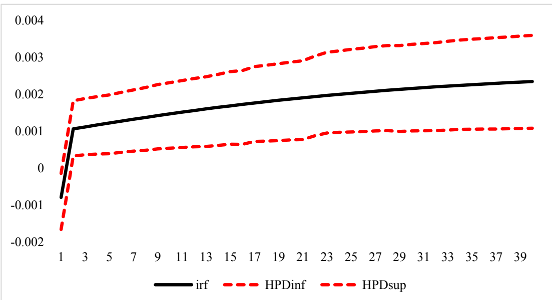
Brazil



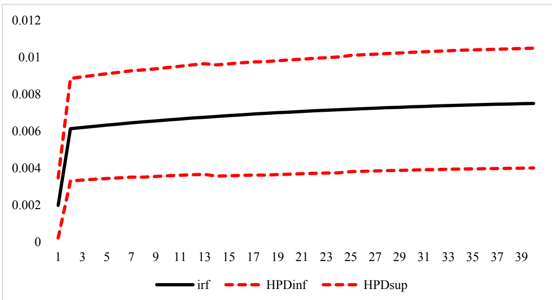
Russia



India



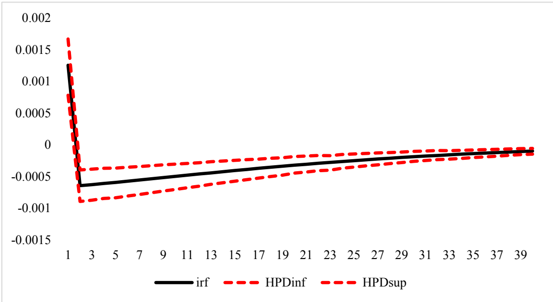
South Africa



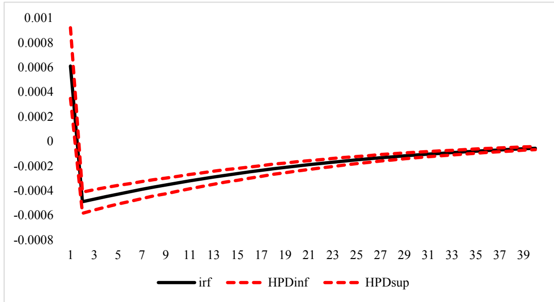
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.117) Impact of Debt Shock on Overall Consumption of Domestic Goods - MINT

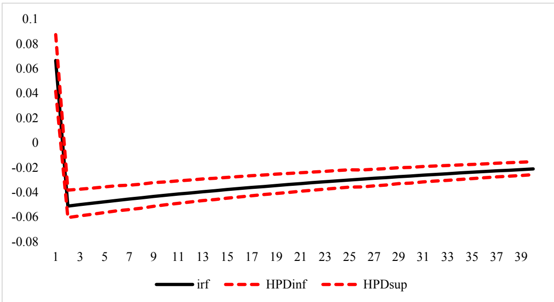
Mexico



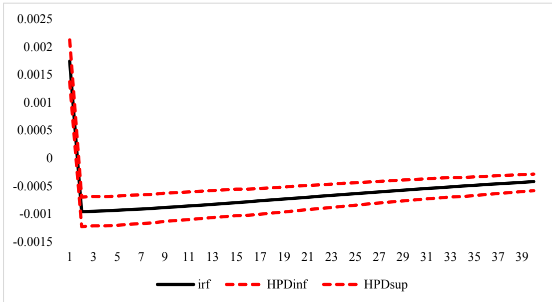
Indonesia



Nigeria



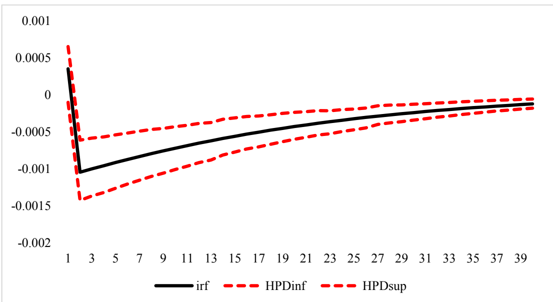
Turkey



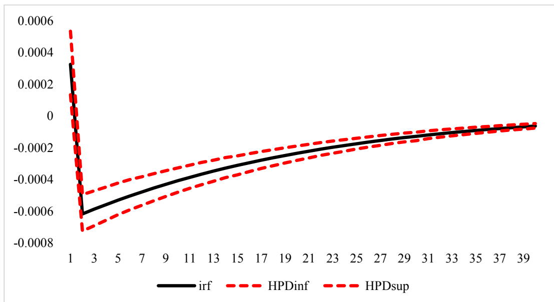
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.118) Impact of Debt Shock on Overall Consumption of Foreign Goods - MINT

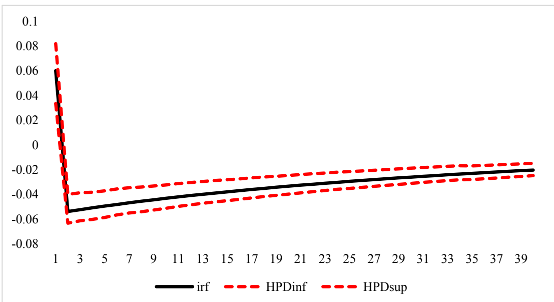
Mexico



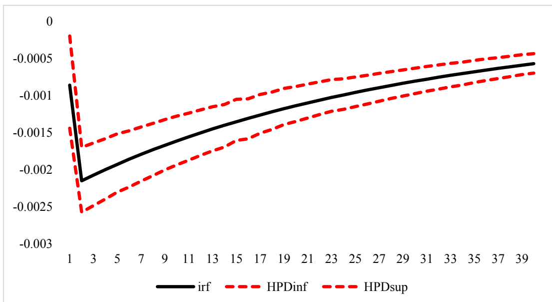
Indonesia



Nigeria



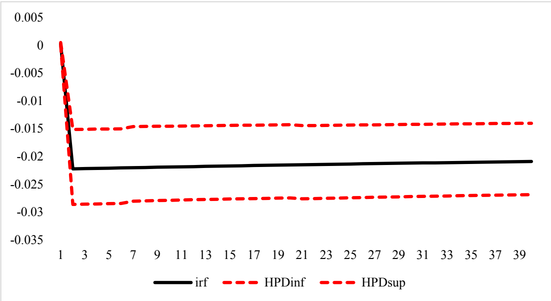
Turkey



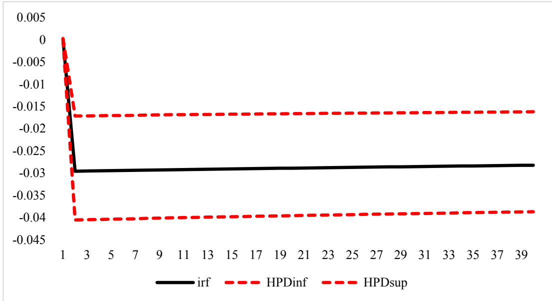
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.119) Impact of Debt Shock on Non-Ricardian Consumption of Domestic Goods - MINT

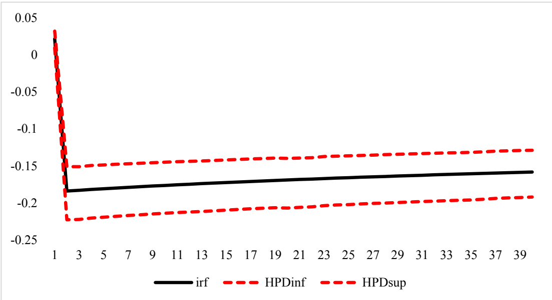
Mexico



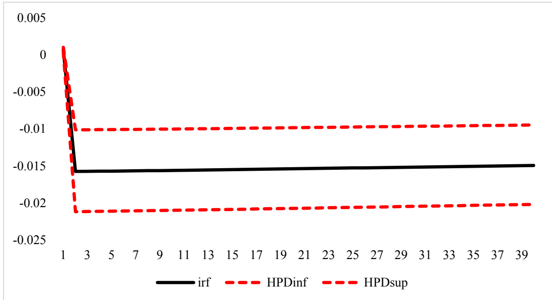
Indonesia



Nigeria



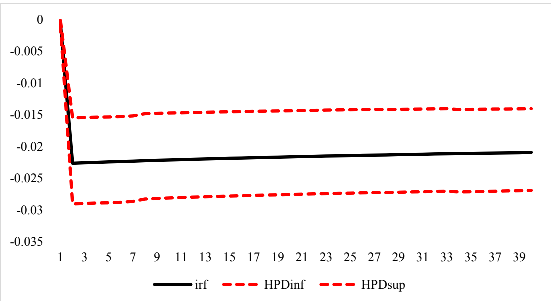
Turkey



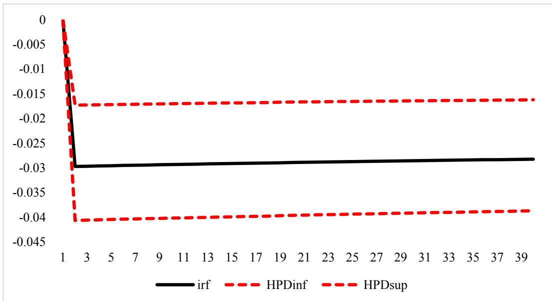
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.1110) Impact of Debt Shock on Non-Ricardian Consumption of Foreign Goods - MINT

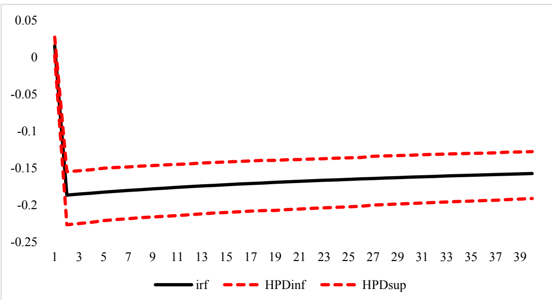
Mexico



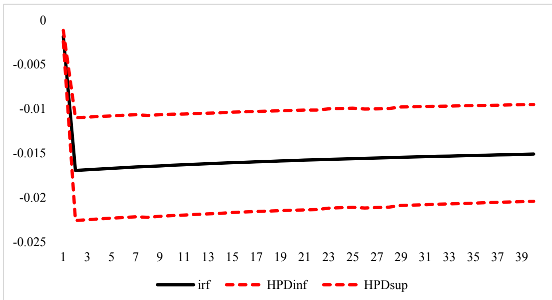
Indonesia



Nigeria

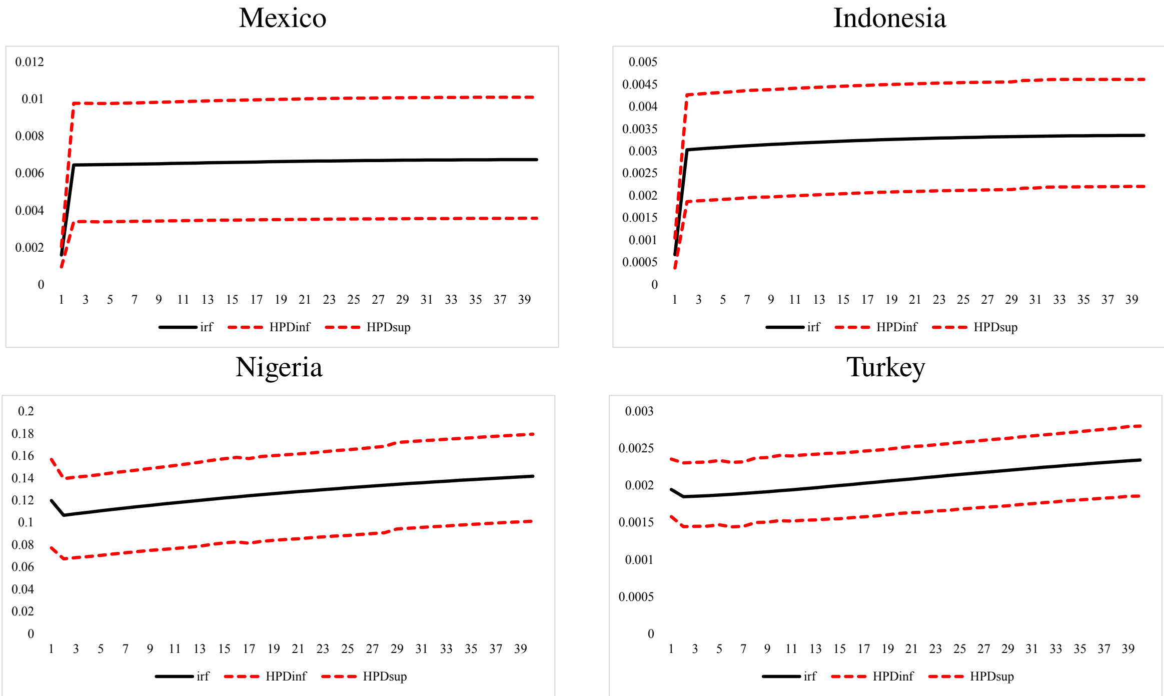


Turkey



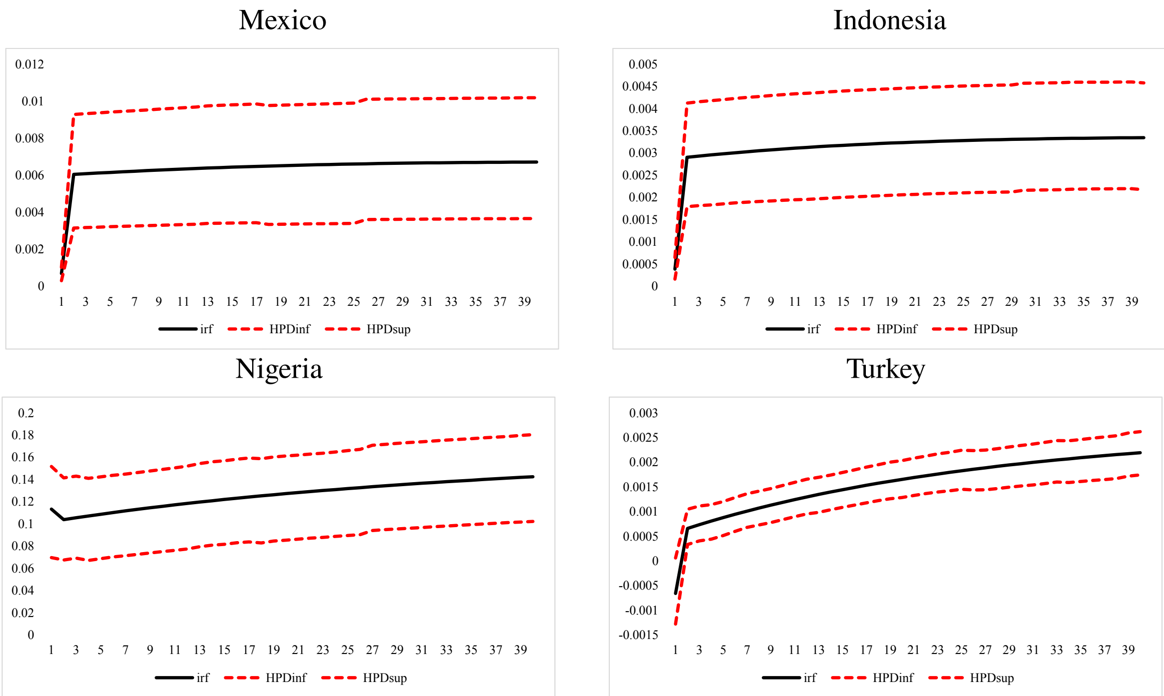
Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.1111) Impact of Debt Shock on Ricardian Consumption of Domestic Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Figure (C.1112) Impact of Debt Shock on Ricardian Consumption of Foreign Goods - MINT



Note: Solid black lines denote the response of the consumption variable to the relevant shock. Dashed red lines are 90 percent confidence intervals. Variables are expressed as percent deviation from initial steady-state values.

Epilogue

Comprising three main chapters, this PhD thesis contributes to the literature on the distributional impacts of fiscal policy.

Using the fixed effects estimator, the first chapter examines the redistributive impact of supporting social spending sectors by cuts in other sectoral expenditures in a panel of 50 middle-income countries over the period 2005–2015. The second chapter employs the panel VAR framework estimated by the GMM method towards analysing the distributional impacts of government expenditure and tax shocks in a group of 56 middle-income countries over the period 2005–2015. The third chapter applies the Bayesian DSGE method in examining the consumption effects of commodity and fiscal policy shocks in the leading middle-income countries: Brazil, Russia, India and South Africa (BRIS), on one hand, as well as Mexico, Indonesia, Nigeria and Turkey (MINT), on the other, for the period ranging from 2003Q2–2020Q4.

It would be observed that a common thread that runs through all three chapters is their exploration of issues related to: fiscal policy, income distribution, and middle-income countries. Upon exploring the insights which the findings from this thesis uncover regarding the vital interplay between these three issues (i.e., the common thread across the chapters), it becomes apparent that fiscal policy can wield considerable influence in facilitating significant distributional gains within middle-income countries. However, it is essential to recognize that not all categories of fiscal policy tools have uniform effects on the income distribution within middle-income countries. Some of these fiscal policy tools may be equalizing, while others may be dis-equalizing. Likewise, the impact of fiscal policy tools can vary depending on the specific category of middle-income countries under scrutiny. For example, certain fiscal policy tools may prove equalizing in lower middle-income countries, but their effects can be dis-equalizing in their upper middle-income counterparts. The details regarding the results obtained have been provided below, shedding light on the aforementioned considerations as well as how they determine the precise effects of fiscal policy within middle income countries.

The first chapter of the thesis reveals that the income gap can be lowered, with all percentiles gaining, if the education sector is funded by cuts in public expenditure on the transport and communication sector, the defence sector, and "other" sectors. Upon splitting the data based on national income, the chapter finds that within the subsample of upper middle-income countries, the equalising role of government spending reallocations in favour of the agricultural sector becomes manifest. Also, within the subsample of lower middle-income countries, the inequality-reducing impact of spending reallocations towards the social protection and health sectors becomes evident. Along with revealing the kinds of spending reallocations that are equalizing within middle-income countries, the first chapter also recommends that, when reallocating away from the relevant financing sectors (i.e., the sectors from which expenditure is being reallocated towards the social spending sectors), policymakers should place greater priority on inefficient expenditures (within the financing sectors), particularly, as "white elephant" projects have often constituted a challenge within emerging countries.

Meanwhile, the second chapter of the thesis finds that government and education spending shocks typically exhibit the most noticeable distributional effects. Specifically, shocks to both of these expenditures positively impact the low- and middle-income groups, with high-income groups also benefiting from education spending shocks. Meanwhile, social protection shocks often exhibit brief equalising effects; and health spending and tax shocks generally have no detectable effects on income inequality. Also, social protection and health spending shocks largely elevate the income share of the wealthy, whereas tax shocks generally do not benefit the income groups under study. These findings hold even after controlling for inflation, reordering the variables, and using other inequality measures. The chapter also contributes by comparing the findings for middle-income countries to high-income ones. In this regard, the chapter shows that the findings for both groups of countries may vary in terms of the distributional consequences of the same fiscal measures, but nonetheless, they often accord on some general trends. Interestingly, the equalizing effect of health expenditure and tax shocks is seen in high-income countries. Also, the third chapter of the thesis finds that both Ricardian and non-Ricardian households reduce consumption following negative shocks to commodity output and prices. Specifically, the shocks cause a drop in total consumption, with Russia seeing the biggest drop among BRIS countries, meanwhile, the consumption decline obtained for Nigeria is greater than that of Russia as well as the rest of MINT. However, the kind of household that cuts consumption the most differs by country as well as by commodity shock. Nonetheless, positive shocks on public transfers raise aggregate consumption across BRIS and MINT and play a crucial role in facilitating a redistribution pattern that is associated with a fall in consumption for Ricardian households but results in a rise in consumption for their poor non-Ricardian counterparts, thereby reducing the consumption ratio between the former and the latter, with the reduction in BRIS being most pronounced in South Africa, meanwhile, it is most evident in Nigeria within MINT as well as for both groups of countries. The third chapter of this thesis equally demonstrates that negative tax shocks and positive debt shocks increase consumption ratios across BRIS and MINT by benefiting Ricardian households while impacting adversely on non-Ricardian households. Also, following commodity shocks, both Ricardian and non-Ricardian households reduce consumption of both foreign and local commodities within BRIS and MINT (with the exception of South Africa), albeit with the decrease in foreign goods being higher. The chapter equally makes a further contribution by comparing the findings for BRIS with those of MINT. Compared to BRIS, MINT record on average, a higher instantaneous decline in aggregate consumption, Ricardian consumption, and non-Ricardian consumption.

As regards policy significance, the findings from the first chapter suggest that in middle-income countries, it is crucial to take into consideration the redistributive roles of expenditure reallocations. In the spirit of maintaining a neutral fiscal stance, supporting social spending sectors through budget cuts in the transportation and communication sector, defence and "other sectors", might enable policymakers accomplish inequality-reducing spending reallocations. However, the exact social expenditure sector to be funded varies between upper and the lower middle-income countries. Specifically, upper middle-income countries could place more emphasis on reallocating resources to the agricultural and educational sectors, while lower middle-income countries may prioritise social security and health care. With respect to the second chapter, the most important policy implication is that abrupt changes in government expenditure (like those seen during the COVID-19 epidemic) may assist in minimising income disparities. Nonetheless, the response of the income distribution is not uniform to all categories of social expenditure; hence, the specific expenditure under consideration matters for the precision of details. Meanwhile, the key takeaway of the third chapter is that the heavy dependence on commodities in BRIS and MINT implies that households in these countries are vulnerable to negative commodity shocks, which tend to reduce spending for poor and non-poor consumers alike. However, government transfers assist in increasing household spending and reducing the consumption ratio across households during commodity shocks. Moreover, compared to debt-funded expenditures and negative taxes, public transfers appear to be a more effective instrument of fiscal policy for mitigating the impact of negative commodity shocks on consumption within BRIS and MINT.

In terms of areas for further research, prospective extensions on public expenditure reallocations might modify the degree of sectoral disaggregation. Additionally, future studies on fiscal policy shocks could investigate the distributional effects of unexpected changes in other sectors of public expenditure, which have not been examined in this thesis. Similarly, subsequent papers on commodity shocks could evaluate the effects of other shocks that could potentially impact consumption (e.g., fiscal policy tools such as public investment and consumption tax).

Finally, the time period covered in this thesis is determined by available data. As such, further research on the general theme of the thesis might consider a longer time-frame as the necessary data become available.

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