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DECLARATION

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

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"Labour is prior to, and independent of, capital. Capital is only the fruit of labour and could never have existed if labour had not first existed. Labour is the superior of capital and deserves much the higher consideration".

- Abraham Lincoln

Introduction

This study investigates the way economies can overcome developmental bottlenecks by relying on productive use of labour, its accumulated education, embodied and disembodied knowledge and innovative skills. At the intersection of Foreign Direct Investments (FDI) and the labour market, it is empirically analysed how Multinational Enterprises (MNEs) can influence and be influenced by labour skills and labour mobility and how economic policy can shape this relationship. This is the common ground for three chapters of the thesis.

The labour market can be characterised along several dimensions. Among these are the level of education, the cost of labour, the type of regulation and the working conditions, the characteristics of workers. The activities of MNEs and FDI are strongly intertwined with such characteristics of the labour market. On the one hand, MNEs are attracted to countries with certain labour-market characteristics. On the other hand, they contribute to shaping them.

There are several studies on labour market regulation as factors that encourage or discourage FDI (Radulescu and Robson, 2013; Aggarwal, 2005; Pandya, 2010). The cost of labour has also attracted extensive research, showing that cheap labour attracts FDI, especially in developing countries (Khachoo and Khan, 2012; Janicki and Wunnava, 2004). However, studies have also noted that cheap labour can discourage companies from investing in certain countries if this is associated with poor skills. This argument has led to some research on the role of human capital as a factor in FDI attraction (Narula, 1996; Deyo, 1987).

However, the evidence of this is rather mixed. In this study, it will be argued that part of the reason for this result is that previous studies have focused on quantitative measures of education, such as average years of schooling, disregarding the qualitative aspects of education.

Recognising this also leads to appreciating that the different aspects of human capital differently associate with different types of inward FDI. The thesis will address this gap, conceptualising and empirically testing the relationship between different qualities of human capital accumulation and different qualities of inward foreign direct investment.

Regarding the effect that FDI may have on the labour market, research has focused extensively on the effect of FDI on wages and cost of labour (Driffield and Taylor, 2000). Inward FDI have a direct effect on average wages of foreign-owned companies, but also an indirect effect on average wages in domestic companies in the same geographic region and sector (Girma et al., 2019). Wage spillovers can be explained by two main reasons. On the one hand, MNEs transfer technology to local firms, thus influencing the productivity increase of local firms. On the other hand, if foreign

companies are competing with domestic ones, they may take over the market share of domestic companies which leads to lower output and lower wages.

This study will focus on the direct effects of MNEs on wages. Substantial research was undertaken in this field and findings have mainly confirmed that that foreign-owned firms pay higher wages than local firms (Girma and Gorg, 2007; Heyman et al., 2007; Hijzen et al., 2013). However, there is a discussion about whether higher wages are the results of company ownership or worker heterogeneity. This thesis contributes to this debate by providing novel employer-employee data from Serbia.

Lastly, when looking at the effect of FDI on host economy, the literature extensively analysed the outcomes in productivity growth, output and exports (Caves, 1974; Balasubramanyam et al., 1996; Melitz,2003) but surprisingly overlooked the key dimension of the labour market such as the overall level of employment. This gap will be addressed by investigating the effect of inward FDI on employment in Serbian municipalities, with a focus on the effectiveness of subsidies to attract FDI.

This thesis is organised around three chapters which are linked by a focus on the interplay between FDI and the labour market, in terms of the role of labour skills in FDI attraction, mobility in the labour market and effect of subsidies on overall employment. Around these three dimensions are the three chapters of the thesis.

Chapter one investigates the role of the quantity of education, measured by average years of schooling, versus the quality of education, measured by international standardised test on student cognitive abilities, on FDI volume and on FDI composition, based on the notion that a country's human capital (HC) is largely the result of the quality of education.

HC matters for MNEs when their activities are non-routine. The extent to which jobs are routinized explains the quality of employment and therefore the quality of investments. Thus, the host country's HC is assumed to be more relevant for FDI that create non-routine jobs or more technologically and knowledge-intensive jobs.

The results from the first chapter support the idea that the quantity of education is important to attract FDI in both developed and developing countries. However, the quality of education and higher cognitive abilities of students are associated with higher FDI only in developed countries.

This is in line with the idea that developed countries attract a higher share of FDI in more technologically advanced industries, which require non-routine activities. Indeed, when explaining the share of FDI in high-tech industries, the magnitude of the effect of quality of education is very large, twice as large as the effect of the quantity of education. The question is whether the countries that develop high-quality HC, i.e. technologically literate individuals, with high cognitive skills, will be able to attract FDI in knowledge-intensive industries.

The literature on FDI and HC suggests that countries that have attained a minimum level of (or a threshold) of HC will extract more benefits from FDI but whether it will serve as a determinant to attract more high-quality FDI remains, to a large extent,

unanswered. These questions are not only interesting for individual countries but carry global implications for economic policy and MNE strategy.

Most of the studies in the field of HC and FDI, for example Deyo (1987) or Narula, (1996) rely on quantitative measures of HC which presumes that one year of schooling in country A tells as much about labour skills as one year of schooling in country B, which disregards differences in quality of education in different countries. The same logic is used in studies about HC and economic growth (Barro, 1991; Bils and Klenow, 2000; Pritchett, 1996). However, more recent literature in the field of education economics (Hanushek and Kimko, 2000) has widely accepted the role of cognitive abilities as opposed to years of schooling when measuring human capital. The thesis introduces this approach in the analysis of the determinants of FDI.

Another problematic approach in the literature is observing FDI as homogenous investments. The technological and knowledge intensity of MNE operations matters for categorization between low and high-quality FDI, as more developed HC is more likely to matter for more technologically intensive MNEs (Pradhan, 2006).

In chapter two and three the perspective changes to analysing the effects of FDI on the labour market. **Chapter two** addresses the long-standing issues in the literature on the effects of FDI on host countries, such as the effect on wages. There is a large empirical literature on foreign wage premia, suggesting MNEs tend to offer higher wages to workers than domestic companies, particularly in developing countries. Therefore, it may be assumed that there is a financial benefit for workers that change from domestic to foreign employer. The investigation of differences in wages paid by foreign and domestic companies, known as "foreign wage premium", is a longstanding area of research.

By using employer-employee data for Serbia, chapter two reveals that workers hired by foreign MNEs experience a better dynamic in salary than those employed in (or moving to) domestic companies. This differential is stronger for better-educated workers. This result supports the idea that MNEs can have a positive direct effect on wages in the host economies and the workers which are better able to exploit the opportunities offered by incoming MNEs are the more skilled ones. However, those results also raise the question of the possible crowding out of domestic firms and possible implications in terms of inequality.

This phenomenon is observed due to MNEs possessing more advanced technologies, or "ownership advantage" as known in international business literature, than domestic companies. Driffield (1996) found that in a developed country, like the UK, the average wage paid by industry was 7% lower than what foreign-owned companies paid, due to differences in productivity. It is, therefore, assumed that foreign-owned companies have different factor demands for labour in comparison to domestically owned companies (Driffield, 1996). However, as we will see, a higher average wage does not necessarily mean the employment of higher quality human capital.

Inward FDI influence the labour market, it allows labour mobility between foreign and domestic companies making it possible for workers to carry knowledge and practices from MNEs to domestic firms. At the same time, higher wages offered by MNEs may disrupt the functioning of domestic companies as the best workers will change jobs to

earn more. According to Arnal and Hijzen (2008), some studies based on worker-level data provide inconclusive results about the impact of FDI on wages. Even though many studies show that foreign ownership positively influences wages in host countries, some studies find insignificant negative effects.

Therefore, it is not clear what drives these differences in estimated foreign wage premium across studies. They may reflect differences in workers' capabilities, ownership of MNE or quality of FDI. Various studies have been finding that MNEs pay higher wages than domestic companies (for example Aitken et al, 1996; Lipsey and Sjoholm, 2004). However, whether there is true company ownership effect or is it more that foreign wage premium is a result of the different composition of workers is a matter of discussion. Whether workers who move from domestic to foreign-owned companies experience an increase in wages and whether that change in wages is moderated by worker education is a matter of investigation in chapter two.

In chapter three, it is analysed how FDI affect overall employment, in particular, analysis is about the effect of subsidised FDI on the labour market and the level of employment. As noted above, this area of research is part of the broader investigation of the effects of FDI on host countries and into the effectiveness of subsidies. Surprisingly, the literature on the effects of FDI has rarely looked at the overall employment effects despite the clear relevance of this aspect for policy. Like in chapter two, the context of the analysis is Serbia, which for this issue in point is quite an interesting case.

Indeed, attracting FDI has been a key item of industrial policy in Serbia, where FDI have increased dramatically over the last two decades. However, the potential effectiveness of the FDI policy in Serbia has generally not been evidence-based. The main belief was that the provision of subsidies for FDI will solve structural economic issues. With subsidy-driven FDI policy, it is clear that investment incentives aim to deter firms from investing in more natural locations and encourage them to invest in less developed regions. Governments around the world offered various incentive packages, like fiscal subsidies, to attract more FDI, believing that it is the best way to increase employment.

The literature has not devoted attention to this topic, even though, according to Incentives Monitor (2018), since 2010, $1.5 trillion worth of FDI projects have been supported by governments that have provided over $200 billion in subsidies to establish or expand operations, creating 7 million jobs. Most governments aimed to achieve greater investments and job creation. Most of the literature in the field focused on investigating the relationship between FDI and GDP growth and addressing subsidies only indirectly or at the aggregate level. Furthermore, Narula and Pineli (2018) mention that the literature has investigated FDI and economic development by looking at the aggregate income and not so much at employment. Fighting mass unemployment, especially in rural areas has been stressed as the main reason for subsidy provision.

Chapter three investigates whether workers really benefit from subsidised FDI, and to what extent it makes sense for governments to pay MNEs to employ workers and how sustainable is this approach. With the use of municipality level data about employment and subsidies for FDI in Serbia over the period 2006 to 2017, it is found that subsidised

FDI had some positive employment effects but only on subsidised jobs. Any multiplier effects have not been identified.

The major commonality of chapter two and three is that they are focused on the economy of the Republic of Serbia. The data from Serbia has been investigated for the first time in FDI-labour market and FDI-subsidies context. This is an important case because FDI policies in Serbia lack empirical justification and, like many others, are based on unjustified expectations that providing monetary incentives for FDI is going to make up for the lack of other relevant factors like human capital. Although policy recommendations from those two chapters will inform policymakers in Serbia, they will have wider applicability. First of all, Serbia is a showcase for other transition countries in the region (namely Albania, Bosnia and Herzegovina, Croatia, Montenegro, FYR Macedonia). Second of all, the wider Eastern European region shares FDI policies adopted by Serbia. Countries like Bulgaria, Romania, Ukraine have also aimed to achieve economic development by attracting FDI with subsidies and performed poorly in doing so (EBRD, 2012).

Serbia is a legal successor of former Yugoslavia, which has been formed by Serbia, Croatia, Bosnia and Herzegovina, FYR Macedonia, Montenegro and Slovenia after they liberated from Nazi occupation in 1945. What united them was not only one language - Serbian, one ethnic origin and culture, it was also a socialist economic order. Yugoslavia was firmly ruled by the authoritarian regime for several decades and built a strong industry that made it one of the most advanced European economies in the 1970s (Comisso, 1980).

Yet, it became too influential in the world, with its non-aligned movement. The Western powers required it to be aligned with the West and started to undermine its unity by financing nationalistic movements (Kovic, 2011). Eventually, national tensions escalated into a war in the early 1990s. The outcome is that six former Yugoslavian countries are now aligned with the West but are not economically powerful at all. The transition from socialist economic order to the market-driven economy has been turbulent and FDI were sought as a *panacea* for economic underdevelopment. However, with the absence of strong institutions and the presence of widespread corruption FDI policies have not led to an expected positive outcome.

Nonetheless, there was a great supply of educated and, for the needs of the socialist economy, skilled workers. The education system of the socialist economy was producing a lot of graduates from technical universities such as engineering but also physics, economics, etc. The performance of workers with such background was at a high level, even when compared to the West. As documented by Milanovic (1999) Serbian engineers were among the first to develop domestic nuclear energy, modern military arsenal, domestic aircraft and plane carrying ships. In the early 1980s, the workers from China were sent Belgrade to learn how to develop mining technologies, and were fascinated with the success of Serbian coal-producing corporation "RTB Bor". The same company was acquired by Chinese "Zijin Mining Corporation" in 2018. It was drowning in debts and working with that same technology that was developed half a century ago.

This is to suggest that there was a strong foundation, in terms of high-quality human capital, inherited from the socialist era. The education was also entirely free.

Standardised education performance indicators suggest that educational achievements were substantial when compared to more advanced European countries. However, with the transition to a liberal market economy, the gap between the type of education produced and the needs of the modern economy was widening. Even highly skilled workers who matched the needs of a modern economy could not be used efficiently by companies what were trapped in the old ways of doing business. The low quality of foreign investments pushed the returns to education even lower and further depressed any incentive to acquire and productively use the education (Milanovic, 1999).

With the shift from socialist economic order to the liberal market economy, the structure of the economy has slowly changed over the previous decade. The major contribution to the creation of value-added (of 60%) is from services, mainly real estate and trade. The secondary industry contributes to one-fourth while the primary industry accounts for one-tenth of value-added (EBRD, 2017). With such characteristics of the economy, policymakers saw FDI attraction as an opportunity to enhance manufacturing but domestic value-added in the secondary industry is low. A unique characteristic of a transition economy is also a big role of state-owned enterprises.

According to EBRD (2017), in 2016 Serbia stood out in the Central Eastern European region with one of the highest shares of SOE assets in GDP at around 70%, just behind Croatia whose SOEs assets accounted for 80% in GDP. Even though about 50% of the assets are concentrated in the energy sector, SOEs are also present in mining, transport (road, railway and air transport companies), manufacturing (e.g., chemicals, pharmaceuticals, furniture), communications and agriculture (EBRD, 2017).

If we analyse the Serbian economy in the period after the 2000s we will notice that it is characterised by excessive privatisation of state-owned enterprises, including those that have been making losses but also those that have been highly profitable or even natural monopolies. This is one of the specific features of FDI in Serbia and region. The privatisation process attracted the first wave of FDI inflows. FDI inflows in Serbia grow from $52 million in 2000 to over $4 billion in 2018, inward FDI stock grow from 13% of GDP in 2000 to 79% of GDP in 2018.

In transition countries, former state-owned technological giants were sold at under market prices to privileged individuals, who quickly got rid of workers. The supply in the labour market was overwhelmingly higher than demand which meant low labour cost. This is what attracted MNEs to keep establishing low-value adding activities. At the same time, this led over 220.000 people immigrating from the Balkan region, annually (Eurostat 2019). Consequently, there are obstacles of MNEs to upgrade their activities even if they want to do so, as there is no longer an adequate supply of skilled workers. Upgrading MNE activities is important as knowledge and technological intensity of operations matters for the raise of host-country demand for skills.

It may be argued that attracting FDI has been the main industrial policy of Serbia since the 2000s. However, such policies have been designed to address the symptoms of regional underdevelopment, such as high unemployment, instead of true causes, such as technological backwardness. An important question, therefore, is the extent to which FDI, attracted by unsustainable and "negative" location advantages such as low labour cost or subsidies, can contribute to industrial development as well as simply generating employment.

The specific feature of capital flow and the labour market in Serbia and more generally in Balkan peninsula is low capital accumulation capability and high structural unemployment. According to Madzar (2017), the intensity of capital accumulation in a domestic economy is best observed when from the share of investments in GDP we deduct the foreign trade deficit. For the period from 2001 to 2013, this measure was negative in nine out of eleven years. On top of this, capital markets are extremely shallow and underdeveloped while interest rates at the money market are substantially above the European average (EBRD, 2017). In such circumstances attracting FDI seems to be of existential importance for the economy.

At the same time, the labour market is characterised by three major factors: Firstly, low labour productivity. At about EUR 10.000 value-added per employee, Serbia is below Central and Eastern Europe average of about EUR 25.000 or EU average of about EUR 55.000. However, there are industries in which Serbian productivity is above the EU average, like Information-Communication Technologies and construction, mainly due to lower labour cost. Secondly, the biggest share of unemployed, about 40%, are individuals with the highest level of education. This implies the low level of jobs quality. Thirdly, high immigration is creating gaps in the labour market, which makes it harder for employers to find workers.

In such circumstances, labour productivity is very much dependent on FDI. This is also highlighted in EBRD (2017) report on Serbia, where private sector development and productivity growth are identified as the key obstacles for economic development. However, more systematic measures are necessary for the development of the domestic private sector, that could cooperate with foreign MNEs.

The continuous improvement of corporate governance and managerial knowledge and fight against nepotism/corruption in the public sector are factors necessary for greater FDI quality and quantity, specific to countries the Balkan peninsula. Since those measures require strong political will and give results only in the long run, the easiest way to attract FDI is through subsidies. Serbia and other transition countries used this approach, hoping to reduce unemployment.

However, the reduction of unemployment was based on the greater demand for unskilled workers, which is a result of MNE tendency to outsource labour-intensive activities from developed countries and focus on high-value adding in home countries. This is the way developed countries keep domination in a Global Value Chain[1] - by pioneering in technological innovation.

Since the beginning of FDI liberalisation in transition countries, business and policy experts and the academic community warned policymakers that uncontrolled globalisation and attraction of FDI, radical change of international trade rules, is threatening to change the labour market dramatically. The thesis is analysing how FDI influenced this change.

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[1] Participation in GVCs takes two main forms: 1) Backward participation: importing foreign inputs for exports, 2) forward participation: producing inputs used in third countries' exports (OECD, 2017:41).

The one common denominator which three chapters share is labour in the process of FDI attraction. The empirical investigation of those phenomena is based both on unique data sets that have never been used before and also on publicly available data that is being observed from a new point of view. While there are similarities between chapters, each of them is focused on a different level of analysis. chapter one emphasises the cross-country difference in human capital and distribution of FDI, chapter three moves to municipality level and chapter two focuses on the worker level.

CHAPTER I: Human capital and the quality of inward foreign direct investments

Abstract

The purpose of this study is to analyse to what extent the difference between quantity and quality of Human Capital (HC) is relevant for the quantity and quality of inward Foreign Direct Investments (FDI). Most developing economies keep attracting multinational enterprises (MNEs) with short-term goals in labour-intensive industries, with little or no embodiment in the local environment. As such, low-value adding investments erode national HC base, leading to the vicious cycle of low-quality investments. The legitimate question is whether countries are unable to attract high-quality investment due to the low-quality of HC? This study, which combines traditional and more advanced proxies of HC, considers a sample of 54 developed and developing countries. It is found that the role of HC quality in FDI attraction is industry-specific and that it varies depending on the country's level of development. The quality of HC seems to matter relatively more for high-quality FDI than for overall FDI.

Keywords: Quality of FDI; Human capital; Determinants of FDI; FDI impact on the host country; Developing country location advantages.

1.1 Introduction

This chapter investigates the importance of human capital for the attraction of inward FDI. In particular, it explores how differences in the quality of human capital relate to the quality of FDI. Throughout the chapter high-quality of human capital refers to the high quality of education, since human capital is a result of cognitive skills acquired through schooling and the education system of the country, which has both a quantitative component (empirically measured by the average years of schooling of the workforce in the country) and a qualitative component which refers to the cognitive abilities of workforce (measured by the scores that country achieves in international standardised tests such as Programme for International Student Assessment, PISA) (Harmon and Walker, 2000).

These two components have been extensively used to explain the country's economic growth but rarely to explain the country's inward FDI. Indeed, the literature on human capital and FDI did not reach a consensus. Some studies argue that HC does not have an independent role in attracting FDI, while others stress that they do matter for developed countries because in those countries MNEs operate in more technologically-advanced industries, which requires more educated workers (Blomstrom and Kokko, 2003).

The thesis builds on those arguments to propose a framework in which differences in countries' education system relate to differences in FDI. It is argued that high-quality FDI, such as those in technologically advanced industries require better cognitive

abilities to master the more frequent non-routine activities. Hence, countries, where FDI are predominantly of the high-quality type (such as most developed countries), will benefit more from the education system that produces more high-quality human capital – workers with better cognitive abilities.

According to OECD (2017), those are workers with high cognitive ability and complementary organizational and communication skills that are able to complete long and complex sequences of tasks and adapt quickly to the technologically changing environment. On the other hand, workers with low cognitive ability are employed in jobs with high routine intensity. This is the main difference between high and low-quality HC.

Those conjectures are tested with the use of data from 56 countries worldwide for the period from 2000 to 2015. The results suggest that education quality, is a significant determinant of FDI in developed countries while the quantity of education is relevant in both, developed and developing countries.

The cognitive ability of HC is crucial for the greater attraction of high-quality FDI. Workers with better cognitive ability, on average, have less routinized jobs and are less exposed to the risk of job displacement. Additionally, continuous skill development, through on-the-job training is as important as formal education. Countries that manage to establish a symbiosis between educational institutions, companies and the domestic private sector, support the development of a high-quality HC. However, the benefits of quality HC for the economy will appear only if HC is used productively.

The rest of the chapter is organised as follows: Section 1.2 discusses the theory of multinational enterprise and the theory of human capital and provides a review of the empirical literature focused on FDI and HC. Section 1.3 discusses the methodology and data. Section 1.4 provides econometric analysis and results. Finally, section 1.5 and 1.6 provide results, concluding remarks and some policy recommendations.

1.2 Literature review

The literature review section is structured around four pillars of the chapter. Firstly, the foundation of the research question is the theory of multinational enterprise. Secondly, the theory of human capital is discussed. The third pillar deals with the different dimensions and measurement of human capital. In the fourth pillar, the quality of foreign direct investments and the quality of human capital is discussed, including the meaning of those terms and different ways in which human capital and FDI interact.

1.2.1 The theory of the multinational enterprise

While it is not the purpose of this thesis to extensively elaborate on the theoretical explanations of MNEs, it is necessary to explain the central role of MNEs as major carriers of FDI. We define a Multinational Enterprise (MNE) as "a firm which owns or controls value-adding activities in two or more countries" (Pearce, 2000:1). The major form of investment by MNE is a Foreign Direct Investments, which is defined as an investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose is to have an effective voice in the management of the company. This is the major distinction from portfolio

investment. With FDI, the aim is to control operation in a foreign country and thus be able to influence the way it contributes the MNE-group profits. In portfolio investments, a shareholder does not aim to alter how the firm is managed, but merely to share the existing profits.

The first attempt to explain FDI was by a macro-level theory which is the extension of the Heckscher-Ohlin model which is used to explain international trade. The Heckscher-Ohlin model suggested that countries specialise in the production and export of goods that they can produce relatively more efficiently, using production factors that are relatively more abundant. Since the cost of goods depends on the factors of production, countries with cheap labour are more efficient in producing labour-intensive goods. On the other hand, countries import goods that use more intensively the relatively scares factor. The model was limited to explaining trade when commodities and goods are imbalanced, assuming that capital can not move across borders. (Leamer, 1995). The different endowments in factors of production reflect into different relative prices. According to the HO model and the Stolper-Samelson theorem, trade in goods continues to equalise factor prices across countries. Another way to equalise prices is the movement of factors not only the movement of goods.

The macro-level theory of FDI, can be thought as an extension of the HO model where the assumption of immobility of capital across countries is removed. This implies that capital would move from capital-abundant countries toward countries where capital is scarce (hence with higher remuneration). However, this theory has important limitations. Firstly, a particular country is assumed to either import or export capital, while in fact most developed countries did both, received inward FDI and involved in outward FDI. Secondly, the theory indicated the one-way flow of FDI, from developed countries, where capital is abundant, to developing countries, where capital is scarce. In fact, the first, post-war, FDI pattern shows flows from developed to other developed countries. Thirdly, industry-level factors seem to encourage FDI in some industries and discourage in others. If it was only national capital availability that influence FDI, any industry or any firm could do it. Finally, FDI were supposed to move the capital from places where it is abandoned to places where it is scarce, while in fact many firms did not involve in the capital transfer but raised funds at the capital market in the host country (Pearce, 2000), (Dunning and Rugman, 1985).

Hymer's theory of the MNE shows criticism of the macro-level theory of FDI and provides two pillars for the explanation of MNEs. It is specifically referred to the theory of MNEs and not the macro-level theory of FDI. Firstly, firms become MNEs because they possess a very strong source of competitive advantage. The international expansion comes about as a way of optimising the competitive use of such firm-level attributes. This leads to the ownership advantage of Dunning's (1981) eclectic framework. Secondly, the competitive structures of some industries would provoke more firms to internationalise more extensively than in other industries. A broad generalisation was that concentrated industries would be most likely to be populated by MNEs.

The presence of the MNE is itself a manifestation of market failure. MNEs usually operate in "concentrated" industries, where a small number of large companies dominate the market and beat small local competitors due to superior technology or dumping pricing (Pearce, 2001). "Large oligopolistic firms can operate over national

boundaries precisely because they are 'imperfect', with firm-specific ownership advantages over other firms, scale and scope economies and internalised markets for technology and skills. All these violate the requirements of perfect competition. It is not clear, therefore, that the interaction between the efficient internalised markets of MNEs with the deficient ones of host developing countries will lead *automatically* to mutual benefit" (Lall, 2000:6).

An extension to Hymer's theory of MNE is provided by Dunning (1981) who explained why FDI go to particular countries, the focus is on the location of FDI. He introduced the concept of ownership(or firm-specific) – internalisation - location advantages, so-called "OLI framework" to explain the motives for MNE activity. This concept underpins an integrated approach to analysing MNEs. Ownership advantages provide firms with the ability to compete internationally. Those are things like advanced technology, specific managerial knowledge and skills.

The "L" part of the OLI framework is central for this study. Location advantages explain benefits can be derived from the use of ownership advantages in specific locations outside of the home country of the MNE. Those are special characteristics of host countries, like labour price, infrastructure, proximity to other markets. The availability of developed human capital is one of those location-bound characteristics which determine FDI. The quality of education in the host country, for example, portrays the potential innovative capabilities of the local labour force. Finally, internalisation advantages explain why ownership advantages that are used in foreign locations are used internally by the firm itself (thus becoming MNE) rather than being licenced to a local enterprise.

According to Rugman and Verbeke (2008:6), the motives for FDI lies in the "MNE ability to organise activities internally such that it is able to develop and exploit firm-specific advantages (FSAs) in knowledge and other types of intermediate products. The proprietary ownership of such FSAs serves to overcome the externality of knowledge being a public good". At the same time, Dunning (1981) explains that different motives for MNE investment generate different outcomes for the host economy. The investment motives (resource, market, efficiency and strategic asset seeking) reveal the difference in FDI "quality".

The division of investment motives, following Dunning (1998), to resource-seeking, efficiency-seeking, market-seeking and asset-seeking provides a framework for understanding the determinants of FDI. The strategic development of MNEs was resource-based. However, in the early 19th century, the forerunners of MNEs were trading companies. The agriculture and mineral raw materials were sourced by Western occupiers from their colonies, back to home countries. For example, the British occupation of India and the establishment of "British East India Company" served as a secure source of raw materials to support fast industrialisation of the UK.

In the early 20th century, the Second Industrial Revolution in the UK brought technological advances, fuel-powered machines, assembly lines, which led to a substantial rise in the optimal scale of production. Additionally, the central feature of the period between 1914 and 1939 was economic depression and high trade barriers. Therefore, firms needed to look for larger markets, but could not supply them efficiently by exports. Market-seeking FDI were also enabled with the increased homogenisation

of demand and improvements in transportation and communication infrastructure. The emergence of MNEs in Europe reflected those developments. The developments during and after World War II fueled the US military industry and rebuilding of Europe after 1945 resumed steady economic growth. The expansion of Europe and the US in this period was a remarkable opportunity for MNE development (Pearce, 2001).

According to Dunning (1998), the observation of international capital flows shows the changing geography of FDI after the 1970s. The gradual lowering of trade barriers allowed MNEs to create integrated international supply networks. Individual subsidiaries could produce (or assemble) final products or components while importing intermediate goods from other countries, in which they are produced at a lower cost due to host country's location characteristics such as low cost of labour, energy, etc.

Those subsidiaries are vertically integrated and flexible in terms of reallocating to other locations, as local embeddedness is low, the linkages with local suppliers or research institutions are low or completely absent. According to Dunning (1998), those are efficiency-seeking FDI, implementing cost-cutting strategy and looking for semi-skilled labour and relatively good infrastructure. Therefore, it hypothesised that this type of investments mainly targets developing countries.

Since many countries invested in generating strong scientific capabilities, MNEs realised that to maximise their ability to develop innovative products they need to learn from those countries and internationalise their R&D activities. The new pattern of FDI flows, in the late 20th century, shows that MNEs increasingly began to exploit knowledge-intensive industries of host countries (Pearce, 2001). The expansion of R&D is sort of the MNE activity characterized as high-quality FDI, that mostly targeted developed countries and also came from other developed (notably triad[2]) countries. This is the type of investment characterized as asset acquiring FDI, which takes place in countries that offer high-quality location bound assets, complementary to MNEs ownership advantages. Among the key high-quality location bound assets is HC or "human-based infrastructure", which is valued by MNEs undertaking activities with high technological and knowledge intensity (Dunning, 1998).

Dunning (2003) suggests that low-quality investments rely on the use of low-cost labour or natural resource exploitation, while high-quality investments co-exist with local business and non-business institutions, establishing ties with domestic firms and research institutes. However, some of the main drivers behind the changing geography of FDI is related to the technological revolution, trade liberalization and new economic realities in the 1990s.

Within those circumstances, MNEs increasingly relied on high-quality HC in order to create sustainable ownership advantages. Investors in developing countries are largely interested in cheap labour, natural resources and market size, while in developed countries they are more interested in HC and innovative local environment (Dunning, 2003). However, it is interesting to question whether high-quality FDI will flow into developing countries should they achieve the level of HC of developed countries.

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[2] North America, EU, Japan

The impact of changes in global economic trends, such as trade barriers, automatization of manufacturing and etc., on the nature of MNE operations, is expected to be different depending on their ownership advantages and expansion strategy. The industrial composition of FDI will also be in line with those factors.

1.2.2 Theory of Human Capital

The concept of capital has important antecedents in the work of Adam Smith and Karl Marx. Marx (1981:953) suggested that " capital is not a thing, it is a definite relation of production pertaining to a particular historical social formation, which simply takes the form of a thing and gives this thing a specific social character. Capital is not the sum of the material and produced means of production. Capital … is the means of production monopolised by a particular section of society, the products and conditions of activity of labour-power". The capital can be understood as a combination of material and immaterial assets.

The term "capital" has been used primarily in the business context to describe money while in the late nineteenth century economists and sociologists gave broader meaning to "capital". Adam Smith treated people as capital and suggested that capital applied to labour as well as material things, so its link with production became less obvious (Hodgson, 2014). Consequently "human capital" emerged as a term that describes the value of knowledge as an input in production. According to Hodgson (2014), the first usage of the term 'human capital' was made in a journal of economics in an article by Irving Fisher (1897), who proposed that all factors of production, including machines, land and labour, should be described as capital. Becker et al. (1966) defined human capital as the accumulated stock of education, knowledge and skills. The extension of this view of HC and a more comprehensive definition was provided by Ehrlich & Murphy (2007:2), where HC is defined:

"*An intangible asset, best thought of as a stock of embodied and disembodied knowledge, comprising education, information, health, entrepreneurship, and productive and innovative skills, that is formed through investments in schooling, job training, and health as well as through research and development projects and informal knowledge transfers*"

According to this definition, we can see that HC was seen as one of the production factors. investments in HC appear in several modalities, which include investments in education or school, health and specific skills or on the job training, which enhances its magnitude. The goal of human capital theorists was to estimate labour value so that it can be quantified and put in the production function, to 'explain' the magnitude of output, the contribution of education, the demand for education.

According to Hodgson (2014), the historical meaning of the term "capital" has been evolving and many economists and philosophers opposed an idea that humans can be treated as capital. The main reason is that "'human capital' of a waged worker is of a very different nature from the 'capital' owned by a capitalist. Both are assets but – as long as slavery is prohibited – only one can act as collateral… machines can serve as collateral on a loan, but the labour-power of a wage-worker cannot. When the worker defaults on loan repayments, it cannot sell the 'wealth' constituted by her future earnings, unless she sells herself into slavery" (Hodgson, 2014:12). It was suggested

that a free man can not be sold at the market and therefore, it cannot be called capital. However, economic science never accepted the "collaterability" of capital and adopted the term "human capital" due to its value and contribution to the production process. In economics, there have long been broadly two approaches to the valuation of human beings. One is to estimate the cost of producing an individual in terms of care, nutrition and so on. The other is to evaluate an individual in terms of all expected future earning

For an HC theory to emerge, with strong conceptual principles, it was not before 1962 and Gary Becker's "Theoretical analysis of investments in human capital". The main assumption in this analysis is that individuals improve their living standards over time as they increase their competencies and educational attainments. To support this premise, Becker et al. (1966) developed a model of wealth maximisation. It explains returns on investments in human capital. However, according to Marginson (2019:1), "human capital theory imposes a single linear pathway on the complex passage between heterogeneous education and work. It cannot explain how education augments productivity, or why salaries have become more unequal, or the role of status".

The theory provided grounds for expansion of higher education and, while it does not consider capacities that, for example, parents pass to their children, it argues that in the first instance higher education can be primarily understood as preparation for work and career. The education itself, not family income or cultural attributes or social networks, is the starting point for an explanation of career outcomes and earnings (Marginson, 2019).

The study of investments in HC is an investigation about future financial benefits arising from increased competencies. The evolution of the literature on HC came about just at the time when a tertiary sector of the developed economies started to generate more output than the traditional manufacturing sector, which had dominated world economy since the industrial revolution and adoption of steam power.

According to Becker et al. (1966), on average, better-educated labour will be earning more than labour with lower educational attainments. "The studies have shown that high school and college education greatly raise a person's income… and that earning of more educated people are almost always well above the average" Becker (1994:4). This is also confirmed by OECD (2017), in a report finding that more skilled workers enjoy better job security and higher earnings. Becker et al. (1966) point to the role of education in employability. It is considered that the fast development of the tertiary industry in the US and the UK required creativity and skills, which significantly changed the view of labour as just another factor of production. The main proposition was that labour cannot be viewed only in terms the number of individuals available for work or hours worked. The new focus is on knowledge and skills acquired within work that constitutes the core of HC.

This is the main difference between more conventional studies about HC and the contemporary view of HC theory. Marshall (1925) who disregarded the role of experience and skills and argued that labour shouldn't be considered as a form of capital followed "pre-Smith" view of capital, while the more contemporary view suggests that knowledge and skills are the results of investments and that accounting for economic relevance of labour cannot be based on counting those who are available for work. As a result, studies focused on analysing the role of knowledge and skills in personal

earnings, concluding that, on average, unemployment is lower among those with higher education. Also, other non-monetary benefits of investments in HC development have been considered, showing that better educated, on average, live longer and healthier lives and have a higher social responsibility.

There have been numerous studies in the field of investments in HC and future earnings that have taken different directions after Becker (1962) postulated basic principles in the field. Schultz (1974) elaborated on the role of family and individual's background as the determinant of HC. Schultz (1974) distinguishes between labour, that refers to the overall population available for work and HC that refers to the labour based on skill quality. According to Schultz (1974), HC comprises a set of skills, education and experience that we refer to as capital and that are valuable for employers. Therefore, it is valuable for the economy while labour is a more general term that does not make a difference among higher and low-quality workers. Consequently, HC can be considered a further level of labour definition, even though some studies see these terms as synonyms.

As mentioned by Lucas (1988) there is a complementarity between human and physical capital. In this vein, HC allows progress towards the technological frontier, due to its role in the absorption of foreign technology and knowledge. The model that Solow (1956) proposed relies extensively on technological change for the explanation of economic growth and under the assumption that people and capital are immobile, it would mean that countries with the same technology and production preferences will have the same income.

The literature suggests that there are numerous factors influencing labour competencies, those can be direct, supported by employers or formal institutions, and indirect, social attitude towards education, which can be supportive or discouraging. Studies that have tackled this issue produced consistent findings of the impact of labour educational attainments on the country's location advantage. There is a consensus that more educated labour in the host country means more investments (Choi, 2015; Gittens, 2013; Hanushek and Woessmann, 2008; Kapstein, 2002). On the other hand, whether those investments will mean economic growth and development is another question, which is to be investigated further.

As mentioned before, there are theoretical arguments that, on average, more educated individuals will earn more than less educated individuals. Therefore, it makes sense to invest in HC. On top of this, investments in HC benefit not only individuals themselves but also the overall economic development, since HC is responsible for the adoption of new technologies and represents a key factor in national absorptive capacity. As suggested by Nelson and Phelps (1966), HC is not a simple input in the production process but a factor for technological diffusion within the economy.

1.2.3 Measuring Human Capital

The focus of this study is on the education component of HC, which has been measured mostly by "quantity of education" or the average years of schooling. However, some literature has questioned that approach. The quality of education has been recognised as a key element of attracting FDI. It has been suggested that it provides a clear indication of the skill differentials across countries that were absent from the prior

discussion of school attainment (Hanushek, 2013). It is also found that international tests' scores are correlated with country-level IQ data (Hafer, 2017).

The different use of the term " human capital" created confusion in scientific circles since there is less understanding of what empirical research is trying to measure when talking about human capital (Hodgson, 2014). Therefore, it is important to eliminate any doubt about how human capital is measured in this study. The focus is on the cognitive ability of pupils acquired by education and measured by international standardised tests.

Cognitive skills are not an entirely individual characteristic, their determinants are also social and genetical. Therefore, cognitive skills are also influenced by other factors not captured in this study. Other human capital proxies are based on skills and cognitive ability generated through education. This approach has been used in studies on the economics of education. Hunahsek and Woessmann (2009) suggest that measuring cognitive skills has two major advantages: (1) cognitive skills encompass variations in the knowledge that schools aim to generate through their programme and thus relate the outputs of schooling to labour market success; (2) by allowing for differences in performance among students with differing quality of schooling (but possibly the same quantity of schooling), they open the investigation of the importance of different policies designed to affect the quality aspects of schooling. The data used in this study capture the quality of education as well as the quantity of education, through international standardised tests. International test scores provide consistent measures of aggregate differences in cognitive skills across countries. As such, they do not attribute all differences in cognitive skills to the schools in different countries.

A common approach to HC measures in the current literature is based on the quantity of schooling as a direct measure of HC, without much discussion about the disadvantages of this benchmark. Most of the empirical research in labour economics has followed the approach of Becker (1962) and Mincer (1958), who set foundations for the research of labour skills. They have set a framework to measure the impact of investments in education on future earnings. However, the suggestion by Mincer (1958) that schooling affects general labour skills and therefore accounting for the years of schooling as a measure of human capital has its limitations.

The existing, more recent studies, for instance Barro (1991), Bils and Klenow (2000), or Pritchett (1996), have the same limitations, such as assumption that a year of schooling in country A tells as much about the quality of education as a year of schooling in country B, assuming certain homogeneity between countries. The use of school enrolment, average years of schooling or literacy rates do not allow general conclusions about the quality of HC or cross-country comparison of HC development.

Hunahsek and Woessmann (2009) try to tackle the qualitative aspect of education. The two international tests, Programme for International Students Assessment (PISA) and The International Mathematics and Science Study (TIMSS) are the most prominent and relevant measures of student abilities, by international standards. Although they try to measure the same thing, the two tests take different approaches. According to Smithers (2004) TIMSS, which was founded in 1995, aims to assess the level of adoption of math and science curricula and the extent to which schools are able to implement curricula. On the other hand, PISA, which was founded by OECD in 2000, aims to test the ability

of students to practically apply their knowledge. For instance, schools teach students how to read, but PISA is not testing whether students have mastered reading. It is interested in the other end of learning, whether what is read can lead to making certain conclusions about the text.

Cognitive skills are, at the same time, a reflection of numerical cognitive ability. This is a point that has been confirmed in psychological studies, that numerical capabilities mirror cognition (Geary, 1995). A historical overview of numerical cognition, apart from information processing and other cognitive functions, was provided by LeFevre (2016), who also argued that understanding of the numerical cognition function is not a new phenomenon, as it developed in the early 1950s. This is about the same time when international comparative studies educational attainment started to be developed (Smithers, 2004).

Hanushek's (2015) simple growth model shows that countries with an average of 4 years of schooling achieve about 2.9% GDP growth while countries with an average of 9 years of schooling achieve about 3% growth. The insignificant improvement of growth with a significant improvement of average years in schools is explained by the fact that schooling affects only a certain portion of skills. Therefore, the model, which considered expected results in international student tests, implies that countries with the lowest test scores of 350 points achieve about 0.5% GDP growth while those with maximum test achievement of 550 points achieve about 4.9% GDP growth.

However, there are certain limitations of the international tests measures. PISA tests don't give information whether students' performance in the test is because of the education system or in spite of it, as in many countries hiring private tutors is a regular practice for parents (Smithers, 2004). The opponents of PISA tests question its methodology. Smithers (2004), suggests that PISA does not take into account differences in school curricula around the world and therefore its generalised questions might favour certain education systems. It is further suggested that for this reason, differences in PISA results do not say much about the differences in the quality of the education system. However, this can also be seen as an advantage of this test, as it has a unified approach to everyone and therefore avoids bias.

Nonetheless, there are concerns in the literature about the measurement bias in PISA. According to Kreiner (2011), the comparison between countries on the basis of PISA is inadequate because the majority of countries fall in the middle of PISA tests score ranking, but, small differences in average scores can change the position in the overall ranking by 10 to 20 places. Students with potentially the same ability have a different probability of achieving approximately the same result, claims Kreiner (2011), if questions are not equally difficult in all countries.

Yet, the test is designed to assess the quality of the education system at the country level, not the individual student performance. It is also impossible to predict which aspect of PISA will improve the country's positioning and concentrate on training those particular assignments as questions are distributed randomly. Therefore, for the purpose of this study, PISA is considered to be a good proxy for the quality of education, it aims to measure the ability of students to the functional application of knowledge. The problem-solving skills, which are tested by PISA are more generic and more demanded in the era of fast technological change.

Hanushek's (2009) study suggests that cognitive skills, acquired through schooling, generate economic growth, but there are different measures of cognitive skills. As it was shown, there is no consensus on whether international tests of student achievement are perfect measures. However, a critique of PISA is pointing to its lack of adequacy for inter-country comparison, not to its inadequacy to proxy cognitive skills well. In fact, literature does not question the possibility of tasks, developed in PISA, to measure students' cognitive ability. The group of experts which develops items for PISA tests every couple of years is addressing numeracy, science and reading capacity correctly.

1.2.4 FDI quality and Human Capital

The literature on the role of human capital in FDI attraction has provided inconclusive results. At the early stages of the research in this area, some studies like Root and Ahmed (1979), Deyo, 1987 and Hanson (1996) find that quantitative HC proxies (literacy rates, school enrolment and etc.) were insignificant in explaining inward FDI, compared to other economic and political factors. However, their analysis was conducted with a sample of developing countries only. Miyamoto (2003) found that HC was not a significant determinant of inward FDI, in the presence of other factors, among studies using FDI data for the 1960s and 1970s, because other control variables may have captured the effect of improved socio-political stability due to improved HC

This was consistent with the trend of FDI flows until the 1970s, that were mainly market and efficiency-seeking (Dunning, 1998). According to Narula (1996), tertiary education does not influence the level of FDI inflows in many developing countries at the early stage of development. The role of education in FDI attraction may depend on the country's level of development because developed countries already have developed an institutional environment that attracts inward FDI, and educated labour becomes more useful as countries approach the technological frontier.

Narula and Marin (2003) argue that the type of activities undertaken by MNEs is pre-determined by the country's level of economic development co-determined by location factors such as human capital. They argue that depending on the country's level of development, HC will play a different role in attracting inward FDI.

The motives for FDI in developing countries are predominantly efficiency-seeking and market-seeking, in the least developed countries that are resource-seeking and in developed countries they are asset-seeking. Zhang and Markusen (1999) argue that that differences in technological-intensity of MNE operations arise as a result of cross-country differences in factor endowments including human capital. It is further argued that knowledge-intensive production is following the availability of rare resources such as skilled labour. In other words, more developed human capital would result in more high-quality FDI.

It is argued that the proxy for HC is positive but insignificant because investment motives of MNEs in developing countries are idiosyncratic or specifically efficiency-seeking. MNEs are often driven by low-cost labour, as nature of their (routine and assembly) operations is such that only unskilled labour is needed (Noorbaksh et al, 2001). Therefore the role of HC is deemed to become relevant as countries approach

the technological frontier. This is in line with Kosak (2012), who suggested that the economic activity of developing countries should be based on capabilities of, mainly, primary and secondary school graduates. Since there is no investor's demand for quality HC, it is assumed that quality HC would not attract any more inward FDI, as that is not what MNEs are looking for in developing countries (Gruber and Kosak, 2014).

At the same time, the education system should provide HC which is able not only to attract foreign technologies but also provide innovations of their own. Therefore, education systems should adjust to the level of a country's technological development at the early stages of development but should be more proactive and dictate the path of technological development at the later stages. What this means is that labour competencies should adjust to the type of FDI but only until the point of reaching a minimum threshold of knowledge, when HC should drive the type of FDI (Gittens et al., 2013). In other words, in the early stages of economic development labour will be employed by MNEs that have no asset-seeking motives, but with the investments in education, the quality of labour, its knowledge and skills will attract knowledge and technology-intensive FDI.

Considering country-specific i.e. location advantages, according to Dunning (1998) the relevance of HC for FDI changes may depend on whether countries are developed or developing, but also depending on the type of FDI that countries aim to attract.

The type of FDI is related to the concept of structural change, which means that MNEs can contribute to development if directed to industries with high potential for technological and knowledge spillovers that allow domestic companies to upgrade competitiveness. The literature on host country location advantages has mainly concentrated on exploring determinants of FDI as homogenous investments.

However, different MNEs enter same host countries with different motives, hence the technological and knowledge intensity of their investment will be different. For example, MNEs with asset-seeking motives, as postulated by Dunning (1981), will rely on local knowledge to advance their ownership advantages. The cooperation with local suppliers, an embodiment with local institutions, R&D or capital vs labour intensity, focus on exports vs local market demand, are among the things that differentiate FDI and should be considered in categorization between low and high-quality FDI (Pradhan, 2006). A similar logic is applied by Lavopa and Szirmai (2014) who look at the FDI composition based on their belongingness to modern (utilities, construction, transport, communication etc.) or traditional sector (agriculture, trade, restaurants, hotels, etc.)

The industrial composition of FDI reveals the quality of investment, to some extent, as some industries are naturally more knowledge-intensive than others. As the theory of MNEs, previously discussed, suggests that on average FDI are more likely to appear in technologically sophisticated industries, regardless of the country's level of development.

According to OECD (2017) high-quality FDI or technologically and knowledge-intensive FDI, come from industries like aerospace, alternative/renewable energy, biotechnology, consumer electronics, electronic components, engines and turbines, financial services, semiconductors, software & IT services, space & defence. According to Burgel and Murray (2000) technologically intensive industries are characterised by

rapid innovation and knowledge intensity, that requires continued effort in research and a solid technological base.

FDI in those industries can be considered high-quality FDI not only because they produce sophisticated goods and services but also because the main determinant for such investments and input in their production is developed human capital. Individuals with a high-quality education, "scientists and engineers involved in the conception or creation of new knowledge, products, processes, methods and systems in the management of the corresponding projects" (INE, 2012:9). According to Falk (2012), FDI in technologically advanced industries often have substantial R&D expenditures.

Moreover, Costinot et al., (2011) argue that those industrial sectors are naturally R&D and capital intensive, so it can be assumed that involvement of MNEs in those industries would also increase demand for skill-intensive jobs, Those sectors have high job complexity (or are hardly routinized). The measures of the quality of FDI will be based on the technological and knowledge intensity of operations of MNEs.

Steensma and Reiter (2010) argue that country's economic policy drives the differences in FDI sectoral distribution and that they are positively related to human capital when the regulatory framework discourages foreign investors from entering certain economic sectors that influence national security. It is suggested that FDI need to be directed into those industries that countries want to develop. Economic policy can tailor regulation in such a way that the right type of FDI is attracted, even though this might reduce the overall FDI inflows.

Understanding the quality of FDI is the focal point here because contrary to low-quality FDI, high-quality investments have valuable resources useful to the host country economy. As Buckley and Pearce (1979) explain, knowledge and R&D represent a natural monopoly. The value of knowledge and technology, which are the key part of ownership advantage, depends on MNE ability to keep it secretly or to internalise it. Consequently, knowledge-intensive MNEs are prone to internalise their R&D abilities and engage in internal exports, between the flagship firm and subsidiary.

The potential for the transfer of those valuable resources to the host economy is very limited, as MNEs try to keep their ownership advantages rare and hard to imitate. The availability of developed HC in the host country, i.e. with investments in own absorptive capacity development, it is expected that HC becomes more relevant for high-quality FDI (Bennett et al., 2001). It is, therefore, suggested that the role of state regulations is essential in the embodiment of high-quality investments.

However, some reports, like OECD (2017), show that low skilled labour participation is present even in high-tech manufacturing as this activity uses foreign-produced inputs to a large extent. Therefore, it should also be noted that the industrial classification of FDI does not provide the full picture of the quality of FDI. Many developing countries suddenly start to export technologically intensive products but do not upgrade local technological capabilities. The fascinating element of this process is the global scale and scope of production fragmentation. Advanced technologies allowed companies to disintegrate global value chains considerably. At the same time liberalisation of FDI and trade policies around the world allowed the scope of production networks to reached global dimensions Srholec (2007).

Since advanced technology requires complementary human skills to operate efficiently, it is often hypothesized that skilled labour availability is one of the factors that influence the location of FDI (Gao, 2002:2). Benhabib and Spiegel (1994) see the role of HC in economic development through the lenses of absorptive capacity, i.e. through the role of HC in absorbing foreign technologies. Nonetheless, countries do not make productive use of high-quality labour at all stages of development. For example, countries at the pre-caching up stage in the absorptive capacity concept[3] will have a little use of education system which provides a great number of engineers and scientists.

The ability of labour to absorb foreign technologies and knowledge is not only a matter of accumulated HC. As noted by Narula (2004), absorptive capacity has different elements. It is a function of the national R&D capacities and requires the whole set of supporting institutions. Those include formal institutions that protect intellectual/private property rights or universities which provide firms with educated labour. At the same time, informal institutions, which support the collaboration of private and public sector, must exist.

Therefore, it is hard to expect that HC *per se* will allow successful absorption of foreign knowledge and that it will respond to the variables of economic growth. In those arguments, the role of human capital is discussed as an element of national absorptive capacity, i.e. the ability of local labour to absorb potential knowledge and technology spillovers from MNEs. If we look at FDI policies as a process of attraction – embodiment – aftercare, the focus of the aforementioned analysis of HC is the "embodiment" aspect of FDI policy.

Even though some studies found a significant role of HC in FDI attraction, most of the critique, however, when it comes to the HC role in FDI was related to the possible omitted variable bias and methods used. Noorbakhsh et al. (2001) investigate the role of HC measured by secondary school enrolment rates and accumulated years of tertiary education, in explaining inward FDI. They conclude that HC is a key determinant of the amount of inward FDI received by a country. With the same HC proxies, Sauter and Walter (2008) also confirm the significant impact of HC (in the presence of other economic and political factors) on FDI inflows and portfolio investments. However, those studies usually do not take into account the qualitative aspect of HC and do not distinguish between the different technological intensity of FDI.

At the same time, Benhabib and Spiegel (1994) make an important contribution by finding that HC can indirectly impact economic growth to a large extent, through its role in the attraction of physical capital. In other words, HC can be considered as an important location advantage that could attract FDI. Some studies analysed the role of workers' higher education in MNEs' choice of the host country. For example, Choi (2015) analysed international tests scores in math and science as a measure of HC (in 32 different countries), finding that educational attainments play an independent role in attracting FDI. However, the focus was on the investments originating exclusively from the US.

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[3] See Narula (2004) for detailed explanation of the stages in absorptive capacity concept.

Hanushek and Kimko (2000) provided evidence that quantitative measures of HC, such as years of schooling, lose significance in explanation of economic growth when other explanatory factors are accounted for, while the effect of qualitative measures, such as cognitive skills remains unchanged in spite of other factors. However, the literature on FDI rarely disentangles the disparate role of HC quantity and quality in FDI attraction.

When it comes to the quantitative aspect of HC, first of all, more years of schooling increases worker's performance in routine intensive jobs (Mankiw et al., 1992), which is what matters for and attracts efficient-seeking FDI. Second of all, education is important to facilitate the absorption of foreign technologies (Nelson et al., 1996). The increase in the years of schooling is related to the ability of labour to operate technologies in the primary or manufacturing industry and therefore attracts more resource or efficiency-seeking FDI.

The initial levels of education are also relevant for FDI in services as at this stage labour knowledge of foreign languages and customer service skills are important for MNEs seeking to cut costs. According to the World Economic Forum - WEF (2017), the education component of HC is the most relevant one, for both FDI and economic growth because:

"Three channels have been suggested through which education affects a country's productivity. First, it increases the collective ability of the workforce to carry out existing tasks more quickly. Second, secondary and tertiary education especially facilitate the transfer of knowledge about new information, products, and technologies created by others. Finally, by increasing creativity, it boosts a country's own capacity to create new knowledge, products, and technologies" (WEF, 2017).

Choi (2015), argues that HC, measured by pupil performance in math and science in international tests, is in a positive relationship with labour productivity and therefore correlated with higher inward FDI (measured by foreign affiliate sales). The inconsistent results of empirical studies that tried to explain the role of HC for inward FDI attraction may be attributed to the lack of appropriate proxies and consideration of other factors which determine this relationship. Hence, there is a good starting point to expand research in this area.

When it comes to the qualitative aspect of HC, Choi (2015) suggests that different quality of HC across countries explains structure (quality) of FDI in the first instance, but also the quantity of FDI. First of all, this is explained by the lower costs of employee training in countries with already developed HC, which makes investing abroad cheaper and more attractive. The labour that has developed advanced IT skills, numerical and inductive reasoning within the education system will be ready to work without substantial employer's investments in training. OECD (2017) suggests that the education system in high-income countries teaches skills that provide a foundation for effective and successful participation in the social and economic life of advanced economies. Those are considered to be key information-processing skills: literacy, numeracy and problem-solving in technology-rich environments, all of which allow lower costs for employee training. Choi (2015) uses this presumption to build a hypothesis that high-quality HC in host country requires less investment in training and therefore MNEs are attracted to invest in such locations.

The importance of HC quality for inward FDI is dual. It is relevant for the quantity of FDI and quality of FDI. Choi (2015) particularly points to the relevance of high-quality HC as a determinant for MNEs which operate in knowledge-intensive industries. It is argued that empirical evidence confirms the impact of HC on "horizontal" FDI, where horizontal FDI means MNEs involving in the same activity in the host country as in its home country.

Therefore, the argument offered by Choi (2015) that investing in HC quality will decrease employer's dissatisfaction with labour skills and eventually narrow the skill gap, suggests that companies will have the disposable income to invest in R&D rather than in employee training. Second of all, increasing the quality of HC, i.e. increasing cognitive skills, makes knowledge transfer between MNE headquarter and subsidiary easier which affects the greater inflow of FDI.

This is a sound argument, knowing that, for example, the employers spent over £45 billion on employee training in the UK, while those in the US spent over $150 billion in 2015 (UKCES, 2015). According to the World Bank Enterprise Survey (2013), in high-income OECD countries over 45% of funds spend on employee training comes from companies with at least 10% foreign ownership. At the same time, UKCES (2015), reports high skills shortages in the labour market, especially in digital and IT industries, cybersecurity and science. Those industries employ higher-skilled workers and their shortage is mainly reported by large MNEs, while small and medium companies report a shortage of semi-trained workers, like electricians or construction workers. The problem is also spurred by skills atrophy as it is also the case that highly skilled workers are employed in unproductive activities.

According to UKCES (2015), 60% of graduates in Science, Technology, Engineering and Maths (STEM) enter jobs unrelated to STEM. It is pointed out that "doing jobs that do not use a worker's skills and talents fully is damaging for the individual, their employer and the overall economy. It can lead to boredom, demotivation, low job satisfaction and skill attrition for the individual, as well as being an inefficient use of HC across the economy" (UKCES, 2015).

With the higher cognitive skills of labour, more FDI in knowledge-intensive industries is attracted, so the industrial composition of FDI is also improved. For example, Yeaple (2003) suggests that the variation in sales of US MNE subsidiaries abroad is explained by labour skills in the host country. Amoroso et al. (2015) also investigated the role of labour skills in the attraction of knowledge-intensive greenfield FDI, finding that country sector pairs that had received this type of investments, have higher relative skilled labour than those that received investments in manufacturing activities. This is in line with Romer (1989), who suggested that developed HC influences the supply of new ideas and advanced creativity. We can expect that this attracts more asset-seeking FDI. The higher cognitive skills influence capacity to innovate and therefore provide sources of R&D, which attracts more FDI in research-intensive industries, such as pharmaceuticals and etc. (Vandenbussche et al., 2006).

At the same time, it is pointed out that knowledge-intensive greenfield FDI will target countries with higher purchasing power, in other words, more developed countries. On the other hand, the analysis suggests that MNEs with efficiency-seeking motives would not be attracted to the locations with highly skilled labour, as higher skills level of

labour is likely to be associated with higher wages, in fact the study shows negative impact of developed human capital for FDI in labour-intensive manufacturing (Amoroso et al., 2015).

Vandenbussche et al. (2006) also argue that the two aspects of HC have a different role in investment allocation. They suggest that HC plays a crucial role in technological progress which requires more quantity of HC for imitation and more quality HC for innovation. The intensive use of quality HC is prominent in innovation-driven activities of MNEs. Therefore, the contribution of HC to inward FDI can be separated into a *level effect* and *composition effect*. The availability skilled labour or the quantity of HC is an important determinant of the level or quantity of FDI, while the quality of HC, i.e. availability of innovative and creative labour is an important determinant of the composition of FDI.

The high-quality of HC is associated with high labour costs, and high labour costs are considered as a location disadvantage when it comes to FDI attraction. However, Basile et al. (2008) suggest that low labour costs attract a certain type of MNEs - efficiency-seeking ones, and therefore it may be considered a location advantage but the high cost of labour may be an indicator of high labour skills and also serve as a location advantage. Basile et al. (2008) found that MNEs from non-EU countries were attracted by high wages in host countries as they saw it as an indicator of high labour competencies.

The interaction between education quality, which is central to developed human capital, and FDI quality is best summed up and explained in Figure 1.1. When countries are focused on quantity of FDI, there is the high significance of the education quantity and somewhat smaller significance of education quality. On the other hand, when countries are focused on the quality of FDI, the quantity of education is the least significant while the quality of education is the most significant factor.

Figure 1.1: The relevance of human capital for high-quality FDI.

	QUANTITY OF EDUCATION	QUALITY OF EDUCATION
QUANTITY OF FDI	+++	++
QUALITY OF FDI	+	+++

1.3 Methodology and data

The empirical analysis of this chapter is based on 54 countries (developing and developed)[4], which have participated in the OECD PISA assessment over the period from 2000 to 2015. The study analyses the impact of average PISA score as a measure of quality of HC and average years of schooling as a measure of quantity of HC on inward FDI stock as a percentage of GDP and on the number of technologically

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[4] The country categorization (developed vs developing) is based on the country GNI per capita in 2000. Based on the World Bank's Atlas method, countries with GNI per capita of less than $12.475 are developing and with more than that are considered developed. Appendix 1.4 for full country list.

intensive FDI projects[5] as a share of overall projects, as a measure of quality of FDI. The dependent and independent variables (with the exception of World Governance Indicators and high-quality FDI projects that) are expressed as a natural logarithm. This will allow interpreting coefficients as elasticities. The full list and explanation of all variables is provided in Appendix 1.1.

Dependent variables

First, as a dependent variable, the natural logarithm of inward FDI[6] stock as a percentage of GDP is used. This is a commonly used measure when studies need to capture cumulative FDI inflows, especially as the independent variable effect on FDI is with several years lag since PISA scores change every three years. The FDI flow data is too volatile to be used in relation to an independent variable that changes very slowly, which is the case with PISA. The same logic is applied by Vollmecke et al. (2017), who estimated the impact of FDI on GDP growth rate, with the use of FDI stock. Additionally, according to Nielsen et al. (2017), flow data is more relevant when studies try to capture the entering decision or the change of the number of firms, while the stock data have predominantly been used in studies that analyse the location choice of FDI in relation to host country characteristics, which is the case in this study.

Second, in order to investigate the role of HC in the attraction of different quality FDI, this study considers the industrial composition of FDI in relation to PISA. Therefore, a dependent variable used for this purpose is the number of high-quality FDI projects as a percentage share in a total number of FDI projects received by a country in a given year[7]. The distinction between low and high-quality FDI projects is based on the OECD industry classification by technological intensity. The OECD classification distinguishes between four levels of technological intensity: the high-technology industries, medium-high technology industries (the combination of the two in this study is referred to as high-quality FDI). The low-technology industries, medium-low technology industries (the combination of the two in this study is referred to as low-quality FDI). The full list and classification of industries, correlation coefficients and descriptive statistics are provided in Appendix 1.2 and Appendix 1.3 respectively.

The important limitation of the first chapter of this thesis is that it distinguishes between different FDI qualities based on knowledge and technological intensity of the industry and not on knowledge and technological intensity of the activity within the industry, even though there is high propensity among MNEs to import technologically advanced products and use them as inputs in assembly lines in host countries. Eventually, countries may also export high-tech products but that is no evidence of the technological capability of the local economy, but more of a "statistical illusion".

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[5] For detailed classification see OECD technological intensity definition:
https://www.oecd.org/sti/ind/48350231.pdf
[6] The value for Serbia for the period from 2000 to 2007 and for Montenegro for the period from 2000 to 2009 is calculated based on each country's share in joint value of FDI stock for Serbia and Montenegro (formerly one country) for the period from 2000 to 2007
[7] FDI projects are obtained from fDi Markets, a database produced by fDi Intelligence, a division of the Financial Times Ltd., which tracks cross-border greenfield investment projects across different industries and countries worldwide.

Although the activity of FDI is not captured here, and I acknowledge this limitation to measuring FDI quality, there are some segments of the economy that stand out in terms of technological and knowledge intensity. According to Marsili (2001), those are aerospace, pharmaceuticals, ICT, electronic components, engines and turbines. The empirical literature shows that technologically advanced products are among the biggest product group in international trade and some studies used this approach in measuring FDI quality, like Amoroso et al. (2015). The information about FDI industry concentration is more available than information about their activity, which is why studies often relied on industry-level data,

Independent variables

The main independent variable is the average PISA[8] score in reading, math and science by the country for the period from 2000 to 2015. If PISA score was missing in one year it was mirrored from the most recent previous testing year. OECD developed PISA to measure student cognitive skills and conducts the testing in OECD member countries as well as partner countries every three years since 2000 (the test scores being available for: 2000, 2003, 2006, 2009, 2012, 2015). The use of this measurement of cognitive skills as a function of HC is important as it portrays the change of knowledge absorption which schools are trying to teach.

Hanushek and Kimko (2000) first proposed the use of results from international tests in maths, reading and science, measured by Programme for International Student Assessment (PISA), to build a measure of cognitive skills as a function of HC. They suggest that science and numeracy skills of students essentially determine their competitiveness when they become available in the labour market. Hanushek and Kimko (2000) suggest that the measurement of cognitive skills as a function of HC is more important as they portray the change of knowledge absorption which schools are trying to teach.

The cognitive element of HC is, therefore, considered to be crucial when measuring HC quality. Hanushek and Kimko (2000) find that high scores on international tests such as PISA are directly related to high productivity. In order to avoid the possible bias of particular test such as PISA, the study also accounted for the results of International Association for the Evaluation of Education Attainment (IEA) or The International Mathematics and Science Study (TIMSS). Those are the tests that ought to provide homogenous measures of educational outcomes. In order to develop a unified measure of HC results from different tests were combined, but the outcomes were the same as if the results of one test were used.

The conclusions from the above-mentioned studies, in simplified terms, can be summarised as the anticipation of improved labour cognitive skills leading to higher economic growth. In other words, HC quality has three dimensions: (1) numeracy, leading to (2) cognitive skills, leading to (3) productivity. According to the OECD (2017), the understanding of both, math and science requires capabilities to apply

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[8] The Programme for International Student Assessment (PISA) is a triennial international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students.

knowledge in practical problem-solving situations and draw evidence-based conclusions about the challenging tasks.

Since measures of cognitive skills have shown to be generally applicable, and that they allow understanding of differences in education quality, cognition can be understood as micro-measure of HC. It allows particular insight into the differences of student capabilities who have the same years of schooling. Those capabilities are relevant for the labour market as they influence productivity, while years of schooling and enrolment rates provide more quantitative, macro-measures of HC, which do not make differences between different qualities of education systems. However, the best way to reconcile those two approaches is to use cognitive skills tests scores and add years of schooling.

<center>Control variables</center>

The validity of results is strengthened by accounting for control variables. It is controlled for the quantity of education with the average years of schooling and other country characteristics normally used to explain FDI, such as exports of goods and services (as a percentage of GDP), GDP per capita (in constant US dollars), total government expenditure on education (as a percentage of GDP)[9] ,gross enrolment ratio in tertiary education (as a percentage of population, for both sexes)[10] , the worldwide governance indicators, which are the World Bank's indicator of institutional quality. For the full list of variables, explanations and sources of data, see Appendix 1.1.

A fixed-effect model will be estimated on the group of 54 countries (26 developed and 28 developing) in the sample, that includes only PISA testing years (2000, 2003, 2006, 2009, 2012, 2015). The PISA score will be observed in testing years only, while the value of inward FDI stock in testing years is taken as an average of inward FDI stock (as a percentage of GDP) in non-testing years until the next testing year. For example, FDI stock as a percentage of GDP reported in 2000 is the average over the years 2000, 2001 and 2002. The value reported in 2003 would include 2003, 2004 and 2005, and so on. All the other control variables are observed in PISA testing years only.

A fixed-effect model will be estimated on the share of high-quality FDI projects in overall FDI projects. Due to the lack of data for the dependent variable, PISA will be observed in only four testing years (2003, 2006, 2009, 2012). The value of the dependent variable (the share of high-quality FDI projects per country) in testing years is taken as a sum of high-quality FDI projects in non-testing years until the following testing year. For example, the share of high-quality FDI projects in 2003 is the sum of high-quality FDI projects in 2003, 2004 and 2005. In 2006, it is the sum of values for 2006, 2007 and 2008, and so on.

There are 54 countries observed (developed and developing) over the period from 2000 to 2015, while other control variables are taken into account, they are fixed over time or have very little variation but play important role in FDI attraction. Based on

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[9] For the countries that are missing data sporadically, the average of the existing data is applied to the missing values. Out of 324 observations, 58 were missing.

[10] For the countries that are missing data sporadically, the average of the existing data is applied to the missing values. But as most countries were missing data for 2015 only, the 2014 data is applied to 2015. Out of 324 observations, 59 were missing.

theoretical and empirical arguments discussed above, several explanatory variables are included.

The illustration of the net average share of high-quality projects in two groups of countries is provided in Figure1.2. For the purpose of comparisons, Figure 1.2 shows percentage shares of high-quality FDI projects minus percentage share of low-quality FDI projects in overall FDI projects by country[3] It is noticeable that developed countries, on average, experience more high-quality FDI projects than developing countries.

The Figure1.2 shows that it is not about how much high-quality FDI does the country have, it is about the difference between high and low-quality. We can see that the difference between the share of high-quality FDI projects and low-quality FDI projects in the overall FDI is much higher in developed than in developing countries. Although there are certain outliers in both groups of countries, like the Czech Republic in developed group and Malaysia in developing group of countries, there is a big difference between the share of high and low-quality FDI projects in overall FDI. On average high-quality FDI share in developing countries is 9% while it is 42% in developed countries.

Therefore, more MNEs appear in high-quality industries in developed countries. The theory of MNEs suggests, as it is discussed in section 1.2, that in order to engage in FDI companies need to have a firm (or ownership)-specific advantages, like knowledge or technology, so it is expected for MNEs to emerge in R&D intensive industries (Dunning, 1998). Since developing countries are further away from technological frontier, it is not surprising that in developing countries the net average share of high-quality FDI is substantially lower than in developed countries.

Figure 1.2: The net average percentage of high-quality FDI share in the overall FDI from 2003 to 2012

DEVELOPED COUNTRIES

DEVELOPING COUNTRIES
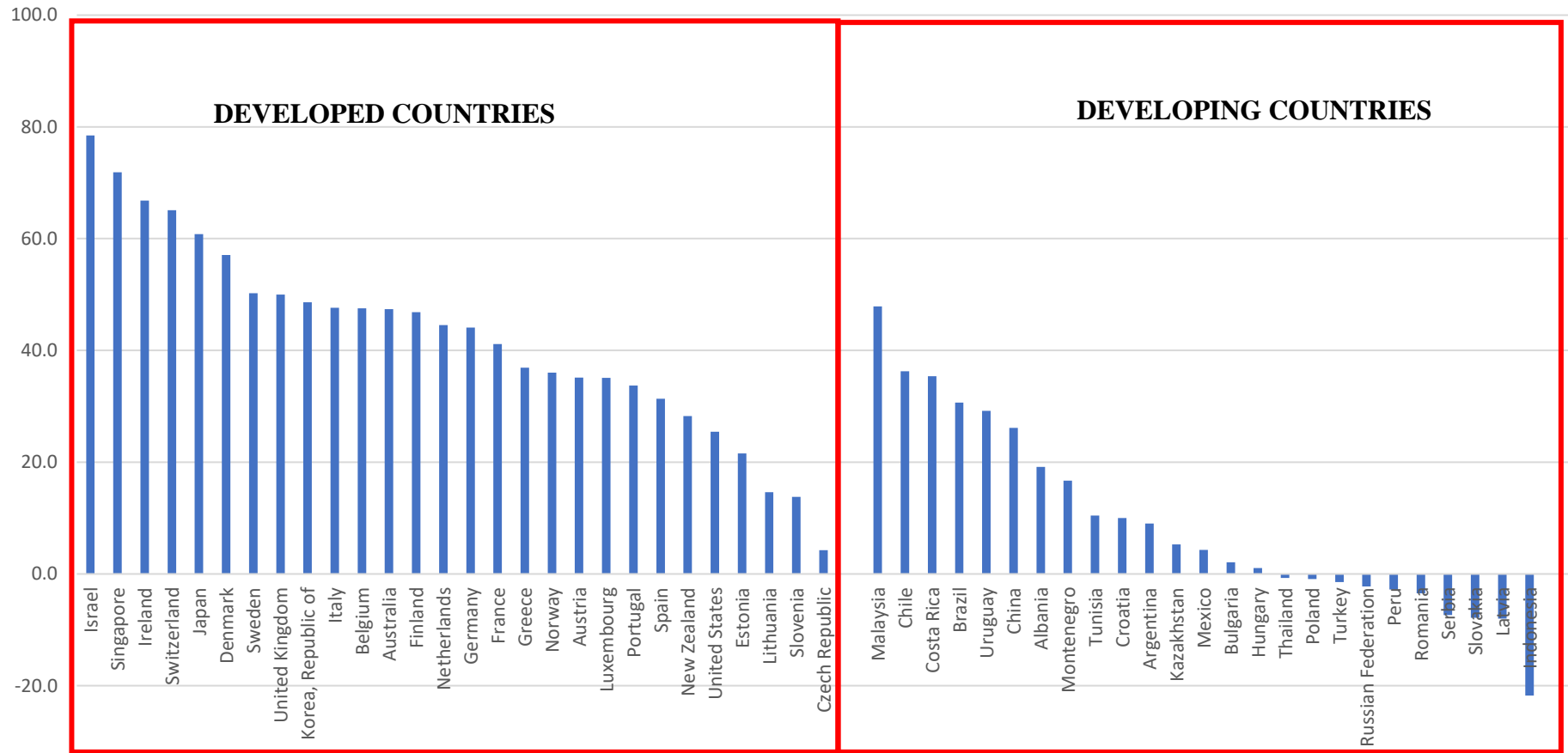
Source: Author's illustration based on fdimarkets data

1.3.1 The validity of PISA scores

To add credibility to explanations emerging from regressions in this chapter, it is a good idea to provide additional indicators of the quality of education, apart from PISA. The OECD provides a framework to assess adult skills (unfortunately only for several high-income countries and only for the year of 2015). Around 166000 adults aged 16-65 were surveyed in 24 countries and sub-national regions: 22 OECD member countries – Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden, the United Kingdom and the US. A decade after the publication of results from the first round of the Programme for International Student Assessment (PISA), its seminal assessment of the knowledge and skills of 15-year-olds, the OECD has conducted its first Survey of Adult Skills, which extends the assessment of skills to the adult population.

According to OECD (2013:4) "the survey, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), focuses on skills – literacy, numeracy and problem solving – similar to those assessed in PISA; but the two studies use different assessment tasks, reflecting the different contexts in which 15-year-old students and older adults live. The surveys have complementary goals: PISA seeks to identify ways in which students can learn better, teachers can teach better, and schools can operate more effectively; the Survey of Adult Skills focuses on how adults develop their skills, how they use those skills, and what benefits they gain from using them".

"PIAAC assesses the proficiency of adults from age 16 onwards in literacy, numeracy and problem-solving in technology-rich environments. These skills are key information-processing competencies that are relevant to adults in many social contexts and work situations, and necessary for fully integrating and participating in the labour market, education and training, and social and civic life. In addition, the survey collects a range of information on the reading- and numeracy-related activities of respondents, the use of information and communication technologies at work and in everyday life, and on a range of generic skills, such as collaborating with others and organising one's time, required of individuals in their work. Respondents are also asked whether their skills and qualifications match their work requirements and whether they have autonomy over key aspects of their work" OECD (2013:4).

Although there is variation between countries when PISA and PIAAC scores are compared, in both tests all countries fall into the same competence level (level 5). As it is shown in Figure 1.3 the two measures are highly correlated. The advantage of PISA in the context of this work is that it is available for a longer period of time.

Figure 1.3: The average PISA and PIAAC scores for the year 2013
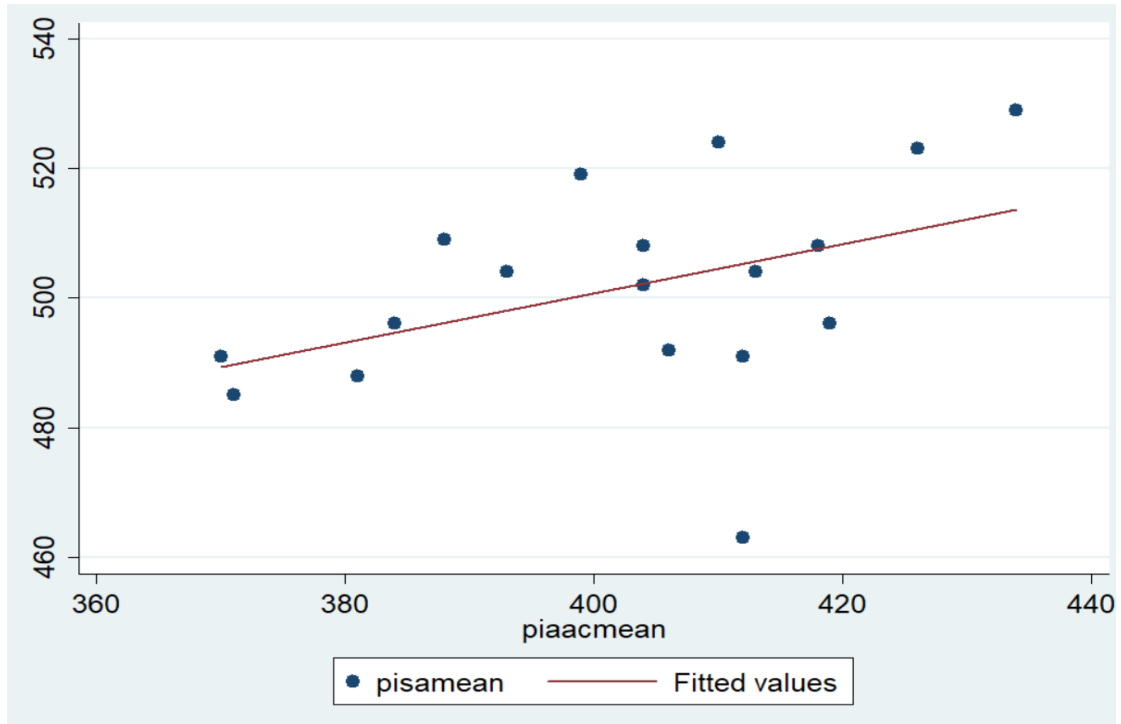
Literacy proficiency at level 5 requires the respondent to search for and integrate information across multiple, dense texts; construct syntheses of similar and contrasting ideas or points of view; or evaluate evidence-based arguments. They often require respondents to be aware of subtle, rhetorical cues and to make high-level inferences or use specialised background knowledge. Numeracy proficiency at level 5 requires the respondent to integrate multiple types of mathematical information where considerable translation or interpretation is required; draw inferences; develop or work with mathematical arguments or models; and critically reflect on solutions or choices (OECD, 2013). Therefore, it can be reasonably assumed that PISA captures skills which are later valued in the labour market.

1.4 Econometric analysis

The longitudinal dimension of the dataset used in this analysis, suggests estimation techniques that allow accounting for unobserved individual country heterogeneity, using fixed-effect econometric models. A Hausman test of the random effects vs. fixed effects specification, available upon request, supports the latter.

A basic **equation (1)** takes the following form:

$$\ln (ifdi)_{it} = \alpha + \beta_1 \ln (pisa)_{it} + \beta_2 \ln (gdp\_pc)_{it} + \beta_3 \ln (exports)_{it} + \beta_4 (wgi)_{it} + \beta_5 \ln (sch)_{it} + \beta_6 \ln (edu)_{it} + \beta_7 \ln (tert)_{it} + \mu_i + \varepsilon_{it}$$

Where the subscript *i* refers to countries and the subscript *t* refers to the year under observation, ε is an error term and μ refers to country fixed-effects. At this stage the goal is to observe the impact of PISA on inward FDI stock as a percentage of GDP, pooling all 54 countries.

Lastly, the same model is estimated but with the use of share of high-quality FDI projects as dependent variable.

equation (2):

$$hq\_ifdi_{it} = \alpha + \beta_1 \ln(pisa)_{it} + \beta_2 \ln(gdp\_pc)_{it} + \beta_3 \ln(exports)_{it} + \beta_4 (wgi)_{it} + \beta_5 \ln(sch)_{it} + \beta_6 \ln(edu)_{it} + \beta_7 \ln(tert)_{it} + \mu_i + \varepsilon_{it}$$

All regressions are estimated for the whole sample of countries and developed and developing countries only.

1.5 Results

Table 1.1 The summary results of PISA impact on overall and high quality FDI				
	(1) ln IFDI			**(2) HQ_IFDI**
VARIABLES	All countries	Developed	Developing	All countries
ln PISA	0.887	1.832*	0.972	56.22**
	(0.662)	(1.113)	-0.905	-26.76
ln GDP_PC	0.0212	0.886***	-0.0901	21.73***
	(0.151)	(0.310)	(0.201)	-5.922
ln EXPORTS	0.276***	0.198	0.302**	9.733**
	(0.0905)	(0.153)	(0.124)	-3.817
WGI	0.822***	0.134	0.977***	-0.0941
	(0.139)	(0.214)	(0.193)	-5.745
ln SCH	1.592***	1.252***	1.345**	23.87**
	(0.341)	(0.407)	(0.573)	-11.77
ln EDU	0.197	0.237	0.214	15.45***
	(0.151)	(0.231)	(0.207)	-5.793
ln TERT	0.415***	0.190	0.479***	9.640**
	(0.0917)	(0.150)	(0.127)	-3.93
Constant	-9.204**	-22.23***	-7.815	-645.4***
	(3.930)	(7.780)	(5.200)	-159.6
Year dummies	yes	yes	yes	yes
Observations	324	156	168	216
R-squared	0.514	0.464	0.559	0.542
Number of id	54	26	28	54
Robust heterostedastic standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

The results from the equation (1) (table 1.1), suggest that when all countries are observed together, the average years of schooling, as the quantitative measure of human capital, is significant in explaining overall inward FDI stock. The qualitative measure, PISA score is not statistically significant in explaining the dependent variable, in the

presence of all control variables[11], in all countries sample. The same applies to developing countries sample.

As we can see in (table 1.1) equation (1), exports as a percentage of GDP and WGI indicators are more significant in explaining FDI than PISA in developing countries. Those findings confirmed previous studies, like Narula (1996) that overall FDI in developing countries are not driven by developed human capital, as factors like institutions and average years of schooling play a more important role. Those findings also confirm earlier studies that developing countries do not benefit from increased investment in education at the same rate as developed ones do unless other economic and institutional factors are in place (Gruber and Kosak, 2014).

When it comes to developed countries, the situation is slightly different. The fixed-effect regression Table 1.1 equation (1) suggests that the impact of PISA on overall inward FDI stock in developed countries is significant, at the threshold level, P=0.1. A 1% increase in average PISA score would result in approximately 1.8% increase in overall FDI. As we can see, in developed countries sample, PISA is a more relevant determinant of FDI than in developing countries sample and its coefficient is larger in magnitude than of average years of schooling, which remained significant.

Kosack (2012) also confirms this point, suggesting that the highest return on tertiary education is achieved in developed countries, where demand for the quality HC is continuous. Moreover, Kosack (2012) finds that overall higher per-student spending in high and upper-middle income countries results in better student performance in international tests, such as PISA.

Therefore, the equation (1) shows that overall inward FDI stock as a percentage of GDP in developing countries is not determined by qualitative measure of human capital such as PISA but rather by a quantitive measure such as average years of schooling, while in developed countries both quantitative and qualitative measures of human capital are significant in explaining inward FDI. This means that the quality of education, labour cognitive problem-solving skills matter, but in addition to quantity of education such as average years of schooling.

A tentative explanation for this finding is that in developed countries the share of high-quality FDI is higher. To the extent that the overall inward FDI is tilted more towards high-quality FDI, it is not surprising that the quality of the education system is more important among this group of countries. Indeed, s shown in Figure 1.2, in developed countries the share of high-tech FDI is systematically much higher that the share of FDI in low-tech industries. Conversely, in developeing countries, this difference is much smaller and in a few countries is even negative, suggesting that the share of FDI in low-tech industries is higher than that in high-tech ones. However, within the developing countries group, there is some degrees of heterogeneity, with some countries showing shares of FDI in high-tech industries in line with developed countries. In order to test for this conjecture more directly, the share of high-quality FDI in overall FDI is used as the dependent variable in the last column of Table 1.1

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[11] Full table provided in Appendix 1.5

The key aspect of the analysis is equation (2) of Table 1.1, where the impact of human capital is estimated specifically on high-quality FDI. It is noticeable that PISA score, a qualitative measure of human capital, is highly significant as a determinant of the share of high-quality FDI projects in overall FDI project. This is true for all countries and it is in line with Amoroso et al. (2015) who argued that skilled labour is relevant determinant for greenfield FDI in knowledge-intensive projects but not in efficiency-seeking FDI.

Another important finding is that average years of schooling, as a quantitative measure of HC have not been rejected as determinants of FDI even for high-quality projects but the coefficient for PISA is twice as big in magnitude as the number of years of schooling (SCH). Indeed, PISA makes difference when high-quality of FDI are observed. A 10% increase in PISA score would increase the share of high-quality FDI in overall FDI project by about 5.6 percentage points.

1.6. Conclusion

In this chapter it has been argued that there is a need to disentangle between quantitative and qualitative measures of HC. The arguments presented here suggest that qualitative measures of the educational component of HC should be considered when analysing the economic relevance of HC together with quantitative measures. The reviewed literature suggested that the most appropriate proxies for the quality of education, which is the key part of HC, are international standardized tests that mirror cognitive skills, such as PISA. The empirical analysis showed that the role of cognitive skills in relation to inward FDI varies depending on whether countries are developed or developing.

In developed countries, an average 1% growth of overall PISA score would lead to approximately over 1.8% increase in overall inward FDI stock (as a share of GDP). On the other hand, this is not so in developing countries.

The findings to a large extent confirm those presented by Choi (2015), who concluded that the role of HC quality is significant in explaining inward FDI. However, not exclusively, as this study confirmed, measurement of education requires a combination of qualitative and quantitative proxies. At the same time, this study extends our understanding of the role of HC in FDI attraction, as it is now differentiated between HC quantity and quality. It is clearer that the quality of education matters more in developed countries for overall FDI than in developing ones and quantity of education is relevant for overall FDI regardless of the country's level of development.

PISA is more significant for FDI in developed countries because in those countries FDI are more present in high-tech industries. A similar finding is provided by Narula (1996), showing that human capital matters more for developed countries. The contribution here is that the quality of education is more important for high-quality FDI. The effect of PISA is twice as large as the effect of average years of schooling. In developing countries the quality of education is not as significant for overall inward FDI as the share of high-quality FDI in overall FDI is, on average, lower.

The main policy recommendation in terms of the relevance of education for FDI is that in developed countries, the improvement of labour cognitive skills and investing in education, would, on average, lead to an increase of overall inward FDI stock. For both,

developing and developed countries the most important is the quality of education and improvement of cognitive abilities of students and PISA scores in order to attract a greater share of high-quality FDI projects in overall FDI projects. Therefore, those countries that manage to teach, through the education system, skills measured by PISA also manage to have a relatively greater share of high-quality FDI in overall FDI.

The suggestion that overall inward FDI stock is less responsive to HC quality in developing countries, has also been proposed by Gao (2002), who finds that regional distribution of overall FDI in China is not determined by the quality of HC. Therefore, the creation of domestic companies in knowledge-intensive industries seems to be the only source of demand for quality HC.

As the results about high-quality FDI show, MNEs operating in certain industries, such as software & IT services, renewable energy, industrial machinery or financial services, are very much interested in HC quality when making decisions about investments in developing countries. Therefore, the investments made to improve student performance in PISA is not wasted. Although it will not help increase an overall inward FDI stock in developing countries, it will be crucial for increasing the share of high-quality FDI in overall FDI, and that is the point. An increase in the amount of high-quality investments, not necessarily overall investment leads to the productive use of cognitive skills.

Appendix 1.1 The full list and explanation of variables

Variable explanation	Variable meaning	Variable name	Label	Source
Dependent	The natural log of total inward FDI stock received by a country as a share of GDP.	Inward FDI stock as % of GDP	ln IFDI	UNCTAD
Dependent	The percentage share of inward FDI project in high-tech industries as a share of total FDI projects	The number of high-quality inward FDI projects	hq_IFDI	fdimarkets.com
Independent	The natural log of PISA score. PISA score in reading, math and science (an average of countries' scores in three fields). The Programme for International Student Assessment (PISA) is a triennial international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students.	PISA score	ln PISA	OECD

Control: **Market demand.** Many studies have found that market demand can be an important determinant of FDI, like Janicki and Wunnava, (2004), Bevan and Estrin, (2004), Walsh and Yu, (2010), it is usually measured as GDP per capita. According to Nielsen et al. (2017), this measure has been used in 85 out 115 sample studies, that estimated market demand or purchasing power as a determinant of FDI, where the relationship was positive. This is a sign that high GDP per capita means higher purchasing power and therefore higher potential profits for companies (Chung and Alcacer, 2002).	The natural log of gross domestic product in current international dollars, purchasing power parity PPP adjusted)	GDP per capita constant US dollars	ln GDP_PC	World Bank
Control: **Economic openness**. Trade or economic openness measure a country's ability to attract investment. Free trade is important for knowledge and technology transfer between headquarters and subsidiaries as well as for inputs sourced from abroad (Dunning et al., 2001).	The natural log of exports of goods and services (% of GDP). Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments.	Exports of goods and services (% of GDP)	ln EXPORTS	World Bank

Control: **Institutions.** One of the crucial factors that drive nexus between FDI inflows and its developmental effects is the quality of institutions. The main elements of the "institutional quality" are summed up in high private property rights protection, easy contract enforcement, firm rule of law, low corruption and high political stability. Slesman et al. (2015) also argue that FDI effects on the economy are directly linked to the country's threshold level of institutional quality, finding that countries with institutions at below threshold level attract investments with negative effects on economic growth.	1. Voice and Accountability, Political stability, Government effectiveness, 2. Regulatory quality, 3. Rule of law, 4. Control of corruption World Governance Indicator is created as one variable, as a yearly average of all elements that compose WGI. Every element has weight from -2.5 to 2.5.	The Worldwide Governance Indicators 2015	WGI	World Bank
Control: **Education.** studies that analysed the relationship between economic growth and education, used average years of schooling as a proxy for the educational component of HC, for example, Krueger and Lindahl (2001). The small number of those that actually analysed the impact of HC on FDI like Yeaple (2003), also relied on average years of schooling. From the theoretical point of view, education impacts economic growth through its effects on HC. It increases labour productivity, innovative capacity and ability to absorb foreign knowledge and technology.	The natural log of average years of schooling. An average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level.	Average years of schooling	ln SCH	
	The natural log of government expenditure on education, total (% of GDP). General government expenditure on education (current, capital, and transfers) is expressed as a percentage of GDP. It includes expenditure funded by transfers from international sources to the government. The general	Government expenditure on education, total (% of GDP)	ln EDU	World Bank and UNESCO

At the same time, it should be noted that average years of schooling per se, are not suitable control variable as it evolves very slowly in a quite predictable manner.	government usually refers to local, regional and central governments.			
	The natural log of gross enrolment ratio, tertiary, both sexes (%). Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level.	Gross enrolment ratio, tertiary, both sexes (%)	ln TERT	World Bank

Appendix 1.2: The list and classification of industries	
Industry	**Quality 1=high; 0=low**
Aerospace	1
Alternative/Renewable energy	1
Automotive Components	0
Automotive OEM	0
Beverages	0
Biotechnology	1
Building & Construction Materials	0
Business Machines & Equipment	1
Business Services	1
Ceramics & Glass	0
Chemicals	1
Coal, Oil and Natural Gas	0
Communications	1
Consumer Electronics	1
Consumer Products	0
Electronic Components	1
Engines & Turbines	1
Financial Services	1
Food & Tobacco	0
Healthcare	0
Hotels & Tourism	0
Industrial Machinery, Equipment & Tools	1
Leisure & Entertainment	0
Medical Devices	1
Metals	0
Minerals	0
Non-Automotive Transport OEM	0
Paper, Printing & Packaging	0
Pharmaceuticals	1
Plastics	0
Real Estate	0
Rubber	0
Semiconductors	1
Software & IT services	1
Space & Defence	1
Textiles	0
Transportation	1
Warehousing & Storage	0
Wood Products	0

Appendix 1.3: Descriptive statistics

All countries

Label	Obs	Mean	Std. Dev.	Min	Max
log IFDI	324	3.55	0.80	0.31	5.88
ln PISA	324	6.14	0.11	5.79	6.32
ln GDP_PC	324	9.73	0.96	7.47	11.58
ln EXPORTS	324	3.66	0.60	2.20	5.44
WGI	324	0.62	0.77	1.19	1.97
ln SCH	324	2.29	0.21	1.57	2.56
ln EDU	324	1.53	0.25	0.73	2.14
ln TERT	324	3.95	0.46	2.04	4.74

All countries

Variable	Obs	Mean	Std. Dev.	Min	Max
HQ_IFDI	216	64.00	14.01	22.60	95.10
ln PISA	216	6.14	0.11	5.79	6.32
ln GDP_PC	216	9.74	0.95	7.72	11.54
ln EXPORTS	216	3.67	0.58	2.20	5.44
WGI	216	0.62	0.76	-0.93	1.97
ln SCH	216	2.29	0.21	1.57	2.56
ln EDU	216	1.54	0.26	0.73	2.14
ln TERT	216	3.97	0.44	2.34	4.70

Correlation coefficients

	log IFDI	ln PISA	ln GDP_PC	ln EXPORTS	WGI	ln SCH	ln EDU	ln TERT
log IFDI	1.0000							
ln PISA	0.1339*	1.0000						
ln GDP_PC	0.2557*	0.7281*	1.0000					
ln EXPORTS	0.6553*	0.3381*	0.1986*	1.0000				
WGI	0.3351*	0.7203*	0.8794*	0.3001*	1.0000			
ln SCH	0.1762*	0.5908*	0.6034*	0.1935	0.5296*	1.0000		
ln EDU	0.2156*	0.3444*	0.4370*	0.1543	0.4886*	0.2893*	1.0000	
ln TERT	0.0406	0.4826*	0.4742*	-0.0851	0.4134*	0.5128*	0.2535*	1.0000

Appendix 1.4: The list of countries	
Developed countries (26)	**Developing countries (28)**
Australia	Albania
Austria	Argentina
Belgium	Brazil
Czech Republic	Bulgaria
Denmark	China
Finland	Chile
France	Costa Rica
Germany	Colombia
Greece	Croatia
Ireland	Estonia
Israel	Hungary
Italy	Indonesia
Japan	Kazakhstan
Korea, Republic of	Latvia
Luxembourg	Lithuania
Netherlands	Malaysia
New Zealand	Mexico
Norway	Montenegro
Portugal	Peru
Singapore	Poland
Slovenia	Romania
Spain	Russian Federation
Sweden	Serbia
Switzerland	Slovakia
United Kingdom	Thailand
United States	Tunisia
	Turkey
	Uruguay

Appendix 1.5: The multivariate regression: The impact of PISA on FDI (all countries)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln PISA	4.337***	1.686**	1.932***	1.658**	0.865	0.878	0.887
	(0.806)	(0.748)	(0.724)	(0.714)	(0.689)	(0.686)	(0.662)
ln GDP_PC		1.083***	0.943***	0.826***	0.346**	0.348**	0.0212
		(0.112)	(0.112)	(0.115)	(0.138)	(0.137)	(0.151)
ln EXPORTS			0.443***	0.424***	0.306***	0.328***	0.276***
			(0.0973)	(0.0956)	(0.0927)	(0.0931)	(0.0905)
WGI				0.463***	0.848***	0.837***	0.822***
				(0.135)	(0.144)	(0.144)	(0.139)
ln SCH					1.963***	1.860***	1.592***
					(0.345)	(0.348)	(0.341)
ln EDU						0.291*	0.197
						(0.155)	(0.151)
ln TERT							0.415***
							(0.0917)
Constant	-23.09***	-17.34***	-19.12***	-16.52***	-11.26***	-11.64***	-9.204**
	(4.950)	(4.313)	(4.181)	(4.167)	(4.049)	(4.035)	(3.930)
Observations	324	324	324	324	324	324	324
R-squared	0.097	0.330	0.378	0.405	0.470	0.477	0.514
Number of id	54	54	54	54	54	54	54

Standard errors in parentheses *** p<0.01, ** p<0.05, *
p<0.1

CHAPTER II: Multinationals and wages: Evidence from employer-employee data in Serbia.

Abstract

Many studies have reported that foreign-owned companies pay, on average, higher wages than domestic ones. However, this can be attributed both to the different composition of the workforce and to a wage premium at the individual worker level. This chapter contributes to this literature, by observing whether individuals that change job, from domestic to foreign-owned companies experience a change in their wages. Furthermore, it is investigated whether this difference in wage patterns is moderated by workers' education. This chapter is one of the very few micro-econometric studies that deal with such a question, in a transition country – namely Serbia, with the use of employer-employee data in private sector, over a long time period (15 years). It is found that changing jobs is positively associated with worker wage and that the wage change is higher when workers are moving from domestic to the foreign company than vice versa. The evidence suggests that more educated workers benefit the most from leaving domestic companies.

Keywords: Mobility in the labour market; Job change; Wage change; MNEs and wages; Transition economies;

2.1. Introduction

This chapter is about wage dynamics related to job change. In particular, I analyze labour mobility and wage change. This chapter is not addressing the determinants of labour mobility *per se* - why workers are more likely to move from domestic to a foreign company or vice versa but what is the effect of labour mobility on wages.

The main questions of this chapter are (1) whether workers who move from domestic to foreign-owned companies experience an increase in wages larger than those that do not change jobs (or move from foreign to domestic-owned companies) and (2) whether that change in wages is moderated by worker education.

The investigation of differences in wages paid by foreign and domestic companies, known as "foreign-wage premium", is a longstanding area of research. Various studies have been finding that MNEs pay higher wages than domestic companies (for example Aitken et al, 1996; Lipsey and Sjoholm, 2004). However, whether there is true company ownership effect or is it more that foreign wage premium is a result of the different composition of workers is a matter of discussion. In other words, multinational companies may pay on average higher wages than domestic companies because they employ more skilled workers, which are normally paid higher wages. In order to properly understand whether multinational companies - and in particular foreign-owned firms operating in a given host country - pay higher wages for similar workers, it is crucial to control for workers' characteristics. In this chapter, worker characteristics are kept constant while observing whether the changing job to MNEs affects workers' wages. Therefore, the notion that MNEs pay higher wages due to the different composition of workers is accounted for.

Since the competitive advantages of MNEs and domestic companies in developed countries are at a similar level, it is likely for foreign wage premium to be higher in developing countries (Glass and Saggi, 2002). This relates to the expectation that the quality of jobs created by MNEs in developing countries is significantly higher than those created by domestic companies, due to the technological superiority of MNEs.

Workers' mobility is a key channel through which MNEs can affect host country development. On one hand, research has been addressing the mobility from MNEs to local firms, since workers carry specific skills and experience, as MNE organisation and networks are embodied in their employees. Labour mobility is considered an important mechanism for the transmission of knowledge from MNEs to domestic companies as new skills and training brought by foreign firms diffuse to the domestic sector (Poole, 2013; Pradhan, 2006). On the other hand, studies analysed the creation of new firms by former MNE employees, so-called "spinoffs", that establish their own businesses in the same industry as their previous employer (Andersson and Klepper, 2013).

In these cases, the literature has highlighted how MNEs can foster local development by increasing the potential for transfer of knowledge embedded in MNEs workers to the local firms they could move to. This chapter analyses different mechanisms through which MNEs can foster welfare in the host economies. It looks workers' welfare in terms of higher wage which could lead to the country's growth through an increase in aggregate demand Another contribution is the originality of data and information about worker characteristics. As Earle et al. (2012) noticed, studies with firm-level data are usually missing information about worker characteristics, so it is not possible to control for the effect of worker heterogeneity on foreign wage premium. Since this information is available it is possible to claim that, to the extent that a foreign wage premium exists, entry or expansion of foreign MNEs can benefit workers that are able to be employed in these companies. At the same time, it may also lead to crowding-out of domestic companies, which may face stiffer competition for a limited pool of skilled workers, and may face higher costs to attract talented workers.

In this study, linked employer-employee data from Serbia (from 2000 to 2014) is used. I isolate and estimate the impact of foreign ownership on the wage change of workers who move from a domestic to a foreign company. It is found that not only MNEs in Serbia pay, on average, higher wages, but also that they pay higher wages to similar workers, so the pure change from domestic to foreign company leads to the wage change. This wage increase is higher for more educated workers which can thus extract larger benefits from the entry of MNEs in Serbia, The magnitude of this effect is not small, there is a 21% higher wage change for more educated workers who move from domestic to a foreign company.

The rest of the chapter is organised as follows: Section 2.2.1 discusses labour mobility and wage change, under what circumstances workers change companies and how is that related to their wage dynamics. Section 2.2.2 discusses empirical literature which is precisely about the company's ownership and its effect on wages. Section 2.2.3 provides a review of the empirical literature that focuses on worker heterogeneity as a reason for the difference in wages. Section 2.3 describes data and country characteristics. Section 2.4 presents the econometric analysis. Section 2.5 and 2.6

presents the results and robustness checks. The final section, 2.7, provides concluding remarks and some policy recommendations.

2.2 Literature review

The literature review section is organised around three main dimensions of the chapter. Firstly, there is a discussion about general labour mobility effect on wages, regardless of the types of companies that workers work for. Secondly, there is a specific discussion about labour mobility and the effect of company ownership on wage change. This section is sub-divided into one part where the conceptual literature is reviewed and one with a review of empirical evidence. Thirdly, there is a discussion about the moderating effect of worker-specific characteristics, like education, on wage change.

2.2.1 Labour mobility and wage change

According to Kidd (1991), there are, theoretically, two conflicting forces that drive the outcome of changing jobs. On the one hand, labour mobility benefits employees as it is arising from time one spends on job search and on training. Labour turnover comes as a result of expected positive returns on labour mobility. On the other hand, employees who change jobs forego job-specific skills accumulated with the previous employer.

Abbott and Beach (1994) also argue that those who change jobs bear costs due to the loss of investments in training so the gains of changing job need to be higher than costs. Therefore, it is an empirical issue to investigate whether there is a positive or negative return on a job change. The underlying motive for company change is an expectation that it will be followed either by positive wage or by job quality change, both leading to higher employee satisfaction.

The change of employer is considered to have a positive impact on job satisfaction if it does not involve the change of occupation (Zhou et al., 2017). Moreover, if the job change results in significant skills mismatch, it could also result in a negative wage change, regardless of worker education. There is an expectation that changing jobs would have a positive impact on worker wage due to the value of their experience with the previous employer. However, if changing jobs also means changing occupation, experience with the previous employer might be worthless. Zhou et al. (2017) highlight the difference between those who change jobs and occupations and those who change jobs within the same occupations. At the moment of change, both groups experience increased job satisfaction – "the honeymoon effect". However, in the second year after the change, the latter group experiences a decline in job satisfaction after the change, which then slightly increases, while the former group experiences a decline in job satisfaction that does not increase later – "the hangover effect".

Nonetheless, in an analysis of occupational change in Great Britain and Germany, Longhi and Brynin (2010) find that the change of jobs (which also involves the change of occupation) is, on average, beneficial since the wage of workers who change jobs increases more than the wage of workers who do not change jobs. This study is focused on wage as the main aspect of job satisfaction and also measured it at the moment of change. Even though theory recognises several dimensions of job satisfaction (like significance and autonomy of work undertaken or skills needed) the benefit that is

measured here is a financial one – wage. Even though job satisfaction is not all about wage studies highlight that wage is a big part of job satisfaction (Hamermesh, 1999).

Empirical studies normally estimate wage change at one point in time and control (with a dummy variable) whether a worker changes job. The coefficient of such a dummy variable explains the difference in wage change between those who changed jobs and those who have not changed jobs. Abbott and Beach (1994) use this approach to investigate the dynamics of wage change, for female workers in Canada, that comes as a result of a job change. They find that job change is responsible for the short-run wage increase of up to 9%.

In an analysis of wage growth and job turnover, Bartel and Borjas (1981) find that labour mobility substantially determines not only wage levels but also the dynamics of wage growth. However, this pattern is also age-dependent. The workers who changed jobs voluntarily experienced a wage increase, if they changed in the early career. Labour mobility negatively affected the wages of more senior workers who decided to change job later in their career. Campbell (2001) suggests that there are two types of wage changes that come as a result of a job change. The first one is short-run wage change that happens at the moment of a job change. The second one is long-run wage change which incorporates the effects of job change and on the job wage growth due to company productivity and worker skills.

Therefore, it is hard to make a difference between those whose wage changed due to company change and those who stayed within the same company but also experienced wage change. The most accurate is an estimation of short-run wage change as the comparison between workers who changed jobs and those who stayed within the same job is difficult in the long run since there is on the job wage growth for stayers caused by unobservable factors. This is pointed out by Campbell (2001) who found that wage increase arising from the job change, over the three years period, is about 10%. Only four-tenths of this growth is related to a job change, while the rest is related to the higher rate of on the job wage growth. Widerstedt (1998) finds that returns on work experience are higher for workers who change jobs than for those who do not change. However, it is not directly caused by the change but rather by the accumulated knowledge and experience. In sum, the literature has not come the conclusive answer as to whether changing jobs positively affects wages. It is suggested that this is an empirical question whose answer may depend on several contextual characteristics, therefore it is difficult to make a hypothesis.

2.2.2 Foreign ownership effect

Conceptual literature

The literature shows that not only changing jobs influences worker's wage but also that MNEs pay higher wages than domestic companies. There have been several studies trying to evaluate the impact of FDI on worker wages. A review of those studies is provided by Barba Navaretti et al. (2004) who offer theories that suggest that MNEs support labour development in host countries, by offering new jobs that require higher skills, thereby encouraging students to attend universities (Blomstrom and Kokko, 2002).

There is a view that MNEs pay higher wages to different workers because they tend to concentrate in knowledge and technology-intensive industries that require higher wages The theory of MNEs proposes that in order to engage in FDI companies need to have a firm (or ownership)-specific advantages, like knowledge or technology, so it is expected for MNEs to emerge in knowledge and technology-intensive industries and create high-quality jobs that require more educated workers (Dunning, 1998). If advanced technologies and knowledge is the main source of MNE ownership advantage, more educated workers would be demanded by foreign companies and their compensation is also higher.

According to Fosfuri et al. (2001) over time MNEs find it expensive to pay expatriates and try to train local labour that could take over some of the technical and managerial positions. They also argue that labour is less mobile if there is adequate training in the workplace. MNEs perceive investments in labour as a way to keep them within the company and avoid the spillover of knowledge to local competitors.

A high worker turnover means that MNE workers may start working for domestic companies which leads to knowledge spillovers and thus provides competitive advantages to their domestic competitors. Moreover, Gorg et al. (2007), in their analysis of Ghanaian employers, find that employees of foreign companies, on average, stay longer with the same employer than those in domestic companies. It is suggested that labour mobility can serve as a channel for technology spillovers from FDI. MNEs can transfer its technology to its subsidiary only after local staff has been trained, while later they can be hired by domestic companies.

In addition, Egger and Kreickemeier (2013) suggest that wage differences are related to firm characteristics, so more productive firms which make higher profits will pay higher wages, regardless of ownership. In fact, they argue that if two types of companies, foreign and domestic have the same level of productivity, there will be no foreign wage premium. It is proposed that wage premium is related to the company's global, not national profits and that only more productive companies pay higher wages.

The literature identifies some more reasons for foreign companies to pay higher wages than domestic companies, to similar workers doing similar jobs (Heyman, 2007). First, one of the explanations, why MNEs pay higher wages, is that there is lower job security in foreign companies that they need to compensate for with higher wages. This is related to the probability of MNEs to close plants and reallocate their activities (Bernard and Sjoholm, 2003). Once controlled for size and performance, MNEs are more footloose and more likely to close than domestic companies.

Second, MNEs may be forced to pay higher wages due to the labour market information asymmetry that puts MNEs in a disadvantaged position when it comes to finding best workers, due to the absence of local networks. Labour market imperfections, therefore, induce MNEs to offer higher wages to attract the best workers (Girma and Gorg, 2007).

Third, to the extent that foreign companies are more productive than domestic and that their productivity advantage comes from ownership advantages such as technology or knowledge, they would offer higher wages to avoid high worker turnover.

Fourth, since effective use of ownership advantages, such as superior technology and knowledge requires more skilled labour, MNEs invest in employee training substantially more than domestic firms. In order to avoid losing that investment and letting workers *spin-off* to competitors, MNEs tend to offer higher wages (Fosfuri et al., 2001). Gorg et al. (2007) suggest that foreign wage premium is not an automatic result of company change but a more gradual process.

This implies that foreign wage premium is gained over time because workers become more valuable to the company after they have gone through substantial training and acquired job-specific experience. MNEs have shown to be larger, more productive, have better access to capital through headquarters and have higher profits, which can also explain more investments in employees and more expenditure on wages. The contribution of foreign companies to the labour market is seen not only as a contribution to employment but also to the training of labour that later may also become available to local competitors or can start their own businesses due to experience from MNEs (Dunning, 1988; Narula, 1996).

Furthermore, Miyamoto (2003) suggested that by investing in employee training, not only FDI contribute to the development of worker skills but also that it leads to the gradual increase in the quality of MNE operations as greater skills of labour attract better quality FDI. The better the quality of FDI the better the quality of jobs offered which leads to higher wages.

All of those factors are expected to positively affect average wages (Earle et al., 2012). Whether foreign ownership will have a positive or negative impact on individual worker's wage depends on human capital quality, but also on the presence of domestic MNE competition, which is not as strong in developing countries as in developed ones. The most productive companies can bear the costs from the liability of foreignness and are prone to become MNEs. Since domestic companies in developing countries are less productive (as they are further away from the technological frontier) than MNEs, foreign wage premium may exist.

However, MNEs face greater competition in developed countries where domestic companies are closer to the technological frontier, therefore there may be lower foreign wage premium in developed countries. The technological gap between home and host country of MNEs plays a role in foreign wage premium. Consequently, it is no surprise that research in this field has shown that FDI impact on wages in developed countries is, on average, neutral and positive in developing countries (Javorcik, 2014).

Empirical literature

The empirical work on foreign wage premium can be organised around three main aspects.

The first is focused on the change of company ownership, while workers remain the same, investigating whether the change of company ownership influences wages paid by the company (Hijzen et al., 2013; Heyman et al., 2007). The second is focused on comparing average wages in MNEs and non-MNEs (Heyman, 2007). The third is focused on the impact of company ownership on wage change by observing worker

movement between the companies and considering individual worker characteristics (Martins, 2011), which is most closely related to this study.

Analysing the change of company ownership via foreign takeovers in Sweden Heyman's et al. (2007), found at the company level that foreign ownership caused about 11% increase in wages, even after controlling for industry characteristics. However, company-level analysis is not perfect. As authors acknowledge, foreign acquisitors tend to target domestic companies that already pay above-average wage.

Therefore Hyeman et al. (2007) compare wage differences between foreign-owned MNEs with domestic MNEs. It is concluded that wage differences at the worker level are not driven by foreign company ownership and that actual wage differences are between MNEs and non-MNEs, rather than between domestic and foreign companies. This means that a big proportion of discrepancy in wages between companies with foreign and domestic ownership is explained by their level of multinationality. The foreign ownership wage premium is then only 2% and the difference between foreign and Swedish owned MNEs is almost zero.

The findings produced by Heyman (2007), at the worker level, show that foreign companies pay about 4% higher wages than domestic ones, but when accounting for individual characteristics such as experience and education, the coefficient drops to about 2.5%. However, it has been argued that majority of studies analyse the causal effect of change in ownership by observing domestic companies, that have been acquired by MNEs, as foreign ones but without observation of employee changes that come together with acquisitions – the dismissal of unskilled workers and hiring of skilled workers, which can bias foreign wage premium upwards (Hijzen et al., 2013).

Hijzen et al. (2013) study the impact of company ownership on wage changes in developed and developing countries separately, in a comparable cross-country analysis of the UK, Germany, Portugal and Brazil, Indonesia, at the company level and at the worker level.

Hijzen et al. (2013) confirm that in less developed countries there is a greater difference between foreign and domestic wages. At the firm level, an increase in wage due to the acquisition of the domestic company by a foreign one would be between 2% and 21% higher wage in Germany and Indonesia, respectively. However, as confirmed by both Hijzen et al. (2013) and Heyman (2007), an estimated foreign wage premium is significantly reduced at worker level when individual characteristics can be controlled for. Even after controlling for those factors, foreign ownership maintains a significant effect on mover's wage.

Workers who move from domestic to foreign companies experience a wage increase (of about 1% in a developed country like the UK and about 6% in a developing country like Brazil), while those who move in the opposite direction have no or even negative effect on their wage. The results on labour mobility imply that the difference between the company and worker-level analysis are not just due to the different characteristics of workers but also due to the impact of foreign ownership on wages of incumbent versus newly employed workers. Hijzen et al. (2013) attribute foreign wage premium to the increase in the quality of jobs provided by foreign companies.

An analysis most closely related to the one in this chapter is the one conducted by Martins (2011), based on Portuguese data. He found that workers moving from domestic to foreign companies experience an average wage change of 18%, while those moving in the opposite direction experience an average wage change of -8.4%. This study specifically focused on labour mobility (workers changing between foreign and domestic companies) rather than companies changing ownership. The same approach is used in this chapter as it allows observation of the same worker so disentangling of the different ability of workers and company's wage is possible. However, workers may work for low paying domestic companies, in which case a change from domestic to a foreign company would most likely provide bias results.

This possibility is controlled for since firm-specific characteristics are taken into account. Moreover, it is not only about wage change at the moment of a job change but also about wage growth in the long run. Martins (2011) also finds that workers who move from domestic to foreign company experience higher wage growth (about 4%) than those who move from foreign to the domestic company (about 2%). Therefore, job change in the direction from domestic to a foreign company is expected to have not only a positive impact on wage change but also on wage growth. Similar results have been found for Germany and Norway where moving from domestic to foreign company leads to a wage increase (Balsvik, 2011; Andrews et al., 2010).

Andrews et al. (2010) suggest that job change causes a temporary wage increase but also long-term growth. At the same time, this wage increase is substantially smaller than what is found at the company level- when the ownership status of the company changes due to foreign acquisitions, not because of labour mobility. Andrews et al. (2010) also find that take over effect on wages is smaller than job change effect. This allows avoiding potential bias, since, at the firm level, companies can replace unskilled workers with more expensive skilled workers. Another important finding is that those who move from domestic to foreign experience a positive wage change, much higher than wage decrease experienced by those who change from foreign to domestic (Andrews et al., 2010).

Overall, there seems to be a consensus in the literature that there is a wage premium associated with foreign-ownership of a firm, mostly evident in developing countries. Therefore, based on the discussed literature about foreign wage premia, the first hypothesis is proposed:

Hp1: A change from domestic to a foreign-owned employer is positively associated with an increase in wage.

2.2.3 Heterogeneous effects: the role of workers' education

Following Jovanovic (1979), one needs to allow for the fact that workers are heterogeneous, which means that they differ in productivity just like in knowledge and skills. The growth of wages is, therefore, supposed to reflect the worker's different ability. At the same, the labour market information asymmetry results in uncertainty about labour productivity before employment. Consequently, as proposed by Campbell (2001:4), "the starting wage offered by companies is based on the expected value of productivity given the information available at the time the job commences.

When starting the new job, there may initially be great uncertainty over actual productivity which implies that as new information arrives, future earnings may rise considerably above or below the starting wage".

Managing worker's wage is an important aspect of human resource management which is responsible for success of MNEs. The specificity of the MNE is the ownership advantage that derives from knowledge, i.e. human capital of the firm. Therefore, human resource management is the core element of the MNE ownership advantage. There is a complementarity between company's human capital and financial performance (Narula & Verbeke, 2015). The more educated workers generate more knowledge and stronger ownership advantages for foreign companies, thus they are offered higher wages. This is one of the ways to reward valuable workers, the way MNEs appreciate employees has long-term consequences on the company's organisational strategy (Andersson et al., 2019).

Whether wage will rise or fall after the job change depends on some measurable factors, such as worker's education or experience with previous employers, but also on factors that can not be measured precisely, such as worker's skill match with the job requirements (Widerstedt, 1998). According to Heyman et al. (2007), those who change companies also have work experience with the previous employer that might be valuable. Therefore, it is concluded that wage changes are driven by worker heterogeneity, or "heterogeneity effect".

According to Gorg et al. (2007), controlling for the education and other worker characteristics, the coefficient of foreign ownership is reduced but positive and highly significant. A 1% increase in foreign ownership leads to an increase in the hourly wage of about 0.45%. Batra and Tan (2002) support this argument and also find that there are high productivity gains from MNE training. Not only is the training provided valuable for the work that employees conduct but it also provides them with personal satisfaction and the sense of being valued. It is found that employee training results in productivity gains of up to 75% in Indonesia or Nicaragua and up to 45% in countries like Mexico or Malaysia.

With the observation of wages and US MNE activity in Mexico in the 20th century, it was found that FDI are positively correlated with the demand for highly skilled labour (Feenstra and Hanson, 1997). The study observes the activity of regional manufacturing facilities since a big share of employment was generated by the outsourcing of US MNEs. The regions with the biggest concentration of FDI were also the regions with the biggest increase in the share of skilled labour in total wages.

Abbott and Beach (1994) find evidence that education of workers matters for a wage increase when changing jobs. Those with university degree experience higher wage change when changing jobs than workers with lower educational attainment. Their argument is that more educated workers have greater ability to absorb knowledge at the workplace and use it productively at the new workplace. Therefore, the level of education is a moderator of the relationship between job mobility and wage, in addition to accumulated firm-specific human capital, but it is also an important determent of job change itself. Sousa-Poza and Henneberger (2004) find that more years of schooling cause higher propensity of a job change. This is because the transition between two jobs

and adaptation to a new environment is more easily overcome by more educated workers (Bowlus and Neuman, 2006). Therefore, there are objective expectations that education would play a critical role in wage growth (Mincer, 2012).

Moreover, more educated workers benefit more from the move from domestic to a foreign company because the complexity of tasks is assumed to be greater within foreign companies. MNEs use more complex technologies and require more skilled workers. Those that move to MNEs experience higher wage growth if they have higher education (Abbott and Beach,1994).

Hijzen et al. (2013) suggested that foreign ownership does not have a direct impact on wages, but rather indirect, through MNE creation of high-quality jobs. On the other hand, Andrews et al. (2010) suggest that there are individual worker characteristics that drive this wage increase. For example, foreign companies employ more productive workers with higher education, so it stands to reason that the more educated workers are those that can expect the highest wage increase when moving to an MNE.
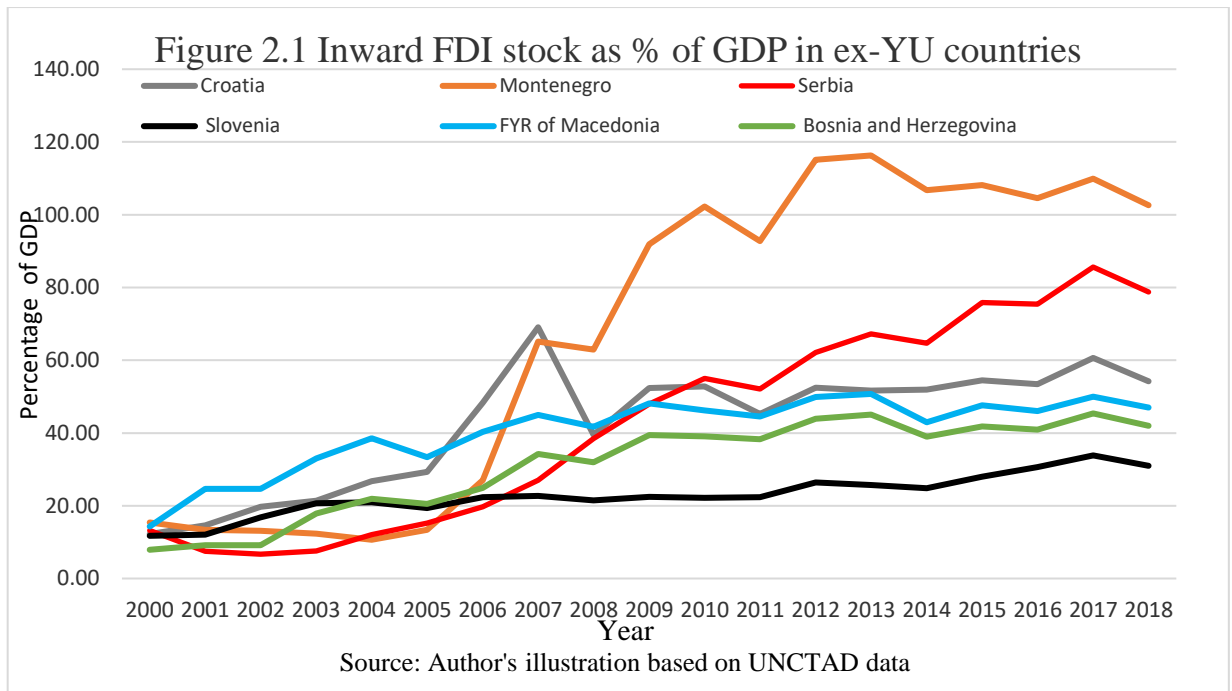
A similar argument is developed by Poole (2013) which, although predominantly focusing on the spillovers from MNEs to domestic companies through workers who move from one company to another carrying knowledge, social capital or management style, she suggests that more educated MNE employees benefit more from positive wage change, when they move to domestic firms than less educated employees. The argument is that higher-skilled former MNEs workers are better able to convey information and technology to domestic company workers and that higher-skilled domestic company workers are better able to absorb new technology through interactions with former MNE workers. The largest spillovers occur when former MNE workers have greater educational attainment and experience compared to domestic company workers (Poole, 2013)

Based on the discussed literature about the role of individual worker characteristics in wage change, the second hypothesis is proposed:

Hp2: More educated workers benefit more from changing from domestic to the foreign-owned company than less-educated workers.

2.3 Methodology and data

The empirical analysis will be conducted on the case of Serbia, relying on employer-employee data for the period from 2000 to 2014, provided by Serbian Social Register. This is a particularly interesting period for this kind of analysis since inward FDI in Serbia were negligible before 2000 and grew at a high rate after that, which is explained by political changes and liberalisation policies that favoured foreign capital. As presented in Figure2.1 the flow of inward FDI to Serbia was among the highest in the region. With the exception of early post-NATO aggression years, when investments were stagnating, there was a sharp increase in inward FDI to Serbia. After 2009 among former Yugoslavian republic only Montenegro had higher inward FDI.

Figure 2.1 Inward FDI stock as % of GDP in ex-YU countries

Source: Author's illustration based on UNCTAD data

As shown in Figure2.2 inward FDI stock as a percentage of GDP to Serbia started at about 13% in 2000 and reached almost 80% in 2018. However, an average GDP per capita fluctuated slowly from about 4000 US$ in 2000 to about 6800 US$ in 2018 which is only 33% increase over the period of 16 years, meaning that average annual GDP growth was just about 2%.

Figure 2.2: Serbia: Inward FDI stock % of GDP and GDP per capita
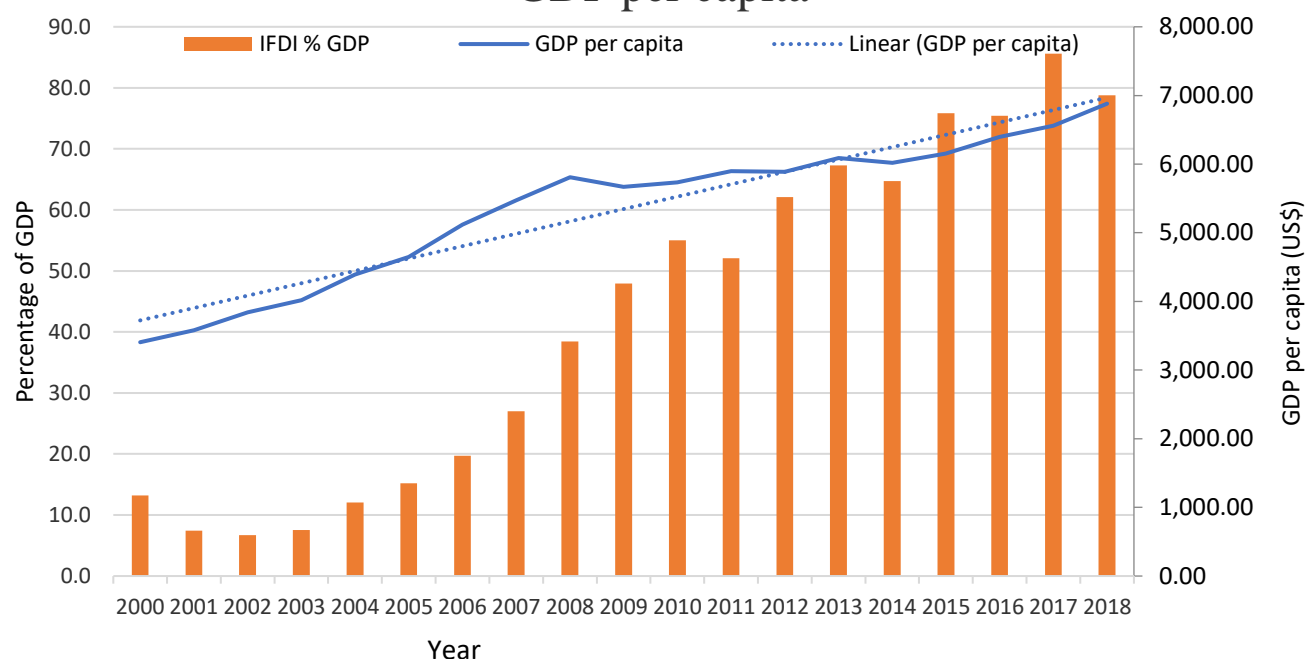
Source: Author's illustration based on UNCTAD data

Serbia is an interesting case as, just like all the other former socialist countries, it formulated economic policies based on FDI-driven economic growth. After the political changes in 2000, as all of the countries in the region, Serbia based its FDI policies on big subsidy packages, which included the provision of a free arrangement of urban construction land, corporate tax exemptions and up to EUR 10.000 subsidy per every new job, under the conditions of Development Agency of Serbia[12]

This study focuses on employer-employee data, where the same worker is tracked over the period from 2000 to 2014. This also means looking at the whole history of inward FDI in Serbia, since data is observed from the year 2000 when MNEs started investing in Serbia via FDI. The dataset allows observation of employee gross annual wage, education level and employer ownership (foreign vs domestic)[13]. The entity is considered foreign if 10% or more is held by a foreign national, in line with International Monetary Fund criteria.

Even though there are suggestions, like Heyman (2007) that "multinationality" matters and that main wage differences are not between domestic and foreign companies, this chapter does not analyse the difference between domestic and foreign multinational companies. This is not only because of data constraints but also because Serbia, as a transition country, does not have many privately-owned domestic MNEs. As a matter

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[12] http://ras.gov.rs/en/invest-in-serbia/why-serbia/financial-benefits-and-incentives
[13] See Appendix 2.1 for variable explanation and descriptive statistics

of fact, there is barely a few of them, and that is also reflected in extremely low outward foreign direct investment flows (UNCTAD, 2019).

The dataset is provided by Serbian Social Register and it contains 1500 individuals randomly chosen among people born between 1965 and 1975. No individual retired within the observed period. As of 2014, Serbia has 3.1 million people available (active) at the labour market, 2.5 million people are employed (out of them 700.000 work in public sector) and the unemployment rate is 19%.

The sample excludes employees in the public sector and in state-owned enterprises. The sampled individuals have worked in about 3000 private companies in the observed period. None of the companies changed ownership via acquisitions. This allows focussing on workers changing companies rather than on companies changing ownership. The data allow identifying only changes from foreign to domestic and from domestic to foreign companies, investigating whether such a change has led to a change in wage.

However, due to data limitation, it is not possible to identify workers changing jobs within the same type of company ownership, i.e. from domestic to domestic or foreign to foreign. Within the group of workers that do not change jobs, there could be some that actually do. Workers moving from domestic to domestic and from foreign to foreign cannot be distinguished from workers staying in the same company. I submit that if this was considered the differences in wage between those who change jobs and those who do not would potentially be even higher.

The data allows measuring not only differences in wage growth when workers move from domestic to foreign compared to moves foreign to domestic but also to compare wages of foreign to domestic movers with wages of workers that stay in domestic firms only.

Due to data limitation, the hourly/daily wage cannot be observed and similarly the overall number of days an individual worked during a year is not available and neither the days a worker was employed for domestic and foreign companies. This is an issue because in the year workers changes jobs they would have a wage from both the foreign-owned and domestic-owned firms, which cannot be compared, due to different job spells.

I deal with this data limitation by considering the growth in wages from one year before changing jobs to one year after changing job (thus excluding the year the workers change employer). There are some robustness checks where I take longer periods before and after changing jobs. The data cleaning procedure involved removal of observations with extreme values for wage change (over 3000%). Some individuals were missing wage data for the year after the change. Therefore, the final sample included 984 individuals.

Every individual's wage is observed in relation to the company of employment. The wage change (Y) is computed as a percentage change between a wage one year before and one year after the change of the company. In the year of change from domestic to a foreign company, the dummy variable DF takes value 1 and in the year of no change, it takes value 0. At the same time the variable change (N) itself is constructed, that is

the association between changing jobs and wage, regardless of whether it is from foreign to a domestic company or vice versa. The variable "N" takes value 1 if the worker changed employer and 0 otherwise.

Additionally, the change in wage is computed also for a group of individuals who did not change companies. In other words, two additional variables are created for foreign company workers only (F) and domestic company workers only (D). Variable "F" takes value 1 if individuals worked for a foreign company only and 0 otherwise and "D" takes value 1 if individuals worked for a domestic company only and 0 otherwise. Their wage change is observed on a year-on-year basis. They are part of the control group, which means they worked for foreign or domestic company only, but their wage change is observed with respect to workers who changed employers.

The education (E) of workers is constructed based on five education levels. Education variable takes value 1 – primary school, 2 – secondary school, 3 – upper secondary, 4 – university bachelors degree, 5 – university masters degree. The median education of the worker is computed during the whole observed period and used as a time-invariant variable.

2.4 Econometric analysis

This section presents the results of the econometric analysis. The idea is to estimate how the dynamics of wages differ in workers that moved from domestic to foreign-owned firms, as opposed to those moving from foreign to domestic-owned firms, and those remaining in domestic or in foreign-owned firms.
In equation (1) the purpose is to investigate whether the change of job drives the change of wage:

$$(1) \quad Y_{it} = \alpha + \beta_1 N_{it} + \delta_1 E_i + \varepsilon_{it}$$

where
Y is the wage change, for worker i at the time, t
A is constant
N takes value 1 if the worker changed between companies, and zero otherwise
E is a measure of workers' education level, constructed as an ordinal variable taking values from 1 to 4, where 1 = primary school, 2 = secondary school, 3 = undergraduate degree, 4 = masters degree.
ε_{it} is the error term.

In equation (2) the purpose is to investigate whether wage change at time t (between t-1 and t+1) is driven by company ownership:

$$(2) \quad Y_{it} = \alpha + \beta_1 DF_{it} + \delta_1 E_i + \varepsilon_{it}$$

In equation (2) DF takes value 1 if the worker moved from domestic to a foreign company in a year, and zero otherwise
It is further distinguished, in equation (3), N-type of workers in those that remain in domestic firms D and those that remain in foreign firms F

$$(3) \quad Y_{it} = \alpha + \beta_1 DF_{it} + \beta_2 F_{it} + \beta_3 D_{it} + \delta_1 E_i + \varepsilon_{it}$$

where

D takes value 1 if the worker remained in domestic companies, and zero otherwise
F takes value 1 if the worker remained in foreign companies, and zero otherwise

In order to test whether the level of education moderates the effect of worker mobility on wage change, we estimate the following equation (4):

(4) $Y_{it} = \alpha + \beta_1 N_{it} + \beta_2 DF_{it} + \delta_1 E_i + \beta_3 DF_{it} * E_i + \varepsilon_{it}$

The coefficient β_3, associated with the interaction between education and change from domestic to foreign company dummy (DF*E) captures whether more educated workers benefit more from moving from domestic to a foreign company.

I also run regressions where main explanatory variable FD is substituted with DF=1-FD. This is just a way to present results in a different form, which allows to show whether workers moving from foreign to domestic firms enjoy some wage discount, as opposed to those staying in foreign or domestic firms.

2.5 Results

The descriptive data overview shows that, on average, MNEs pay higher wages than domestic companies. As presented in Figure2.3, over the period from 2000 to 2015 foreign wages have been consistently above those paid by domestic companies, with national average wages fluctuating somewhere in between those two.

Figure 2.3: Salary average (log) - domestic vs foreign
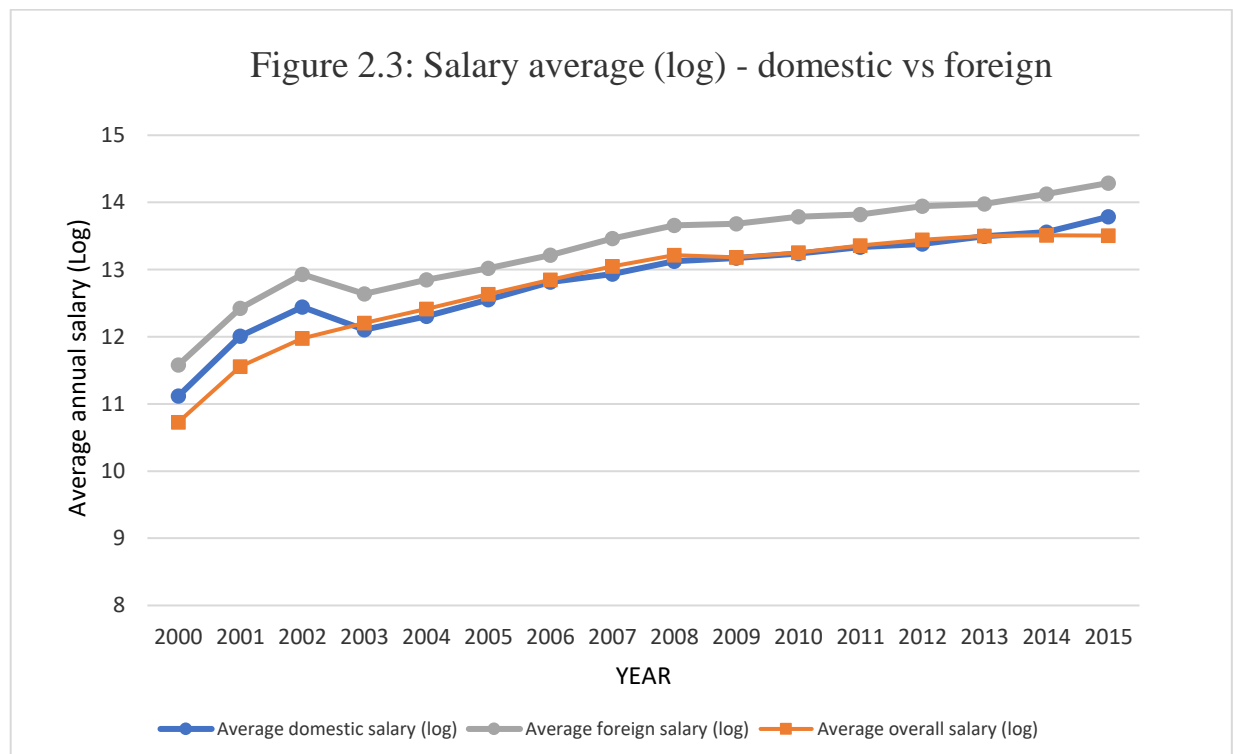
Source: Author's illustration based on Serbian Social Register data

However, if observed individually (Figure2.4 and Figure2.5), in both types of companies more educated workers receive higher wages than less educated ones.
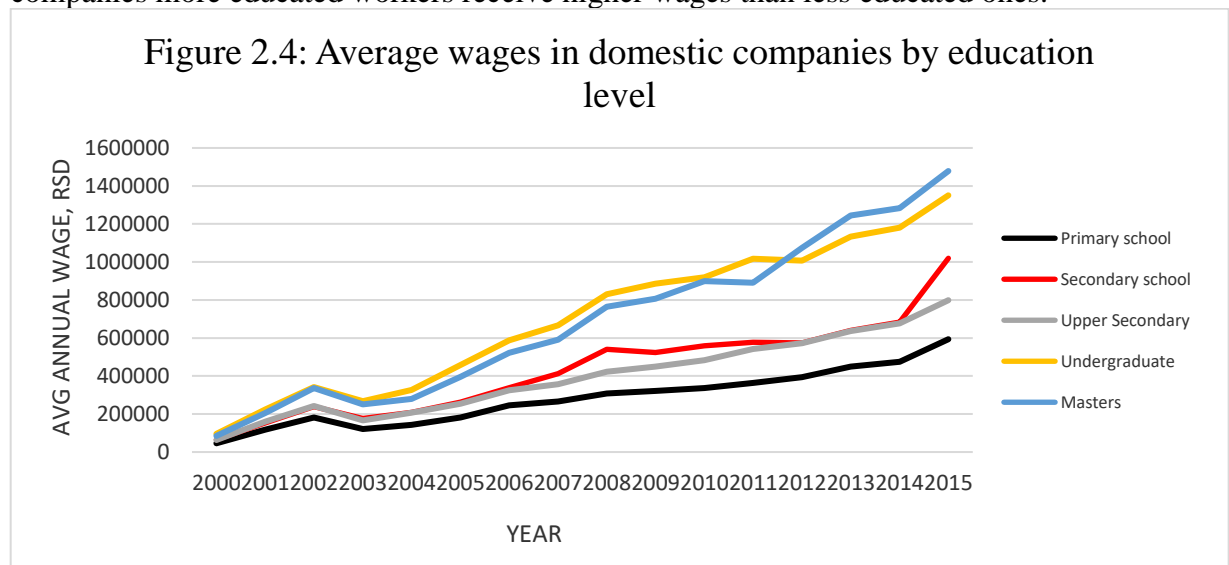
Figure 2.4: Average wages in domestic companies by education level

Source: Author's illustration based on Serbian Social Register data

Figure 2.5: Average salaries in foreign companies by education level
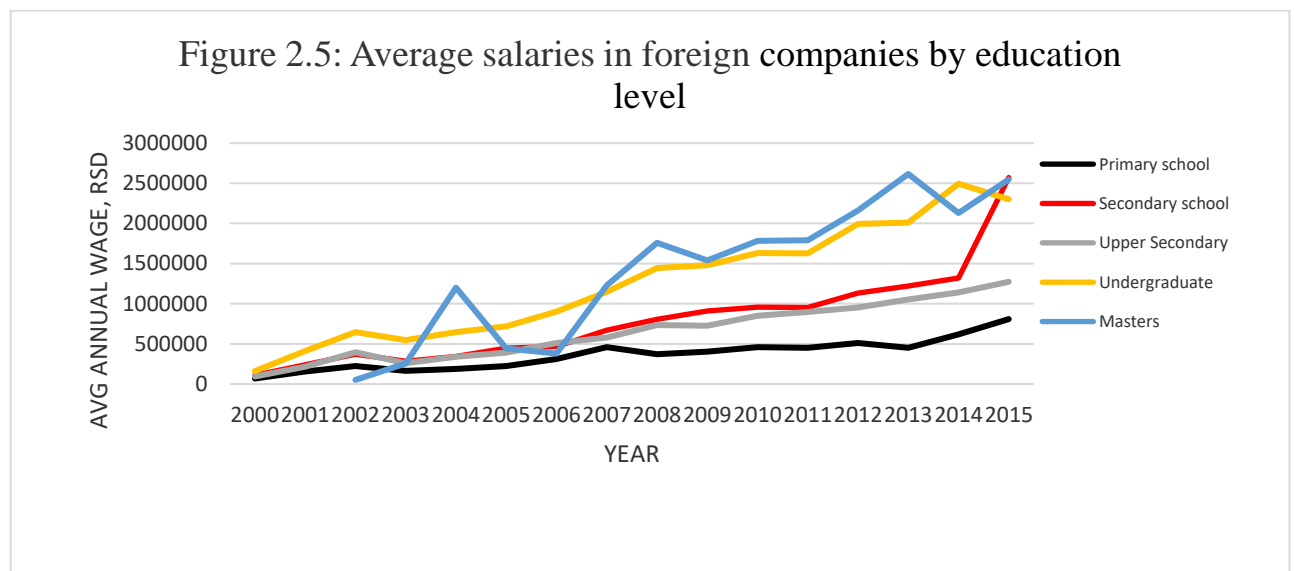
Source: Author's illustration based on Serbian Social Register data

Over the observed period (2000 to 2015) a vast majority of workers that changed employers (about 83%) did it only once during their career. Furthermore, local firms experience an influx of former MNE employees indeed. In the observed sample, 63.4% of workers changed from foreign to a domestic company. On the other hand, there are 22% of those who change from domestic to foreign companies.

The regression output shows that the model has high explanatory power. About 18% of the variation in wage is explained by domestic to foreign company change. According to Table 2.1, column (1) there is already a positive impact on wage change with the job change, regardless of the direction. Those that change jobs have about 80% higher wage growth relative to those that do not change. However, as shown in column (2), with the change from domestic to a foreign company, that impact is even greater. On average, a change in the wage of workers moving from domestic to the foreign firm is more than

90% higher than the change of wage for workers that either do not change employers or move from foreign to domestic. It is not about doubling the wage but having higher growth. For example, if the wage of those who change from foreign to the domestic company increases by 2%, the wage of those who change from domestic to foreign would increase by 4.2%.

Table 2.1: The effect of job change on wage

VARIABLES	(1)	(2)	(3)	(4)
	Y			
N	83.61***			61.42***
	(7.591)			(13.11)
DF		92.61***	32.30**	-13.99
		(9.081)	(15.91)	(34.19)
F			-53.60***	
			(14.31)	
D			-62.21***	
			(13.32)	
E	6.461***	6.401***	6.605***	6.517***
	(2.312)	(2.314)	(2.315)	(2.241)
DF*E				21.28*
				(13.98)
year dummies	yes	yes	yes	yes
Constant	-85.24***	-85.24***	-24.20	-99.70***
	(14.86)	(14.87)	(19.82)	(15.66)
Observations	14,756	14,756	14,756	14,756
R-squared	0.187	0.186	0.188	0.188

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

When controlling for the wage growth of non-changers, in column (3), it is noticeable that changing job from domestic to foreign company leads to a positive wage change compared to those who stay in foreign or in domestic companies only. Those workers that change from domestic to the foreign company have a 32% higher wage change compared to those who change from foreign to a domestic company.

Finally, as shown in column (4), there is a direct effect of education and it is unrelated to changing jobs and ownership change. Workers with higher education have a higher change in wage and that is independent of the fact that they change jobs. This also means that there is a divergence in wages between more educated workers and less-educated workers. The results in column (4) show that there is a positive and significant moderating effect of education. The least positive effect of job change is for workers with the lowest education level, while the workers with the highest educational attainment experience higher wage increase. This supports the view that MNEs reward

relatively more the higher educated workers, which are key to maintaining and developing ownership advantage of the MNE.

Interestingly, the change from domestic to a foreign company is completely insignificant in column (4) as all the effect is captured by the interaction of that change with education. In other words, there is no effect of the job change for workers with education below secondary education (E=2).

2.6 Robustness checks

The wage change in Table 2.1 was observed one year before and one year after company change. In order to test the validity of this observation, the robustness test estimates the impact of company change on an average wage change two years before and two years after (Table 2.2). However, results remain qualitatively the same. The change from domestic to a foreign company causes a significant change in wage, and the more educated workers the higher the wage change. However, in this case, the direction of change (domestic to foreign) matters and not the change itself. If the same analysis is conducted on the basis of wage change that is computed as an average change three years before and three years after the company change, the results remain very similar. Although this reduces the number of observations, it confirms the robustness of the analysis.

Table 2.2: The effect of job change on wage
(2 years window)

	(1)	(2)	(3)	(4)
VARIABLES	**Y** (2 years window)			
N	77.35***			29.13***
	(4.960)			(8.706)
DF		98.41***	69.93***	-28.95
		(5.901)	(10.40)	(22.83)
F			-28.60***	
			(9.471)	
D			-29.05***	
			(8.737)	
E	7.439***	7.439***	7.475***	7.976***
	(1.287)	(1.287)	(1.289)	(1.610)
DF*E				45.07***
				(9.319)
year dummies	yes	yes	yes	yes
Constant	8.984	8.984	37.98***	-8.724
	(8.974)	(8.960)	(12.51)	(9.620)
Observations	10,363	10,363	10,363	10,363

R-squared	0.100	0.102	0.103	0.108

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2.7. Conclusion

This chapter contributes to the empirical literature on wages and foreign ownership, by studying the case of Serbia, with rich employer-employee data. The literature about labour mobility and wage change showed that job change is not always related to an increase in wage. There are many additional factors that influence wage change. There are demographical characteristics like age, gender and etc. Some of the studies suggested that within rather than across occupation change is important. However, the literature also found that company ownership and worker characteristics are independent drivers of wage change. The foreign wage premium has been mostly observed in developing countries since domestic competitors lack knowledge and technology to compete with MNEs (Hijzen et al., 2013).

The findings of this study are in line with that expectation since it was found that not only MNEs in Serbia pay, on average, higher wages, but also that they pay higher wages to similar workers, so the pure change from a domestic to a foreign company leads to the wage change. Although most of the lessons from this study are based on Serbian data, results are in line with those obtained in other countries, so the message applies more generally.

At the same time, data limitations such as the possibility to identify workers who change jobs within the same type of company ownership (domestic to domestic or foreign to foreign), may suggest that salary change occurs even when labour moves within the domestic sector. Furthermore, there are also other worker and company characteristics (like worker experience with a previous employer or company industry) which are not observed, so strong causality as such cannot be claimed. As Gorg et al. (2007) suggested, even with the observation of different worker and company characteristics and accounting for the training provision, it is hard to isolate particular causes of foreign wage premium since there are factors like experience, social capital and learning by doing which are hard to measure.

The results are not simply suggesting that MNEs pay higher wages, on average, as some of the literature so far proposed, assuming that MNEs employ a greater proportion of skilled workers. More educated workers who change from domestic to foreign companies are benefiting more from such a change than less-educated workers. This is in line with Heyman (2007) finding that higher education of workers has a positive impact on average wage change. Kidd (1991) also confirms the positive relation between years of schooling and the probability of changing companies. There is a 21% higher wage change for more educated workers who move from domestic to a foreign company.

It is important to highlight that job change may be the result of dismissal or voluntary change. However, the dataset used in this study does not provide any information about dismissals. There is a possibility that foreign wage premium is driven by the fact that workers are dismissed by the foreign company and have to accept a lower salary at the

domestic company. Nonetheless, there are other foreign employers available for dismissed workers.

This chapter also shows that workers with higher education have a higher change in wage and that is independent of the fact that they change jobs. On top of this, the wage gain from moving to foreign MNEs is concentrated in the more educated workers. This also means that there is a divergence in wages between more educated workers and less-educated workers.

Although there is a strong correlation between wage increase and company change, it is unknown whether this is caused by asymmetric labour market information, higher productivity within MNEs or higher investment in training. The argument of training as a driver of higher wages in MNEs can be laid out based on previous studies but it is not a variable controlled for in this chapter.

The findings have important policy implications. First, attracting MNEs will possibly increase the wages of Serbian workers. This is certainly good news since it can increase welfare and consumption, thus boosting growth in the Serbian economy. However, since these gains will be disproportionally internalised by more educated workers, one needs to consider the resulting wage inequality arising between workers and the potential tensions that this could create. The evidence provided by Figini and Gorg (2011) shows that wage inequality in developing countries increases with inward FDI stock (as a percentage of GDP). As suggested by Hale and Xu (2016) this is mostly due to the FDI bringing more sophisticated technologies and managerial practices in secondary industry, which demands more educated workers.

Consequently, higher demand for more educated labour leads to higher wages for this group of workers creating the gap between more and less educated. However, this effect diminishes as countries come closer to the technological frontier. By measuring total wage inequality[14] Figini and Gorg (2011) found that, while on one hand, there is evidence that FDI, on average, increases wages in host countries making some workers better off in absolute terms, undermines balance in wages among skilled and unskilled workers (Figini and Gorg, 2011).

Second, the evidence is consistent with the idea that attracting MNEs can leverage investments in education. The larger the share of workers with a higher level of education, the larger the benefits from attracting MNEs. However, while wage increase is good news for Serbian workers, it could have an adverse effect on local Serbian companies, which are likely to face the prospect of the best workers moving to MNEs, or having to pay higher wages in turn, to retain their workers. Without a corresponding increase in productivity, this may severely harm the competitiveness of Serbian companies.

A more precise answer to the question of MNE impact on labour could be provided with the observation of worker development within MNEs. In particular, the employee progress in the corporate hierarchy would reveal more than just the relevance of its education for the company. The foreign wage premium might be accompanied by other benefits like training but also by negative conditions such as inability to progress to

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[14] By means of Gini and Theil inequality indices

managerial positions in foreign companies. The employment of local labour at managerial positions in foreign companies would also indicate MNE contribution to higher wages The career progress and eventual pay rise over time would suggest that employee gains valuable experience in addition to its education. The possible directions for future research include observation of current SME owner's experience from MNEs, and looking at the spin-off effect rather than just the financial effect of MNE presence on labour market.

Appendix 2.1: Descriptive statistics and variables explanation

Variable	Label	Obs	Mean	Std. Dev.	Min	Max
Salary change	Y	14756	57.08401	211.6524	-100	2979.677
Domestic to foreign company change	DF	14756	0.0321903	0.1765112	0	1
Foreign company workers only	F	14756	0.0879642	0.2832525	0	1
Domestic company workers only	D	14756	0.8652074	0.3415135	0	1
Change of company	N	14756	0.0468284	0.2112783	0	1
Education	E	14756	2.144517	0.7101322	1	4
Education internaction with domestic to foreign company change	E*DF	14756	0.0700393	0.4006065	0	4
t - year, j - company, i – worker,						

Correlation coefficients

Variable	Y	N	DF	F	D	E	E*DF
Y	1						
N	0.0969	1					
DF	0.0935	0.8228	1				
F	-0.001	-0.0688	-0.0566	1			
D	-0.0591	-0.5616	-0.4621	-0.7868	1		
E	0.0269	0.0049	0.008	-0.0511	0.0394	1	
E*DF	0.0952	0.7888	0.9587	-0.0543	-0.443	0.0534	1

CHAPTER III: Employment and state incentives: Are subsidies for FDI ineffective? The case of Serbia

Abstract

This chapter analyses the effects of government subsidies for FDI on employment at the municipality level in Serbia, which is a showcase for other transition countries. It is found that, on average, subsidies per se are not a significant determinant of employment. In the period of subsidy based FDI attraction, once controlled for other relevant factors, municipalities which received subsidised investments have not experienced higher employment in comparison to the period of no subsidies and in comparison, to municipalities that never received subsidised investments. The failing part of subsidising policy is that subsidies are ineffective in creating additional jobs, beyond the jobs created by subsidised MNEs, there is no crowding in and there is some evidence of crowding out in the least developed municipalities. Some positive effects emerge, with a two-year lag, in the municipalities which, conditional on the level of development, have lower wages.

Keywords: Foreign Direct Investments; Subsidies; Employment; Local development

3.1 Introduction

At the 2016 "EBRD Western Balkans Forum", the Serbian prime minister proudly made an announcement to foreign investors that – "whichever country makes you a subsidy offer, come to us and we will give you even more, at least 5% more" (EBRD, 2016). This was a continuation of ten years long subsidy-driven FDI policy. Despite a long period of subsidies[15]-based policy for FDI attraction in Serbia, systematic evidence on the effectiveness of such policy is lacking. Yet, Serbia is not the only country to go along with the "subsidy crowd". In the last 20 years, 95% of all FDI policies around the world were favouring FDI with some sort of incentives (UNCTAD, 2011). Global trends in subsidies suggest that many countries around the world provide some sort of incentives to attract FDI, but they differ in terms of scope, targeted industry and the final goal of this policy.

According to Incentives Monitor (2018), since 2010 $200 billion worth of subsidies were given to companies that invested $1.5 trillion to establish or expand operations, creating 7 million jobs. It is reported that tax holiday (50%) and direct subsidies (40%) are the two most common forms of incentives. Most governments aimed to achieve greater investments and job creation. The average incentive per job reached its maximum in 2013 at over $48.000. Some operations may have high capital investment but very low worker salaries, while others can require low investments but produce high benefits for workers in terms of training and benefits. The incentives provided by developed countries mostly targeted high-quality investments.

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[15] According to OECD (2001) subsidy is any state policy which interferes in the market by favoring or discouraging certain economic activity.

For example, the US subsidised (with about 15% of total capital investment) *Apple* and *Exxon Mobile*, which are domestic MNEs, but also South Korean MNE *Lotte Chemical*, which has a high intensity of R&D operations. On the other hand, Slovakia provided a subsidy (also about 15% of total capital investment) to Austrian MNE *Mondi* – chapter/fibre packaging producer. This is to suggest that different countries may provide similar subsidies, but they target different classes of investors, thus their possibilities to benefit from potential spillovers and externalities are very different (Incentives Monitor, 2018).

Most of the literature in the field focused on investigating the relationship between FDI and GDP growth and addressing subsidies only indirectly or at the aggregate level. Furthermore, Narula and Pineli (2018) mention that the literature has investigated FDI and economic development by looking at the aggregate income and not so much at employment. Fighting mass unemployment, especially in rural areas has been stressed as the main reason for subsidy provision. It seems relevant to address the relation between subsidised FDI and employment.

The literature has identified various determinants of inward FDI, including macroeconomic, institutional, infrastructure, human capital factors. Government policies aimed at attracting FDI (like fiscal subsidies) are one of these important determinants. Agiomirgianakis et al. (2004) consider subsidies particularly important for the attraction of MNE investments. OECD (2017-1) reports that governments increased support for investments, particularly R&D activities, while global trends suggest that government subsidies have a positive correlation (0.4) with the attraction of R&D investments.

Countries like Germany and South Korea have disproportionally higher investments compared to their incentives. On the other hand, countries like Russia, France and Hungary provided more government incentives relative to received investments (OECD, 2017-1)

The FDI subsidising policy boomed in the late 1980s, in developed countries. For instance, MNEs from the auto industry in Japan expanded to the US with the use of host country subsidies, ranging from (per job subsidy) $11.000 for *Nissan* to $50.000 for *Subaru*. The subsidising policy spread out to developing countries, as the example of India giving over $200.000 per job created in the *Ford* factory shows (Thomas, 2010). The practise was later adopted by transition countries. For example, Central and Eastern Europe (CEE) radically liberalised FDI policies and countries in *Visegrad*[16] group started offering tax subsidies to attract FDI in the late 1990s, however, this practice was not a significant determinant for the level of inward FDI (Beyer, 2002).

The main difference between subsidy strategies in three types of countries was that developed countries, most often, adopted FDI facilitation and "after-care" programmes which encouraged the technological upgrade of production facilities. Some large developing countries required knowledge-sharing and joint ventures, which allowed them to adopt foreign technologies (Bellak at al., 2008) Instead, most transition countries offered generous subsidies and MNEs were asked to employ a certain number

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[16] http://www.visegradgroup.eu/

of workers at any (usually minimum) salary but were not required to engage in knowledge-sharing or establish linkages with local suppliers (Reiter and Steensma, 2010).

In the FDI race, countries seem to compete in the provision of tax breaks and subsidies to MNEs, although there is no evidence that subsidy-attracted FDI provide benefits to the local economy. There is also little evidence that MNEs wouldn't invest without subsidies (Chor, 2009). The "prisoner's dilemma" in this context is unavoidable. If governments were "prisoners" they would all be better off if they collectively decided not to provide subsidies. The greater frequency and value of investment incentives leads to greater competition among countries for inward FDI. As a result, every country is driving up the subsidy ladder, trapped in a vicious cycle of catching up with the level of subsidy given by another neighbouring country.

This study will investigate the issue of employment and subsidies at the municipality level, that is a new approach to whether subsidies for FDI attraction are justifiable from the macroeconomic perspective. Investigating the impact of subsidies for FDI on employment rather than on GDP growth allows for disaggregate results, while municipality rather than macro-level approach enables isolation of the effect of subsidies in municipalities with different levels of development. That is more relevant than aggregate data analysis as policy recommendations can be more precise.

As Filipovic and Nikolic (2017) noticed, despite decades of subsidy-based FDI attraction policy, no significant empirical work has been undertaken to analyse the effects of subsidising policy on employment and regional development. This is the first study of this kind based on Serbia and it is of great importance to evaluate the effects of subsidies. Its results may not apply globally as they are based on one country – Serbia, but they will very likely inform policymakers in other transition economies since their economic structure and subsidy schemes are very similar.

The main questions of this study are whether (1) subsidies are correlated with municipality level employment and (2) whether the effectiveness of subsidies is dependent on the level of municipality development.

The rest of the chapter is organised as follows: Section 3.2 provides theoretical support for subsidies and literature review of empirical findings of the expected impact of FDI on economic growth and employment. Section 3.3 is devoted to a description of data and methods. Section 3.4 is devoted to the empirical analysis of the relevance of state subsidies for municipality level employment. Results and concluding remarks are provided in Section 3.5 and Section 3.6 respectively.

3.2 Literature review

The literature review section is organised around three main lines of discussion in the literature about state incentives for FDI. Firstly, there is a review of the specific literature dealing with subsidies for FDI, modalities of subsidies and their effects in different countries. Secondly, there is a review of the literature that deals with the effects of subsidised FDI and justification for such policy, from the economic development point of view. Thirdly, absorptive capacity is discussed from the point of

view of the specific contextual conditions that might influence the impact of subsidised FDI on employment.

3.2.1 FDI and subsidies

Researchers have been investigating whether potential benefits from FDI are justified by the cost. One of the rising costs in FDI attraction are state subsidies. OECD (2001) reports that incentives in general, regardless of whether they target domestic or foreign companies, may be driven by the necessity to advance national R&D, fix market failures or increase employment of vulnerable groups of people or balance regional development. They also aim to provide the necessary services which are otherwise not profitable for the private sector (like transportation of citizens in remote areas).

Bellak et al. (2008) suggest that subsidies come as a result of government's intention to fix market failures in a situation where there is a large discrepancy between the social and private rate of return on investments. However, very often politically motivated subsidies are used in the absence of market failures since governments are under political pressure to be portrayed as job creators (Christiansen et al., 2003).

Governments engage in subsidising policy by influencing investment location, scale, type and mode of entry. Bellak et al. (2008) suggest that subsidising makes more sense when it leads to greater benefits from the investment to society as a whole. It is suggested that investments in R&D activities give back to society more than to private investors, while labour-intensive manufacturing provides the biggest returns to the private investor. Consequently, more subsidies should target specific activities of high-quality FDI and upgrade value-adding activities of existing FDI projects (Mallya et al., 2004)

At the same time, incentives can be seen as a substitute for high institutional quality, in environments where property rights are not adequately protected (Christiansen et al., 2003). Investment costs are higher in countries that are more corrupt so MNEs perceive government incentives as a way to overcome those barriers (Cuervo-Cazurra, 2008).

Yet, overall, on average, evidence suggests that not only corruption reduces FDI but also changes its origin composition (Cuervo-Cazurra, 2006). Therefore, critics suggest that the use of subsidies to attract FDI is the waste of money and it should rather be used to advance transparency. Moreover, through subsidies, the public finances private investor's expenses, but the profit is not shared with financers – the public. Arsic (2010) notices that subsidies can easily be tailored to satisfy private interest disregarding the interest of the public. At the same time, politicians usually extol this idea due to the immediate effects of new plants on employment (Greenstone and Moretti, 2003).

Subsidising practices around the world showed different results in FDI attraction. Developing FDI incentives programme requires precision and detailed criteria based not only on the sectoral distribution of FDI, but also on the industry and activity of MNEs, since investment incentives may often be very harmful to host countries (Mallya et al., 2004; Morisset and Pirnia, 2000; Demirbag et al., 2007). Many country-level studies showed that government incentives do not contribute to an increased FDI stock. This was the case in Indonesia, as suggested by Wells et al., (2001) or in transition countries as suggested by Beyer (2002). On the other hand, some examples (like

Ireland) show that incentives for FDI can serve as a filter for high-value adding activities. Te Velde (2001) suggests that incentives for MNEs in knowledge-intensive industries, goes hand in hand with government projects on skill labour supply, though immigration policies and also encouraging cooperation between universities, domestic companies and MNEs.

Cantwell and Mudambi (2000) suggest that investment incentives can play a decisive role for investments only if MNEs are choosing between two locations with the exact (or very similar) characteristics. Otherwise, their power to drive the decision about the location of investment is minimal. The effectiveness of subsidies in FDI attraction is dependent on the host country's development level. Cleeve (2008) suggests that in African countries, fiscal policies like tax holidays for MNEs are an important determinant in FDI attraction because traditional factors such as good infrastructural or advanced labour skills are absent across most of the countries. Rolfe et al. (1993) found that investment incentives had minimal impact on US companies' investments in the Caribbean. It is suggested that investors mainly focused on trade constraints and market size.

The relative importance of incentives is subjective to the company's strategy and that managers value different kinds of investment incentives at different periods. In particular, there are seven factors influencing the manager's perception of incentives: (1) market orientation - export-oriented companies are more likely to respond to tax holidays and import duties exemption than companies focusing on local market; (2) type of investment - new entrants would prefer direct subsidies as they experience high initial expenses and no profit in the first year, while expanding of existing operations is less capital intensive but more profit generating; (3) country of investment – incentives would matter relatively more if the host country is missing basic determinants of FDI, like political stability, infrastructure, etc.; (4) product – manufacturing of capital goods would require great investment in fixed assets, compared to services, so land grants would matter; (5) investment size – large investors prefer subsidies that increase with the size of their investment; (6) size of the labour force – meaning that big employers would prefer employment-related subsidies more than companies that employ smaller number of workers; (7) year of investment – investors would value incentives more in the years of economic stagnation than in the years of dynamic growth (Rolfe et al.,1993).

Reiter and Steensma (2010) suggest that more state subsidies bring the right FDI if they are followed by performance requirements and combined with state industrial policy, as it was the case in South Korea. On the other hand, examples like Turkey or Mexico show that countries often give subsidies without clear expectations, just hoping that MNEs will bring something back to the broader society.

Subsidies differ in the form of provision, direct subsidies meaning direct payments from the government to the company and fiscal (or tax) subsidies meaning tax exemption or tax reduction form company's payments to the government. The literature also makes a difference between employment and investment subsidies. Investments are usually attracted by low taxes and the existence of tax subsidy is even more attractive. Hungerford and Gravelle (2010) suggest that those measures encourage investments because the cost of investment is lower, which allows greater and automatically cheaper

output. In other words, companies which do not have to pay taxes for several years would make higher profits.

However, Rolfe et al. (1993) suggest that empirical studies did not find a significant relationship between tax holidays for several years and attractiveness of a host country unless it is coupled with import duty exemption and other favourable factors (like political stability, competitive salaries infrastructure). This was also confirmed by Mallya et al. (2004) who suggested that incentives should be instruments that crowd-in domestic investments, but tax holidays do not act as such an instrument.

More profit after tax means more capital for future investments, so new employees can be hired. There is also an expectation that greater aggregate demand for labour would drive average salary upwards. Therefore, investment subsidies are also indirectly employment and salary subsidies. The employment-stimulating subsidies are directly targeting greater employment with the state paying the salaries (or part of salaries) of workers employed by a private firm (Mallya et al., 2004).

On the other hand, if investment-stimulating measure persists, in the long run, it may be counter-productive as subsidies come at the expense of other socially important goods and services and compete with the private sector. Christiansen et al. (2003) report that developing countries give up $35 billion per year to multinational companies due to tax subsidies. Therefore, subsidies for FDI may also harm macroeconomic stability. WTO argues that there is a deprivation of overall well-being, as subsidies are inefficiently distributed. Market price distortions are expected due to the difference in optimal and actual market prices. Nonetheless, as pointed out by Hungerford and Gravelle (2010), no studies estimated the direct impact of subsidies on employment.

However, there are findings suggesting the significant but incremental impact of subsidies on FDI flows. According to Solis (2011) subsidies are an effective instrument for FDI attraction only if primary determinants of FDI are in place, like high institutional and macroeconomic stability, basic infrastructure and availability of (skilled) labour. Since those same "pull factors" are the drivers of competitiveness it is also suggested that over time, subsidies can actually reduce the level of FDI, given that there will be fewer funds left to invest in the main determinants of FDI. There are views that investment incentives, such as subsidies, might be important to motivate first mover investors (Cass, 2007), even though more subsidies do not automatically mean more FDI. Moreover, there are suggestions that subsidies for FDI worsen other development factors, such as entrepreneurial culture, competitiveness and the budget deficit (Solis, 2011).

Therefore, the existence of direct subsidies and tax holidays may be a sign of the bad quality of public goods and services and less educated labour. Consequently, there are suggestions that host countries should directly invest in the primary determinants of FDI rather than paying to MNEs (Solis, 2011). Arsic (2010) points out that excessive state subsidising leads to neglecting of true institutional reforms that should make an economy investment-friendly.

It can be argued that there are at least three reasons why subsidies as an instrument for FDI attraction may be problematic. First of all, subsidies are **unsustainable**. Countries resort to subsidisation policies in the absence of strong institutions and other necessary

location advantages (Dorozynski et al., 2015). High-quality investors hesitate to invest in risky places, so countries offer subsidies as compensation for weak institutions (high corruption) (Hausmann and Fernandez-Aria, 2000). MNEs attracted by subsidies (and not by local knowledge or other business infrastructure) tend to disinvest when state subsidies are exhausted, which makes investments unsustainable in the long-run. Great availability of incentives would induce companies to frequently move to more incentive-generous locations (Christiansen et al., 2003).

Secondly, subsidies for FDI are **unfair**, they mean state interference in the market competition. Since foreign MNEs are usually larger and more technologically advanced than local SMEs, subsidies provided to MNEs put local companies in the unfavourable position which disrupts the market competition. Local companies usually cannot meet the government's criteria for subsidies, in terms of investment and employment requirements, thus one should consider competitive disadvantage that FDI subsidies impose on SMEs (Jensen, 2004).

Finally, subsidies are **unclear**. Although there are criteria for subsidy allocation, investors negotiate with civil servants for non-monetary benefits, like urban building land. According to Dorozynski et al. (2015), providing land, sorting out legal ownership and connecting to utility infrastructure is often even more costly and complicated than providing direct subsidies. This opens doors for corruption and political influence. Civil servants are likely to use subsidies and take credit for investments in the period of (re)election, disregarding economic necessity (Nathan and Malesky, 2010).

This is why many researchers questioned the idea of subsidies. Bojovic (2017) questions the efficiency of subsidies. The study investigated whether the state is overpaying for subsidies, i.e. whether the same amount of subsidised FDI and the same number of FDI-created jobs would have occurred with fewer subsidies. The method allowed an assessment of efficiency – whether the same amount of input (subsidies) would generate a greater output (investment). With the use of Data Envelopment Analysis method, he found that about 70% of subsidies would have allowed the same level of investments and jobs. In other words, 30% of subsidy payments have been wasted.

Although Bojovic's (2017) study does not consider other relevant variables that could have influenced the efficiency of subsidies, it does suggest the optimal value of subsidies for future investment projects. Wells et al., (2001) find similar evidence in Indonesia, suggesting that only direct (measurable) costs have exceeded the benefits of FDI subsidies, in terms of taxes paid by companies. Arsic (2010) theoretically discusses whether the application of some other instruments would have given better results. It is suggested that direct payments to companies are the least effective compared to other forms of incentives (like tax holidays and subsidised loans). This is explained with high costs that the state budget bares immediately and uncertain income in the future.

Hungerford and Gravelle (2010) suggest that empirical testing about the effectiveness of those measures on employment and investments can be positive but costs for the state, on average, have been higher than the benefits. Empirical studies usually disregard "invisible" costs, beyond the amount of subsidies, those include public administration costs that deal with this issue (Christiansen et al., 2003). Subsidised FDI may generate employment but this cannot compensate for social inequality, since

subsidizing means taking money from all workers (taxpayers) and directing them towards business owners, not to the socially vulnerable ones. Additionally, FDI subsidies encourage dependence on foreign ownership and MNE-dominated industries rather than local entrepreneurship (Soilis, 2011).

Transition countries, like Slovenia, Romania, Poland and the Czech Republic have also used tax incentives and subsidised loans (where part of the interest rate is covered by the state) to attract FDI. Cass (2007) suggests that the richer the country and the more progressive in terms of transition towards market economy the more funds it devotes to subsidies. However, when all types of subsidies are accounted for, the share of subsidies in GDP is the highest in Serbia (1.5%), compared to Poland (0.8%), the Czech Republic (0.78%) or Slovenia (0.66%), which are the winners of transition (Arsic, 2010).

An example of excessive tax holidays was provided by Solis (2011), who noticed that Costa Rica gave up tax income of over $363 million in 2010 due to tax holidays provided to MNEs. The study also questions the host country's intention to include the informal sector to "tax-paying sector" if even the formal sector itself is often exempt from taxation. There are suggestions that the most profitable and liquid businesses end up receiving subsidies even though they would have invested without such incentives Halvorsen (1995).

A very prominent example in FDI attraction is the Czech Republic, which went successfully through the transition process, and it used investment incentive programmes and experienced high FDI inflows. However, high FDI inflows were least caused by incentives, research shows (Mallya et al., 2004). The study examined the effectiveness of incentives for FDI, in the Czech Republic, by looking at the share of FDI which was attracted by subsidies. The survey reveals that the existence of direct subsidies for FDI motivated only 10% of responding investors. Moreover, the investment incentives scheme was favouring larger companies and was introduced in the late 1990s when political changes delivered economic and trade liberalisation, privatisation process was gaining momentum. Therefore, it is concluded that FDI incentives had a marginal contribution of crowding-in of other investments (of only 3%) (Mallya et al., 2004).

Literature has also examined other aspects of subsidising policy, whether they contribute to crowding-in of other firms, whether they result in more benefits than costs and whether incentives contribute to the upgrading of FDI projects towards high-value adding ones. According to Oman (2000) at the national and local level, subsidies for FDI have not led to crowding-in. The cost of subsidising FDI were greater than benefits in terms of growth of tax income in Indonesia (Wells et al., 2001). The FDI subsidising policy was relatively successful when it targeted knowledge-intensive FDI projects and upgrade of existing MNE activities towards high-value adding, like in case of Ireland (Te Velde, 2001).

At the same time, since the nature and scope of spillovers are different from different FDI, subsidies might have a more positive effect should they focus on high-quality investments. Goldberg (2004) believes that FDI-generated employment in financial services requires more skills than jobs created in manufacturing. It is suggested that investment incentives would make sense for financial sector FDI, but this has not been empirically tested. Gastanaga et al. (1998) suggest that the potential impact of state

incentives to different types of FDI should provide a better understanding about their effectiveness, but empirical studies about determinants of FDI usually disregard this variable.

3.2.2 FDI and development

Countries that have been trapped in the vicious cycle of poverty - no savings - no investments - no jobs and no income – again leading to no savings, have seen FDI as a panacea for developmental bottlenecks. Injecting fresh foreign capital was meant to allow financing of economic growth and bring positive externalities from MNEs. The conventional presumption was that FDI inflows would automatically result in the inflow of knowledge and technology leading to fast income convergence (Iammarino, 2018). As noted by Radosevic (1994), the pervasive policy advice to transition economies was to privatize, liberalise trade and abandon subsidising state enterprise. However, subsidising foreign MNEs was fully acceptable policy instrument. Hence, many countries focused on attracting FDI by providing fiscal incentives, even though the correlation between FDI and economic development is still insufficiently explored while studies that found a correlation between the two rarely say anything about causation (Reiter and Steensma, 2010).

Moreover, expectations are that FDI will lead to GDP growth and if such growth is observed governments tend to believe that their FDI policies work. However, the notion of economic growth is substantially different from economic development. As suggested by Stiglitz (2002), one does not necessarily lead to another. Kuznets, (1967) who introduced the measure of Gross Domestic Product himself warned that it is *overly gross* measure inadequate for the measurement of life quality and human capital development. GDP can grow together with poverty, it can also grow while national health indicators fall. Economic growth is just a monetary measure of the economy's capacity and market value of all goods and services.

On the other hand, economic development requires sustainability, meaning inclusive development encompassing education, health, innovation and lowering social inequalities. Therefore, the attraction of FDI with subsidies may not be considered successful if it is accompanied only by higher GDP growth rates. The FDI policy and the way governments use subsidies are crucial determinants of the potential impact of FDI on economic development (Agosin and Machado, 2010).

The studies about FDI can broadly be categorised into those that investigate what attracts FDI and those that investigate what is the impact of FDI on macroeconomic performance. Employment is a macroeconomic issue and its nexus with the GDP growth is undeniable. Therefore, studies mainly focused on the impact of FDI on GDP growth. In the Solow-type growth model used by Mankiw et al. (1992), it is assumed that FDI are included in the country's capital stock and that they substitute domestic investment. As such, FDI was indirectly found positive in explaining growth, which was explained with the fact that transition economies were already industrialised and with developed human capital base inherited from the socialist era. However, Mencinger (2003) found a negative correlation between FDI and GDP growth in transition countries. He criticized other studies (like, Borensztein et al. (1998) and Easterly (2001) which stated the opposite, for analysing the impact of FDI on GDP in transition countries in the period of mostly negative growth and symbolic FDI flows.

The negative impact of FDI on growth can also be related to the acquisitions in the massive politically motivated privatisation process. Mencinger (2003) suggests that studies which analysed the impact of FDI on economic growth found contradicting results. The differences in periods of observation, country institutional characteristics and the level of development led to different results. Attempts to justify generous host country subsidies for MNEs with a positive impact on the economy are more assumed than empirically tested. The impact of subsidised FDI on short-term economic growth might be positive in some cases, but in the long run, this impact is negative due to weakening competitiveness since host countries have less to invest in competition-advancing factors (human capital, R&D, infrastructure, institutional efficiency) (Solis, 2011).

In the absence of domestic savings and therefore investments, FDI is perceived as a substitute for domestic capital flows which enhances local productivity and employment. Employment, on the other hand, can be reduced due to the crowding-out effect of small businesses which are pushed out of the market by MNEs. According to Mencinger (2003), this trend is especially observed in services and retails trade where MNEs operate like cartels in an oligopolistic market. Malovic et al. (2018) suggest that two-thirds of all FDI in transition countries in South-East Europe (SEE) are in services – retail, banking, real estate. Their econometric analysis found that FDI inflows have no statistically significant impact on GDP and GNP.

Firstly, this is explained precisely with the theoretical presumptions of Pearce (2001) that FDI reduced competition. Secondly, the re-industrialisation of transition countries was dominated by privatisation, so traditional industrial workers were increasingly jobless. They were not able to find jobs in services since that sector was not fully established (Czirfusz et al, 2008). Therefore, the excessive supply of labour was driving force behind FDI that concentrated in low-value adding services. However, Radosevic et al. (2003) suggest the relationship between employment and FDI is dynamic and that changing nature (type) of FDI also leads to a structural change of employment in transition countries.

According to Lall (2000), the subsequent direct effects of FDI on employment depend on another set of factors, beginning with the strategy of the foreign investor regarding the level and speed of technology upgrading, trade orientation, the place of the affiliate in the global production and trade strategies of the parent company, and the levels and types of skills needed for the operation of the affiliate. The strategy reflects the philosophy of the firm as well as the policy framework of the host government. In general, the faster the MNE upgrades its affiliate's technology, raising its productivity and competitiveness, the more rapid will be the growth of production in the developing country. Though raising the level of technology may have some employment-displacing effects, the net effect on the quantity and quality of its employees should be positive.

The employment of workers in MNEs is expected to contribute to the productive use of human capital. At the same time, economies can create greater value with the same number of employed workers, due to greater productivity and technological advancement. Onaran (2008) suggests that economies may experience jobless growth, therefore measuring employment rather than GDP growth in relation to (subsidised)

FDI, narrows down the scope of analysis and allows a better understanding of human capital and, to some extent, economic development.

There is a theoretical explanation of why FDI (and subsidised FDI) are expected to have an effect on employment. Depending on the quality level of investments MNEs will require skilled or unskilled labour and increase the demand on the labour market. The inflow of foreign capital, with the appropriate state policies, may also mean the inflow of foreign technology and knowledge. They may spillover to domestic firms (which have direct links with MNEs), but also produce externalities to all other market actors. This may induce domestic firms to expand and also employ more workers.

The entry of technologically more advanced companies may benefit domestic companies in terms of productivity spillovers and induce crowding-in of new firms. As observed in the Czech Republic by Ayyagari and Kosova (2010) foreign companies contributed to 70% of all exports and invested five times more per employee than local companies. However, technological spillovers may also lead to employment reduction as companies increase productivity and substitute workers with technology.

Consequently, the role of FDI is multidimensional, FDI may contribute to the total capital stock or cause redundancy due to crowding out effect but also direct employment of workers. The crowding-in effect is one of the most important benefits of FDI. This is a phenomenon occurs when FDI when their presence stimulates new downstream or upstream investment that would not have taken place in their absence (Agosin and Machado, 2010). FDI not only create direct jobs but also provoke domestic investments by local companies that also create jobs.

Even though it is expected that FDI will stimulate the competitiveness of domestic firms and force them to invest in new technologies, it is also highly possible that, due to the ownership advantages of MNEs and their advanced technologies, they are more likely to displace domestic companies. This is the opposite situation, with crowding out effect, when FDI displaces domestic investment. This often happens if FDI enters a sector where it is competing with domestic forms and uses its ownership advantages or dumping prices to push the competitors out of the market.

Additionally, MNEs may enable local companies to upgrade their technological capabilities and indirectly create new jobs via forward/backward linkages with the domestic sector (Dunning, 1981). This is the most important potential externality, as jobs beyond those created by MNEs make FDI sustainable and beneficial for the host country. As Dicken (1998:63) put it: "Labour is absolutely central to global production networks as it embodies the knowledge and skills necessary for production".

Thus, workers that have been given access to foreign technologies and "know-how" serve as carriers of tacit knowledge through labour mobility contribute to the formation of new business, so-called *"spin-offs"*. Consequently, there is an objective expectation that more FDI would cause more employment. At the same time, there are suggestions that FDI contribute to employment only if the domestic sector already has "employment capability" if FDI complement domestic employment (Radosevic et al., 2003). As state subsidies are directed towards attracting more FDI, we should expect that those municipalities (sub-regions) that spend more on subsidising FDI will have relatively

higher employment compared to those municipalities which have not received subsidised FDI.

On the other hand, Blomstrom and Kokko (2002) argue that there are no automatic gains from FDI in terms of positive spillovers and knowledge-transfer so incentives do not make sense if the government does not facilitate the development of linkages between MNEs and domestic firms and educational institutions.

The crowding-out effect, that was observed by Kokko and Thang (2014) is detrimental for the local economy if it leads to the disappearance of potentially productive domestic companies. This may lead to monopolisation of some industries and isolation of domestic businesses. Subsidies provided to companies to use very complex technologies in a technologically retardant environment and without linkages with domestic businesses are an ineffective way to stimulate overall employment growth (Reiter and Steensma, 2010). On the other hand, companies operating in low-value adding industries exploit cheap labour in routine intensive jobs and do not allow technological and managerial knowledge transfer (Dunning, 1981). This leads to unemployment and/or obstacles for former MNE employees to set up their own business and create jobs. Therefore, any state subsidies may be wasted.

According to Blomstrom and Kokko (2002), the arguments in favour of subsidies are the same as those in favour of FDI: increase of employment and GDP growth, potential contribution to knowledge and productivity spillovers etc. Narula and Pineli (2018) suggest that those direct effects of FDI have not received much attention in the literature, especially not the costs associated with the extraction of benefits from MNE activity. The potential benefit, such as employment, comes at a cost such as the increase of labour cost for other companies, including domestic ones, or at the increased fiscal spending.

3.2.3 Absorptive capacity and subsidised FDI

Economic theory does not give an unambiguous answer to whether greater absorptive capacity means greater spillovers from FDI, as there are explanations that a greater distance from technological frontier the greater is the chance to capture spillovers from MNEs. However, Castellani and Zanfei (2006) argue that large technological gaps may suggest that the difference between domestic and foreign technological capabilities are so big that local companies can not learn anything. Moreover, according to Girma (2005), empirical results are more straightforward, as it is found that technologically more advanced companies are more capable of capturing technological spillovers from MNEs. There is productivity convergence with MNEs when domestic companies have a higher absorptive capacity.

Although there are findings that, on average, FDI lead to greater employment and economic growth in some countries, certain regions and municipalities in those countries may experience the negative impact of FDI on employment. This will depend to a great extent on the municipality's absorptive capacity (Reiter and Steensma, 2010). Absorptive capacity does not attract FDI, it is a local condition that allows economies to leverage FDI. It refers to the ability of a domestic company to identify, assimilate and exploit foreign technologies (Girma, 2005). The capacity to absorb foreign

technologies, among domestic companies, determines their capacity to increase output and employ more workers, thus contributing to their municipality's employment.

As suggested by Konings (2001), the host country's ability to benefit from FDI fundamentally depends on its ability to absorb foreign technologies. The empirical findings of technological spillovers from FDI to domestic sector in countries, which subsidised investments, like Bulgaria and Romania were found negative, mainly due to lack of absorptive capacity. FDI in countries far away from the technological frontier cannot lead to technological upgrading, regardless of the investment incentives packages (Konings, 2001).

In the case of this study, municipalities which received FDI are expected to generate higher employment if technological spillovers to domestic firms allow them to increase productivity and also employ more workers. The main "pull factors" attracting FDI to the particular location need to be coordinated with the regional industrial policies and clusters in order to benefit from MNE presence. FDI contribute to the connection of municipalities and regions, through agglomeration economies. This creates interdependence and requires public policy to encourage spillovers and balanced distribution of benefits from FDI (Iammarino, 2018).

The implicit assumption is that greater absorptive capacity of companies in particular municipalities of the host country would allow them to cooperate and compete with MNEs and therefore induce greater employment in their municipality. Absorptive capacity can be proxied by the level of economic development or salaries as higher salaries, for the same level of development may proxy higher human capital, so absorptive capacity may be captured by municipality development level. This is likely to encompass what Girma (2005) consider the best absorptive capacity proxy, such as R&D intensity, the technological gap from the frontier or human capital embodied in domestic companies.

If we look at the employment as a potential positive externality from FDI, the extent to which it is exhausted is leveraged by contextual conditions such as, average salary, employee education, infrastructure or proximity to main exporting markets, i.e. economic development level of the municipality. According to Girma (2005), greater absorptive capacity encourages the greater externalities from MNEs. The more advanced municipalities (in terms of their contribution to national GDP) the more absorptive capacity they have and are more likely to benefit from FDI.

The above discussion leads to uncertain predictions on the effectiveness of subsidies for FDI to bolster employment in the host economy. However, the literature has highlighted that the effects of subsidised FDI are more likely to be positive in the presence of local absorptive capacity. The hypothesis will be tested by using both the level of local municipality development and the average net salary levels in municipalities as moderating factors of the effect of subsidies on local employment levels.

3.3 Methodology and data

The data consists of 62 municipalities in Serbia that have received state-subsidised greenfield FDI over the period from 2006 to 2017. During that period the Serbian

government has provided subsidies for 222 investment projects launched by MNEs from 31 different countries. The main receivers of all subsidies (70 %) are firms from only 8 countries, namely the Netherlands, Italy, Germany, Switzerland, Austria, South Korea, Cyprus, the UK. In total, subsidised MNEs invested slightly less than 2 billion euro and 70.000 jobs can be directly ascribed to such subsidised FDI. For those investments, the Serbian government provided an additional 500 million euro. The impact of subsidies is observed in comparison to the period of no subsidies (2002 to 2006) and also in comparison to other 65 municipalities that have never received state-subsidised FDI (from 2006 to 2017). Therefore, the total number of municipalities is 127. Despite an intensive subsidizing policy that started in 2006, Figure3.1 shows employment remained relatively flat from 2002 to 2017, while net salaries have been increasing until 2013 and then stagnated.
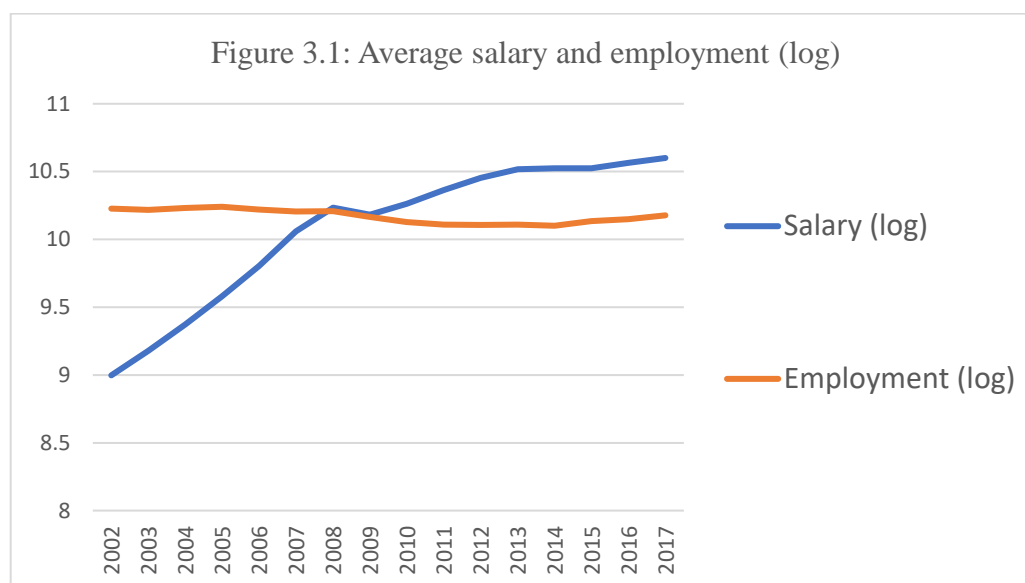
Figure 3.1: Average salary and employment (log)

Source: Author's illustration based on data from the Serbian Ministry of Economy and Finance

Only 3% of all companies in Serbia (as of 2016) are foreign affiliates – 2713 of them. Out of that number, only 6% used state subsidies, which means that there are 2531 MNEs that invested in Serbia without any government incentives. Even though subsidies increased over time, in line with investments, the amount invested by subsidised MNEs, as shown in Figure 3.2 is far below the amount of total (non-subsidised) investments. The change over time of three variables is comparable as data are presented in logarithm.

Figure 3.2: Average investments and subsidies (log)
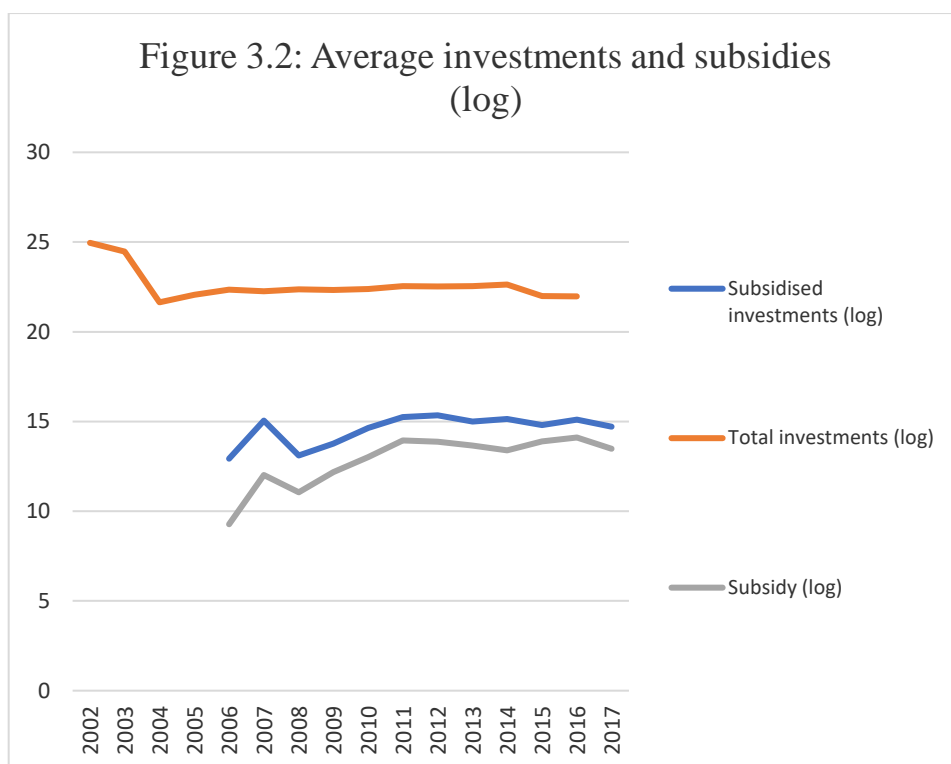
Source: Author's illustration based on data from the Serbian Statistical Office

The terms and conditions for the attraction of direct investments[17] is a legislative Act containing detailed criteria for the allocation of subsidies. Table 3.1 provides a basic summary of those conditions, which apply equally to foreign and domestic investors. However, only 5% of all subsidies have been paid to domestic companies. The criteria for subsidy allocation is based on four levels of municipality development and on three sectors (primary, manufacturing, services). The amount of allocated subsidy primarily depends on the amount of investment in tangible or intangible assets and a number of jobs created per investment project. The priority is given to labour-intensive manufacturing and less developed municipalities.

Table 3.1: The criteria for subsidy allocation

Criteria	Sector	Municipality development level			
		I	II	III	IV
Minimum jobs created	**Primary**	25	25	25	25
	Manufacturing	50	40	30	20
	Services	15	15	15	15

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[17] https://ras.gov.rs/podrska-investitorima/zasto-srbija/podsticaji-za-investiranje

Minimum investment	**Primary**	€ 200,000	€ 200,000	€ 200,000	€ 200,000
	Manufacturing	€ 500,000	€ 400,000	€ 300,000	€ 200,000
	Services	€ 150,000	€ 150,000	€ 150,000	€ 150,000
Maximum subsidy for investments (in tangible or intangible assets or for gross wage expenses after full employment for the investment project has been achieved)		10%	15%	20%	25%
Maximum subsidy for investments over EUR 50 million		_ Maximum 25% for the amount over EUR 50 million _ Maximum 17% for the amount over EUR 100 million			
Maximum subsidy for gross wage expenses*		20%	25%	30%	35%
*maximum per job created		€ 3,000	€ 4,000	€ 5,000	€ 6,000
Additional per-job subsidy for labour-intensive manufacturing on gross two-year wage expenses		_ Over 200 created jobs, extra 10% _ Over 500 created jobs, extra 15% _ Over 1000 created jobs, extra 20%			

Source: Author's illustration based on data from the Serbian Ministry of Economy and Finance

For example, a company investing EUR 500.000 and creating 50 jobs in the manufacturing sector (at, for example, EUR 1000 of gross salary per month) in the most developed municipality (DL 1) is eligible for a direct subsidy of 10% on total investments and 20% subsidy on total gross wages. This means that the state subsidy is EUR 60.000, according to the criteria (500.000*0.1+50.000*0.2).

The same company would have received for the same type of investment projects, a subsidy of EUR 142.500 if it had invested in the least developed municipality (DL 4), since it is eligible for a direct subsidy of 25% on total investments and 35% subsidy on total gross wages, according to the criteria (500.000*0.25+50.000*0.35). In any case, the private investor is 100% owner, even though the state invested 12% of total investment in the first case and 28% of total investment in the second case.

This paradoxical situation is made possible because of the pure expectation of the government that the taxes paid by investor and linkages with the local companies will create additional employment and fiscal income. However, no such condition is set in the contract. The only condition is that investor needs to achieve its full employment (that has been agreed under subsidy allocation criteria) within three years of the date of application for subsidies, or maximum five years if requested by the investor.

In addition, an investor needs to keep operations in the agreed municipality and maintain the level of agreed employment for at least five or three years for big companies and SMEs respectively. Should this not happen the government can activate (previously received) bank guarantee and receive the money back. However, there are

no conditions regarding the investor's cooperation with domestic companies or worker qualifications, for the allocation of basic subsidy.

It is worth mentioning that more developed regions received more subsidies. Figure3.3 shows the distribution of average subsidies and level of employment, by municipality development level (DL 1; DL 2; DL 3; DL 4). Most of the subsidies have been given to MNEs investing in most developed municipalities (DL 1). The trend line shows that as the level of underdevelopment of municipality increases (from DL 1 to DL 4), the level of subsidies decreases. Also, employment follows the same pattern, the level of employment decreases from most developed to least developed municipality.

However, there are municipalities in both development category (DL 1 and DL 4) that received a similar level of subsidies (like municipalities *Vladicin Han* and *Stara Pazova*) but experienced a very different level of employment. The biggest employment level in DL 4 (municipality of *Prijepolje*) is the same as the lowest employment level in DL 1 (municipality of *Senta*). Although it may seem that, on average, lower subsidies mean lower employment, the level of municipality development, i.e. local context and absorptive capacity play a huge role in explaining employment.

Figure 3.3: Subsidies and employment trends (log)
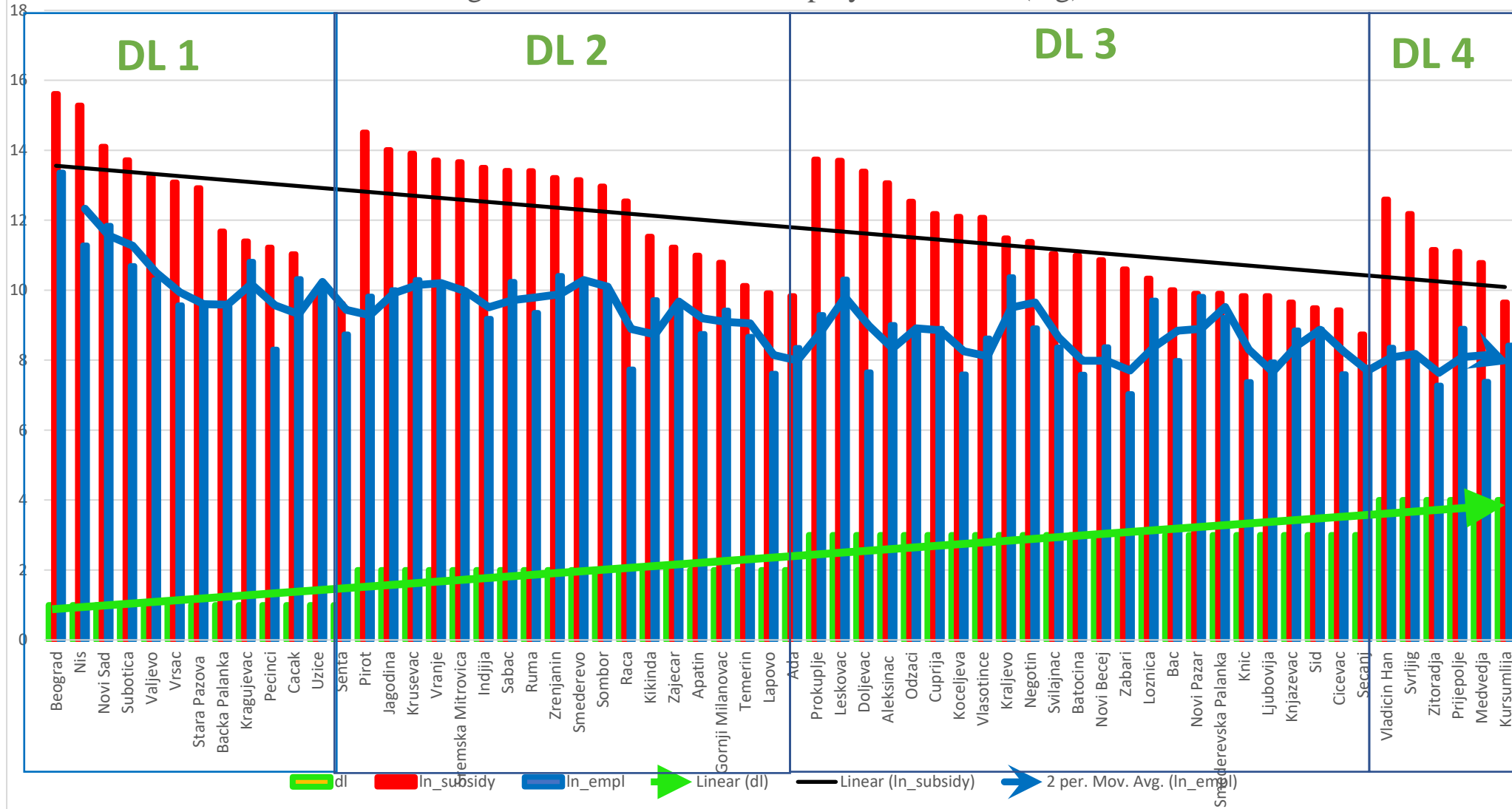
Source: Author's illustration based on data from the Serbian Ministry of Economy and Finance

Within each development category, high subsidies have not always been followed by high employment. In DL 3, the level of employment fluctuates regardless of subsidy level, so there are cases where two very similar municipalities (in terms of economic development), like *Novi Pazar* and *Knic,* received the same amount of subsidies for FDI but that led to a very different level of employment.

Figure 3.4 shows the distribution of the ratio of subsidies per job among municipalities which received subsidised FDI. We can see that with the exception of municipality *Pirot* most of the municipalities received subsidies per job in the range between EUR 2.000 and EUR 8.000, with the average per job subsidy across all municipalities, from 2006 to 2017 is almost EUR 6.000.
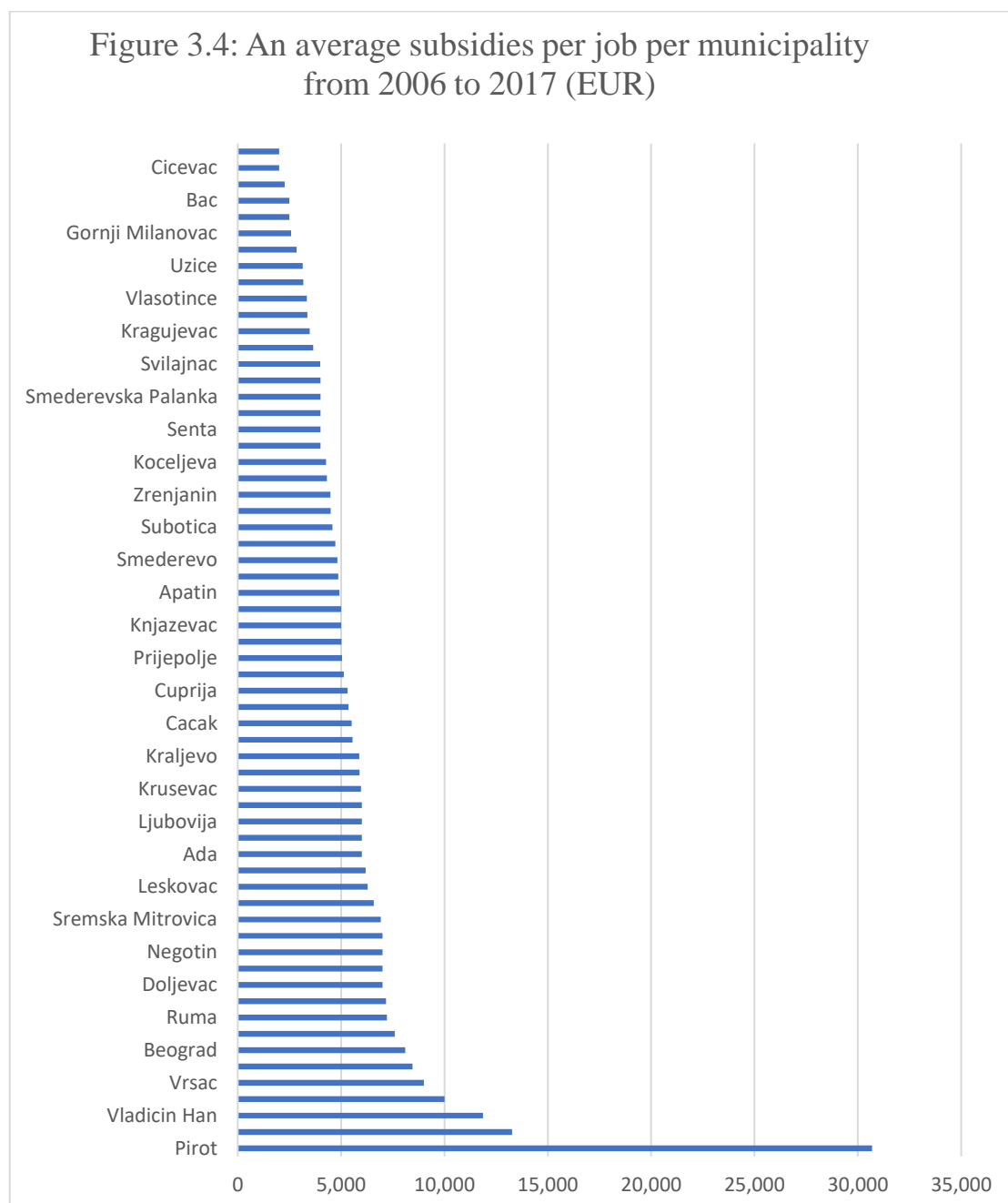
Figure 3.4: An average subsidies per job per municipality from 2006 to 2017 (EUR)

Source: Author's illustration based on data from the Serbian Ministry of Economy and Finance

Figure 3.5 shows the distribution of subsidies per job among municipalities. It is noticeable that most of the municipalities (23%) received investments with per job subsidy from EUR 5001 to EUR 6000, followed by 19% of municipalities with EUR 3000 to EUR 4000, subsidy per job created by MNEs.
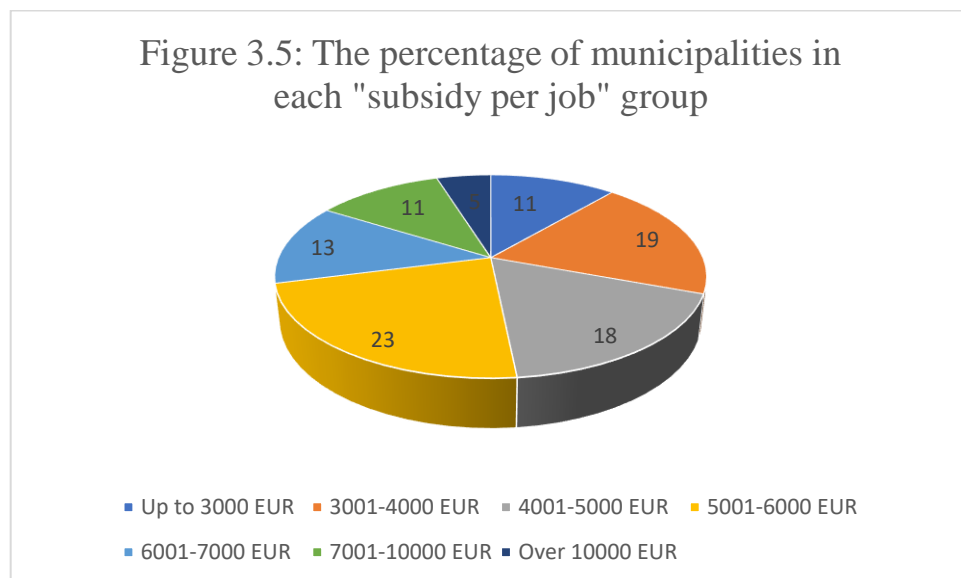
Figure 3.5: The percentage of municipalities in each "subsidy per job" group

Source: Author's illustration based on data from the Serbian Ministry of Economy and Finance

3.4 Empirical analysis

The longitudinal dimension of the dataset allows controlling for time-invariant differences which is important for the understanding of causal relationships between FDI subsidies and employment. The data set, suggests estimation techniques which allow accounting for unobserved individual municipality heterogeneity, either using random or fixed effect, econometric models. In theory, since a whole population of municipalities is observed, the fixed-effects model is normally advised, additionally, Hausman[18] tests support this model. All independent and control variables are observed in the current year and also lagged 1-2 years, which reduces concerns of simultaneity or reverse causality. The one and two-period lagged values are included in the main results as t+1 and t+2. Appendix 1 provides tables with descriptive statistics and correlation coefficients. An analysis is undertaken with the use of Stata software.

Equation (1)

$$\ln(empl)_{it} = \alpha + \beta_1 \ln(subsidystock)_{it} + \beta_2 \ln(netsal)_{it} + \beta_3 \ln(pop)_{it} + \beta_4 \ln(investstock)_{it} + \beta_5 \ln(jobstock)_{it} + \beta_6 \ln(totalinveststock)_{it} + \mu_i + \varepsilon_{it}$$

---

[18] With Hausman test it is formally tested whether fixed or random effects model is preferred. The test showed that random estimator is not consistent, since I can reject the null hypothesis that both fixed and random estimators are equal (P=0.00)

Equation (2)

$$\ln(empl)_{it} = \alpha + \beta_1 \ln(subsidystock)_{it} + \beta_2 \ln(subsidystock)*dl_i \quad \beta_3 \ln(netsal)_{it} + \beta_4 \ln(pop)_{it} + \beta_5 \ln(investstock)_{it} + \beta_6 \ln(jobstock)_{it} + \beta_7 \ln(totalinveststock)_{it} + \beta_8 \ln(subsidystock)_{it} * \ln(netsal)_{it} + \mu_i + \varepsilon_{it}$$

Where the subscript *i* refers to municipalities and the subscript *t* refers to the year under observation, ε is an error term and μ refers to fixed-effects.

The description of all variables is provided in Table 3.2

Table 3.2: Variables

Variable		Label	Explanation	Source
Dependent	Employment	ln_empl	The natural log of total employment (an absolute number of employed labour)	Serbian Statistical Office
Independent	Subsidy stock	ln_subsidystock	The natural log of subsidy stock - a cumulative level of subsidies i.e. the sum of subsidies over time (from 2006 to 2017).	Serbian Ministry of Economy and Finance
Control	Municipality development level	dl	DL is a discreet variable that denotes municipality development level. It is based on municipality's GDP relative to average national GDP. Variable takes the following values 1 - most developed municipalities whose GDP is above the national average; 2 - municipalities whose GDP is 80% to 100% of national average; 3 - municipalities whose GDP is 60% to 80% of national average; 4 - municipalities whose GDP is below 60% of national average.	
	Job stock	ln_jobstock	The natural log of job stock - a cumulative level of jobs created by a subsidised MNE	
	Investment stock	ln_investstock	The natural log of a cumulative level of investment made by subsidised MNE	
	Population	ln_pop	The natural log of total population per municipality	Serbian Statistical Office

	Total investment stock	ln_totalinveststock	The natural log of total cumulative (non-subsidised) investments per municipality	
	Average net salary	ln_netsal	The natural log of the average net salary per municipality	

Table 3.3: The impact of subsidies on employment

				t				t+1	t+2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables					ln_empl				
ln_subsidystock	0.00341***	0.00292***	0.00195***	0.0180**	0.0228***	-0.00276	0.00538	0.00948	0.00328
	(0.000754)	(0.000731)	(0.000746)	(0.00744)	(0.00729)	(0.0112)	(0.0111)	(0.0114)	(0.0116)
ln_netsal		-0.259***	-0.261***	-0.262***	-0.270***	-0.260***	-0.268***	-0.136***	-0.0327
		(0.0229)	(0.0226)	(0.0226)	(0.0258)	(0.0225)	(0.0258)	(0.0262)	(0.0262)
ln_pop			0.140***	0.139***	0.0601	0.135***	0.0519	0.0373	0.0214
			(0.0304)	(0.0304)	(0.0368)	(0.0304)	(0.0370)	(0.0377)	(0.0375)
ln_investstock				-0.0141**	-0.0187***	-0.00571	-0.0114	-0.0162**	-0.0134*
				(0.00652)	(0.00641)	(0.00734)	(0.00734)	(0.00750)	(0.00765)
ln_jobstock						**0.0278****	0.0228**	0.0300***	0.0407***
						(0.0112)	(0.0109)	(0.0112)	(0.0118)
ln_totalinveststock					0.00847**		0.00845**	0.0106**	0.00985**
					(0.00406)		(0.00407)	(0.00416)	(0.00430)
year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Constant	8.812***	11.11***	9.693***	9.711***	10.27***	9.726***	10.33***	9.282***	8.564***
	(0.0111)	(0.204)	(0.379)	(0.379)	(0.461)	(0.378)	(0.462)	(0.471)	(0.469)
Observations	1,999	1,999	1,871	1,871	1,626	1,871	1,626	1,623	1,499
R-squared	0.475	0.509	0.545	0.546	0.468	0.548	0.469	0.366	0.297
Number of municipality	127	127	127	127	127	127	127	126	126

3.5 Results

The results presented consider the effect of subsidies and other control variables on employment in the current year (time t) and in the next two years (t+1 and t+2). As results from table 3.3 shows, subsidies, have a significant effect on municipality level employment in columns (1) to (5). However, after controlling for jobs directly created by subsidised MNEs (Column 6) the effect on overall employment vanishes, both in the year of subsidy approval and in the following two years.

It is worth noting that, as expected, average net salary paid in the municipality is negatively correlated with employment suggesting that higher salaries lead to less demand for workers, while in the column (3) population is positively correlated, suggesting that an increase in population, which may derive from internal migration, is associated with a growth in employment at the municipality level. In column (4) subsidised investments are significantly negatively correlated to employment. This is consistent with the idea that the more capital intensive are the subsidies, the more workers are substituted with machinery, which leads to a decrease in employment.

In column (5) subsidies remain positive and significant even after controlling for total investment stock (all other non-subsidised investments). However, in column (6), in the presence of a variable measuring jobs created by subsidised investments only, the effect of subsidies on overall employment becomes insignificant, which means that subsidies only contribute to the employment generated by subsidised investments. The result shows that a 10% increase in subsidised jobs would lead to an average 0.2% increase in employment. Finally, in column seven, when all independent variables are accounted for together, subsidies have no effect on municipality level employment. At the same time $R^2 = 0.54$, suggest strong overall explanatory power of the model. If we observe the impact of subsidies in the following two years (columns t+1 and t+2), there is no change in results.

Table 3.4 presents the results from equation (2), where the main independent variable subsidy stock interacts with the municipality development level. If we observe results in the current year (t-0), there is a consistently negative and significant effect of subsidies when interacted with municipality development level, suggesting that the more developed the municipality (dl close to 1) the smaller is the negative impact of subsidies for FDI on employment.

Just like in table 3.3, the coefficient is the biggest in column (1), where the main effect – subsidy stock is positive and significant. In columns (2) and (3) the average net salary and population have a negative and positive impact respectively. In column (4) subsidised MNE investments have a negative effect on employment. In column (5) MNE-created jobs have no effect on employment in the current year while this variable becomes positive and significant in the following years (t+1). In column (6), total (non-subsidised) investment stock remains the only positive and significant control.

Table 3.4: The impact of subsidies on employment - municipality development level interaction

Variables	t						t+1	t+2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ln_empl							
ln_subsidystock	0.0133***	0.0107***	0.0101***	0.0278***	0.0194	0.0195	0.0533**	0.0770***
	(0.00172)	(0.00169)	(0.00173)	(0.00761)	(0.0120)	(0.0119)	(0.0253)	(0.0247)
ln_subsidystockxdl	-0.00428***	-0.00339***	-0.00354***	-0.00360***	-0.00340***	-0.00230***	-0.0369*	-0.0615***
	(0.000673)	(0.000659)	(0.000678)	(0.000677)	(0.000712)	(0.000714)	(0.0194)	(0.0190)
ln_netsal		-0.244***	-0.247***	-0.248***	-0.248***	-0.256***	-0.138***	0.0477
		(0.0229)	(0.0226)	(0.0225)	(0.0225)	(0.0260)	(0.0264)	(0.0368)
ln_pop			0.126***	0.125***	0.124***	0.0448	0.0369	0.00725*
			(0.0303)	(0.0303)	(0.0303)	(0.0369)	(0.0376)	(0.00405)
ln_investstock				-0.0155**	-0.0122	-0.0155**	-0.0175**	-0.0128*
				(0.00648)	(0.00742)	(0.00742)	(0.00748)	(0.00732)
ln_jobstock					0.0106	0.0123	0.0214*	0.00989
					(0.0117)	(0.0113)	(0.0119)	(0.0115)
ln_totalinveststock						0.00756*	0.00949**	-0.260***
						(0.00407)	(0.00414)	(0.0259)
year dummies	yes	yes	yes	yes	yes	yes	yes	yes
Constant	8.812***	10.98***	9.708***	9.727***	9.732***	10.33***	9.322***	10.34***
	(0.0110)	(0.204)	(0.376)	(0.376)	(0.376)	(0.461)	(0.469)	(0.459)
Observations	1,999	1,999	1,871	1,871	1,871	1,626	1,623	1,499
R-squared	0.486	0.516	0.552	0.553	0.553	0.473	0.369	0.473
Number of municipality	127	127	127	127	127	127	126	126
DL	Implied effect of subbsidies in municipalities with different development level							
1	0.00902	0.00731	0.00656	0.0242	0.016	0.0172	0.0164	0.0155
2	0.00474	0.00392	0.00302	0.0206	0.0126	0.0149	-0.0205	-0.046
3	0.00046	0.00053	-0.00052	0.017	0.0092	0.0126	-0.0574	-0.1075
4	-0.00382	-0.00286	-0.00406	0.0134	0.0058	0.0103	-0.0943	-0.169

The lower part of Table 3.4 shows the implied effect of subsidies on employment in municipalities with different development levels. For example, once all variables are accounted for, subsidies have a positive effect on employment only in the most developed municipality (dl 1). The implied effect of subsidies for FDI on employment showed that subsidies had a negative or neutral effect in all municipalities, apart from the most developed ones.

3.6 Conclusion

As shown in the international investment reports (Incentives Monitor, 2018; OECD, 2001), there is a tendency among host countries to provide state incentives to attract FDI. The macroeconomic goal of subsidy-based FDI attraction is to increase employment and establish linkages with MNEs which should result in higher productivity of domestic companies. Ultimately host countries aim to foster GDP growth by paying MNEs to employ workers and invest in assets. The literature review suggests that subsidies matter only after the main determinants of FDI (such as developed human capital, rule of law, infrastructure and innovative business clusters) are in place. Furthermore, literature highlighted that the problem with this policy is not only how to differentiate those investors that would have invested anyway (due to other location advantages in the host country) from those who are only driven by subsidies, but also that potential spillovers are neither guaranteed nor related to the number of subsidy-attracted FDI projects.

Different countries developed different incentive schemes (tax holidays, import duties exemptions or direct subsidies) for MNEs based on capital investment and a number of employed workers. This study is based on data about direct subsidies, which have been an important part of economic policy in transition countries in the last decades. With the use of municipality level data about subsidies in Serbia, this study analysed the effect of subsidies on employment, controlling for other relevant factors.

The effect of subsidies on employment can be observed in three ways: (1) Direct jobs created - jobs created only by subsidised investment (2) indirect jobs created - additional jobs created due to crowding in and spillover effect, (3) jobs reduction – due to crowding-out effect as the rest of the companies which are not subsidised decrease employment.

If jobs created by subsidised investments are not controlled for, it would seem that subsidies have a positive effect on employment. Subsidised jobs add to the employment of the municipality, but the subsidised investment does not have an additional effect on employment which is not already captured by subsidised jobs. On average, subsidies created some jobs, but they do not encourage crowding in and do not create additional jobs. The positive effect of subsidies on employment is neutralised by those jobs created by subsidised investments. Therefore, subsidies are not sustainable in the long run as salaries of workers in private MNEs are largely paid by all taxpayers and after potential lay off there will *ceteris paribus* be the same number of unemployed workers.

The important question is the consideration of counterfactual - whether the existing jobs would be created were there no subsidies. This is has been considered through the comparison of two groups of municipalities in Serbia – those that have received

subsidised investment and those that have not. Using the fixed-effect model we are also able to control for time-invariant characteristics, hence not only compare employment in municipalities that received subsidies with those that did not receive them but also over time within the same municipality. The results suggest that employment pattern is not significantly affected by subsidies, once the jobs directly created by subsidised activities are accounted for.

The literature highlighted that the problem with this policy is not only how to differentiate those investors that would have invested anyway (due to other location advantages in the host country) from those who are only driven by subsidies, but also that potential spillovers are neither guaranteed nor related to the number of subsidy-attracted FDI projects. In structuring FDI attraction policy, it is important to investigate the interaction of all the parties involved, the government as a subsidy provider, the MNE activity and a domestic private sector.

Subsidies provided for greater employment in labour-intensive manufacturing are missing the point. Low labour cost is becoming less important in the era of fast technological innovations and changing FDI distribution towards more skill-intensive industries. As suggested by Te Velde (2001) countries can maximize benefits from incentives only if those are directed towards knowledge-intensive industries.

Although on average, subsidies led to the creation of direct jobs, we find some evidence of crowding out in the least developed municipalities, where they contributed more to the increase of unemployment than an increase in employment. Subsidies led to more job creation in more developed municipalities despite the fact that greater amount of subsidies is offered for companies investing in less developed municipalities, so there is a complementarity between the absorptive capacity of municipality and subsidies. Furthermore, there is limited evidence that positive employment effects may materialise with a few years delay only in most developed municipalities.

The results support the idea that in the case of Serbia direct subsidies for FDI represent an ineffective way for employment stimulation since there is no significant effect of subsidies, beyond the jobs created by subsidised MNEs. Their ability to compensate for the institutional and structural macroeconomic weaknesses is extremely limited and short-sighted. The current regulation on subsidising policy in the example of Serbia is unsustainable, unfair and unclear. "One size fits all" logic is not applicable, since investors differ within sectors and incentives cannot be tailored by sector (primary, manufacturing and services).

These findings are in line with Hungerford and Gravelle (2010), who suggest that subsidies are not effective in increasing overall employment. Very often countries finance subsidies at the expense of overall welfare and by increasing public debt.

Based on our findings, greater subsidies for investments in underdeveloped areas do not contribute to a convergence in regional development, because underdeveloped areas are missing significant absorptive capacity, incarnated in developed human capital and business infrastructure, which is the necessary condition in order to exhaust potential spillovers from FDI. As suggested by Reiter and Steensma (2010) this may be due to domestic sector's inability to absorb foreign technologies and consequently increase productivity and employment or because MNEs are not even investing in

technologically intensive projects so there is no potential for spillovers at all. FDI policy should concentrate on attracting different types of investments, not just as much FDI as possible. As suggested by Radosevic et al. (2003) the structure of FDI is crucial for greater effects on employment. This means encouraging high-value adding activities of MNEs that will not only create direct jobs but also allow spillover effect and indirect job creation within the domestic sector.

It is worth considering that the generation of job spillover effect, as suggested by Mudambi (1999), may need longer periods of time than what is observed in this study, which is a limitation that should be acknowledged. This is particularly the case if subsidies increase the extent of the affiliate's embeddedness and contribute to making the investment "sticky". In this perspective, it is the sequential investment that the country seeks, which are worth much more, in development terms than the initial investment.

A further caveat to our analysis is that in order to properly evaluate the effectiveness of FDI policy in even greater detail, future research may need to assess how much employment would have been generated if the subsidies were used for some other sort of (public) investment, instead of targeting the attraction of MNEs.

In sum, the most important rationale for FDI subsidies would be to generate externalities and crowding in effects. In the case of Serbia, subsidies did not seem to achieve this goal. One could say that this is the failing part of subsidising policy - that subsidies are ineffective in creating additional jobs, i.e. creating positive employment growth pattern. The point of employment subsidies is to create jobs on top of what is subsidised, but this is not what the results suggest happened in Serbia. The subsidies-based FDI attraction policy will lead to employment only in subsidised companies. However, if the goal is to achieve crowding in effect and greater employment in the rest of the economy current framework for subsidising foreign investors is ineffective indeed.

Appendix 3.1

Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
year	2000	2009.5	4.610925	2002	2017
municipality	2000	64.044	36.23244	1	127
ln_empl	1999	8.586857	1.148449	6.326149	13.44233
ln_subsidystockxdl	1873	3.342421	6.197303	0	18.13104
ln_subsidystock	1873	3.175724	5.895411	0	18.13104
ln_netsal	1873	9.978357	0.5764915	7.774015	11.04585
ln_jobstock	1873	1.28788	2.451003	0	9.142704
ln_investstock	1873	3.641138	6.735586	0	19.3459
ln_pop	1869	10.23697	0.9364531	7.199678	14.33666
ln_totalinveststock	1628	16.90575	2.029975	8.782708	23.91516

Correlation coefficients

	ln_empl	ln_subsidystockxdl	ln_subsidystock	ln_netsal	ln_jobstock	ln_investstock	ln_pop	ln_totalinveststock
ln_empl	1							
ln_subsidystockxdl	0.3239	1						
ln_subsidystock	0.3362	0.9993	1					
ln_netsal	0.0763	0.4143	0.4171	1				
ln_jobstock	0.3566	0.9877	0.9904	0.4122	1			
ln_investstock	0.3295	0.996	0.9965	0.4162	0.9822	1		
ln_pop	0.9574	0.3284	0.3399	0.0991	0.3605	0.3326	1	
ln_totalinveststock	0.6047	0.4514	0.4607	0.6892	0.4675	0.4603	0.5731	1

Chapter IV: Key findings and conclusions

The findings from this study carry important implications for policymakers and fill some gaps in the current literature.

Firstly, the literature about FDI and HC mostly relied on quantitative measures of HC such as average years of schooling, which is shown not to be completely adequate. Although average years of schooling remain a significant determinant of FDI, international student assessment of cognitive abilities and qualitative aspects of education, which can be measured through PISA tests are more relevant for more technologically-intensive FDI.

While this measure has been used in studies related to economic growth, this study is one of the first using it in relation to different types of FDI. While, the literature vastly observed FDI as homogenous investments, while in this study it has been argued that there is a theoretical foundation to distinguish between low and high-quality FDI. Furthermore, with the use of OECD classification of the technological intensity of industries, it has been shown that making a distinction between different FDI "qualities" matters from the empirical standpoint, as different cognitive skills matter for different investments.

The results show that MNEs operating in certain industries, such as software & IT services, renewable energy, industrial machinery or financial services, are very much interested in HC quality when making decisions about investments. Therefore, the investments made to improve student performance in PISA is not wasted, it is crucial for increasing the share of high-quality FDI in overall FDI.

Secondly, inward FDI provide an opportunity for the employment of local workers and foster mobility in the labour market between domestic and foreign companies. This can allow workers to benefit from a job change, especially through a wage increase. While this has been investigated using data from developed or large emerging countries (e.g. Heyman, 2007; Martins, 2011), this is the first time employer-employee data is analysed from a transition country, such as Serbia. Therefore, the findings add to the existing literature which concluded that MNEs pay higher wages. However, this study is not simply suggesting that MNEs pay higher wages, on average, as some of the literature so far proposed, assuming that MNEs employ a greater proportion of skilled workers.

The findings reveal that MNEs pay higher wages than domestic companies, to the same type of workers. This chapter also shows that the wage gain from moving to foreign MNEs is concentrated in the more educated workers. This also means that inward FDI may lead to a divergence in wages between more educated workers and less-educated workers. Although it might sound as positive finding in the short term, in the longer term this may negatively affect the competitiveness of local companies, as they are likely to face the prospect of the best workers moving to MNEs, or having to pay higher wages in turn, to retain their workers. Without a corresponding increase in productivity, this may severely harm the competitiveness of local companies.

Thirdly, this thesis contributes to the academic and policy debate on the role of FDI subsidies as a mean to achieve economic development. From this perspective, FDI subsidies are particularly justified if they create spillovers and crowding in effects. However, the study on Serbia, reveals that municipalities that received subsidised FDI did experience better employment trajectories, but this effect seems to be confined to the direct jobs created by subsidised investments. Once these jobs are accounted for, no significant effect of FDI subsidies on local employment is discernible. This is the failing part of subsidising policy - that subsidies are ineffective in creating additional jobs, i.e. creating positive employment growth pattern. The point of employment subsidies is to create jobs on top of what is subsidised, which is not what is found in the case of Serbia.

4.1 Policy implications

FDI are an inevitable part of economic development and almost every country around the world hosted some sort of FDI. The process of globalisation and FDI liberalisation enabled value-adding activities to become increasingly knowledge and technology-intensive, not just in technologically intensive industries but also in more labour-intensive industries. Therefore, the expectations are that MNEs, as major carriers of FDI, will contribute to more productive use of labour and produce positive wage spillovers.

The realisation of this potential depends on various location-specific characteristics and government regulation. The results of this thesis address those issues and produce important economic policy implications. There are three most important suggestions for policymakers to maximize benefits from FDI.

1. **Attract high-quality FDI, not any FDI:**

It is important to understand that not all FDI is the same, and countries should focus on the "right" type of FDI. One way to do this is to improve the quality of education. The findings suggest that countries that managed to improve performance in education quality, as measured by PISA scores, also manage to perform better when it comes to increasing the share of high-quality FDI in overall FDI. Improving those segments of education which are measured by PISA is not exclusively reserved for developed countries. The significant change in performance can happen over a period of ten years, which is relatively fast.

For example, over the last decade, Poland increased its score in reading from 479 to 518 score points, which is equivalent to a full school year. Countries like Serbia, Turkey or Romania increased their performance in math by at least thirty points since 2003. One of the measures that help achieve better results is making education universally accessible and while this may require greater expenditure on education, this is not the only factor that can help in performing better, what matters is how resources are distributed and the qualitative differences in education policies.

2. **Encourage labour mobility, but cautiously:**

MNEs, on average, pay higher wages than domestic companies. Workers who switch from domestic to the foreign employer experience about 32% higher wage change than workers who move in the opposite direction and the effect is even greater for more

educated workers. While this good for workers, it may have harmful effects on the overall economy in the long run. Domestic companies are likely to face a deficit of qualified labour and loose market competition. Economic policy should encourage labour mobility since that is also a channel for knowledge and technology spillovers. However, if the only direction of the labour movement is from domestic to foreign company this channel can not be exploited. Therefore, policymakers should consider measures to provoke movement in the opposite direction as well, from foreign to domestic companies.

3. Don't subsidise, prioritise:

Economic policy should focus on specific industries – knowledge-intensive industries and formulate state incentives criteria based on the potential for crowding-in of domestic companies. Economic policy should favour inward FDI but not with direct subsidies as this measure is ineffective in generating new jobs, beyond already subsidised ones. The direct subsidies per job created have not shown to be effective therefore other forms of stimulative policies should be implemented.

Those can include (1) tax benefits based on industry and activity of MNEs rather than the sector (2) part funding for employee training (3) financial incentives based on the educational composition of the workforce. Yet, incentives can only complement a strong institutional environment and rule of low. Investments in labour, skills and education are not wasted if other institutions are functioning. The symbiosis between developed HC and inward FDI can bring great results for economies but only if the domestic sector is at the core of economic policy.

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