# *British overseas railway investment and economic development: the Colombian National Railway Company and its impact on the Colombian interior*

Article

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# BRITISH OVERSEAS RAILWAY INVESTMENT AND ECONOMIC DEVELOPMENT: THE COLOMBIAN NATIONAL RAILWAY COMPANY AND ITS IMPACT ON THE COLOMBIAN INTERIOR

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**Abstract**

This study explores the financial performance and economic impact of British investment in the Colombian National Railway Company, the largest British direct investment in Colombia during the first period of globalisation. It aims to ascertain the railway's impact on the regional economy and explain why it failed as a going concern. It explores three dimensions: the use of guaranteed railway bonds, the financial performance of the company, and the economic impact within different sectors of the local economy. The article implements existing methods such as financial analysis, internal rate of return, social savings, counterfactual analysis, and tailors these to a case study methodology for a micro business history of a single company. The article provides three main conclusions. Railway bond guarantees were critical to completion of the railway but detrimental to its long-term financial viability. The company was operationally profitable but stymied by construction delays. The railway contributed to growth of the export sector, internal agricultural trade, and government revenues. Contributions include tailoring the social savings method to a local rather than national focus, re-evaluation of the role of railways in Colombian economic growth, and exploring the influence of railways on internal trade within Latin American economies.

**Keywords:** Railways, Foreign Direct Investment, Railway Imperialism, Capital Markets, Free Standing Companies, Economic History, Business History, Railway Profitability, Rate of Return, Latin America, British Overseas Investment, British Imperialism

**Word Count:** 8228

## I – INTRODUCTION

Railways operating as free-standing companies were the 'dominant force in British FDI in the early twentieth century' (Boughey, 2009, p. 497), yet due to a preoccupation with their imperial dimensions (Davis, Wilburn, and Robinson, 1991) they have seldom been addressed through individual business histories, or case studies that address individual business entities. Prominent scholars of free-standing companies have argued that insufficient source material exists for a micro perspective (Casson, 1998, p. 100), and the implementation of this approach

has relied on the archives of conglomerates connected to the railways (Blakemore, 1990; Katzenellenbogen, 1973). British overseas railway investment in Colombia has been largely overlooked, and the lack of case studies for Colombia represents a significant lacuna. This article presents a case study of the Colombian National Railway Company. Its £2.38 m capitalisation represented the largest nominal British investment and it was the only instance in which bond guarantees were successfully implemented. Yet paradoxically, despite receiving government support, it went bankrupt in 1921. As the railway was directly tied to coffee exports, exploring its experience allows re-evaluation of the role of railways in Colombian export-led development and the contribution of railways to the growth of the internal economy.

This article analyses the company's experience from a micro perspective. Since case studies can be implemented as a tool to evaluate broader debates, theoretical concepts, and methodologies (Yin, 1993, pp. 55–73), this approach facilitates re-evaluating existing debates in the historiography by considering two principal research questions. First, why did the railway company fail? Second, what impact did the development of the railway have on the economy of the Colombian department of Cundinamarca? Answering the first question would help to explain Colombia's poor railway expansion performance. The impact of the railway on the economy is assessed by analysing six commodities: coffee, corn, rice, potatoes, plantains and salt. These were some of the most traded items and consequently provide a representative overview of the economy. This approach provides a fresh perspective on the debate about the economic impact of railways in Colombia, which has been dominated by studies utilising the 'social savings' method (McGreevy, 1971; Ramírez, 2001). The study is divided in three thematic sections. The first section addresses the origins of the company and the role of guarantees on its bonds in the successful completion of the project. This section also provides a comparative analysis of the implementation of the bonds. The section thereafter analyses the financial performance of the company, for which two comparative frameworks are proposed.

The third section evaluates the railway's economic impact. The final section concludes the article, outlining the contribution to existing debates and insights for future research. This study argues that the failure of the company was primarily a result of political and institutional factors, most notably the impact of conflict on construction and the deleterious form in which bond guarantees were applied in Colombia. The study also demonstrates that railways played an important role in the expansion of coffee exports and the growth of internal agricultural trade, and that it had an important indirect impact on government revenues by distributing the products of the national salt monopoly.

The economic historiography of Latin America has identified two major divergences in railway experience. The first is track mileage and the second is the aggregate economic benefit accrued. This benefit has been measured internationally using the social savings method (Caron, 1983; Coatsworth, 1981; Fishlow, 1965; Fogel, 1964; Hawke, 1970; Herranz, 2011a, 2011b; McGreevy, 1971; Ramírez, 2001; Summerhill, 2003; Zegarra, 2013). Controversies persist such as whether railways were inseparable from the export sector or contributed to the growth of the internal economy (Kuntz Ficker, 2014; Riguzzi, 2009). Micro business histories have made an important contribution to this debate (Kuntz Ficker, 1995). Latin American countries broadly follow a pattern in which aggregate benefit correlates to track mileage (Herranz, 2014). Colombia follows this pattern: track mileage and social savings were both low (McGreevy, 1971; Ramírez, 2001). Uruguay represents an exception to this rule, since (similarly to in the US and Europe) significant track mileage in the context of the country's size was combined with low social savings (Díaz, 2017; Herranz, 2011a). Herranz (2011a) attributes this to the demographic spatial configuration of Uruguay, and greater application of fluvial transportation in comparison to neighbouring Argentina, where social savings were much higher (Herranz, 2011b). In Peru social savings were also low. The monopoly conditions created by the Grace

contract, which transferred the country's railways to a single British company (Miller, 1976), elevated rates, and cut off subsequent investment in the sector. The resulting combination of a 'small … railway sector' and 'high transportation costs' lowered the economic benefit of the technology (Zegarra, 2013, pp. 65, 69).

Railway bond guarantees played a prominent role in successful railway expansion during the first period of globalisation (1870-1914) (Díaz, 2015, pp. 251–55, 269–71; Kuntz Ficker, 2015a, 2015b, p. 83; Lewis, 1983, pp. 97–123; 1991, pp. 35–8; Miller, 1993, p. 133; Summerhill, 1998). Subsidising foreign companies engendered hostility throughout the region, but in such countries as Argentina, Uruguay, and Brazil during expansion, any pockets of resistance within the national elite were overwhelmed by those who 'publicly defended' British companies as 'agents of progress' (Díaz, 2015; Summerhill, 1998; Wright, 1974, p. 89). In Mexico, a historical propensity for hostility toward foreign interests was overwhelmed by the authoritarianism of the *Porfiriato* (Coatsworth, 1981; Kuntz Ficker, 2015b).[1] In Peru, guarantees played an important role in the initial expansion of the railway network but were impeded by the insolvency of the Peruvian government associated with the Grace contract (Miller, 1976; Zegarra, 2015, pp. 174–75).

In Colombia, the situation was very different. The system was implemented briefly during the 5-year authoritarian regime of Rafael Reyes (1904–09), termed the *Quinquenio*, to encourage railway expansion with British capital. Voracious resistance formed almost immediately within national politics toward guarantees of railway bonds, resulting in the spectacular collapse of the Great Northern Central Railway of Colombia project. The ensuing scandal and protracted

[1] The *Porfiriato* is the period of Mexican history under the dictatorship of Porfirio Diaz (1876-1911) during which there was a rapid development of the Mexican economy supported in large part by foreign investment.

diplomatic crisis generated a toxic view of the sector in the capital markets of London and Paris, cutting off further investment (Bromberger, 1913; Primmer, 2018, pp. 111–19, 124–138, 2019). Bond guarantees were abandoned, and the Colombian National Railway Company remained the sole entity supported by the system. Despite the system's overall significance, Colombian historiography has either broadly overlooked its implementation (Panchón and Ramírez, 2006) or broadly mirrored the contemporary antagonistic anti-imperialist political discourse (Correa, 2012). The construction of railways depended on state fiscal capacity and, once completed, they directly contributed to the growth of revenues through increased customs duties on exports. The result was a series of feedback loops that supported rapid expansion (Bignon, Esteves, and Herranz, 2015). By providing an outlet to the Magdalena River, the Colombian National Railway Company supported the expansion of the market for salt produced at the government's principal mines in Zipaquirá and Nemocón, which represented an important source of tax revenues. After considering these issues, this study analyses the development of this trade and its contribution to government revenues.

In Colombia, low social savings combined with high unitary savings per ton-kilometre (ton-km) of similar scale to those in Mexico or Brazil, where social savings were extraordinarily high (Coatsworth, 1981; McGreevy, 1971; Ramírez, 2001; Summerhill, 2003). In Uruguay and Peru, low social savings were related to low unitary savings per ton-km caused by higher railway tariffs and inexpensive alternatives (Herranz, 2011a; Zegarra, 2013). The traditional perspective within the national historiography parallels the 'geography is destiny' hypothesis (Gallup, Gaviria, and Lora, 2003), which argues that railways were unsuited to the country because of its mountainous geography and climate, and their application represented a misallocation of capital (Panchón and Ramírez, 2006; Rippy, 1943, 1966; Safford, 2010). This perspective has been challenged recently by Meisel, Ramírez, and Jaramillo (2016), who

outline very high returns from the sector during the period of state-led expansion (1920–1950). The combination in Colombia of high unitary savings, high returns, and low track mileage seems counterintuitive. High unitary savings indicate significant economic benefits, and if they were a remunerative investment, then track mileage should have expanded. This paradox indicates there is a missing factor within the explanatory frameworks applied to the national experience.

An assumption of the interdependence of railways and coffee exports is ubiquitous in Colombian historiography, but relatively little quantitative work has been undertaken to explore the relationship (Bejarano, 1987; Correa, 2012; Horna, 1992; Kalmanovitz, 2010; McGreevy; 1971; Ocampo, 1984; Palacios, 1980). The preoccupation with coffee combined with the dominance of social savings has also resulted in economic historians neglecting the contribution of railways to the internal economy. Social savings are calculated on the basis that trade utilising railways would have continued had it relied on the pre-rail system of transportation. However, in Colombia, unitary savings were so great (87.5%) (Ramírez, 2001) that a significant proportion of internal trade – especially within the agricultural and mining sectors – might have been unviable without the railway. Trade which emerged as a result of lower transport costs was highly dependent on the development of railways. The national historiography has tended to focus on other investments in the economy as progenitors of economic growth, most notably coffee plantations. The micro approach implemented in this study enables re-evaluation of the dominant conclusion provided by the social savings method that 'railway construction did not play a major role in [Colombian] economic growth' (Ramírez, 2001, p. 118), in a similar manner to how its application within British historiography was followed by critiques of its explanatory power (Gourvish, 1980, pp. 38–9; Hawke, 1970).

## II – BACKGROUND

### Colombia

Colombia is a mountainous country in South America and its interior is broken up by three chains of mountains and two major rivers. The Magdalena River is the largest, running from the south of the interior to the Caribbean port city of Barranquilla. The river acted as a fluvial highway between the interior and the outside world, and the role of most railways was to provide a link to the river for major population centres. Colombia is on an equatorial latitude, and its climate varies by altitude rather than seasonal changes in temperature. Most agricultural commodities can be produced within the varied environments of the interior: temperate crops at higher altitudes and tropical crops at lower levels. The Colombian National Railway Company served as an outlet for international trade by connecting Bogotá in the department of Cundinamarca with the Magdalena River, but it also served as a means of interchange of commodities produced in these different climatic zones. Cundinamarca was one of the most economically important regions of the interior along with Santander, Antioquia, Cauca and Caldas. Each region developed individual railway projects to provide connections to the world economy and serve international trade. Bogotá and the surrounding area lie approximately 2600–2700 m above sea level, with a climate resembling a perpetual spring. The railway terminal was located in the port city of Girardot, which is only 326 m above sea level and has a stiflingly hot tropic climate. As a result, the railway passed through a full spectrum of productive climatic zones of the interior.

[Insert Fig. 1 here]

### Origins of the British company

The Colombian elite spent the 19th century engaged in experimental speculative production of tropical export crops (Ocampo, 1984). Coffee, which was cultivated in the subtropical zone between the temperate highlands and the tropical river valleys, was the most important of these crops. The construction of the railway was integral to the process of 'coffee railways' (McGreevy, 1971, pp. 244–79) consolidating the most successful export crop of the interior as the central driver of the Colombian economy. The development of the railway was spearheaded by the emerging *hacendado* (coffee planter) class, in reference to a 'man of progress' who wished to 'impose' European civilisation on the interior with 'better roads, cheap railways, and free exports' (Palacios, 2006, p. 77). British trading houses were limited to 'one British firm … operating … at Barranquilla' (Platt, 1973, p. 137). The economic niche they occupied elsewhere (Darwin, 2012, pp. 169–70) was filled by the domestic commercial elite, who established businesses in international trade centres to form transnational business networks (Rausch, 2017, pp. 25–30).

Coffee created vast political and economic power (Bejarano, 1987; McGreevy, 1971; Palacios, 1980). The *hacendados* used this influence to influence public policy, successfully direct government resources to the project in the form of a subvention, and attract foreign expertise, ensuring the development of a rail link for their coffee plantations. The subvention provided $445,142 of the total $850,000 construction costs of the railway, and the project benefitted from the expertise of Cuban engineer Francisco Javier Cisneros (Horna, 1992). The railway reached Tocaima on the edge of the coffee-producing region in May 1883 (Foreign Office, 1910, p. 30). The project subsequently lost political impetus, since the goals of the *hacendados* had been achieved. This persisted until British financier Henry Jenks purchased the concession on 30 October 1899. The vendor was local businessperson Juan Bautista Mainero y Trucco, an extremely astute and aggressive entrepreneur with business interests throughout the country

(Molina, 1998, pp. 74–114). The purchase coincided with the start of the disastrous War of a Thousand Days but 'before the news of a revolution … was published in England'.[2] By the time Jenks became aware of the conflict, he had already raised £600,000 of 6% debentures mortgaged against the railway, which proved deleterious to the railway's long-term viability.[3]

**Government bond guarantees**

The railway faced the same geographical and environmental challenges that were argued to have impeded Colombia's railway development (Correa, 2015; Panchón and Ramírez, 2006). Tropical rainstorms caused several serious landslides, one of which swept away much of the line between La Mesa and Hospicio, requiring an expensive reconstruction (Foreign Office, 1910, p. 27). In addition, the bridge over the Apulo River was destroyed twice by heavy rainfall, once in March 1904, and again in the following month. This resulted in the suspension of traffic between Juntas de Apulo and Anapoima for 3 months (Foreign Office, 1910, p. 27).[4] The project had been ongoing for almost 2 decades when the British took over the project in 1899. Despite these challenges, British engineers were able to complete the final 82-km section of the 132-km railway with relative ease, taking only 5 years to complete the project (1904–9) (Foreign Office, 1910, pp. 25–8). Repairing damage to the railway (sustained from both war and climatic calamities) required additional capital, but the railway had already been mortgaged against the 1899 bonds.

The government agreed to guarantee interest on a new set of bonds, but the guarantee was different to those employed in Brazil. There, the government guaranteed annual dividends to shareholders, who, in the case of the Great Western of Brazil, collected 'guaranteed dividends

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2 'Claim of the Colombian National Railway, Limited against the Government of the Republic', TNA, FO55/415, f. 236.

3 Ibid, f. 244.

4 'Colombian National Railway Report of 1904', Guildhall Library, Stock Exchange Reports, Box 879, f. 1.

during every year it operated until the turn of the century' (Summerhill, 1998, pp. 547–9). Furthermore, the guarantees were accounted for differently. In Brazil, support payments were repayable only if the profitability of the railway rose above a certain level. In Colombia, they were treated as an interest-bearing loan, which was eventually used to push the company into bankruptcy and enforce nationalisation (Primmer, 2018, pp. 195–206). Even though support was not as extensive as that extended in Brazil, its impact on the success of the project was stark. Without the guarantee, the company would most likely have ended up as many other British concessions did: going bankrupt before the project was completed with a partially completed railway left in its wake. The 6% government guarantee on £430,000 of bonds saved the company from this otherwise inevitable fate.

The support was contingent on several concessions from the company. The first was £165,000 of share capital, which in addition to the government's existing £135,000 stake, represented 33.3% of the enterprise (República de Colombia, 1909, p. 138). The company ceded its claims for compensation and agreed to invest £21,000 of the receipts of the debenture issuance in a 'pleasure and health resort, with [luxury] hotel and necessary houses and shops' in Apulo to act as a tropical retreat for the political elite of the capital (República de Colombia, 1909, p. 139).[5] These concessions had a combined nominal value greater than the face value of the bond issuance, but the agreement led to significant political opposition.[6] The £430,000 bond issuance should have been enough to complete the line, but there were additional complications. Heavy rainfall caused further landslides, meaning the line was rebuilt 'several times over', and a 40-km section between Apulo and Girardot had to be re-laid because of insufficient sleepers, low

5 'Colombian National Railway Report of 1907', Guildhall Library, Stock Exchange Reports, Box 974, f. 1.

6 The original claim for compensation made by Henry Jenks was for £333,548, which combined with £165,000 of share capital and £21,000 of investment in Apulo, comes to £519,548.

grade iron rails, and decayed wooden bridges (República de Colombia, 1909, p. 139–40).[7] To ensure the project's completion, the government authorised a final issuance of £450,000 of 6% debentures in return for 'representation on the board' and the appointment of national 'engineers to superintend the final works'.[8] A significant portion of these debentures was immediately transferred to Henry Jenks's son Shirley as repayment of £180,000 in interest payments, which had been made on the company's behalf. Of the bonds, £257,142 was issued at a 30% discount to cover the debt, leaving only £192,857. Once sold in London at a 20% discount, this left a £154,285 residual cash balance available for construction costs (Torres Elicechea, 1921, p. 60). This balance enabled the railway project to be completed. By the end of 1909, the numerous challenges had been overcome and an uninterrupted service along the entirety of the 132-km line was in service (Foreign Office, 1910, p. 27).

## III – PERFORMANCE

### Company finances

The Colombian National Railway Company became profitable quickly. In 1911 just 2 years after the completion of the project, revenues exceeded operating costs. Just 2 years later, net receipts were £70,645, and by 1919, they exceeded annual debenture interest (£88,800) by reaching £90,992. In 1928, net receipts were £212,097, representing 8.91% of the railway's total capitalisation. Fig. 3 presents the first of two comparative frameworks to evaluate the performance of the company which presents a simple annual return on capital modelled on the method implemented by Irving (1978, p. 46). This allows comparisons with average returns for British railway investment from various aggregate studies (Davis and Huttenback, 1986, p.

[7] The section had been constructed before the Colombian National Railway Company took over the railway, mostly by Cisneros, some under national administration. 'Colombian National Railway Report of 1908', Guildhall Library, Stock Exchange Reports, Box 1021, f. 1.

[8] 'Colombian National Railway Report of 1908', Guildhall Library, Stock Exchange Reports, Box 1021, ff. 1–2.

107; Edelstein, 1982, p. 125; Irving, 1978, p. 46; Lewis, 1983, p. 217). The return on share capital demonstrates the return to shareholders after the payment of interest-bearing debentures.[9]

[Insert Fig. 2 here]

Fig. 2 clarifies that the finances of the company were above average, whether compared to British railways, British overseas railways, Latin American, or Argentine railways. The overall return to shareholders was low during the first decade but subsequently reached parity with the 5.33% average rate of return for Latin American railways (Edelstein, 1982, p. 125). It rose to a peak of 14.29% in 1927, concurrently returning 9.14% on all capital, representing 3.38 and 1.71 times the regional average. Despite this broadly positive financial development, the railway faced bankruptcy during the financial year 1921/1922. If all Latin American railways had been subjected to similar economic conditions, most would have shared its fate. As a case in point, in Mexico, where the *Porfiriato* enabled rapid railway expansion, the net receipts of railways were insufficient to pay interest on bonds, let alone dividends to shareholders (Kuntz Ficker, 2015b, p. 83).

**The debt spiral and its causes**

The main cause of the debt spiral and subsequent bankruptcy were expenses incurred as a result of the civil war. The railway and river terminal were situated in the very epicentre of the conflict and were 'a constant scene of fighting'.[10] The railway's local manager George Odell described how 'wooden bridges … [were] repeatedly burnt and destroyed', 'locomotives … dismantled of the most important parts … rendering them useless', and 'the telegraph line … [was] destroyed'. The company's general stores, warehouses, and stations were looted by both the

[9] The return on share capital is net receipts less debenture interest divided by outstanding share capital. The return on all capital is net receipts divided by all capital investment (debentures and share capital).

[10] 'Claim of the Colombian National Railway Company, Limited', TNA, FO55/415, f. 236.

government and rebels, which left Odell feeling 'helpless to save the Railway Company property from total destruction'.[11] Associated construction delays were even more deleterious to the company's long-term finances, because of annual interest incurred on the £600,000 raised in 1899. Net receipts did not rise above annual interest until 1920. By this point, 20 years' worth of interest had been incurred, as well as 12 and 13 years on the £880,000 raised in the subsequent issuances of 1908 and 1909. Cumulative interest was £1.26 m, representing 84.4% of the nominal value of the debt (£1.48 m).[12] Debentures were floated at a greater discount to nominal value, meaning that more was being expended on servicing the debt than on construction.[13] The 1908 debentures were floated at 80% and incurred 6% interest, representing an effective rate of 7.5%. The operational profitability of Uruguay's railways developed in a way not dissimilar to the Colombian National Railway Company (Díaz, 2017, Appendix B). Servicing debt with a 7.5% effective interest rate without institutional support would have bankrupted most (if not all) of them leading to a much less extensive network.

The deficit between net receipts and debentures during 1909–19 was paid on the company's behalf by the national government. Since the guarantee was accounted for as a separate interest-bearing debt, these support payments led to rapid growth of the company's debt liabilities. When bankruptcy occurred in 1921, the debt owed to the national government had grown to over £1.4 m, almost equalling the total outstanding debentures (£1.48 m). Of this, £475,000 was cumulative interest. This debt spiral made bankruptcy inevitable and was a legacy of additional interest incurred during construction delays: £129,000 of interest incurred on the £600,000 of debentures floated in 1899 (see Table 2).[14] An additional £400,000 was raised in

11 Odell to Mallet, 25 August 1902, TNA, FO 135/269.

12 The calculations are as follows: 20 years x 6% interest on £600,000 = £720,000; 13 years x 6% interest on £430,000 = £335,400; And 12 years x 6% interest on £450,000 = £324,000. This gives a total of £1,259,400.

13 Republic of Colombia, Colombian National Railway (1908) Customs Guaranteed 6% Debentures', *The Times*, 26 October 1908.

14 'Claim of the Colombian National Railway Company, Limited', TNA, FO55/415, f. 244.

1907 at a 20% discount to address this unforeseen expenditure, creating £161,250 of additional debt directly attributable to these interest payments. This debt carried annual interest of £9,675, resulting in £135,450 of additional expenditure between 1907 and 1921.

Poor outcomes in the railway sector have been attributed to the geographical and climatic factor endowments of the country (Panchón and Ramírez, 2006; Rippy, 1943; Safford, 2010). Fig. 3 tests this concept quantitatively. It projects two counterfactuals of company finances: one without the elevated construction costs resulting from geographical and climatic complications, and one without the financial consequences of the civil war. It is likely that the projection significantly understates the impact of the war, since neither the devastation to the economy (which limited demand for transport services) or the destruction of company property are considered within the model. Unaided and aided IRR are calculated in Table 3 for each of the scenarios. These calculations form the basis of a second comparative framework where performance is contrasted with railway companies in Brazil and Uruguay (Díaz, 2017; Summerhill, 1998).

The internal rate of return (IRR) calculation takes the capital expenditure, net revenues and the final disposal value in 1928 to provide a representative return on capital over the life of the investment (Mcclelland, 1972). The terminal value of the investment is calculated with a geometric depreciation rate of 1.4% mirroring that implemented in similar studies which supports direct comparisons with a host of individual railways in Uruguay and Brazil (Herranz, 2004; Díaz, 2017; Summerhill, 1998). Coincidentally, when using this depreciation rate, the terminal value is broadly in line with the price paid by the Colombian government for British railway companies operating in the interior of Colombia on a per-kilometre basis.

[Insert Fig. 3 here]

[Insert Table 3 here]

Without construction delays, the decreased debt level caused the company's financial deficit to decrease much more rapidly, and in counterfactual 1, by 1921, the company could pay back all government support payments from net receipts. In counterfactual 2, the peak cumulative deficit decreases compared to counterfactual 1, but construction delays and increased overall debt levels mean that the deficit does not decrease as rapidly. The performance of the railway in counterfactual 1 is much better than in counterfactual 2 or the actuals. Counterfactual 1 raised unaided IRR from 2.61% to 4.65%, which is greater than the increase provided to actuals by the government guarantee: 2.61% to 3.59%. In other words, removing construction delays from the equation has a greater impact on the company's overall financial viability than applying a government guarantee on its bonds. In addition, aided IRR in counterfactual 2 is lower than unaided IRR in counterfactual 1, meaning that even when concurrently removing the financial impact of landslides and applying a government guarantee, the overall financial viability of the project is lower than when construction delays are avoided.

[Insert Fig. 4 here]

The unaided and aided IRR of the Colombian National Railway compare well to those of the Brazilian and Uruguayan railways. The actuals of the company are better than most companies operating in Uruguay, but slightly lower than the most profitable companies operating in the country. Counterfactual 2 largely accounts for the impact of the geographical differences between the two countries. Its unaided IRR and aided IRR are close to the level of the Central Uruguay Railway, which was the most profitable Uruguayan railway (Díaz, 2017). The railway's actual IRR is lower than the basket of Brazilian railways (Summerhill, 1998). The IRR of counterfactual 1 is similar to the least profitable Brazilian railways, meaning that had construction delays been avoided, the railway's experience would have mirrored the situation of similar railways in Brazil. It should be noted that other British railway companies operating

in the country were significantly more profitable than the Colombian National Railway Company (Primmer, 2018). Railways in Brazil and Uruguay were also evaluated over a much longer timescale, with higher profitability in later years making up for lower profitability while traffic was developing, meaning the IRR values for the company likely understate the long-term return from a comparative perspective. As such, in aggregate, the experience of Colombia's sector was likely closer to that of Brazil than to the situation of Uruguay.

## IV – ECONOMIC IMPACT

### Export-led development

Between 1920 and 1928, the value of coffee exports transported by the railway rose from $2.37 m to $6.65 m, with a corresponding rise in tonnage from approximately 5,000 to 11,000. The economic decline in the department of Santander (a neighbouring region of the interior) was associated with 'high transportation costs' caused by the lack of a railway which 'blocked the takeoff of modern capitalism' (Palacios, 2006, pp. 54–5). The contrast between Cundinamarca and Santander illustrates the importance of rail links to the growth of coffee exports in Colombia. Santander was the historical centre of coffee cultivation, but the development of railways in Cundinamarca and Antioquia skewed competitive advantage in favour of these departments, leading to the rapid take-off of export earnings in the 1920s that is evident in Fig. 5. It is reasonable to conclude the increase in production evident between 1920 and 1928 was highly dependent on the railway since there was no similar increase in production in Santander where a rail link took much longer to complete (Primmer, 2020, pp. 25-9).

[Insert Fig. 5 here]

The growth in coffee exported via the railway between 1920 and 1928 was valued at $4.28 m per annum. Ramirez (2001) presents a nominal national GDP figure for 1927 of $850 m, and

the economy grew 7.8% in the following year (Caballero Argáez, 2006, p. 83). Applying this rate to GDP in 1927 provides a figure of $916.3 m for 1928. Departmental revenues provide the best data available for establishing Cundinamarca's proportion of national GDP (República de Colombia, 1930, p. 255). Applying this ratio to GDP for 1928 gives a departmental GDP of $132 m. The growth of the value of coffee exports between 1920 and 1928 represents 3.2% of this figure. When delimited by sector (see table 4) the social savings were only 2.3% of the gross production value of the coffee transported by the railway, yet the growth of this trade represented 3.2% of the GDP in the department, illustrating that the economic impact of railways in Colombia went far beyond their unitary freight savings. Social savings were low in the coffee sector, yet the impact of the technology was high. In 1928, coffee transported for export represented only 4.59% of the total cargo moved by the railway (República de Colombia, 1929) yet this small proportion of freight had a profound impact on the economy.

**Spill-overs into the agricultural sector**

Previously, agricultural trade depended on mule trails, which remained the alternative to railways into the 1920s (Ramírez, 2001, Panchón and Ramírez, 2006; Safford, 2010). High transport costs dislocated the markets of the interior, creating a pattern termed economic archipelagos (Nieto Arteta, 1941). During normal conditions, transport costs along the length of the Bogotá–Honda mule trail (principal alternative route to the railway) were 87% the average market value of corn, 58% of panela (unrefined sugar), and 37% of rice.[15] During the rainy season, the average cost of freight almost doubled (Safford, 2010) making the trade unviable without significant price hikes in the capital.

[15] Average transport costs are applied at $0.0625 per ton-km for the Facatativa cart road (Camacho Roldán, 1973 [1897], p. 23) and $0.31 and $0.58 per ton-km for the mule trail to Honda (Safford, 2010, p. 525). The average price for the period 1846–1865 is calculated using (Urrutia and Arrubla, 1970, pp. 97–8).

When the railway was completed, it transformed economic interconnectivity within the department. The cost of freight decreased from an average of $0.31–$0.58 to $0.05 per ton-km (República de Colombia, 1925b; Safford, 2010, p. 525). The inflation of nominal prices during the 1920s (López, 1970) amplified the impact of this fall in transport costs. Transport costs dropped to a fraction of the value of the commodities, even when mobilising the length of the railway (132 km): 9.27% for corn, 5.62% for panela, and 2.61% for rice. Price variations also decreased significantly. These changes resulted in the development of new trade in bulky agricultural commodities. When the British took over the railway project in 1899, 'there were no potatoes' (Rivas, 1972, p. 41) in La Mesa, a small town situated between the highlands and river valley. By contrast, Fig. 9 illustrates that the railway supported rapidly expanding reciprocal trade in potatoes and plantains between Bogotá and the river valley in the 1920s.

[Insert Fig. 6 here]

Low transport costs created a market for corn from the lowlands expanding the productive areas which could supply the market in Bogotá. The trade in this commodity was substantial, and the railway's statistics suggest that corn was transported an average distance between 64.3 km and 84.27 km during the 1920s (Ortega, 1911, p. 7; República de Colombia, 1921, 1924, 1925a, 1925b, 1926, 1927, 1928).[16] If the same freight had been shipped by mule trail, the average cost would have been 26.1%–43.1% during normal conditions, and 42.1%–73.2% during the rainy season instead of 4.52%–5.91% using the railway. This would have made much of the trade economically unviable, and as such, a significant proportion of the trade can

[16] Average distance is ascertained by dividing the revenue received for the cargo by the tariff applied, and then dividing this figure by cargo tonnage.

be directly attributed to the development of the railway. In 1924, the trade was worth $977,439 (approximately £195,500).

[Insert Fig. 7 here]

The railway also supported the expansion of rice consumption and production. Government statistics suggest that in 1915, rice was an insignificant agricultural commodity: annual production was only 8% that of corn and 9% that of plantains (República de Colombia, 1917, p. 126). Railway freight statistics do not differentiate between domestic and imported rice, but the proportion of each can be ascertained owing to a price differential between the freight charged on domestic and imported foodstuffs.[17] Transportation of rice grew 294% (from 820 to 3,231 tons) in the space of just 8 years, and there was parallel growth of 197% in domestic rice production.[18] The railway was the catalyst for this growth in consumption, as well as the substitution of imports with domestic production. The statistics present a unique snapshot of the economic take-off of the Cundinamarcan agricultural sector; this phenomenon is often overlooked because of the preoccupation with coffee-based export-led development (Bejarano, 1987; McGreevy, 1971; Ocampo, 1984, Palacios, 1980). The growth in the agricultural sector was stimulated not only by the efficiency of the railways as a means of distribution, but also because they enabled transportation of modern agricultural machinery to the interior (Bejarano, 1987, p. 250).

[Insert Fig. 8 here]

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17 $a$ = freight revenue; $b$ = Railway Length; $c$ = tonnage; $d$ = price 1 $e$ = price 2; $p$ = % imported

$$\left(\frac{\frac{\left(\frac{a}{b}\right)}{c} - d}{e - d}\right) = p$$

18 Statistics presented in Fig. 8 are compiled under the reasonable assumption that all intermediate cargo was domestic production. Population was centred in the capital, and towns and villages served by the railway were rural producers of food crops. Little economic incentive existed to import foreign rice in these areas, since it could be produced within the local area.

## The salt monopoly and increased state fiscal capacity

Railways not only depended on but also concurrently supported the development of state fiscal capacity by stimulating the expansion of the export sector and associated customs revenues (Bignon, Esteves, and Herranz, 2015). However, there were other sources of government revenues that railways interacted with in Latin America which have received less attention. Salt is one of them. Salt mines were government monopolies, and thus, important sources of government revenue, to the extent that they were tightly tied to the genesis of the Colombian state itself (Rosenthal, 2012). The railway played an important role in distributing salt produced by the government's principal mine in Zipaquirá (a small town in Cundinamarca). Prior to the railway, the salt trade was so impeded by transport costs on mule trails that in the south of the country, Peruvian salt had to be imported to adequately supply local demand.[19] The railway provided an outlet to the Magdalena River, which allowed the salt to be distributed throughout the country. This expanded the market of the government monopoly significantly, leading to the rapid expansion of production and inter-regional trade, as shown in Fig. 9. Analysis is hampered by the lack of freight statistics for the first decade of the railway's operations, but the statistics for 1920–1928 illustrate a strong trend between the revenues of the national government's salt mine in Zipaquirá and the cargo of the railway.

[Insert Fig. 9 here]

The growth of commerce in salt between Cundinamarca and other regions of Colombia (cargo between terminals) in Fig. 9 closely parallels the growth of production and revenues of the mines at Zipaquirá. The growth between 1920 and 1928 is exclusively made up of cargo between terminals, meaning that it is reasonable to assume that much of this growth depended on the completion of the railway. Residual production during this period is relatively stagnant.

[19] J.H. Johanet, *La Industria*, 5 April 1883.

If the trend evident in cargo between terminals were to end in 1909 at or close to zero (as one would expect), the total revenues for this year would coincide closely with the total residual production in 1920. This suggests that this residual balance represents consumption in Bogotá, and that the growth in revenues was dependent on the railway opening new areas as markets for Cundinamarcan salt. The nominal increase of the Zipaquirá salt mine's revenues (approximately $1.03 m) represented 0.78% of the departmental GDP ($132 m per annum). In 1928 the annual profits of the salt mine were $747k (República de Colombia, 1930, p. 494) and revenues had increased approximately 170% since the completion of the railway. Should the increase in revenues correlate to the increase in annual profits (which is unclear) as a state monopoly the increased trade would have contributed $470k to fiscal revenues, which represented 0.62% of national government revenues (República de Colombia, p. 245). Since Cundinamarca's departmental revenues were only 14.4% of the national total this increase represented a 4.5% increase in the department's contribution to fiscal capacity.

**Overall impact: exports versus internal trade**

The analysis presented in this section demonstrates that the railway made a significant contribution to economic growth in the Department of Cundinamarca. Even though only six commodities (corn, potatoes, plantains, corn, coffee, and salt) are analysed in detail, it is clear the railway's impact on trade was marked. In addition, it should be considered that only one railway of the four which operated in the department is analysed, meaning the overall impact of railways in the department was greater than can be expressed through this single case study.

[Insert Table 4 here]

To date the consensus regarding the economic impact of railways in Colombia has been established utilising the social savings method. The ideas that railways 'did not play a major role in economic growth' (Ramírez, 2001, p. 118) or that their principal economic function was

stimulating the growth of the coffee export sector (McGreevy 1971) were articulated in studies which demonstrated relatively low social savings at the national level. In table 4 social savings estimates have been calculated for the cargo of six commodities transported by the railway within the Department of Cundinamarca based on the total gross production value of each item of cargo. These are unadjusted estimates and therefore upwardly biased, but the difference between the export sector and internal trade is too great for this bias to negate the overall pattern identified therein. The table demonstrates definitively that the impact of the railway on internal trade was many times greater than in the coffee export sector. Whereas the railway only saved 2.3% of the GPV (gross production value) of coffee mobilized by the railway, it provided between 19.3% and 107.9% of the GPV of the five commodities mobilised by the railway related to internal trade. The very high levels of social savings afforded to the trade in these commodities illustrates how dependent the growth of this internal trade on the significant decrease in the cost of freight provided by the railway. This contribution of railways to the internal sector has hitherto been largely unacknowledged within Colombian historiography. This demonstrates that whilst national social savings were low (Ramírez, 2001; McGreevy, 1971) the impact on the internal sector was largely analogous to Mexico (Kuntz Ficker, 1995, 2014; Riguzzi, 2009) where national social savings were very high (Coatsworth, 1981).

[Insert Table 5 here]

Whilst the social savings in the coffee sector were modest, the prolonged stagnation of the growth of coffee exports in Santander – where a rail link was not developed – illustrates the extent to which the explosive growth of the sector in the 1920s relied heavily on the technology (Primmer 2020). During this period of explosive growth in the sector, the growth of coffee mobilised by the railway represented 3.24% of departmental GDP. In contrast, the five commodities from the internal economy analysed represented 1.23%. International trade represented only 26.21% of total annual railway cargo, leaving 73.79% relating to internal

trade. The five commodities analysed represented 14.71% of total annual freight or 19.87% of total internal trade cargo. If we assume that the growth in internal trade dependent on the railway within this basket of commodities is representative of internal trade in aggregate, this represents a total growth within internal trade of $8.2 m representing 6.18% of the departmental economy. Combined with coffee, this would mean that the growth of trade within the economy of the department of Cundinamarca which depended directly on the existence of the railway represented 9.42% of departmental GDP. This is a significant assumption to make, which can be confirmed only through a detailed study of a greater variety of the commodities transported by the railway, for which price data are not available. However, since internal trade is projected to be 6.18% of GDP as opposed to the 3.24% contribution to GDP of coffee, it can be concluded that the impact on internal trade likely outstripped that accrued within the export sector while leaving significant room for error.

## V – CONCLUSIONS

This research aimed to establish the experience and impact of the Colombian National Railway Company. It has been successful in these aims providing three findings relating to the role of bond guarantees, the impact of political instability to company operations and the economic impact of the railway on the regional economy.

Railway bond guarantees are a system of finance which has remained overlooked and poorly understood in the context of Colombia. The first finding demonstrates that the Colombia National Railway Company's bond guarantee was influential in assuring successful completion of the railway project. However, conversely, the way in which the guarantee was implemented largely as a loan to the national government was detrimental to the long-term financial prospects of the company and played a direct role in its eventual bankruptcy. This finding provides a new perspective on Colombian railway history, since it explains why despite being

operationally profitable, British railways in the country did not see the same rapid expansion as in such countries as Argentina, Brazil, Chile, and Uruguay, where the system of bond guarantees was implemented in a much more beneficial manner for the long-term financial viability of railways.

The second finding relates to the impact of political instability in Colombia in relation to the War of a Thousand Days (1899–1902). The analysis of the company's accounting records illustrated that bankruptcy and failure was a result not of a lack of operational profitability, but rather, initial construction delays. While geographical factor endowments were detrimental to the company's finances, its failure cannot be attributed to them. This brings into question the widespread attribution of factor endowments as an explanatory framework for poor outcomes in the sector (Panchón and Ramírez, 2006; Rippy, 1943; Safford, 2010). The most significant factor in the company's bankruptcy was political instability, which resulted in construction delays. This illustrates that owing to the long gestation period inherent to the sector, the most important factor determining success was efficient and rapid completion of the project. The railway was operationally profitable from the outset, but construction delays created a debt spiral so pronounced that even a rate of return on capital which substantially outstripped regional averages was insufficient to escape eventual bankruptcy. The railway was more profitable than railways operating in Uruguay, yet because of the nature of the bond guarantees offered in this country, less profitable companies were financially solvent. In Uruguay there were 1.97 km of track for every 1,000 people compared to 0.22 in Colombia (Bulmer-Thomas, 1994, p. 107). If British railway companies in Uruguay had operated under the same conditions experienced by the Colombian National Railway Company, most would have gone bankrupt and the national network would have been significantly smaller. The same is likely true for other countries in the region. Colombia is an example of insufficient political incentive for foreign investors to ensure the development of a large national network with British capital.

The third finding is that the railway had a very significant impact on the economy of the Department of Cundinamarca. This outstrips the economic impact railways have generally been considered to have exerted in the country in studies applying the social savings method at the national level (McGreevy, 1971; Ramírez, 2001). The railway supported the expansion of the export sector, but it also had an important positive impact on internal trade and fiscal revenues. Based on the data presented, it seems highly likely that the impact of the railway on internal trade was greater than its role in the expansion of the export sector. This finding is in line with what has been argued with relation to Mexico (Kuntz Ficker, 1995, 2014; Riguzzi, 2009). However, it represents a significant deviation from the dominant perspective within Colombian historiography, which views railways as inextricably tied to the export sector (Bejarano, 1987; Correa, 2012; Horna, 1992; Kalmanovitz, 2010; McGreevy; 1971; Ocampo, 1984; Palacios, 1980). The railway also supported the expansion of government revenues by opening the market for salt produced by the government's principal mine in Zipaquirá. This illustrates that the relationship between export expansion and customs revenues (Bignon, Estevez, and Herranz, 2015) was not the only way in which railways in Latin America contributed to the increase of state fiscal capacity.

This article has contributed to Latin American and Colombian historiography in a range of ways. It has illustrated that the economic impact of railways varied by sector of the economy. It has challenged the widely held belief that the predominant impact of railways in Colombia was the expansion of the coffee exports, demonstrating that the influence on internal trade was just as significant. The study has highlighted the importance of institutional support and political stability, which proved more influential than the overall level of profitability of the enterprise. These conclusions provide additional avenues with which to explain differing levels of investments which could be applied to the study of railways or other examples of foreign direct investment throughout the region.

**References:**

Archival Material: London, Guildhall Library, Stock Exchange Reports, Boxes 1115-6, 1167, 1217-8, 1267, 1318-9, 1369-70, 1420-1, 1469, 1512, 1557, 1602, 1647, 1693. London, The National Archives, Foreign Office Section (FO)

Newspapers: The Times

Bibliography:

BEJARANO ÁVILA, J. A. (1987 [2015]): "El Despegue Cafetero (1900–1928)" in J. A. Ocampo Gaviria (ed), *Historia económica de Colombia*. Bogotá, Fedesarollo: 165–197.

BIGNON, V., ESTEVES, R., and HERRANZ, A. (2015): "Big push or big grab? Railways, government activism, and export growth in Latin America, 1865–1913" *The Economic History Review* 68: 1277–1305.

BLAKEMORE, H. (1990): *From the Pacific to La Paz: Antofagasta and Bolivia Railway Company, 1888–1988*. London: Lester Crook Academic Publishing.

BOUGHEY, D. (2009): "British overseas railways as free-standing companies, 1900–1915" *Business History* 51: 484–500.

BROMBERGER, H. A. (1913): *Les Chemin de Fer Exotiques*. Paris: Moniteur Economique et Financier.

BULMER-THOMAS, V. (1994): *The Economic History of Latin America Since Independence*. Cambridge: Cambridge University Press.

CABALLERO ARGÁEZ, C. (2006): *Historia del Sector Financiero Colombiano en el Siglo XX: Ensayos Sobre su Desarrollo y sus Crisis*. Bogotá: Grupo Editorial Norma.

CAMACHO ROLDÁN, S. (1973): *Escritos Varios: Segunda Serie*. Bogotá: Banco de la República.

CARON, F. (1983): "France" in P. O'Brien (ed), *Railways and the Economic Development of Western Europe, 1830–1914*: 28–48. London: Palgrave Macmillan.

CASSON, M. (1998): "An Economic Theory of the Free-Standing Company" in M. Wilkins and H. Shroeter (eds) *The Free-Standing Company in the World Economy 1830–1996*. Oxford: Oxford University Press: 99–128.

COATSWORTH, J. H. (1981): *Growth against Development: The Economic Impact of Railroads in Porfirian Mexico*. DeKalb: Northern Illinois University Press.

CORREA, J. S. (2012): *Café y Ferrocarriles en Colombia: Los Trenes Santandereanos (1869–1990)*. Bogotá: CESA.

CORREA, J. S. (2015): "Colombia" in S. Kuntz Ficker (ed) *La Expansión Ferroviaria en América Latina*. Mexico City: COLMEX: 137–163.

DARWIN, J. (2012): *Unfinished Empire: The Global Expansion of Britain*. London: Penguin.

DAVIS, R. A. and HUTTENBACK, L. E. (1986): *Mammon and the Pursuit of Empire: The Political Economy of British Imperialism, 1860-1912*. Cambridge: Cambridge University Press.

DAVIS, C. B., WILBURN, K. E., and ROBINSON, R. E. (eds) (1991): *Railway Imperialism*. Westport: Greenwood.

DÍAZ, G. (2015): "Uruguay" in S. Kuntz Ficker *La Expansión Ferroviaria en América Latina*. Mexico City: COLMEX. pp. 244–279.

DÍAZ, G. (2017): "Railway Investment in Uruguay before 1914: Profitability, Subsidies, and Economic Impact" *European Review of Economic History* 21: 280–301.

EDELSTEIN, M. (1982): *Overseas Investment in the Age of High Imperialism: The United Kingdom, 1850–1914*. London: Methuen.

FISHLOW, A. (1965): *American Railroads and the Transformation of the Ante-bellum Economy*. Cambridge, MA: Harvard University Press.

FOGEL, R. (1964): *Railroads and American Economic Growth*. Baltimore: John Hopkins University Press.

FOREIGN OFFICE. (1910): "Report on the Railways of Colombia" Vol. XCVI, Cd. 4968.

GALLUP, J. L., GAVIRIA, A., and LORA, E. (2003): *Is Geography Destiny? Lessons from Latin America*. Stanford: Stanford University Press.

GOURVISH, T. R. (1980): *Railways and the British Economy 1830–1914*. London: Macmillan.

HAWKE, G. R. (1970): *Railways and Economic Growth in England and Wales, 1840–1870*. Oxford: Oxford University Press.

HERRANZ, A. (2011a): "The Role of Railways in Export-led Growth: The Case of Uruguay, 1870–1913" *Economic History of Developing Regions* 26: 1–32.

HERRANZ, A. (2011b): "El Impacto Directo del Ferrocarril Sobre el Crecimiento Económico Argentino durante la Primera Globalización" *Revista Uruguaya de Historia Económica* 1: 34–52.

HERRANZ, A. (2014): "Transport Technology and Economic Expansion: The Growth Contribution of Railways in Latin America Before 1914" *Revista De Historia Económica, Journal of Iberian and Latin American Economic History* 32, 13–45.

HOBSBAWM, E. (1998): *On History*. London: Abacus.

HORNA, H. (1992): *Transport Modernization and Entrepreneurship in Nineteenth Century Colombia*. Uppsala: Uppsala University.

IRVING, R. (1978): "The Profitability and Performance of British Railways, 1870–1914" *The Economic History Review* 31: 46–66.

KALMANOVITZ, S. (2010): *Nueva Historia Económica de Colombia*. Bogotá: Taurus.

KATZENELLENBOGEN, S. (1973): *Railways and the Copper Mines of Katanga*. Oxford: Oxford University Press.

KUNTZ FICKER, S. (1995): *Empresa Extranjera y Mercado Interno: El Ferrocarril Central Mexicano (1880–1907)*. Mexico City: COLMEX.

KUNTZ FICKER, S. (2014): "Exports and the Mexican economy (1870–1929)" *Australian Economic History Review* 54: 95–119.

KUNTZ FICKER, S. (2015a): *La Expansión Ferroviaria en América Latina*. Mexico City: COLMEX.

KUNTZ FICKER, S. (2015b): "Mexico" in S. Kuntz Ficker (ed) *La Expansión Ferroviaria en América Latina*. Mexico City: COLMEX. pp. 63–101.

LEWIS, C. (1983): *British Railways in Argentina 1857–1914: A Case Study of Foreign Investment*. Oxford: Oxford University Press.

LEWIS, C. (1991): *Public Policy and Private Initiative Railway Building in Sao Paolo 1860–1889*. London: Institute of Latin American Studies.

LÓPEZ, H. (1970): "La Inflación en Colombia en la Década de los Veintes" *Cuadernos Colombianos* 5.

MCCLELLAND, P.D. (1972): "Social rates of return on American railways in the nineteenth century". *The Economic History Review*, 25, pp. 471-88.

MCGREEVY, W. (1971): *An Economic History of Colombia 1845–1930*. Cambridge: Cambridge University Press.

MEISEL, A., RAMÍREZ, M. T., and JARAMILLO, J. (2016): "Too Late but Profitable: Railroads in Colombia during 1920–1950" *Investigaciones de Historia Económica – Economic History Research* 12: 165–180.

MILLER, R. (1976): "The Making of the Grace Contract: British Bondholders and the Peruvian Government, 1885–1890" *Journal of Latin American Studies* 8: 73–100.

MILLER, R. (1993): *Britain and Latin America in the Nineteenth and Twentieth Centuries*. London: Longman.

MOLINA LODOÑO, L. F. (1998): *Empresarios Colombianos del Siglo XIX*. Bogotá: Banco de la República.

NIETO ARTETA, L. (1941): *Economía y Cultura en la Historia de Colombia*. Bogotá: Siglo XX.

OCAMPO, J. A. (1984): *Colombia y la Economía Mundial, 1830–1910*. Bogotá: Siglo Vientiuno.

ORTEGA, A. (1911): *Documentos Relacionados con el Ferrocarril de Girardot*. Bogotá: Imprenta Nacional.

PALACIOS, M. (1980): *Coffee in Colombia, 1850–1970: An Economic, Social and Political History*. Oxford: Oxford University Press.

PALACIOS, M. (2006): *Between Legitimacy and Violence: A History of Colombia, 1875–2002*. London: Duke University Press.

PANCHÓN, Á. and RAMÍREZ, M. T. (eds) (2006): *La Infraestructura de Transporte en Colombia durante el Siglo XX*. Bogotá: Banco de la República.

PARDO PARDO, A. (1972): *Geografía económica y humana de Colombia*. Bogotá: Tercer Mundo.

PLATT, D. C. M. (1973): *Latin America and British Trade, 1806–1914: The Merchant Adventurers*. Oxford: Oxford University Press.

PRIMMER, A. (2013): "La Historia Económica del Ferrocarril de Girardot" (Master's thesis). Universidad Nacional de Colombia.

PRIMMER, A. (2018): "Capital, Monopoly and Economic Nationalism: A History of British Railways in Colombia, 1902–1930" (Doctoral thesis). University of Bristol.

PRIMMER, A. (2020): "Railway Nationalism and 'Railway Imperialism' in Colombia and the Economic Decline of Santander, 1907–1918" *Revista de Historia Economica – Journal of Iberian and Latin American Economic History*, https://doi.org/10.1017/S0212610919000399.

RAMÍREZ, M. T. (2001): "Los Ferrocarriles y su Impacto Sobre la Economia Colombiana" *Revista de Historia Económica* 19: 81–122.

RAUSCH, J. (2017): *Santiago Pérez Triana (1858-1916): Colombian Man of Letters and Crusader for Hemispheric Unity* Princeton: Markus Weiner Publishers.
REPÚBLICA DE COLOMBIA (1909): *Documentos Relacionados con el Ferrocarril de Girardot*. Bogotá: El Republicano.
REPÚBLICA DE COLOMBIA (1917): *Anuario Estadística de 1915*. Bogotá, Imprenta Nacional.
REPÚBLICA DE COLOMBIA (1921): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1920*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1924): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1923*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1925a): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1924*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1925b): *Ferrocarril de Girardot: Tarifa que Empezará a Regir el 1 de Octubre de 1925*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1926): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1925*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1927): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1926*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1928): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1927*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1929): *Ferrocarril de Girardot: Informe del Gerente al Ministro de Obras Públicas Correspondiente al Año 1928*. Bogotá: Casa Editorial de Arboleba y Valencia.
REPÚBLICA DE COLOMBIA (1930): *Anuario Estadística de 1928, Vol. XXVII*. Bogotá: Imprenta Nacional.
RIGUZZI, P. (2009): "From Globalisation to Revolution? The Porfirian Political Economy: An Essay on Issues and Interpretations" *Journal of Latin American Studies* 41: 347–368.
RIPPY, J. F. (1943): "Dawn of the Railway Age in Colombia" *Hispanic American Historical Review* 33(4): 650–663.
RIPPY, J. F. (1966): *British Investments in Latin America, 1822–1949: A Case Study in the Operations of Private Enterprise in Retarded Regions*. Hamden: Archon.
RIVAS, M. (1972): *Trabajadores de Clima Caliente*. Bogotá: Imprenta Banco Popular.
ROSENTHAL, J. (2012): *Salt and the Colombian State: Local Society and Regional Monopoly in Boyaca, 1821–1900*. Pittsburg: University of Pittsburgh Press.
SAFFORD, F. (2010): "El Problema de los Transportes en Colombia en el Siglo XIX" in Meisel Roca, A. and Ramírez, M. T. (eds) *Economía Colombiana del Siglo XIX*. Bogota: Banco de la Republica.

SUMMERHILL, W. (2003): *Order Against Progress Government, Foreign Investment, and Railroads in Brazil, 1854–1913*. Stanford: Stanford University Press.

SUMMERHILL, W. R. (1998): "Market Intervention in a Backward Economy: Railway Subsidy in Brazil, 1854–1913" *The Economic History Review* 51: 542–568.

TORRES ELICECHEA, C. (1921): *Carta Abierta al Presidente del Senado de Colombia*. Lausanne: Imprenta Delacoste.

URRUTIA, M. and ARRUBLA, M. (1970): *Compendio de Estadísticas Históricas de Colombia*. Bogotá: Universidad Nacional de Colombia.

WRIGHT, W. (1974): *British-owned Railways in Argentina: Their Effect on Economic Nationalism, 1854–1948*. Austin: University of Texas Press.

YIN, R. K. (1993): *Applications of Case Study Research*. London: Sage.

ZEGARRA, L. F. (2013): "Transportation Costs and the Social Savings of Railroads in Latin America. The Case of Peru" *Revista de Historia Economica – Journal of Iberian and Latin American Economic History* 31: 41–72.

ZEGARRA, L. F. (2015): "Peru" in S. Kuntz Ficker (ed) *La Expansión Ferroviaria en América Latina*. Mexico City: COLMEX: 168–203.

**Table 1 –** Bonds issued by the Colombian National Railway Company

| Item | Type of Security | Date Issued | Value |
|---|---|---|---|
| First Debentures | Mortgage against railway | 1899 | £200,000 |
| Second Debentures | Mortgage against railway | 1899 | £400,000 |
| Third Debentures | Government guarantee | 1907 | £430,000 |
| Fourth Debentures | Government guarantee | 1908 | £450,000 |

**Source:** 'The Colombian National Railway Company, Limited. Balance sheet, 31 December 1916', Guildhall Library, Stock Exchange Reports, Box 1469.

**Table 2 –** Indirect financial impact of the Civil War

| Item | Working | Impact |
|---|---|---|
| Interest incurred during civil war | £600,000 at 6% for 3.583 years | £129,000 |
| Total increase in debt | £161,250 raised at 80% to net £129,000 | £161,250 |
| Interest incurred on new bonds | £161,250 at 6% for 14 years | £135,450 |
| Total debt of company | £200,000 + £400,000 + £430,000 +£450,000 | £1,480,000 |
| Percentage increase in debt | £161,250/£1,480,000 | 12.2% |
| Increase in annual interest | £161,250 at 6% | £9,675 |

**Source:** 'Republic of Colombia, Colombian National Railway (1908) Customs Guaranteed 6% Debentures', *The Times*, 26 October 1908; 'Claim of the Colombian National Railway Company, Limited' TNA, FO55/415, f 244.

**Table 3 –** Internal rate of return

| Scenario | Unaided IRR | Aided IRR |
|---|---|---|
| CNRC – Actuals | 2.61% | 3.59% |
| CNRC – Counterfactual 1 (No War) | 4.65% | 5.16% |
| CNRC – Counterfactual 2 (No Landslides) | 3.13% | 4.19% |

**Sources:** See Fig. 3; Method: Summerhill (1998) and Díaz (2017).

**Notes:** The company did not actually receive a full profit guarantee of the kind applied in Uruguay and Brazil; instead, it was effectively a long-term loan from the national government. As such, the aided IRR computes the return in the event that annual support payments were accounted for in the same way as those of Brazil or Uruguay – as part of annual revenues.

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**Table 4** – Sector social savings as percentage of gross production value delimited by commodity mobilised by the railway within the Department of Cundinamarca

| | **Coffee** | **Corn** | **Salt** | **Plantains** | **Potatoes** | **Rice** |
|---|---|---|---|---|---|---|
| Tons | 11,067 | 7,730 | 24,805 | 9,070 | 5,230 | 2,541 |
| Value (GPV) | $6,650,791 | $389,579 | $1,641,821 | $217,699 | $477,019 | $567,207 |
| Ton-Km | 570,342 | 666,261 | 3,205,617 | 671,292 | 469,061 | 335,445 |
| Freight Cost | $73,004 | $33,314 | $160,281 | $33,565 | $23,453 | $24,474 |
| Cost by Mule | $228,137 | $266,505 | $1,282,247 | $268,517 | $187,625 | $134,178 |
| Social Saving | $155,133 | $233,191 | $1,121,966 | $234,952 | $164,171 | $109,704 |
| *% GPV* | *2.3%* | *59.9%* | *68.3%* | *107.9%* | *34.4%* | *19.3%* |

**Sources:** República de Colombia (1921, 1924, 1925a, 1926, 1927, 1928, 1930, p. 255), Pardo Pardo (1972, p. 240), Ramírez (2001).

Notes: Figures are taken directly from the annual freight statistics of the railway and relate to the amount of each commodity mobilized. In all cases but one (rice) the tonnage is the total moved in the year. For rice this was not possible because there were no statistics for ton-km, and as a result only cargo between terminals was included for which the ton-km figure is known. The total freight charged by the company is subtracted from the cost by mule which is calculating using the cost per ton-km applied within Ramírez's study ($0.40).

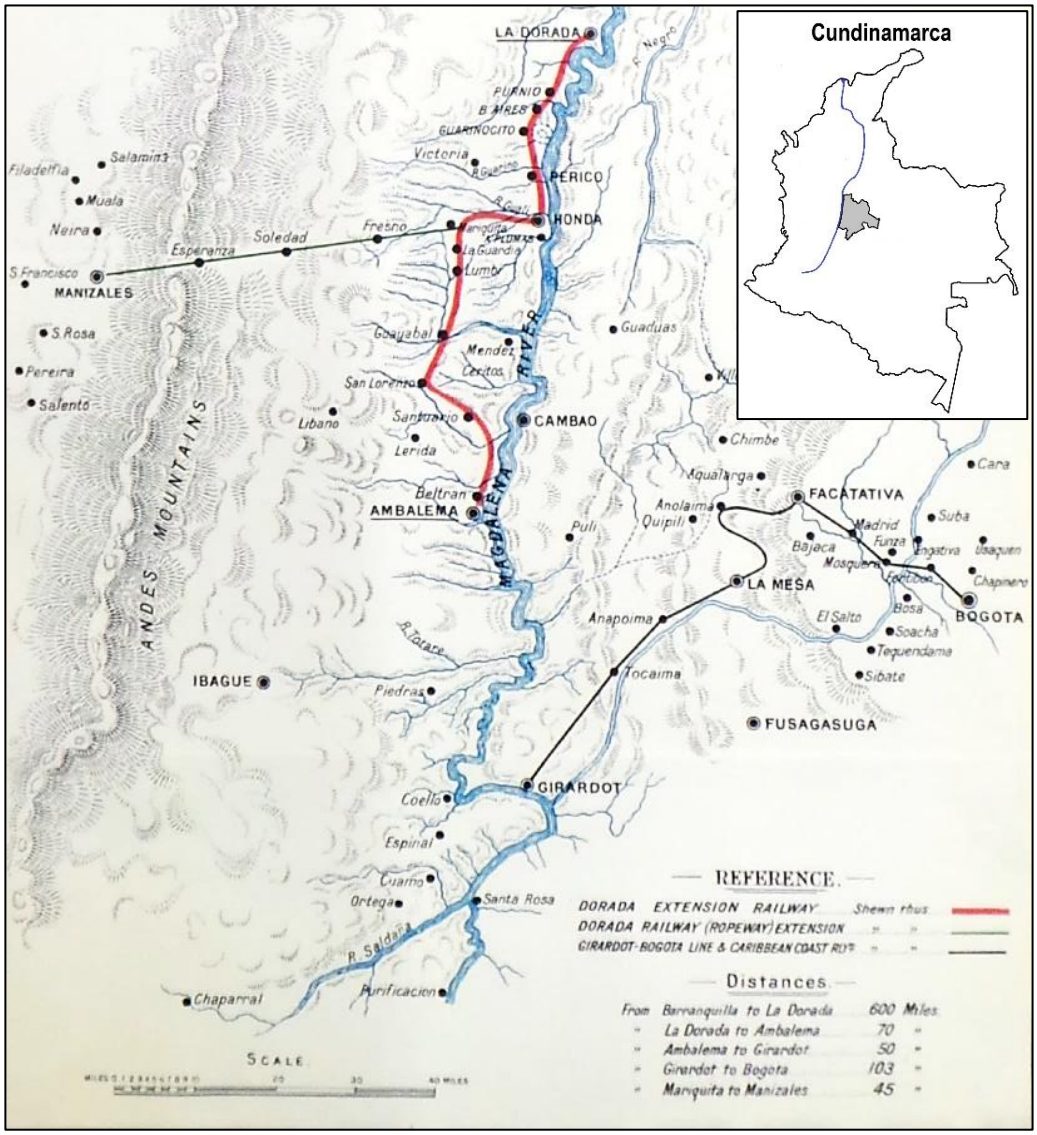
**Table 5** – Growth in trade directly attributable to the railway as a proportion of departmental GDP (Cundinamarca 1928)

| Commodity | Growth ($COP) | % Annual Cargo | % 1928 GDP |
|---|---|---|---|
| Rice | 175,438 | 0.49 | 0.13 |
| Potatoes | 183,541 | 0.83 | 0.14 |
| Plantains | 35,161 | 0.60 | 0.03 |
| Corn | 202,229 | 3.05 | 0.15 |
| Salt | 1,030,000 | 9.75 | 0.78 |
| *Total Internal* | *1,537,463* | 14.71 | *1.23* |
| Coffee | 4,280,000 | 4.59 | 3.24 |

**Sources:** República de Colombia (1921, 1924, 1925a, 1926, 1927, 1928, 1930, p. 255), Pardo Pardo (1972, p. 240), Ramírez (2001), and Caballero Argáez (2006, p. 83).

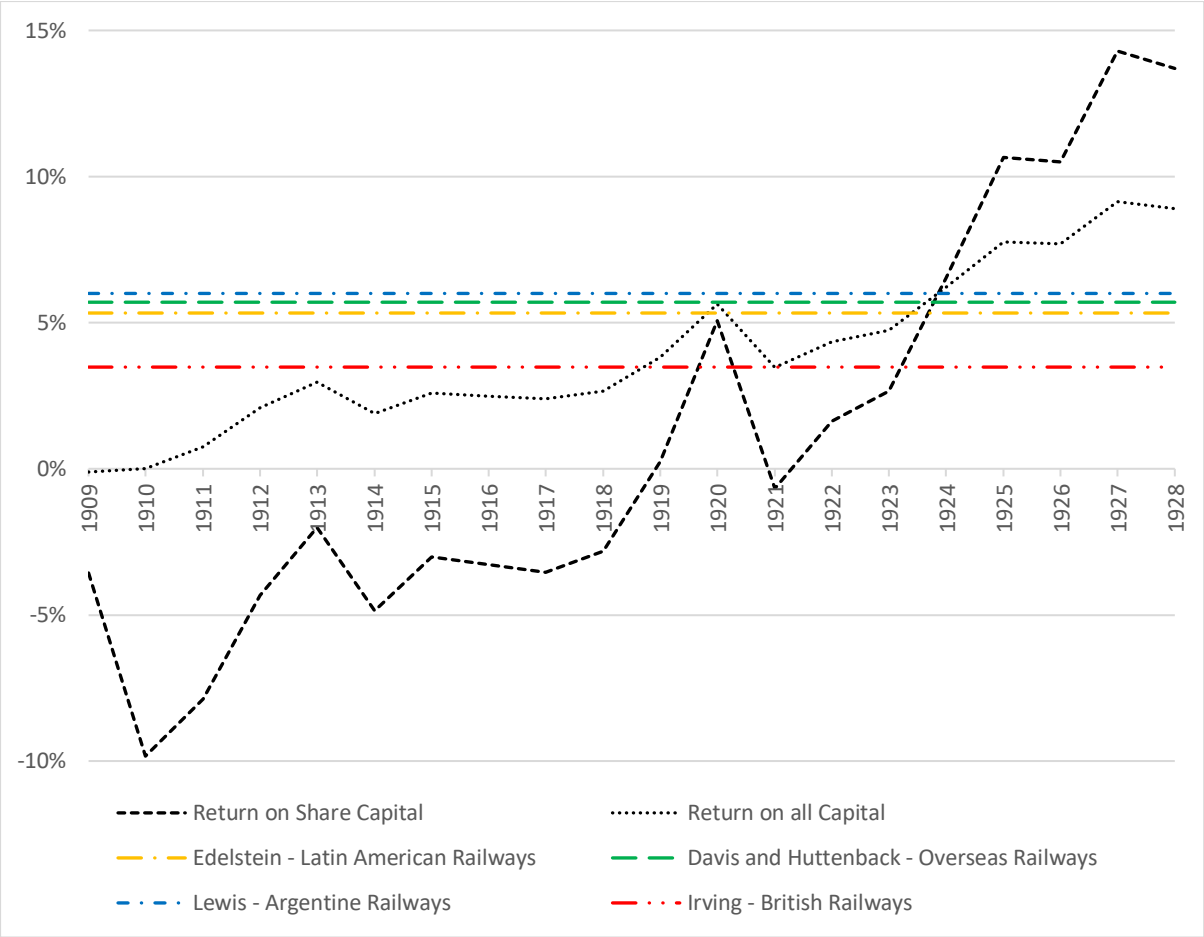
Notes: The growth of trade in salt, rice, plantains, and potatoes relates to that outlined in previous sections. A broad estimate has been made for the growth of trade in corn directly attributable to the railway, which includes all trade between terminals and half of intermediate cargo. The assumption is that where cargo was moved more than the average distance, the trade mobilised by high transport costs by mule trail would have made trade unviable. The cost of using mule trail represented up to 42.1%–73.2% when transported across the average distance of between 64.3 and 84.27 km.

**Fig. 1** – Girardot (Colombian National) and Dorada Railway



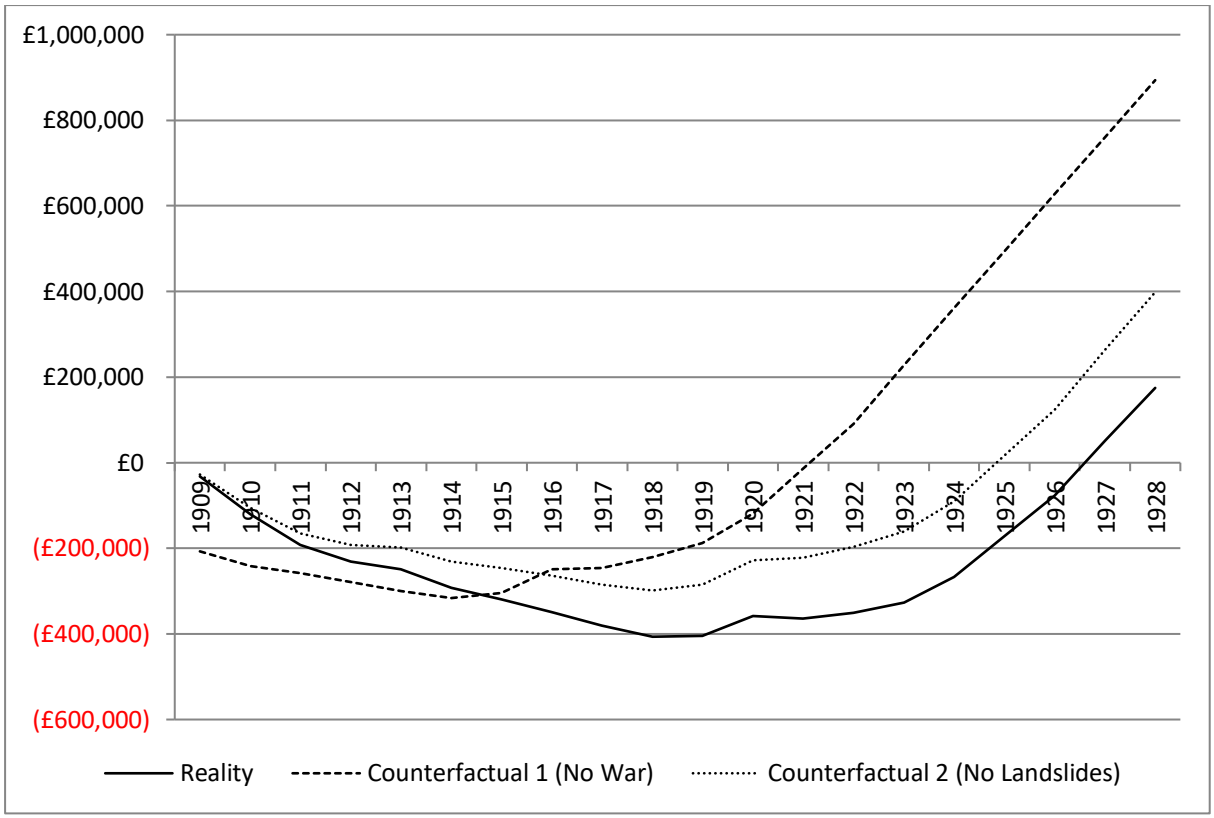

**Source:** Guildhall Library, Stock Exchange Reports, Box 1693, 'Dorada Railway Prospectus' in Dorada Railway Company Report for F/Y 1921–1922.

**Fig. 2 –** Annual rate of return compared with sector averages from aggregate studies




**Sources:** 1909–1921: Guildhall Library, Stock Exchange Reports, Boxes 1115–6, 1167, 1217–8, 1267, 1318–9, 1369–70, 1420–1, 1469, 1512, 1557, 1602, 1647, 1693); 1922–1928: República de Colombia (1929); aggregate studies: Lewis (1983, p. 217), Davis and Huttenback (1986, p. 107), Edelstein (1982, p. 125), and Irving (1978, p. 46).

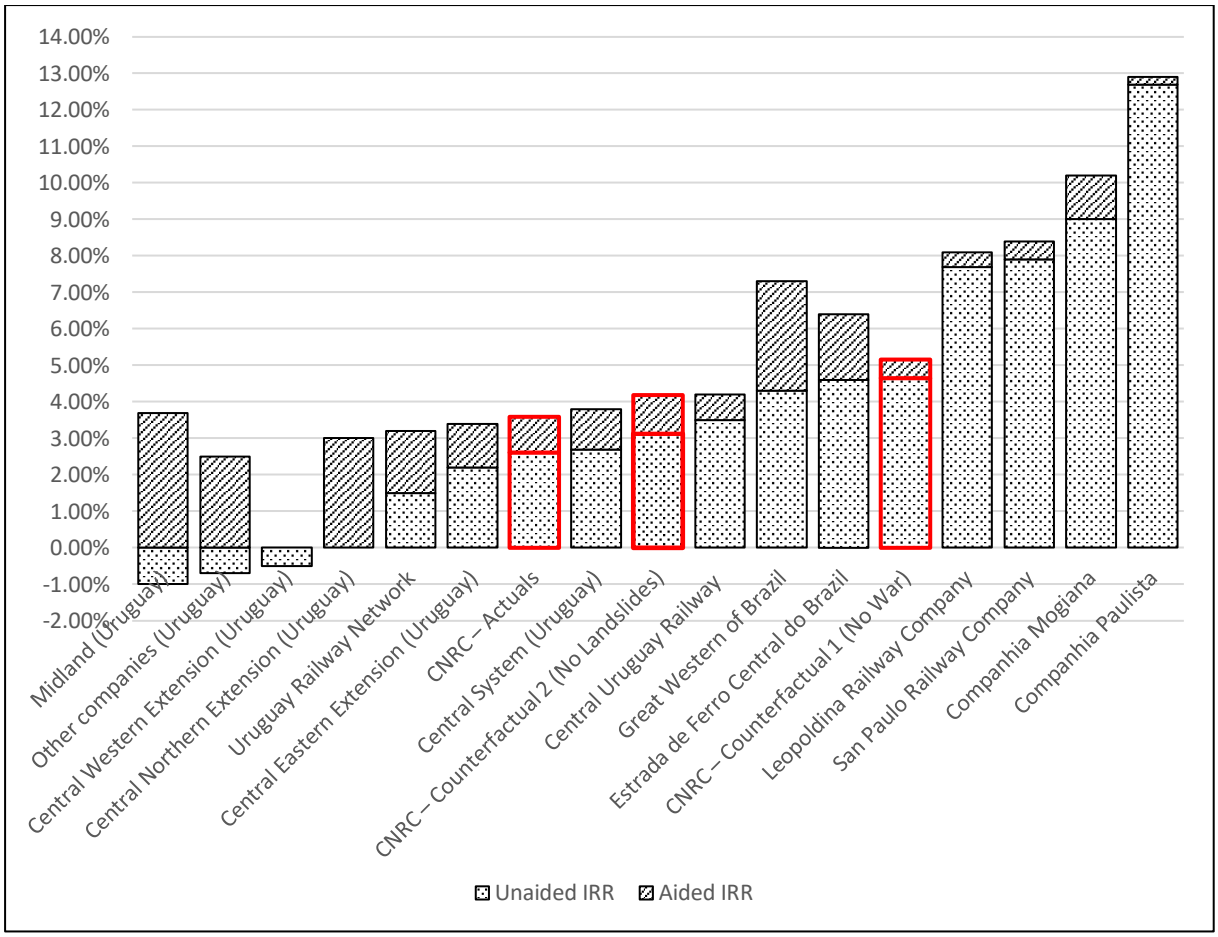
**Fig. 3 –** Counterfactual analysis of railway finances – cumulative deficit/surplus over time




**Sources:** Analysis of data presented in Fig. 2 and Table 2; TNA, BT 31/16224/62637; 'Republic of Colombia Colombian National Railway (1908) Customs Guaranteed 6% Debentures', *The Times*, 26 October 1908; 'Claim of the Colombian National Railway Company, Limited', TNA, FO55/415, f 244.

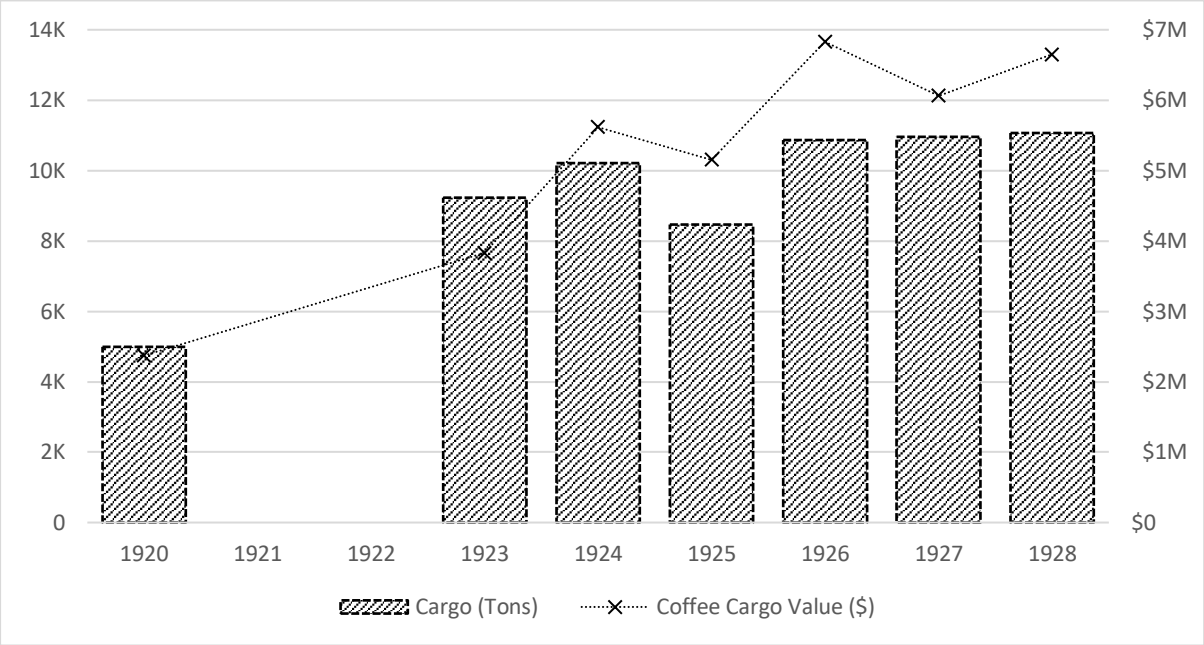
Notes: In counterfactual 1, annual interest is decreased by the £9,675 calculated in Table 2, and finances are moved back 4 years to reflect construction delays (e.g. actuals for 1913 are used for 1909 in the counterfactual). The war interrupted works for 2 years and 7 months, but 4 years is a fairer (and probably conservative) approximation of the overall delay. Construction works got underway properly in 1904, after the damage to company property had been addressed. Since there is a lack of data for later years, actuals for 1928 are used for 1925, 1926, 1927, and 1928 in counterfactual 1. In counterfactual 2, construction costs caused by geographical and climatic conditions are deducted from total debt levels. The £192,857 residual cash balance available for construction costs remaining from the 1908 debenture issuance, as discussed at the end of section II (Development), has been deducted.

**Fig. 4 –** Comparative analysis of internal rate of return



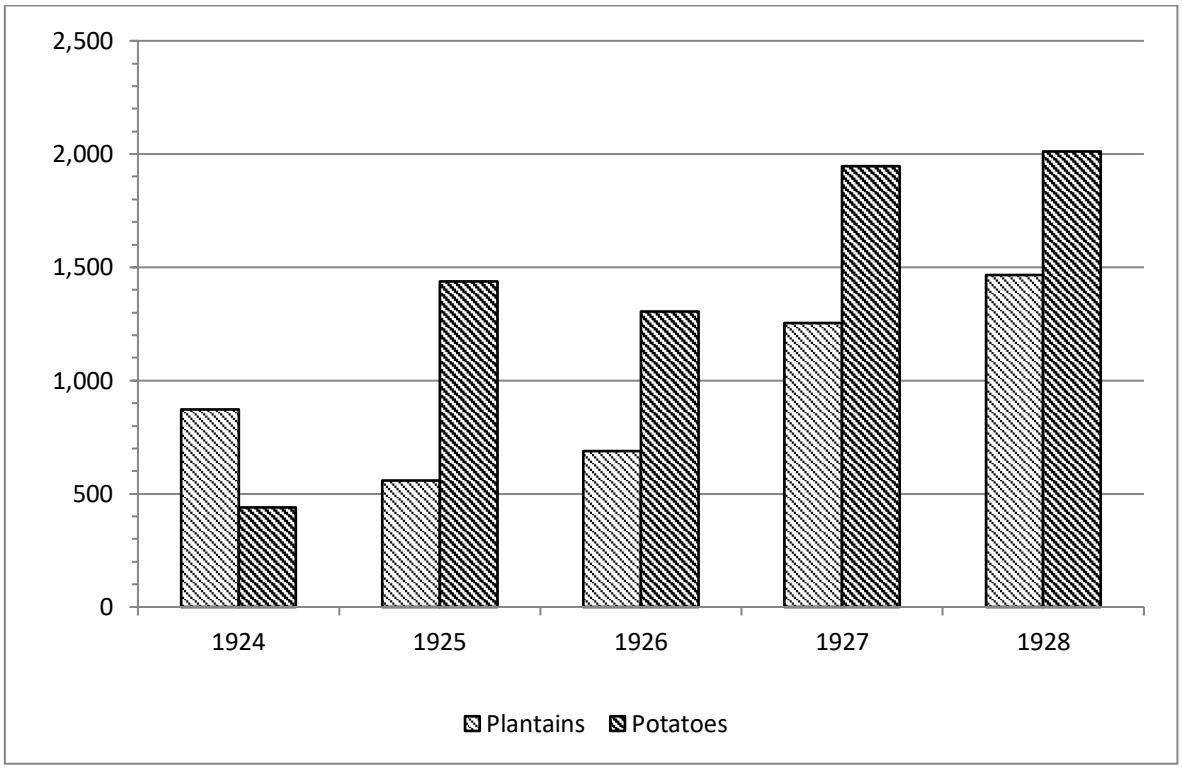

**Sources:** Summerhill (1998, p. 553) and Díaz (2017, Appendix B)

**Fig. 5 –** Tonnage, and gross production value of coffee cargo transported by the railway within the Department of Cundinamarca



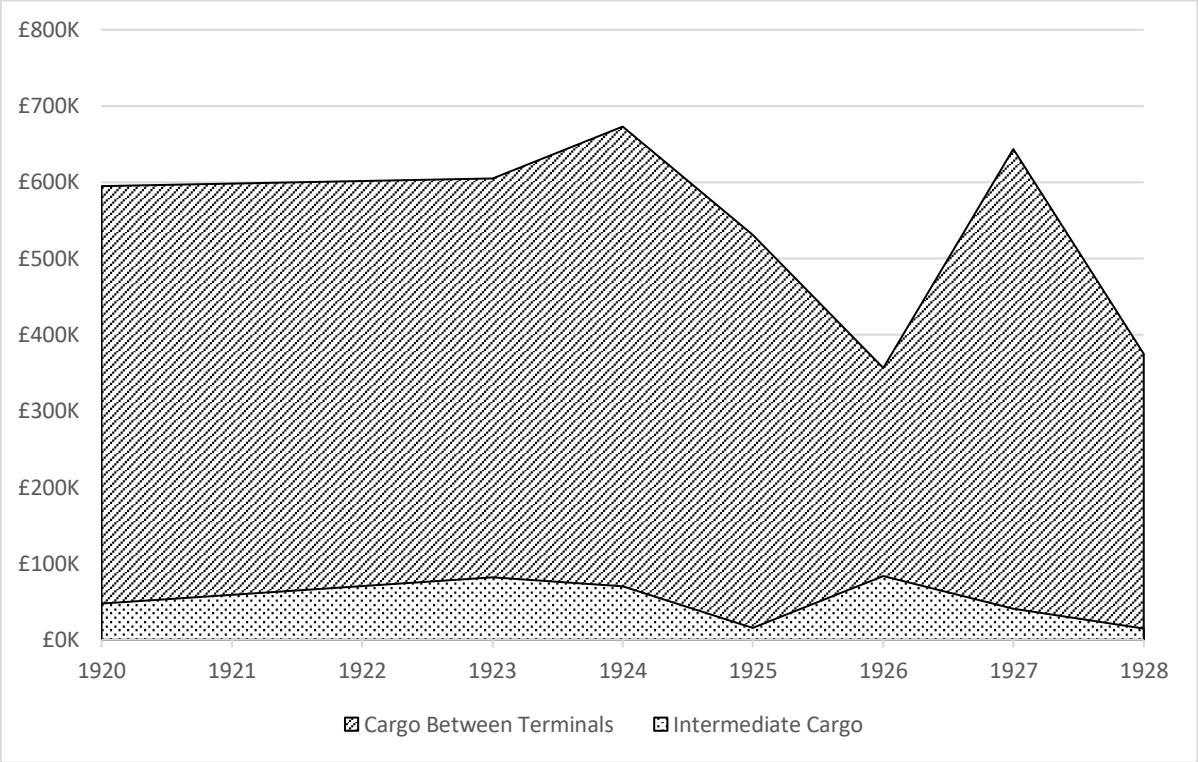

**Sources:** República de Colombia (1920, 1924, 1925a, 1926, 1927, 1928), 'Precio representativo del suave colombiano – mensual desde 1913', Federación Nacional de Cafeteros de Colombia, http://www.federaciondecafeteros.org/static/files/Precio_exdoc_mensual.xls accessed - 28/04/2019

**Fig. 6 –** Tons plantain and potato railway cargo transported between the highlands and river valleys of the Department of Cundinamarca



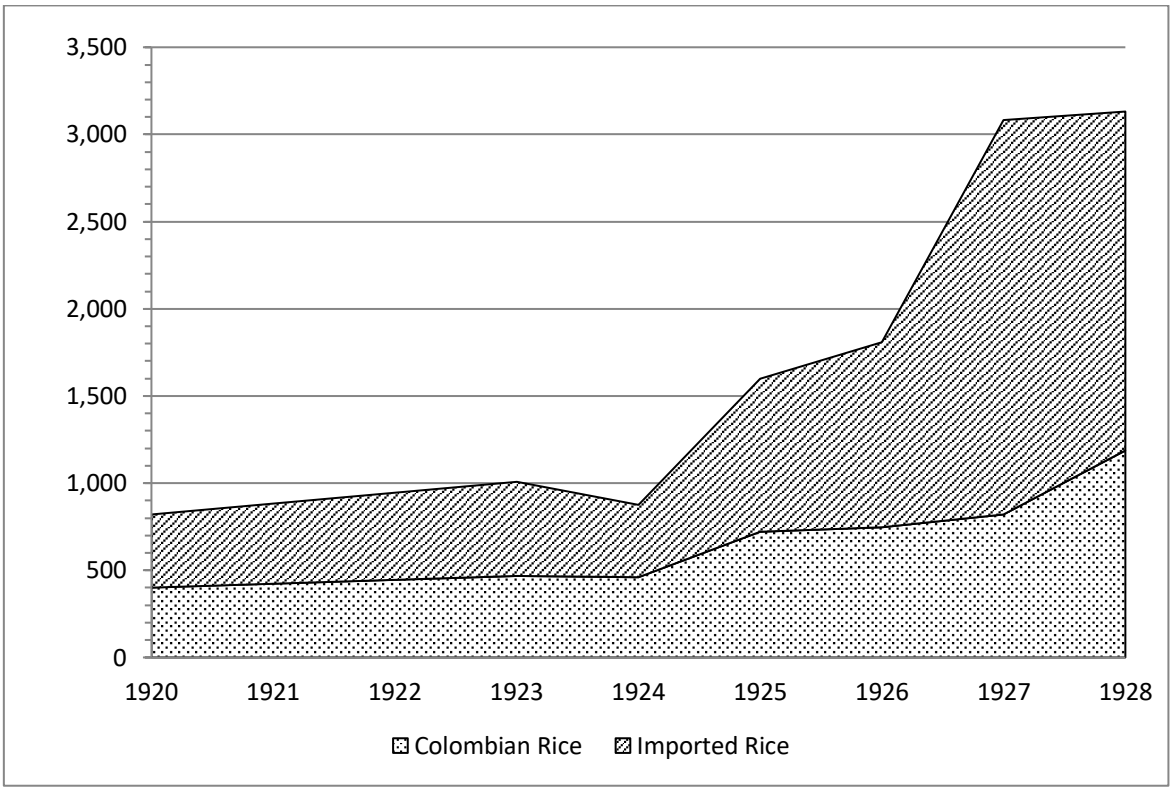

**Sources:** República de Colombia (1924, 1925a, 1926, 1927, 1928)

**Fig. 7 –** Gross Production Value of corn cargo mobilised by the railway in the Department of Cundinamarca



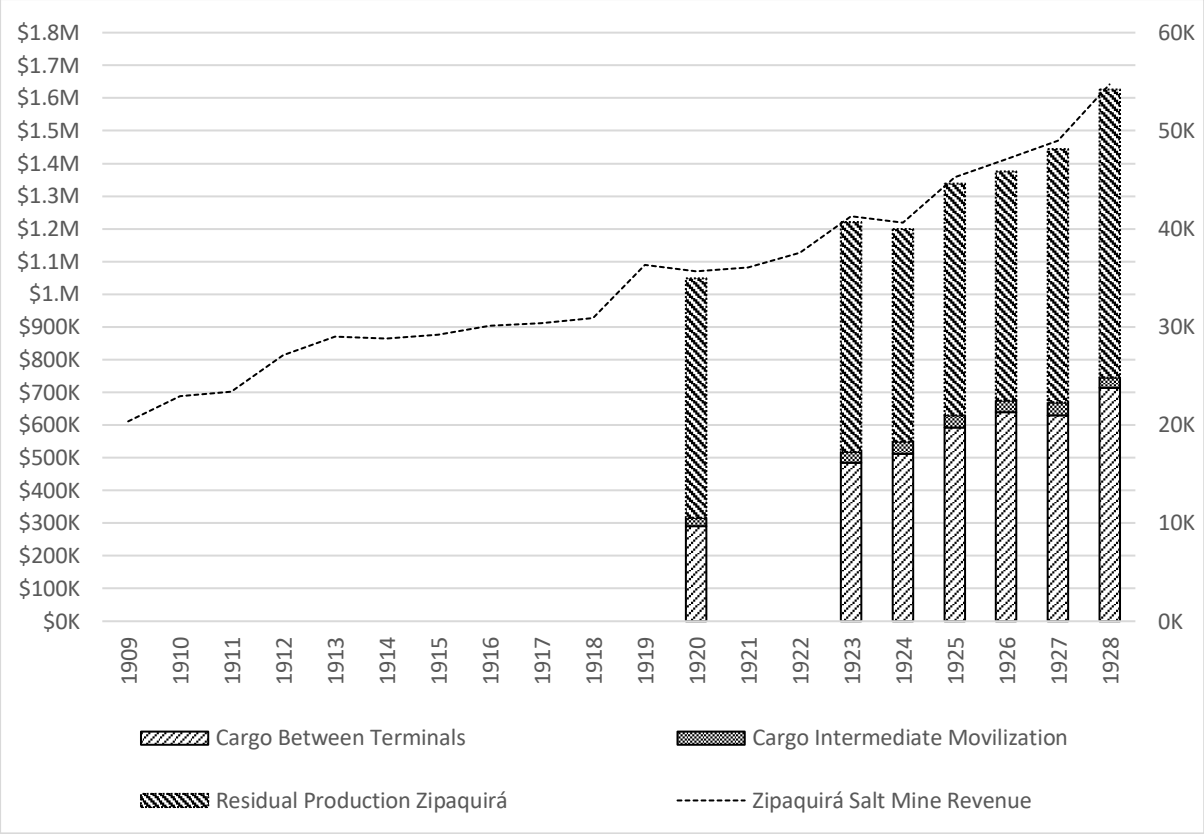

**Sources:** República de Colombia (1920, 1924, 1925a, 1926, 1927, 1928) and Pardo Pardo (1972, p. 240)

**Fig. 8 –** Tons of rice cargo transported by the railway within the Department of Cundinamarca




**Sources:** República de Colombia (1920, 1924, 1925a, 1926, 1927, 1928)

**Fig. 9** – Growth of salt cargo and revenues of the Cundinmarcan Salt Mine at Zipaquirá




**Sources:** República de Colombia (1920, 1924, 1925a, 1926, 1927, 1928, 1930)

Figure captions

Fig. 1 – Girardot (Colombian National) and Dorada Railway

Fig. 2 – Annual rate of return compared with sector averages from aggregate studies

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Fig. 5 – Tonnage, and gross production value of coffee cargo transported by the railway within the Department of Cundinamarca

Fig. 6 – Tons plantain and potato railway cargo transported between the highlands and river valleys of the Department of Cundinamarca

Fig. 7 – Gross Production Value of corn cargo mobilised by the railway in the Department of Cundinamarca

Fig. 8 – Tons of rice cargo transported by the railway within the Department of Cundinamarca

Fig. 9 – Growth of salt cargo and revenues of the Cundinmarcan Salt Mine at Zipaquirá