# Railways and Economic Development in India and Portugal: The Mormugão and Tua Lines Compared, ca. 1880 to ca. 1930, and Briefly Onwards

## *Caminhos de ferro e desenvolvimento econômico na Índia e em Portugal: uma comparação entre as linhas de Mormugão e do Tua, c. 1880 – c. 1930 e adiante*

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Resumo

No final do século XIX, Portugal empreendeu a construção de dois caminhos de ferro de bitola reduzida na província continental de Trás-os-Montes e no domínio colonial de Goa, na Índia, dois territórios subdesenvolvidos sob soberania portuguesa. Ambos eram aplicações práticas do programa português de grandes obras públicas, conhecido historicamente como Fontismo, o qual propunha a angariação de capital nos mercados internacionais e sua aplicação na melhoria do sistema de transportes nacional, antecipando o desenvolvimento econômico das regiões atravessadas pela ferrovia e a criação de suficiente atividade econômica para pagar os empréstimos. Neste artigo, realiza-se um exercício de compara-

Abstract

In the late decades of the 19th century, Portugal undertook the construction of two narrow-gauge lines in the mainland province of Trás-os-Montes and in its colonial possession of Goa, India, two languishing territories under Portuguese rule. Both were practical applications of the Portuguese large public works programme historically known as 'Fontismo' that aimed to raise capital in international markets and apply it to improve the Portuguese transportation system, hoping to develop economically the regions served by railways and create enough economic activity to repay the loans. In this paper, we aim to perform an exercise of historical comparison, using the methodology of compar-

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*Revista Brasileira de História*. São Paulo, May-Aug. 2019. Available at: http://www.scielo.br/rbh
http://dx.doi.org/10.1590/1806-93472019v39n81-10

ção histórica usando a metodologia do comparativismo, sugerida por Michel Espagne. Realçam-se as diferenças e semelhanças entre as duas linhas férreas, tanto durante o processo de decisão, como durante a operação. Demonstra-se como projetos similares tiveram resultados diferentes, de acordo com as circunstâncias correntes, mas também como estes resultados variam conforme o tempo histórico no qual são analisados. Espera-se contribuir para o debate sobre as fricções entre generalidades e especificidades no processo histórico.
Palavras-chave: comparativismo; Fontismo; progresso; colonialismo.

ativism suggested by Michel Espagne. We will highlight the differences and commonalities between the two lines either during the decision-making process and during operation. We will demonstrate how similar projects had entirely different outcomes, according with local circumstances, but also how these outcomes change according with the time frame within which they are analysed. In the end we hope to add to the debate about the feud between generalities and specificities in historical process.
Keywords: comparativism; Fontismo; progress; colonialism.

Railways have been long associated with prospects for economic development. In 19th-century Portugal that association was pronounced because of 'Fontismo', the public works programme named after Fontes Pereira de Melo, the most influential Portuguese statesman of the time. Throughout the second half of the 19th century, 'Fontismo' advocated government borrowing in the international financial markets to build or subsidize modern transport infrastructures both in the mainland and in the colonies. This, it was believed, would develop the economy and thus increase the tax base, which would allow the exchequer to repay the loans. 'Fontismo' also privileged rail links through peripheral regions of the interior to important harbours (Mata, 1988). The argument was straightforward: build a railway and the improved transport that followed would spur economic growth in the regions where the lines operated. Widespread networks in turn facilitated better-integrated, national and transnational markets.

'Fontismo' had its inception in the saint-simonianist ideology, embraced by Portuguese engineers since the 1820s (Macedo, 2009, pp. 28-29). Saint-Simonianism favored the construction of large public works and transport systems that promoted the circulation of people, goods and capital. From the 1830s onwards, railways were considered the best tool to achieve that goal as well as the very personification of progress (Laak, 2010, p. 27) and the gauge

to measure each nation's worth (Adas, 1989, p. 134). This led to the development of the representation of colonial contexts as backwards and underdeveloped, requiring the 'civilizing' intervention of European nations. From the 1870s onwards, different European countries engaged in an intensified pursuit of colonial expansion that included massive investments in large technological systems. Portugal did not wish to fall behind other nations that were building large railway grids in both their mainland and overseas territories. Portuguese technocrats sought to portray Portugal as a modern and technologically-savvy European nation, and as an imperial power, relying on the surplus capital available in the financial markets of Paris and London (Cottrell, 1985, pp. 264-267 and 490-491; Vieira, 1983). Investment in railways in the mainland began in 1851 (Alegria, 1990) and from the early 1880s onwards 'Fontismo' was transferred from the mainland to its colonies (Navarro, 2018; Pereira, 2015a).

Railways frequently stimulated economic growth. However, railway history is littered with stories of lines that failed to deliver the benefits touted by their promoters. The failures are as much a part of the meta-narrative of railways and development as the accounts of success. 'How then to assess the significance of any past transport service or any transport infrastructure project' (Pirie, 2014, p. III) in contexts where the developmental stimulus proved to be weak and/or the new lines unprofitable?

A pair of metre-gauge railways built in Portuguese territories in the final decades of the 19th century (mainland's Tua line and Goa's Mormugão line) is examined and compared in this paper, which is a development of a previous work where we described the construction and first years of operation of those two lines (Kerr; Pereira, 2012). Now, we use them to analyse the more comprehensive relation between railways and economic development, using the theoretical framework of comparativism (see below). To do so, we add statistical data to the analysis, side by side with official reports (from the State and the concessionaires) kept in British and Portuguese archives. We focus on the earlier decades of the two lines but in our epilogue and conclusions we examine briefly their more recent history to fill out the story and to note the argument that the use of different time frames can modify assessments about the success or failure of railways as instruments of development. Additionally, considering that a goal of historical comparison is to identify better that which is general in historical processes and that which is less similar within specific universes of historical investigation, these two cases can contribute to an understanding of the ways in which railways did, or did

not, stimulate economic development within the shared context of 'Fontismo'. In this sense, we also aim to add to the historical debate about 'Fontismo', its long-term impact in Portugal, and the role played by technology (particularly railways) in seeking the ideal of progress (Justino, 2016, pp. 56-63; for a state of the art of the Portuguese railway history, see Pereira, 2015b). The theoretical framework we use is comparativism, as provided by Michel Espagne, who states: comparativism "in the narrowest sense of the term […] is based on the placement of objects side by side". It removes "discrete ensembles from the continuity of reality in order to oppose, juxtapose, or contrast them. It tears the objects being compared out of their contexts". Even though Espagne reminds us that it is a methodology with limitations and just a starting point for the analysis, he also points out that it is an epistemological attitude [that] "constitutes a kind of pragmatic precondition for any extension of the field of perception" (Espagne, 2013, pp. 37-44).

## General overview of Mormugão and Tua lines

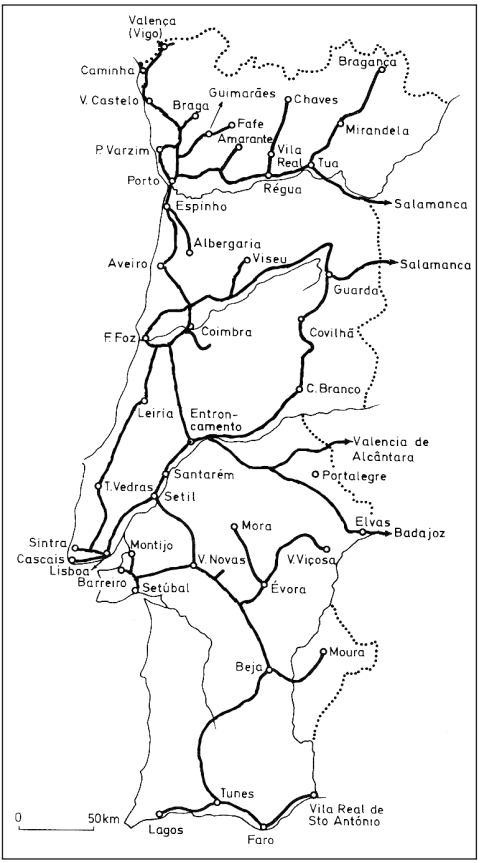
The London-headquartered, privately owned West of India Portuguese Guaranteed Railway (hereafter WIPGR) extended 83 km from the port of Mormugão in Portugal's colony of Goa to Castle Rock in the Goa/British India frontier. At Castle Rock it merged into track built by the Southern Mahratta Railway Company (hereafter SMR) for 111 km from New Hubli located in the Dharwar District of the Bombay Presidency. Construction of the WIPGR began in December 1881. The combined WIPGR-SMR project was opened throughout its full length in 1888. The Mormugão-New Hubli line was conceived as a single project albeit built and worked by separate companies within different jurisdictions until 1 July 1902 when the working of WIPGR was assumed by SMR. The line remains in use in the 21st century as part of Indian Railways.

Figure 1 – Map of SMR and WIPGR, ca. 1900.


Source: Arquivo Histórico do Ministério das Obras Públicas (hereafter AHMOP), Lisboa, Mapas e desenhos. C-1-10-B.

Roughly coterminous with the construction of the Mormugão line, another Portuguese metre-gauge railway came into existence within mainland Portugal. Construction of the 134 km Tua railway from the confluence of the Tua and Douro Rivers to Bragança began in 1883. It was completed to Mirandela in 1887 and to Bragança in 1906. The operation between Mirandela and Bragança was suspended in 1992 and the remainder of the track was closed in 2008 (Pereira, 2017a, chapters 2, 4, 5.7 and 5.8).

Figure 2 – The Tua and Douro lines and the Portuguese network, 1910.




Source: Alegria, 1990, p. 301.

Both lines proved to be challenging pieces of engineering. The Mormugão line had to ascend the precipitous and rainy Western Ghats while the Tua line throughout much of its length to Mirandela passed along a narrow river valley with steep cliffs on both sides. The WIPGR required seven bridges, five viaducts and twelve tunnels along its route to Castle Rock while the Tua line had five bridges, two viaducts, and six tunnels from Foz-Tua to Mirandela (Kerr; Pereira, 2012, p. 187; Martins; Vasconcelos; Lourenço, 2012).

Both railways were typical projects of 'Fontismo'. The WIPGR planned to link a growing network of railways in the interior of British India across the border to Goa's seaport and thus increase the traffic to that harbour by

providing the agriculturally productive, south-western districts of the Bombay Presidency with a direct rail link to a port. More traffic meant more harbour-generated revenues that would enable languishing Goa to become self-sufficient in financial terms (Pereira, 2015a, p. 243).

The development of industry and agriculture was secondary in the WIPGR case. However, it was most important in the case of the Tua line, intended to stimulate the economy of the province of Trás-os-Montes, one of Portugal's most backward and isolated areas. The Tua line was supposed to improve transportation to remote areas of north-eastern Portugal through its transhipment terminus at Foz-Tua, where connection was made with the mainline, broad gauge (1667 mm) railway that extended along the Douro valley from Porto to Spain (Macedo, 2009, pp. 193-230).

These were the main resemblances between the two railways, but there were also important differences between them. For example, the WIPGR involved the intertwined construction of a railway line and an enlarged harbour at Mormugão.

Additionally, and more importantly, the Goan project involved a colonial context and two colonial powers: dominant Britain and languishing Portugal. Indeed, Goa had become a backwater of a minor colonial power, and an economic liability to the Portuguese Government. However, as the former fulcrum of an extended Portuguese maritime empire, Goa had too many emotive associations to be let go (Pereira, 2015a, pp. 241-242). Building a railway was considered a good way to show Britain that Portugal was willing to retain and develop its Indian territories (Pereira, 2017c, pp. 234-241).

The Tua line had no such complexities. It was a railway entirely built in Portuguese territory, with no diplomatic issues to be dealt with, and no port improvement project attached.

## The West of India Portuguese Guaranteed Railway Company (WIPGR)

A railway across Goa to stimulate greater use of the harbour at Mormugão fitted 'Fontismo' like a glove. Portuguese authorities had already responded favourably to attempts since the 1860s to get such a project underway, although, in the event, those efforts failed (Pereira, 2017b, pp. 154-160).

The Goa line required British cooperation to connect directly to a railway in British India. A conjuncture of events in the period 1875-1878 made the

British Government receptive to the idea, a receptivity formalized in a treaty signed with Portugal in December 1878. Article VI opened the door for the WIPGR. The British Government saw a possible railway as an acceptable *quid pro quo* for the substantial concessions made by the Portuguese in other articles of the treaty, e.g., customs union, control of salt and opium production by British agents, and adoption of the British tax system on the production of liquor (Pereira, 2017e, p. 233-242). Additionally, it was a great opportunity for investors in London to apply their surplus capital.

Subsequently, the fact that a well-connected group in England (the Stafford House Committee led by the Duke of Sutherland) lobbied hard for a line from Mormugão into British territory furthered the cause of the WIPGR. The Portuguese hoped that a private company would undertake the project without any financial aid from the State. That did not happen, and the Portuguese had to guarantee a return on investment to the stockholders of a private, British-based railway company formed by the Stafford House Committee in 1881 (Gracias, 1940, pp. 68-80 and 120-207). Portugal offered a 5% guarantee on capital of £800,000 and 6% on additional capital above that figure: 550,000 pounds as stated by two laws of 1885 and 1888 (Pereira, 2015a, p. 249).[1]

The Government of India (GOI) and the Government of the Bombay Presidency were not in favour of the construction of the WIPGR. Both favoured railway construction to provide quicker and cheaper transportation for the crops increasingly grown in the interior southern districts of the Bombay Presidency, provided it was directed to the nearby port of Karwar located within British India, some 20 km south of Goa.[2]

The line to Karwar was one of the obstacles to the construction of the Mormugão line. Some claimed that Britain should not finance a railway towards foreign territory, when it had an option within British India.[3] As in the Portuguese-Spanish negotiations about Iberian transnational railways, the frontier proved to be a significant obstacle (Pereira, 2017d, pp. 236-237; Pinheiro, 1995, pp. 339-340). However, in the end, the objections of the GOI were overridden in London. Pragmatically, R. B. D. Morier, the British negotiator of the 1878 treaty pointed out the Mormugão line would make the substantial costs of some 50 miles of rail track and large harbour works the responsibility of Portugal (Gracias, 1940, pp. 120-207 and 252-311).[4] The British authorities, for their part, agreed to extend the Mormugão connection into British India by authorizing the SMR to construct a line from New Hubli to Castle Rock.[5]

Nonetheless, the presence of two colonial nations, one greatly more powerful than the other, and the need of the proposed WIPGR to cross the border between their territories negatively affected its fortune. Borders do matter; they can significantly affect the operations of trans-border railway lines (López et al., 2009, p. 518; Pereira, 2017c, pp. 246-248).

The WIPGR was completed in 1887. The entire 194 km project to New Hubli was formally opened on 31 January 1888 at a ceremony attended by the Governors of Goa and of the Bombay Presidency, who shook hands at the border.[6] The ceremony led Bombay's leading newspaper, the *Times of India*, to opine that 'to traders the port of Mormugão offers large attractions, and there is not much doubt but that they will be taken advantage of, by Bombay merchants particularly, and others generally'.[7] Unfortunately for Goa and Portugal that prediction did not materialize. The WIPGR remained unprofitable well into the 20th century and a burden on the Portuguese exchequer (Kerr; Pereira, 2012, pp. 189-194).

Furthermore the 1878 treaty contained elements that harmed Goa's economy. The main goods transported by the railway at least until 1902 – cotton, salt, and grain – were produced in British India and not in Goa – the exception being oil seeds (Portugal, 1893-1903). The abolition of custom duties levied against imported British textiles hindered textile activity in Goa. British agents became entitled to control salt production in Goa. Not surprisingly, they hindered it, and Goa, previously a large producer, had to buy it from British India. The subsequent increase in the price of salt harmed the production of salted fish and coconuts (coconut trees benefited from the application of salt as fertilizer). The livelihood of Goans was deleteriously affected and many were forced to seek work in British India (Albuquerque, 1990, pp. 120-124; Pereira, 2017e, pp. 242-245).

Colonel Joaquim José Machado, Governor of Portuguese India, stated in an interview in Bombay in August 1897 that 'Portugal is a poor country, and yet the Government has already paid about pounds 900,000 on account of the railway; the line does not even pay its working expenses'.[8] By 1902 Portugal had paid the WIPGR 1,238,625 pounds on account of the guarantee, almost the entire budget of the harbour improvements and the railway construction (Kerr; Pereira, 2012, pp. 190-191).

The transnational character of the project mattered and provided constraints that limited the flow of traffic to Mormugão. Operational difficulties and manipulative machinations were not the underlying cause of the unprofitability of the WIPGR, but they did contribute to the poor revenues of the line

until 1902. These difficulties included delays created by GOI customs' officials at Castle Rock and reluctance among merchants in British India to set up operations in a 'foreign' area.

A greater problem was the deleterious impact the SMR's Western Deccan line (Londa to Poona, connecting to the Great Indian Peninsula Railway [GIPR] and thus to Bombay) that had not been 'contemplated when the Portuguese were induced to give the guarantee to the line from Mormugão to the frontier'.[9] Additionally, adjustments of tariffs by the SMR and the GIPR had converted the WIPGR 'from the natural outlet of an extensive system into a local line barren of traffic and incapable of meeting its ordinary working charges' such that the annual charge generated by the guarantee 'hung like a blight upon the whole colony'.[10]

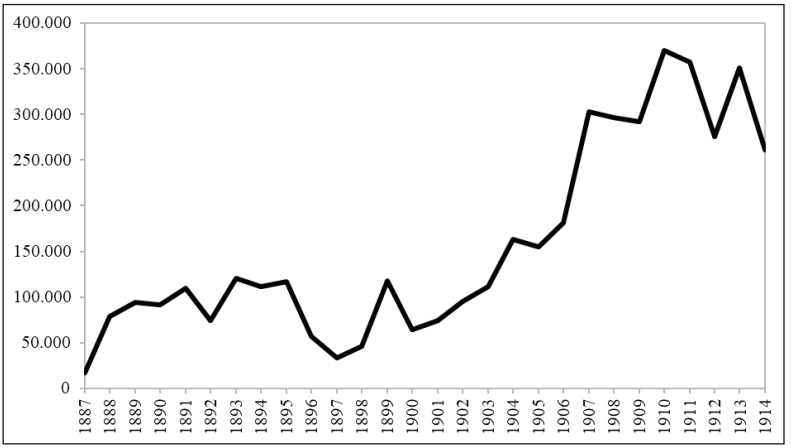
A strong argument can be made that the WIPGR and improved harbour facilities at Mormugão were unlikely to make Mormugão a major port for ships travelling to or from South Asia to Europe. Arguably, by the 1880s the west coast dominance of Bombay with its excellent anchorage and broad-gauge rail communications with most parts of India, supported by a large city with well-developed commercial enterprises was beyond challenge. With little direct oceanic shipping the best Mormugão could hope for was enhanced coastal shipping within trade focussed on Bombay.

The 1889 *Eighth Annual Report* of the WIPGR mentioned a regular steamer service between Mormugão and Bombay, and considerable carriage to Bombay by small 'native craft'. However, no direct boat from Europe had docked at Mormugão except for ships bringing coal for the SMR plus one disabled boat that found sanctuary during the monsoon.[11] Efforts notwithstanding, few ships made the direct voyage from Europe in the period 1888 through 1901. No such ships docked at Mormugão in 1888, 1889, 1890 and 1899. Other years saw arrivals numbering variously from seven (twice), five (twice), four (once), two (twice) and one (once). These were not impressive numbers, and even the better years represented specialized shipments of machinery and construction material for large public works in South India that provided little stimulus to the economy of Goa. In marked contrast, the average annual entry of foreign steamers into Bombay between 1891-92 and 1900-01 was 641, to which number one could add 304 foreign sailing vessels.[12]

The resolution of these frictions occurred in 1902 when the WIPGR was leased to the SMR.[13] Operationally, the agreement made the WIPGR a part of the SMR system and gave the SMR an incentive to make the line profitable. Between 1888 and 1901, the average tonnage transported annually along the

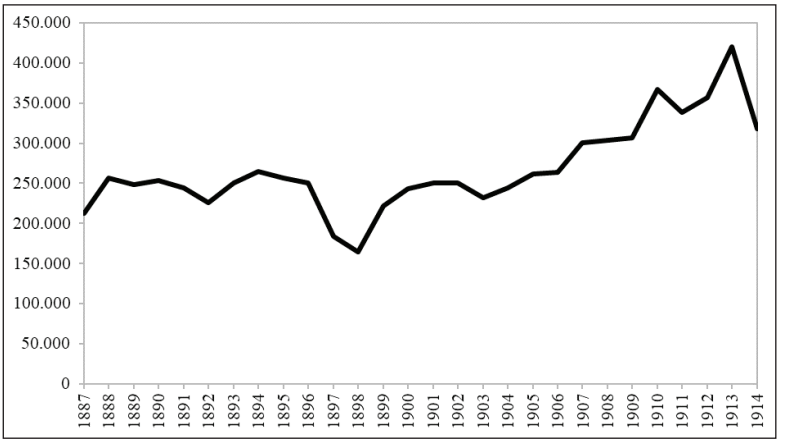
WIPGR was around 85,000 tons (Figure 3). This increased to 250,000 tons annually in the period 1902-1914. Average annual passenger traffic at the turn of the century was around 236,000 passengers until 1902, but it rose to 310,000 passengers for the period 1903-1914 (Figure 4). The SMR used Mormugão for the coal, supplies and construction material it needed for its

Figure 3 – Total cargo transported along the Mormugão line (in tons).




Source: Until 1902: BL-IOR, L/AG/46/19/1, *Annual Report(s) WIPGR,* 1887-1902. After 1902: AHU, book 927 1N. No data available after 1914.

Figure 4 – Passengers, Mormugão line.




Source: Until 1902: BL-IOR, L/AG/46/19/1, *Annual Report(s) WIPGR*, 1887-1902. After 1902: AHU, book 927 1N. No data available after 1914.

growing network in the southern Deccan. In 1905 the SMR arranged for monthly steamers from Europe to Mormugão calling at Lisbon only to encounter a boycott at Bombay that ended the experiment (Ethell, 2003, p. 73). The serendipitous discovery of manganese deposits in the Deccan and in Goa (where some twenty mines were underway by 1907) provided a good amount of ore traffic to Mormugão – 41,377 tons shipped out in 1906, up from 1,200 tons in 1905.[14]

Nonetheless, as late as 1918 the WIPGR had not produced an annual profit exceeding 2.5%, and not until 1927 was Portugal freed from payments on account of the guarantee. The 1927 result was greeted with enthusiasm in Portugal and contributed to a 1929 deal between the WIPGR and the Portuguese government to improve the Mormugão railway and harbour.[15] After 1927, annual profits frequently exceeded 5.5%, freeing the Portuguese Treasury from payments to the company (Dias, 1929, p. 251; Ethell, 2003, pp. 74-75; Gracias, 1940, pp. 280-281 and 312-319; Marques, 2001, pp. 632-634).

Thus, throughout its 20th century existence the London-based WIPGR remained a stakeholder although after 1902 it became little more than a rent-receiving shell of a private company until voluntarily liquidated in 1961. Improvement under the SMR management did not mean that the port of Mormugão became the engine of growth envisaged by the advocates of the WIPGR. Goa benefited little from the railway and its budget remained solvent only because Lisbon assumed a great part of the financial commitment to the WIPGR. The main beneficiaries were the WIPGR's British stockholders (Abecassis, 1951, pp. 121-125).

The WIPGR was a 'gift of an elephant' (to use an Indian metaphor for something expensive to support) that failed to fulfil the rosy developmental goals for Goa touted by its Portuguese advocates, and self-servingly embraced by the WIPGR's British promoters for whom the guarantee, like previous examples in British India, ensured 'private enterprise at public risk' (Thorner, 1950, pp. 168-179).

## The Tua Line

Some engineers within Portugal's Ministry of Public Works were sceptical about the viability of the Tua line. The small population of the region and the lack of decent roads to provide access to the railway stations led them to believe the line would be unprofitable. The proponents of the line expected it to

stimulate economic activity in the region, to bring progress to the Portuguese (ultra-)periphery and to integrate it in the national market. Unlike the WIPGR the 1883 start of the Tua line construction was a response to promotional pressures from within that peripheral region, who desired a quicker and more efficient connection with the coast and the economic, political and technological centre of Portugal. Advocates for a railway line into Trás-os-Montes had appeared in the 1850s but the most active promoter appeared in the 1870s. He was a businessman, Clemente Menéres, with major agricultural investments in the parish of Romeu, near Mirandela (Viseu, 2013a, pp. 48-75).

The Foz-Tua to Mirandela line was assigned to the Companhia Nacional de Caminhos de Ferro (CNCF) – a private enterprise founded by the Marquis of Foz, one of the wealthiest men in Portugal at the time (Santos, 2014, pp. 12-16). The government also conceded a guarantee of interest to the company, 5.5% over a capital of 19.9 *contos* (≈ 4,400 pounds)/km. The 54 km line was opened throughout in September 1887 (Pereira, 2017d, p. 187). Stock and bond capital originated in Portugal, but, considering that State bonds (to cover State's expenditures like guarantees of yield) were issued abroad, we can also argue that foreign capital was involved in the Tua line.

The expectations of the engineers proved to be accurate. Through the 1890s operating costs exceeded revenues and the State was forced to pay the entirety of the guarantee. The severe financial difficulties stemmed from constructions costs that substantially exceeded the budget of 25 contos (≈ 5,555 pounds)/km (overall 1350 *contos*/300,000 pounds) calculated by the State's engineers.[16] The CNCF faced the possibility of bankruptcy, which was avoided by an agreement with its creditors (Santos, 2014, pp. 61-70).

The company's financial picture improved after the 1906 opening of the second section of the line, Mirandela to Bragança, for which the State provided a guaranteed return of 4.5% on a capital expenditure of 26 *contos* (≈ 5,775 pounds)/km. Furthermore, the CNCF paid very little for this railway. Its construction had been undertaken by a local contractor, João Lopes da Cruz, under an extremely tight contract. When the line was almost done, the contractor had no money to finish the construction. The CNCF then terminated the contract, relieving itself of the remaining payments due to Cruz, who went bankrupt (Pereira, 2014, pp. 201-293).

Nonetheless, the Tua line, like its Goan counterpart, was a route that generated little income. Its annual revenue per kilometre consistently ranked it in the lowest group (under 0,5 contos (≈ 111 pounds)/km) among all Portuguese railway lines (Alegria, 2011, pp. 9-10). In 1927, the company leased

two other narrow-gauge tracks in Trás-os-Montes from the State: the Corgo (Régua-Chaves) and the Sabor (Pocinho-Miranda do Douro) lines. This decision proved to be disastrous for the company. Both lines were unprofitable and some of their sections were still under construction – a task that the CNCF took upon itself. Not surprisingly the net profit of the company dropped further although the CNCF remained afloat thanks to State aid. Eventually the government decided to bring the entire national network under one single company. Thus, in 1945 all private concessions (except the Cascais railway, near Lisbon) including the CNCF were terminated and granted to the Portuguese Railway Company (CP) (Santos, 2011).

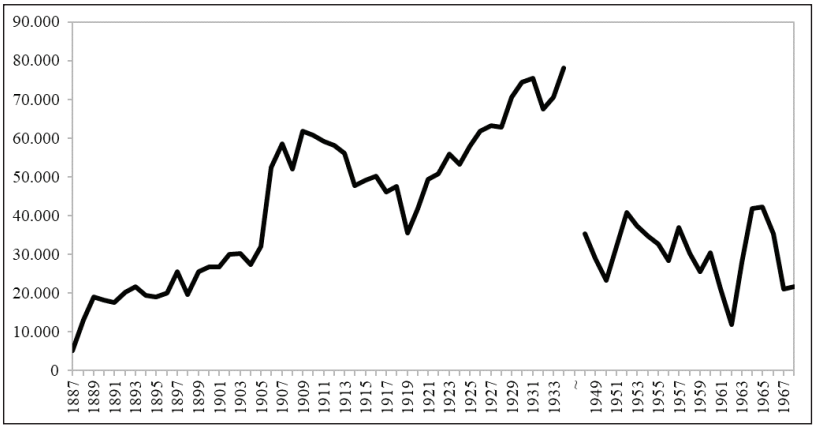
The Tua line was unprofitable, but that did not mean the line had no economic benefits for the region in which it operated. Arguably, many of the agricultural initiatives that, with greater or lesser success, punctuated the subsequent decades within Trás-os-Montes could not have been undertaken without the transportation connection to the wider world provided by the Tua line. The statistical evidence suggests the Tua railway was indeed responsible for an increase in goods transported in and out of Trás-os-Montes (Beira, 2017). Particularly after 1904 and the opening of successive stretches of the line between Mirandela and Bragança traffic volumes on the Tua line increased (see Figure 5).

Most of these goods were non-processed agricultural commodities among which cereals, the main crops of the region, predominated. Cork and wine were also transported out of Trás-os-Montes. Other commodities included olive oil, dry fruits, and other edible products. The railway transported salt, wool and timber products into the region. From 1906 onwards, dipping during World War I and then resuming upwards, the transportation of fertilizers was also important –an indication of greater dynamism in the region's agricultural sector (Beira, 2017, pp. 355-356).

The activity of the Menéres Company accounts for much of this success. Much of the Company's extensive production of agricultural products was transported by the Tua railway. In 1900 Menéres even built a cork processing plant near the Mirandela station. The opening of the remainder of the track to Bragança benefited his businesses further. However, in 1913 he decided to close his cork processing plant in Mirandela and to transfer its machinery to Porto. Ironically, that machinery was carried away from Trás-os-Montes by the same railway built to facilitate development in the region (Viseu, 2013b, p. 103).

During the two World Wars the railway lines in the district of Bragança (Tua and Sabor) transported large quantities of wolfram (tungsten), an ore with military applications. During those conflicts, the price of wolfram reached record highs and Portugal became 'one of the largest producers of this ore in the western world'. In Trás-os-Montes, there were several wolfram mines served by Tua line (Lage, 2011, p. 21).

Figure 5 – Total cargo transported along the Tua line (in tons).

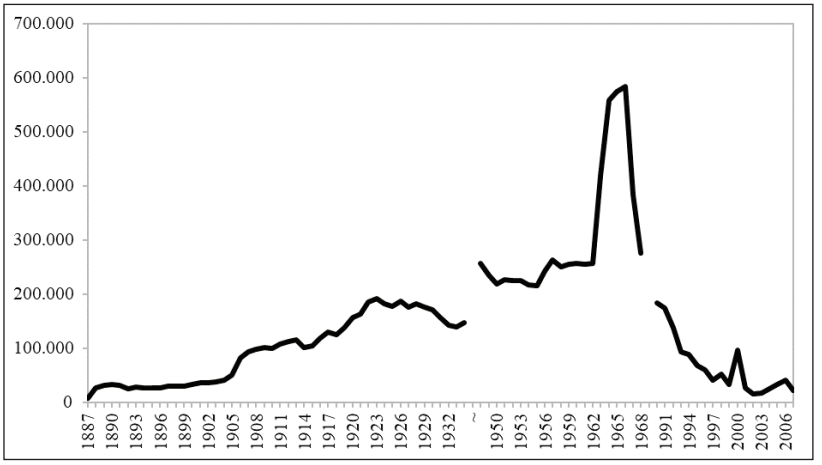



Source: Until 1933: Library of the Bank of Portugal, Lisbon (hereafter LBP). *Companhia Nacional de Caminhos de Ferro. Relatório do Conselho de Administração e Parecer do Conselho Fiscal apresentados à assembleia geral ordinária*, several years. Cited subsequently as [Report Number] *Annual Report CNCF,* [date]. After 1949: CP Historical Archive. *Companhia dos Caminhos de Ferro Portugueses, Boletim Estatístico*, 1949-1969.

The Tua line also enhanced the mobility of the population of Trás-os-Montes. In the pre-railway era, it took four days to go from Lisbon to Bragança, a distance of roughly 450 km in a straight line (Alegria, 1990, p. 127). In 1880 a congressman from Bragança, Pires Vilar, exclaimed in the Parliament that 'the worst fear one can inflict on a public servant is to threaten him with a transfer to Bragança. One supposes that Bragança is the Siberia!'.[17] After the Tua line opened throughout in 1906 travel from Bragança to the Douro line at Foz Tua took five hours, from whence Porto could be reached in four additional hours. Lisbon, in turn, was less than eight hours by train from Porto. A journey to the capital that previously took four days was reduced to less than one day: a vivid example of what David Harvey has so effectively explored as the consequences of what he labels 'time – space compression' (Harvey, 1990).

The people from the region took advantage of the new service. Passenger traffic grew steadily although as late as 1910 trains were half full climbing to 70% load factors between 1918 and 1929. Figure 6 display the passenger traffic 1887-2007. It is likely that some of those passengers took a one-way journey out of Trás-os-Montes: they used the line to emigrate. Recent studies suggest that in the inland, north region of Portugal railways served more to take people out of those regions than to assist them to stay, a phenomenon particularly visible in the parishes that had a railway station (Silveira et al., 2011). Regardless of whether outmigration was beneficial or harmful the Tua line facilitated movement out of the region.[18]

Figure 6 – Passengers, Tua line.




Source: Until 1933: LBP. *Annual Report(s) CNCF*, several years. After 1949: CP Historical Archive. *Companhia dos Caminhos de Ferro Portugueses, Boletim Estatístico*, 1949-1969. After 1991: Pires, 2014, pp. 66-67).

## Epilogue and a Few Conclusions

Apart from the few kilometres around Mirandela the Tua Line has been abandoned. Throughout the years, investment in the infrastructure was low. New rolling stock was bought and replaced in operation, but they could not achieve full efficiency. The speed and quality of the service decreased. The competition of the road and the lorry attracted many of the line's former customers. The railway entered a vicious circle: less customers meant less

investment that meant less customers (Pereira, 2017d, pp. 201-204). Mirandela and Bragança, like much of 21st century Portugal, are now linked to Porto and other parts of the country by major roads and great motorways.[19] A car, bus or lorry can now travel from Mirandela to Porto in less than two hours, and from Bragança in little over two hours. Mirandela and Bragança are bustling small towns, and the latter has a commercial airfield. Modern forms of bulk transportation inaugurated by the Tua line, continued and elaborated in recent decades by road transportation, have intensified the links with other regions and countries.

The Tua line did not kick-start the economic development of Trás-os-Montes. Indeed, as a thin ribbon of modern transportation through often difficult, hilly terrain served by poor roads it was not easily accessible at many stations. However, it facilitated the fitful growth that enabled the region to develop unevenly from considerable backwardness and much poverty to some growth and a better livelihood for some, but certainly not all.[20]

Some economic activity in Trás-os-Montes was fostered by the existence of the Tua line. The enterprises of Clemente Menéres could not have succeeded without the railway. The wolfram mines needed the bulk transportation a railway provided. Nonetheless, Trás-os-Montes remained a poor region in the Portuguese context; it remained a remote interior on the periphery of the Portuguese economy. Without the railway its backwardness and isolation would have been greater, but that modest achievement was a far cry from the rosy expectations of the promoters of the 1870s and 80s. In 2018, the part of line that was not flooded by a recently built dam is being refurbished for touristic purposes (Pereira, 2017d, pp. 204-207).

The lack of success of the WIPGR as an agent of development was summed up by Amâncio Gracias in 1940 when he wrote that Goa remained in 'deep economic anaemia' and that the railway had brought little benefit to the trade balance and no impact whatsoever on Goan agriculture and industry (Ethell, 2003, p. 75; Gracias, 1940, pp. 319-323) – albeit it was a profitable enterprise for the British investors of the concessionaire, who received a 5.5-6% return on their investment, thanks to the guarantee of yield paid by the Portuguese government. Goods' traffic did increase after the 1902 SMR operational takeover but the benefits for the port of Mormugão were limited as external forces continued to conspire against it. A 1918 report from the Portuguese government to the British Foreign Office noted competition had been severe, and the first English shipping lines calling at Mormugão had been boycotted at Bombay and subsequently had avoided Portuguese India. Most

traffic continued to go by sea from Mormugão to Bombay where cargoes were transhipped to steamers bound for Europe. This expensive, circuitous routing with its transhipments, sea insurance, harbour dues and wharfage almost stopped development at Mormugão (Ethell, 2003, p. 73).

The WIPGR experienced increased difficulty after 1947 as the relationship between Portugal and India deteriorated, and the link to the wider network upon which the WIPGR depended was compromised. India closed the border completely in 1955. However, after the Indian Army took over Goa (a forceful but largely peaceful initiative on the part of the GOI) in December 1961 the line was integrated into the operation of the mammoth, State-run Indian Railways.

In 2018 the Goa line was operated by the South Western Railway headquartered at Hubli, one of the zonal administrations that manage the operations of Indian Railways under the executive charge of the Railway Board located in Delhi. The South Western Railway has been re-gauged to the Indian standard gauge of 1,667 mm but otherwise the route through Goa and onwards to Dharwar and Hubli remains much as it was in the late 1880s. Regular passenger service is available to and from Vasco da Gama railway station in Mormugão (now known as Vasco da Gama although the adjoining port is called Mormugão Port) to places near and far within India. Freight trains continue to move commodities to and from the Port although the lines between Vasco da Gama station and the adjoining harbour facilities are operated by the Port Trust. Iron and other ores constitute a substantial proportion of the outward-bound shipments from Mormugão.[21]

In short, today the former WIPGR is a much busier line than it was in the early twentieth century. Mormugão Port has become one of the busiest in India – it is one of the ports designated as a national 'Major Port'. The Port has become an important element of the economy of Goa although agriculture remains central and tourism has become a driver of the local economy.

Tourists totalled 7,785,693 in 2016 among whom were 890,459 foreigners.[22] These tourists arrive by train, plane and bus. Goa has an active airport with a dedicated international terminal opened in the mid-1990s. Because of its route few foreign tourists reach Goa via the former WIPGR. However, since the later 1990s Goa has been linked to Mumbai via the high-speed, Konkan rail line (via Panvel and onwards to Mangalore). Road transport to Goa also is improving.

The history of postcolonial Goa suggests that given a sufficiently long time (over a century in the case of the WIPGR) a railway can achieve some of the

developmental objectives touted by its promoters. Nonetheless, there can be no argument with the assertion that the WIPGR failed to stimulate the economy of colonial Goa. It did not turn Mormugão into a busy port whose revenues and employment opportunities created multiplier effects throughout the Goan economy. Indeed, one can argue that the substantial sums Portugal paid on account of the WIPGR guarantee represented lost opportunities to deploy that revenue productively elsewhere.

The histories of the Tua and the Goa line offer a fruitful basis for an assessment of the extent to which specific railways under the same ideological umbrella ('Fontismo') stimulated economic development. The two lines had much in common: chronological synchronicity; the metre gauge; supervision and guaranteed financial subvention provided by the Portuguese government; difficult engineering works along parts of their routes; poor and isolated populations and economies to be stimulated by the railways; and two railways that proved unprofitable and seemingly failed to achieve the rosy developmental goals touted by their promoters.

However, in comparative history the main benefit is often the identification of differences and how to 'conceptualise the relations between the more general, transnational patterns, and the particularistic patterns located within individual state, or regional, contexts' (Sarkar, 2007, p. 181). Historians must be willing 'to change focus back and forth from the intimacy and complexity of relationships in specific places and their connections to distant places and long-term processes of change…' (Cooper, 2008, p. 94). The devil is often in the details when comparisons are made.

And so it was in the case of the two lines examined in this paper. Both lines were similarly unprofitable, but profit or loss has, at the best, an indirect relationship to measurement of the extent to which specific railways facilitated economic development. Entire lines or specific operations of a railway company have been run deliberately on a limited or no profit basis in the pursuit of externally mandated social goals, e.g., low passenger fares on today's Indian Railways. Clearly the WIPGR did little to stimulate the economy of Goa during the colonial period, whereas the Tua line did have some positive effects on Trás-os-Montes.

The details of the two histories also highlight the extent to which the WIPGR's failures were in considerable measure the result of particularistic factors anchored in the context of colonial South Asia. We identified these factors throughout the paper: the colonial context; a border crossing with the opportunities that created for delay and harassment; large railway companies

within British India willing to build lines and manipulate freight costs to divert traffic away from the WIPGR and the port of Mormugão; the reluctance of businessmen in British India to set up shop in what they perceived to be foreign, while the isolated, colonial context made it unlikely someone like Tua's Clemente Menéres could appear from within Goan society. Finally, the well-established dominance of Bombay and its mercantile enterprises throughout Western India was an almost insuperable obstacle. Indeed, the latter was a known phenomenon that the promoters of the WIPGR – Portuguese authorities and British financial interests alike – chose to discount. As this paper suggested, the established dominance of Bombay probably made it impossible for Mormugão to become a bustling port with direct steamer connections to European ports – a dream not realized until the post-colonial era.

The Tua line faced none of those particular difficulties and offered some hope of stimulating the economy of Trás-os-Montes. The Tua line did not make an attractive profit but it did have beneficial effects on the region through which it was constructed. Ironically, the Tua line was closed and amputated of its most scenic part whereas the former WIPGR continues as a small but continually used part of the massive Indian Railway system.

Our paper, therefore, suggests three answers to the question 'how does one assess the significance of any past transport project': (1) different time-lines may result in different assessments; and (2) historians are well-advised to take the longest time-line possible because benefits and liabilities change and/or may take a long time to become apparent. These two suggestions are not entirely novel but transport planners and historians alike do tend to ignore the value of the longer-term perspective when planning new projects, assessing old projects or using the perceived success (or failure) of previous projects to justify (or reject) new projects.[23] And finally, (3), we advocate an encompassing, well-contextualized approach to any assessment of a transportation project because a narrow focus on the transportation aspects of a transportation project may blind an historian to contextual benefits and liabilities, to collateral damage (or benefit) if you will. Collateral elements in the 1878 Treaty, for example, had deleterious consequences for the economy of Goa while the unprofitable Tua line did stimulate some economic activity in Trás-os-Montes.

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## NOTES

[1] A total of £ 1,350,000 or 6,075 Portuguese *contos* (1 *conto* = 1 million Portuguese *réis* ≈ 222.222 pounds – MATA, 1993). Portugal also granted tax exemptions and the land and timber necessary for the works.

[2] British Library, London, India Office Records (hereafter BL-IOR), L/PWD/3/280, 1872-1873, Letter 4 of 1873.

[3] AHU, pack 2622, Letters of 20 July, 24 August and 26 October 1880; Telegram of 14 October 1880.

[4] AHU, pack 2622, Correspondence, Hawkshaw, Son & Hayter survey dated 14 September 1880.

[5] AHU, pack 2622, Correspondence, Letters of 21 June 1879 and 9 December 1880.

[6] AHU, box 1977 1L, Letters of 10 January and 7 February 1888.

[7] *Times of India*, 6 February 1888, p. 5.

[8] *Times of India*, 16 August 1897, p. 5.

[9] BL-IOR, L/PWD/6/429, Public Works Department Papers, Collection 2115 of 1893.

[10] *Times of India*, 14 June 1898, p. 4.

[11] BL-IOR, L/AG/46/19/1, *Eighth Annual Report of the Directors of the West of India Portuguese Guaranteed Railway Company, Limited,* 12 June 1889, p. 4. Hereafter [Report Number] *Annual Report WIPGR,* [date].

[12] *The Gazetteer of Bombay City and Island*, vol. I (Bombay: The Times Press, 1909), p. 511. Add in the coasting trade and the steamers totaled 1850 and the sailing vessels 44,889.

[13] *Twenty-Second Annual Report WIPGR,* 18 June 1903, p. 3.

[14] *Twenty-Sixth Annual Report WIPGR*, 27 June 1907, p. 5.

[15] *Forty-Eighth Annual Report WIPGR*, 26 June 1929, p. 6: the agreement with the Portuguese Government was reached in February 1929 to provide the funds 'very urgently' needed to improve the railway and harbor in order 'to cope with the greatly increased traffic.'

[16] AHMOP, Junta Consultiva de Obras Públicas e Minas, caixa 25 (1883), relatório 10305 (8 Jan. 1883).

[17] Diario da Camara dos Deputados, 23 Fev. 1880, p. 542.

[18] Remittance flows back to Trás-os-Montes may have been substantial although this requires further research.

[19] The motorways built during the last two decades contributed to the financial crisis that griped Portugal. However, that is another story although we note that, as in the WIPGR, the lure of the presumed benefits of large transportation projects can blind people to the continuing costs such projects can incur. This is not a problem unique to Portugal.

[20] A knowledgeable participant observer writes of the Tua valley in the 1960's and early 70's: local inhabitants 'did not have an easy life' and existed without 'the minimum basic conditions such as sewage, piped water or electricity' (ALEGRIA, 2011, p. 11).

[21] Manganese continues to be mined in Goa. Much of it reaches Mormugão by river barges.

[22] www.goatourism.gov.in/statistics/225; accessed 1 June 2018.

[23] Elements of this argument are to be found in Colin Divall's careful analysis of the case that has been made for the proposed high speed railway line from London to Birmingham (DIVALL, 2015).



Article received June 20, 2018.
Approved January 4, 2019.