

Regulation, competition and performance of Mexico's freight railways

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Mexico restructured its railways in 1995, creating a number of vertically integrated freight rail concessions. These enjoy exclusive rights to serve their territories, structured geographically to ensure competition to serve key markets and complemented by rights of access to specific parts of each other's networks. The trackage rights have not developed to the full extent foreseen in 1995, fuelling claims by some shippers that they are insufficiently protected from potential monopoly pricing abuse, leading to proposals from Congress to introduce open access provisions across the network. This paper examines the case for change in the regulation of competition based on a review of the performance and efficiency of the Mexican freight railway system today and examines options for enhancing competition.

1. Introduction

The large sunk costs that characterize investment in railways confer a considerable degree of natural monopoly to railway operators; in many situations attempting to replicate existing infrastructure to compete with an incumbent railway would be a ruinous endeavor. As a result there is a strong risk that rents can be extracted by private share-holders, through tariffs well above efficient levels, or through over-manning and excessive cost and/or poor levels of service. Regulating the industry to contain these risks is a demanding task whether the system is State-owned or private. Creating conditions for competition between train operators has proved in many circumstances to be more effective than direct regulation of tariffs; usually a combination of the two approaches is employed. Shippers will naturally lobby for measures that could reduce tariffs in their part of the market but the joint production of services that characterises rail operations makes judgement on what constitutes an efficient tariff complicated.

In Mexico, uncertainty over the performance of the railways in terms of economic welfare led to proposals in 2013 to radically change the legal framework for competition, with the potential to substantially undermine the value of the existing freight concessions. In 1995, Mexico's failing State-owned, monolithic railway company was restructured and conceded to private freight train operators. The state retains ownership of the network but track is maintained and upgraded by vertically integrated rail companies under long term concessions. The concessions were structured to provide for competition through

parallel routes and source competition to key markets, through shared control of infrastructure around Mexico City and through provisions for access to the tracks of competitors on specifically identified parts of the network. Trackage rights have not developed to the extent initially envisaged, fueling claims by some shippers that tariffs in their markets are abusive and leading to the 2013 proposals to impose generalized third party access rights across the network.

This paper reviews the case for further reform in relation to competition on the basis of the performance and efficiency of the freight railways since restructuring and assesses options for enhancing competition. The paper is based on the results of work undertaken by the International Transport Forum at the OECD for Mexico's Ministry of Transport and Communications. The work was undertaken in two phases¹ by teams of experts comprising Aimee Aguilar (ITF), Paul Amos (consultant), Victor Aragonés (US FRA), Ghislain Blanchard, (Canadian Transportation Agency), William Brennan (US STB), Benoit Denis (consultant), Jorge Kohon (consultant), Russel Pittmann (US DoJ), Louis Thompson (consultant) and the author. The analysis summarized in this paper was developed by this team.

2. Reform of the Railways in 1995

The railways were nationalized in Mexico in 1937 under a post revolution policy of collectivism and to allow the State to take over responsibility for investing in a more complete national network, something that could not be financed by the indebted "National Railway", owned by

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¹ ITF (2014); ITF (2015).

² Ley Reglamentaria del Servicio Ferroviario, May 1995, <http://www.sct.gob.mx/informacion-general/normatividad/transporte-ferroviario-y-multimodal/leyes-federales/>.

foreign private investors. Service quality and performance remained weak, however, as a result of poor management and regulation under State ownership and operation. By the early 1990s the national railway, Ferrocarriles Nacionales de México (FNM or Ferronales), was running an annual deficit of more than half a billion US dollars and unreliable freight services were an impediment to economic development.

The remedy adopted was to break up FNM and offer concessions to run the railways. Restructuring began in 1995 with the Law on the regulation of rail services². Transfer to private operators began in 1997 and was completed in 1999. Three main concessions were awarded:

- TFM, now Kansas City Southern de Mexico (KCSM);
- Ferromex;
- Ferrosur;
- Plus a number of smaller concessions (including FCCM, Coahuila-Durango and Tijuana-Tecate).

Access to Mexico City is provided by a neutral track access and terminal company (TFVM), jointly owned by KCSM, Ferromex, Ferrosur and the government. This accommodates a commuter passenger operator as well as the freight services of the concession holders.

The government sought to generate revenue from selling the concessions and received approximately USD 3 billion (2014 prices). The concessions offered were therefore long term (50 years) with exclusive rights to serve their territories (for an initial period of 30 years), with only some well-defined and limited exceptions where concessions were required to negotiate conditions for access by another concession. The most important of these “trackage rights” were for KCSM to use Ferromex tracks from Queretaro to Guadalajara (Mexico’s second city) and Ferromex access to KCSM’s Viborillas to Ramos Arizpe segment on the main line north to the industrial and commercial centres of Saltillo and Monterrey. Negotiations over implementation of these rights were protracted and were not settled until 2011.

In 2002, Grupo Mexico, owner of Ferromex, agreed to acquire Ferrosur but the take-over was rejected by the Federal Competition Commission (then CFC, now COFECE). In 2005, Grupo Mexico purchased Ferrosur for USD 300 million, but the acquisition was opposed by KCSM and COFECE rejected the purchase in 2006. The decision was appealed and the acquisition was permitted to go ahead by a Tribunal in 2011, with Ferromex and KCSM agreeing to terms for the exercise of access rights on critical sections of track to pave the way for approval. During the same period, KCSM was permitted to buy

out the other investors in TFM and is now the primary owner. As a result, Mexico now effectively has two large rail concessions – KCSM and Ferromex/Ferrosur – along with the remaining small concessions.

A number of potential system structures were investigated in preparing for the 1995 reforms, ranging from retention of a single company to be operated by the private sector, that would have been in control of all infrastructure and train operations, to fully open access competition in which infrastructure would have been concessioned separately from train operators and all concessioned train operators would have been able to operate and compete throughout the network. The solution adopted was a hybrid approach adapted to Mexican geography and freight markets (Figure 1).

Figure 1 The concessioning structure

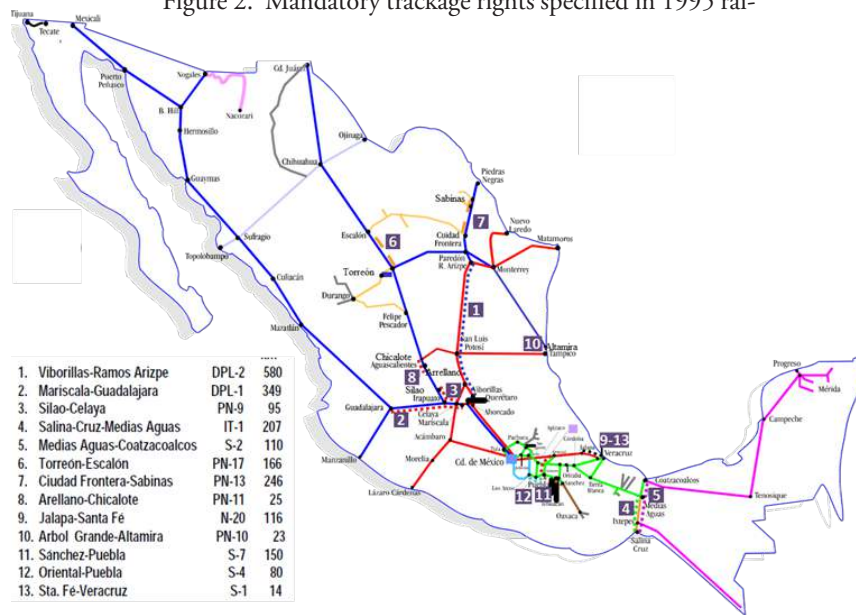


The structure adopted yields four types of rail-versus-rail competition (it should also be noted that there is strong competition from road haulage in many rail markets):

- Direct competition, with alternative routes to key locations (e.g. Monterrey) by two principal competing concessions.
- Side-by-side (parallel) competition, for example by Ferromex and KCSM from the U.S. border to Mexico City, or by Ferromex from the port of Manzanillo versus KCSM from the port of Lazaro Cardenas to Queretaro (and to Mexico City); plus
- Alternative source competition, for example by KCSM from the port of Lazaro Cardenas versus Ferrosur (now part of Ferromex) from the port of Veracruz, both to Mexico City.
- Mandated trackage rights, where one railway operates over the tracks of another and pays a fee for doing so in specific markets where traffic is high enough to support two operators.

About 2 161 kms of trackage rights were identified in 1995. The route length subject to trackage rights amounted to 12% of the total of 17 776 kms concessioned (Figure 2).

Figure 2. Mandatory trackage rights specified in 1995 rail-



Source: SCT.

3. Performance of the Freight Railways

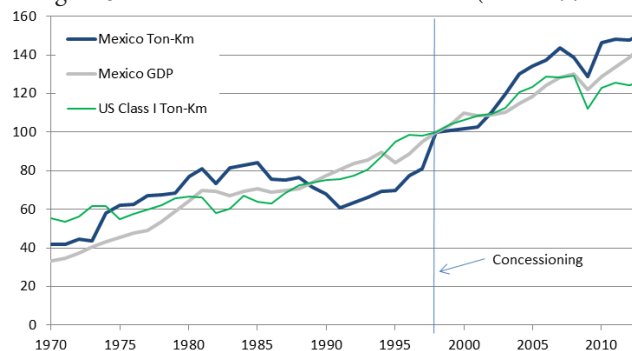
Since transfer to private concessions in 1998, rail tonne-kilometres have grown over 50 percent, faster than national GDP (45 percent) or US Class I freight railways (26 percent) (Figure 3). Traffic density has grown in line with traffic and labour productivity is over six times higher. Average rail freight costs have fallen by about 20 percent since concessioning (Figure 4).

Along with the US and Canada, Mexican average rail freight tariffs are the lowest in the world. Mexican and

US tariffs would be essentially equal, if the US average tariffs were to be adjusted to account for the extremely low rates charged for coal (the Mexican railways transport little coal). Figure 4 shows the freight tariffs applied by FNM together with the tariffs that would have had to be charged to break even, reflecting the share of annual losses attributable to freight, as opposed to passenger operations.

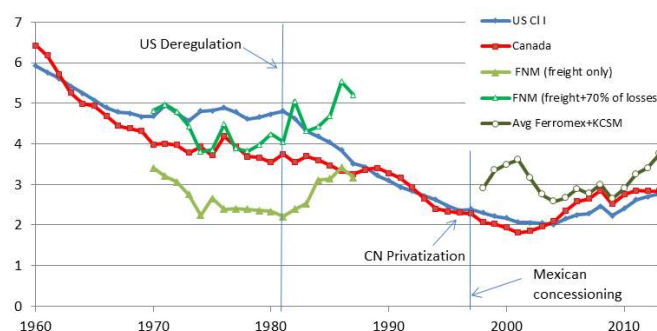
Table 1 indicates the performance of Mexican railways in 1996, under FNM management, and in 2006 and 2012 under concessioned management against the productivity indicators. The efficiency improvements are large.

Figure 3. Mexico: Rail tonne-km vs GDP (index 1998=100)



Source: STB, Statistics of Class I Railroads, various years; and SCT, Anuario Estadístico 2013.

Figure 4. Average rail freight tariffs (2012 US cents/tonne-km)



Source: ITF 2014, Freight Railway Development in Mexico, updated.

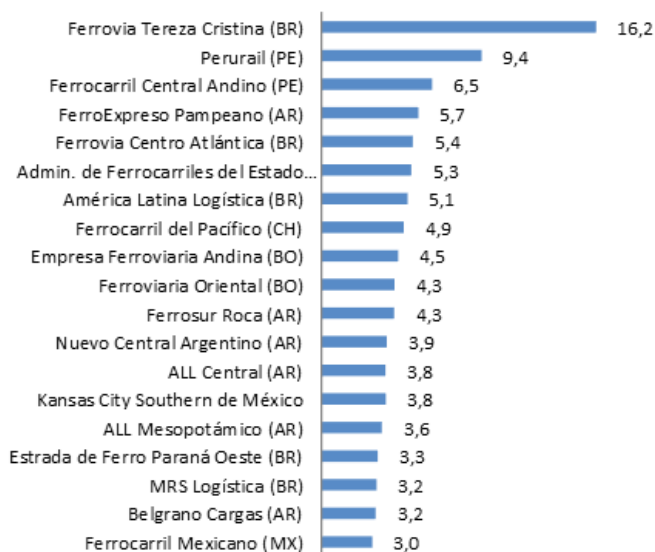
Increases in the productivity of locomotives and freight cars exceed 50%. Labour productivity has improved by 6 times as a result of the changes in operational practices, better management and investment.

Indicator	1996	2006	2012
Ton-kms per locomotive (million)	26.9	59.8	59.9
Ton-kms per freight car (million)	1.56	2.30	2.71
Ton-kms per employee (million)	0.81	5.43	5.33
Ton-kms per litre of fuel	80	107	116

Source: IMT, 2014.

Ferromex and KCSM, the largest Mexican railways, have the highest locomotive productivity among 23 non-mining railways of Latin America, leading by a clear margin. Figure 5 compares the average railway freight tariff of 18 railways in Latin America for which public information is available. Ferromex charges an average 3 U.S. cents per ton-km, the lowest tariff in the group (KCSM charges an average of about 3.8 cents per ton-km). All railways included in Figure 3.8 move general cargo traffic with the exception of MRS in Brazil, the only big mining railway (130 million tons in 2011) in the sample. Even so, MRS has higher average tariffs than Ferromex.

Figure 5. Average tariff of different railways in Latin America 2011-12 (US cents per ton-km)



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range of US and Canadian Class I freight railroads (Table 2). Without question, the Mexican concessions have become world class performers.

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Class I average	70.8
CN	63.3
KCSM	64.0
GTW	65.4
UP	67.3
BNSF	70.2
SOO	70.6
NS	73.0
KCS	74.2
Ferromex	75.4
CP	76.9
CSX	77.3

Note: Operating ratio is the ratio of operating expenses to operating revenues.
Source: AAR, "Railroad Facts, 2014 edition, pages 69-81.

4. Trackage Rights and Protection of Captive Shippers

Rail provides a range of bulk, container and specialized services in Mexico and faces strong competition from road haulage in most markets. It has a natural advantage carrying heavy loads on routes with high density traffic and bulk shippers such as grain, cement and steel are particularly sensitive to rail tariffs as competition from trucking is much weaker for these commodities. Mexican railway operations are fully integrated with the railways of the USA and Canada, with numerous cross-border services. Some of the most profitable services serve industrial plants, notably car manufacturing, located either side of the US border. Inward investment by US and Japanese car manufacturers in Mexico has relied on high quality rail services that enable the virtual integration of plants, with parts and semi-finished goods crossing the border several times before the final product is shipped. For international transport, rail carries the advantage over trucking of avoiding delays for inspections at the border through the use of bonded containers.

The geographical design of the rail concessions and the specification of trackage rights was structured to provide for rail on rail competition in the major markets. The

long delays already noted in the concessions reaching agreements on the terms for use of trackage rights reflect an underlying mutual preference for avoiding competition. The 1995 railway law provides for the Ministry of Transport and Communications to impose conditions where concessionaires fail to reach mutual terms in order that shippers can negotiate with competing train operators. The Ministry intervened to do this on a number of occasions but the concessions used the courts to prevent implementation of the imposed rates. The determinations were blocked by 'Amparo' – the Spanish legal term – on the grounds that they confiscated value from the rights conceded to the railways. Amparo is a legal safeguard introduced to protect businesses and individuals from arbitrary confiscation of property by the State. Judges base decisions on whether the State marshals sufficient evidence to show that its decision respects the law. In the case of economic regulation this means the intention of the law in the guiding the operation of the market and driving positive welfare outcomes. It seems most likely that the determinations of the Ministry on conditions for the exercise of trackage rights failed this test in the eyes of the judges because they were not equipped with the economic expertise and legal capacity to demonstrate conformity with the competition objectives of the law. More convincing argument and documentation might have led to a different result.

Captive shippers enjoy protections under Mexican law, with the Ministry to set tariffs in cases where the Competition Agency (COFECE) determines 'effective competition' is absent. The tests of effective competition include intermodal competition and given the extensive highway network in Mexico therefore set a relatively high hurdle. Neither the Ministry nor the Competition Agency have dedicated expertise in this field. No cases of regulated tariffs have been imposed because of an absence of effective competition to date.

These shortcomings in the capacity to make regulatory determinations led in 2013 to a legislative proposal in Congress, with cross-party support, to introduce open access provisions across the network (Gaceta 2013). Had the proposed change to the railway law been implemented as formulated, it would in all probability have severely curtailed investment in the rail network by the concessions. With the uncertainty created over revenues, and also in the management of train operations – with shippers as well as other concessions holding rights to run trains over concessioned tracks – shareholders would be extremely reluctant to put money at risk. Open access arrangements might be possible in Mexico but probably only if the government was prepared to take over a substantial share of the responsibility for funding infrastructure.

Following extensive stakeholder inquiry the Senate modified the proposed amendments to the Railway law, removing the open access provisions. It instead required the Ministry of Transport and Communications to establish a Regulatory Agency for Rail Transport (ARTF) to strengthen capacity for intervention in setting conditions for the use of trackage rights and tariffs where competition is deemed ineffective. Unfortunately the amendment adopted included a provision that the Agency should be funded within the existing financial resources of the Ministry. Given the need recognized by the Senate to substantially enhance regulatory capacity, this restriction could severely compromise delivery. Should this prove the case the first response should be to add resources in terms of qualified experts in competition economics and law. The Agency was established in 2016.

The basic economic characteristic of railways (relatively high fixed costs, and relatively low marginal costs) tend to force concentration of competition between a small number of operators rather than atomisation of competition. The need to recover fixed costs leads inevitably to some form of "Ramsey pricing" where shippers pay rates that reflect in part their elasticity of demand. This is a discriminatory but efficient pricing system for arriving at a financial sustainable optimum. For any particular service, it is rational for the firm to lower its prices as far toward variable (or marginal) costs as competitive conditions require. Pricing all services close to variable costs would not permit recovery of fixed costs. Fixed costs are recovered by charging each service or customer a rate that is as far above variable cost as possible, which generally depends on the customer's price elasticity of demand. Summed over the full set of customers, the contributions to fixed costs should be sufficient to recover total fixed costs.

Discrimination between different users requesting essentially the same services is proscribed by competition law everywhere, including in the Mexican Railway Law. This is essential for fair competition. This more general, arbitrary type of discrimination should not, however, be confused with Ramsey pricing, which is essential to maximising the benefit of the railway system to the overall economy. Trying to impose uniform tariffs or an arbitrary average contribution to fixed costs would seriously undermine efficiency and price some users off the railway.

US regulation accepts Ramsey pricing and focuses on identifying and rectifying cases in which market power has been abused. US law and related regulations contain reasonably detailed definitions of what might constitute abuse: total revenues that are more than those required to recover costs including a reasonable return on investment; prices for a shipment that exceed stand-alone costs; a revenue to marginal cost ratio greater than 180 %; inefficient

3 See for example the World Bank's Railway Reform Toolkit, https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/railways_toolkit/ch2_2_2.html

operating costs; or abrupt changes in tariffs that would cause disruption. The US definition of effective competition combined with exemptions from any regulation for contract rates and exempt services means that only about 10 percent of traffic is eligible for regulation. It has led to a wide range of average tariffs by commodity and of ratios of revenue to variable cost. The ‘internationally recognised criteria and principles’ that the Mexican Rail Regulatory Agency is required to adopt will need to include Ramsey pricing, acknowledging that prices can vary greatly between different categories of shipper. There is no reason to expect the differences to be any less marked than they are in the US.

5. Conclusion

The 1995 restructuring of Mexico’s railways has been remarkably successful; on a par with the results of the 1981 Staggers Act reform in the USA. Financial performance of Mexico’s two main concessions rivals that of US and Canadian Class 1 railways and average tariffs are at similar, low levels. Mexico’s railways are the most productive in Latin America and investment since 1995 is gradually raising technical standards to those elsewhere in North America. The success of the railways has contributed significantly to economic growth and supported inward investment in critical sectors of the economy; 50% of rail freight carried in Mexico crosses the US border.

Structuring the concessions to provide for rail-on-rail competition in most key markets has been successful in improving the quality of services and reducing tariffs. Competition could and should be enhanced, however, through fuller use of trackage rights. The reason these have not been exploited to the extent envisaged in the 1995 reform is a lack of regulatory capacity in Government. Interventions by the Ministry of Transport and Communications to set access conditions and prices where concessions failed to agree terms were blocked by concessions appealing to the courts where judges were not convinced of the legitimacy of intervention, most probably because of inadequate economic argumentation and evidence. The Ministry was similarly poorly equipped to intervene to set tariffs in markets where competition might be deemed to be ineffective.

The response to this deficit has to be reinforcement of regulatory capacity and the Senate is to be congratulated for having decided in 2014 to enhance regulatory capacity by establishing a rail regulatory agency rather than imposing new open access rights on a system of what are designed to be exclusive concessions, as proposed initially by Congress. The high fixed and relatively low marginal costs of railway infrastructure make atomistic competition impossible and

discriminatory pricing essential to cost recovery.

The expertise required to regulate railways efficiently has resulted in many jurisdictions in the establishment of specific regulatory agencies, which share responsibilities for competition in the railways with competition authorities. Confusion over price discrimination between different market segments on the one hand and different shippers seeking essentially the same service on the other hand is frequent, both inside and outside of Mexico. This makes the regulation of competition in railways an often controversial question. The world’s most successful general cargo railways all practice price discrimination in the form of Ramsey pricing and Mexico is no exception. The challenge for the new Regulatory Agency should not be underestimated. The lessons illustrated by the legislative process in Mexico are valuable for railways everywhere.

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