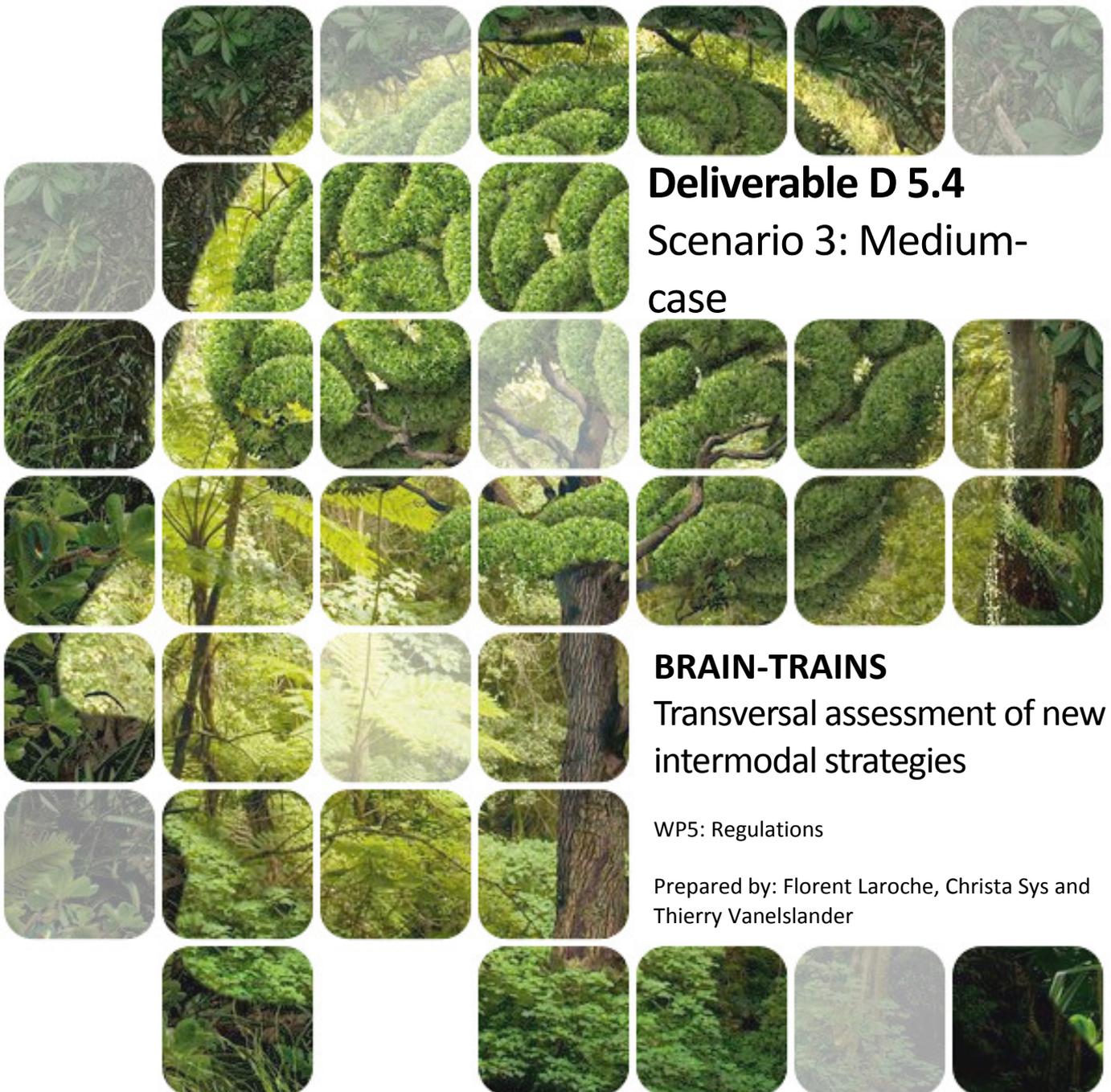




BELGIAN RESEARCH ACTION THROUGH INTERDISCIPLINARY NETWORKS



Deliverable D 5.4
Scenario 3: Medium-case

BRAIN-TRAINS
Transversal assessment of new intermodal strategies

WP5: Regulations

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INTRODUCTION

The objective of this deliverable is to apply the method (cf. deliverable WP5.1) to the medium case scenario developed in the WP 1. The medium case scenario is an intermediate situation between the best case scenario (cf. deliverable WP5.2) and the worst case scenario (cf. deliverable WP5.3). It forecasts an oligopoly in the Belgian market from six rail freight operators in 2014 to four in 2030 and a doubling of the market size from 7.3 billion ton-kms in 2014 to 12 billion ton-kms in 2030 (+64%). As opposed to this, the two other scenarios are more contrasted in their forecasts. The worst case is pessimistic considering a high concentration (monopoly or duopoly) and a slow development of the market size in ton-kms (+10%), while the best case is optimistic, considering a large number of operators (ten) and a dynamic market development (+133%). Consequently, the “medium scenario” can be read as the most likely scenario for the Belgian rail freight.

Considering that the analysis of the two others scenarios was mainly based on the European market, the “medium scenario” is focused on the Belgian rail freight market as follows:

- What is the dynamic of the rail freight market in Belgium?
- Which are the risks to get an oligopoly on the Belgian market?
- Which economic regulation should be implemented on the Belgian market?

This deliverable tests and applies, as a critical synthesis, the main results from the previous deliverables to the Belgian rail freight market. It is based on the market analysis used in the worst scenario to test the risk of concentration and on the economic regulation analysis developed in the best scenario to identify the different levers useful for policy makers to increase the competitiveness of the sector in a context of free market.

The organization of this deliverable is as follows. Section 2 draws the state of the Belgian rail freight market. Section 3 highlights the limits of the analysis to consider the Belgian rail freight market. Finally, the last section discusses and makes recommendations for Belgium considering the results from the medium scenario developed in WP1.



1. STATE OF THE BELGIAN RAIL FREIGHT MARKET

The “medium scenario” forecasts for the Belgian market a doubling of the market size in ton-kms by 2030 (+64%). It looks like optimistic considering the state of the market in 2017, which can be characterized by an economic stagnation in volumes and competitiveness (modal share). Section 1.1 will describe the evolution of the market in volume on the long term, while section 1.2 will draw a dynamic picture of the operators on the market. Finally, section 1.3 will discuss about the competitiveness of the sector in terms of modal shares.

1.1. RAIL FREIGHT TRAFFIC STAGNATION IN BELGIUM

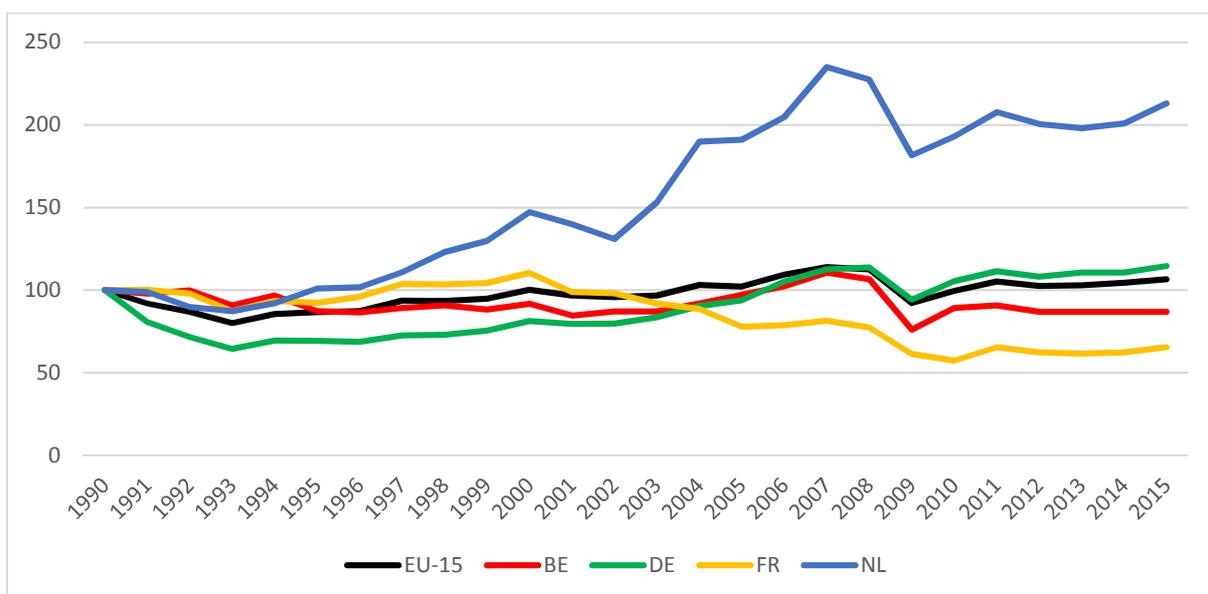
This section proposes an overview of the global evolution of the rail freight traffic in Belgium from 1990 to 2015. A comparison is done in figure 1 with EU-15 and its neighbors, being France, Germany and the Netherlands. It is interesting to highlight three remarks according to the figure 1.

First of all, considering the Belgian curve, except between 2003 and 2009, a slow decrease in terms of ton-kms can be observed between 1990 and 2015 (-13%).

Second, the Belgian dynamic is below the average in EU-15. Along the period, the traffic in EU-15 increased by 6.6%. It is low but positive in comparison to the Belgium dynamic. This situation can be the sign for the Belgian to feature a lack of attractiveness and competitiveness.

Finally, the comparison with its neighbors highlights two contrasting situations. The Netherlands and Germany increased their market respectively by 113% and 10%, while France decreased its market by 35%.

Figure 1: Comparison of rail freight traffic evolution between 1990 and 2015 in Belgium and EU 15 (base 100: 1990)



Source: Eurostat, 2017

These results for Belgium are surprising, especially in comparison to the Netherlands where a strong policy for rail freight has been developed through the set-up in 2007 of the Betuwe line (Laroche &



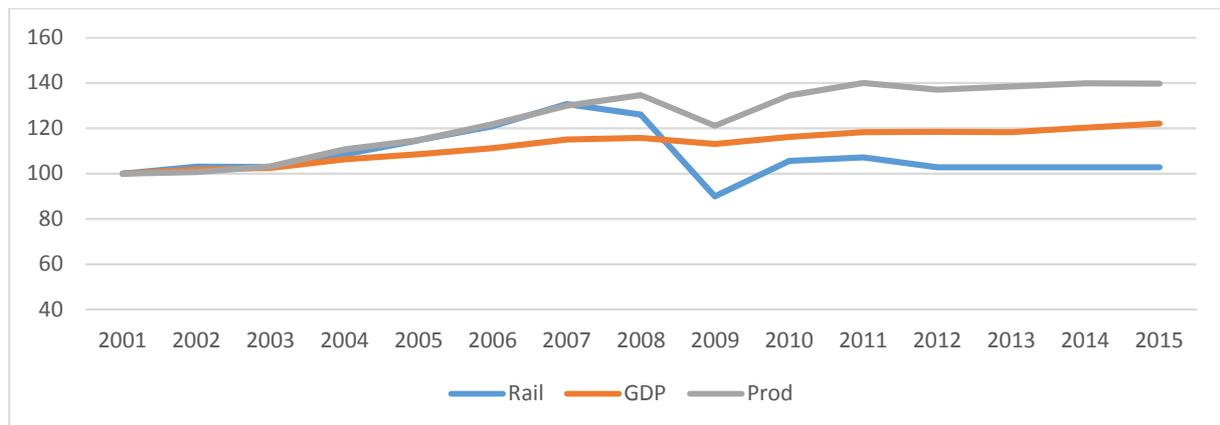
Guihéry, 2015), considering the development of the world trade during the period and the location of Antwerp on its territory. Consequently, how to understand the Belgian situation?

In transport economics, two variables are typically used to understand the transport demand: the GDP growth and the industrial production. The GDP growth includes the general production and consumption into a country. The transport demand increases when the GDP increases and decreases when the GDP stagnates or decreases. The economic literature (Becker et al., 2013) calculates an elasticity from transport demand to GDP at 1.27 in general and between 0.6 and 1 for the rail freight sector. The second variable is more specific to the rail freight market famed to be reactive to the industrial production. Figure 2 proposes a comparison between the GDP growth, the industrial production and the rail freight traffic in Belgium between 2001 and 2015.

A first comment highlights the slow but continued increase of the Belgian GDP in spite of the economic crisis in 2009 (+22%). It cannot explain the stagnation of the rail freight demand during the period (2.8%).

A second comment concerns the correlation between the industrial production and the rail freight market except between 2007 and 2008, where the Belgian production continues to increase and the rail freight market starts to decrease.

Figure 2: Rail freight traffic in Belgium compared to the road traffics and the GDP



Source: Eurostat, 2017

Finally, figure 2 shows that the industrial production can explain a part of the demand in rail freight transport in Belgium but excludes the GDP growth as determinant. Nevertheless, it does not explain the part of the rail freight demand due to the international transit from the Belgian ports to the European market. Furthermore, it is difficult to identify an impact from the market liberalization in 2005.

1.2. NEW ACTOR GAME AND DOMINANT POSITION

Since the liberalization of the Belgian rail freight market in 2005, new operators are operating on the market.



In 2017, the national infrastructure manager (Infrabel) counts 12 active operators on its market. This number is stable since 2014 but it can change according to the definition given to the operator. For the European Commission, there were 27 operators in Belgium in 2015. It defines a “railway undertaking” as “any public or private undertaking licensed [...] to provide services for the transport of goods and/or passengers by rails with a requirement that the undertaking ensures traction” (Article 3, directive 2012/34/EU). According to this definition and knowing that a railway undertaking needs to get a safety certificate from national authorities to operate on the network, a firm can be considered a railway undertaking without safety certificate and any traffic on the network. Otherwise, firms can make the choice to get the safety certificate on a network without traffic for strategic reasons. To solve this problem, it is considered in this study that an active rail freight operator is an operator which has a railway license, a safety certificate and runs traffic on the national network where its safety certificate is registered.

Table 1 gives a picture of the active operators on the Belgian market in 2017. They are characterized according to their nationality, their date of creation as company, the scale of their business (international when they are operating in more than one country) and the date when they started their operations on the Belgian market.

Table 1 : New operators and characteristics on the Belgian rail freight market

Name	Nationality	Date of creation	Market scale	Start in Belgium
Lineas ¹	BE	1926	International	1926
DB Schenker	DE	1994	International	2007
SNCF Fret	FR	1937	International	2007
Crossrail	CH	2000	International	2002
RurtalBahn Cargo Netherlands	DE	2000	International	2006
Europorte	FR	2005	International	2012
Railtraxx	BE	2009	International	2009
Rotterdam Rail Feeding	NL	2004	International	2011
CFL Cargo	LU	1946	International	2014
HSL Polska	DE	2003	International	2017
Captrain (Fret SNCF)	FR	2000	International	2007
Euro Cargo Rail (DB Schenker)	DE	2005	International	2009

Source: Infrabel, 2017 and website from operators

Several interesting observations can be highlighted from the table 1. First of all, the majority of active operators are newcomers and started their activities after 2000. It is interesting to highlight that each incumbent from neighboring countries is operating on the Belgian market (DB Schenker, SNCF Fret and CFL Cargo). Second, only two operators have their head office in Belgium. Most of them have their head office localized around Belgium (France, Germany, the Netherlands and Luxemburg) and Crossrail is the only one operator to be localized in Switzerland. Consequently, they are all operating in more than one country, from Belgium to another, and they remember the strong specificity of the Belgian market as a gate towards the international. Finally, most operators started to operate in Belgium after 2007. Some operators were already present before through the international market by direct competition (since 2003) or cooperation between the national incumbent and foreigner operators. To conclude, the active operators on the Belgian market in 2017 show a strong regional dynamic with

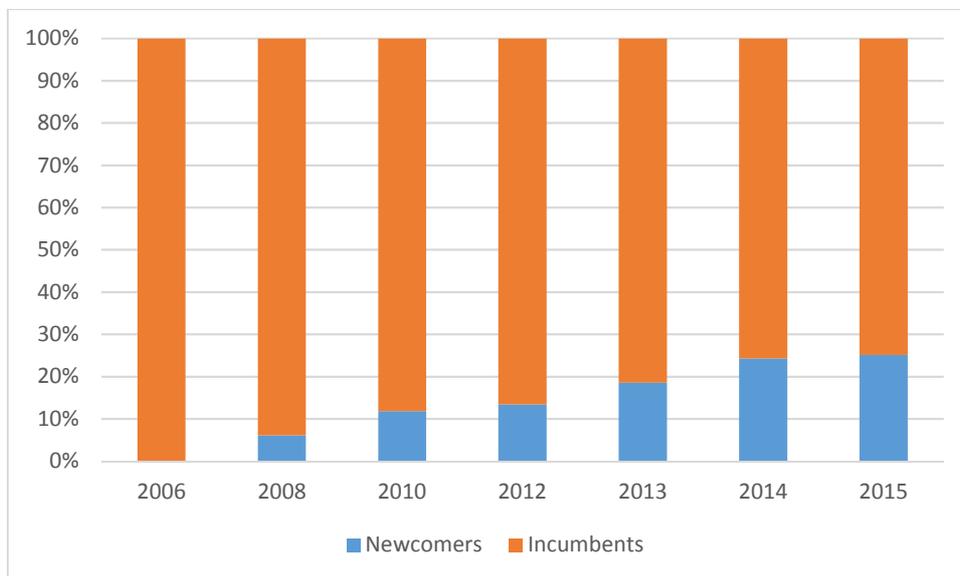
¹ Previously know as B-Cargo, B Logistics, SNCB Logistics



incumbents and newcomers from the neighbor’s countries and a market mainly oriented towards the international.

Nevertheless, the introduction of new competitors from 2005 does not mean for the historical incumbent a strong extinction of its market shares. Figure 3 shows the progression of new competitors in terms of market shares on the Belgian market. It is interesting to note that the progression has been continued, be it slowly, between 2006 and 2014. Since 2014, the market share seems to be stabilized around 20%; below the European average around 30%. It can be the sign of a strong persistence of the national incumbent because of its performance or, less optimistic, the result of barriers and a lack of attractiveness from the Belgian network. This last assumption could explain the stagnation of the rail freight traffic in Belgium despite the liberalization, remaining the need of an active regulation in this sector from public authorities.

Figure 3: Market shares between incumbent and others on the Belgian rail freight market



Source: Eurostat, 2017

1.3. LACK OF COMPETITIVENESS FOR RAIL VERSUS ROAD AND INLAND NAVIGATION

The two previous sections assume a lack of attractiveness from the Belgian rail freight market. Section 1.1 shows a stagnation of the rail freight traffic despite the market liberalization and the dynamic of the port of Antwerp. Then section 1.2 highlights the persistence of the national incumbent reducing the impact of the other competitors.

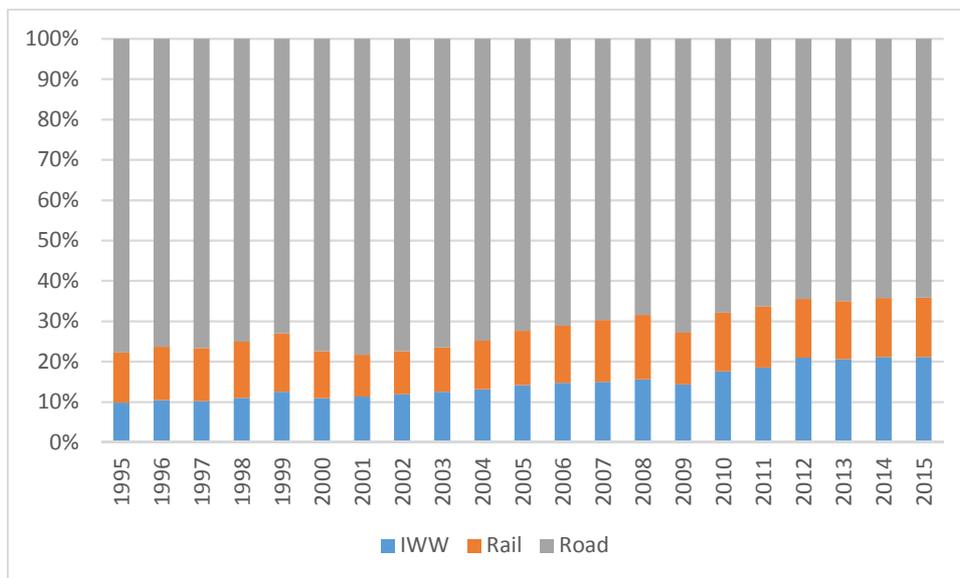
Taking into account these facts, this last section proposes to analyze the competitiveness of the sector through the evolution of the modal share for rail freight transportation in Belgium between 1995 and 2015. Figure 4 shows three interesting trends.

First of all, if the road freight mode keeps a dominant position, its modal share has been greatly reduced since 1995 from 78% to 54% (Eurostat, 2017). Second, the reduction of the road modal share benefited to inland navigation which increased its modal share from 10% in 1995 to 18% in 2015. Finally, the situation for rail freight transport is ambivalent in so far as the modal share remained stable



during the period (around 12%). On the one hand, it is a good sign. The rail freight market followed the global trends in terms of traffic and it did not lose competitiveness to the other modes. On the other hand, the stagnation of the modal share highlights that the rail freight market did not progress in terms of competitiveness to the other modes. Considering the main competitors of rail, inland navigation, it is relevant to ask what has been done for the inland navigation and not for the rail freight market.

Figure 4: Modal share for freight transportation in Belgium between 1995 and 2015



Source: Eurostat, 2017

To conclude, this first part makes an overview of the rail freight sector in Belgium through the analysis of the main trends on the market in terms of volume, modal share and competitors. Results show an ambivalent situation for rail freight, competitive on its market but inefficient to take modal share on road and inland navigation despite the liberalization and the international dimension of the market.

2. LIMITS FOR A RAIL FREIGHT MARKET ANALYSIS IN BELGIUM

An analysis of the Belgian rail freight market needs to take into account several specificities and limits. Section 2.1 shows that more than 70% of the freight traffic is going out of Belgium depending more on external than internal factors. Section 2.2 highlights a lack of a database to follow the Belgian market. Data are few and sparse. Finally, section 2.3 proposes a review of the current economic regulation for the rail freight market in Belgium. It shows that the tools as their impacts are limited.

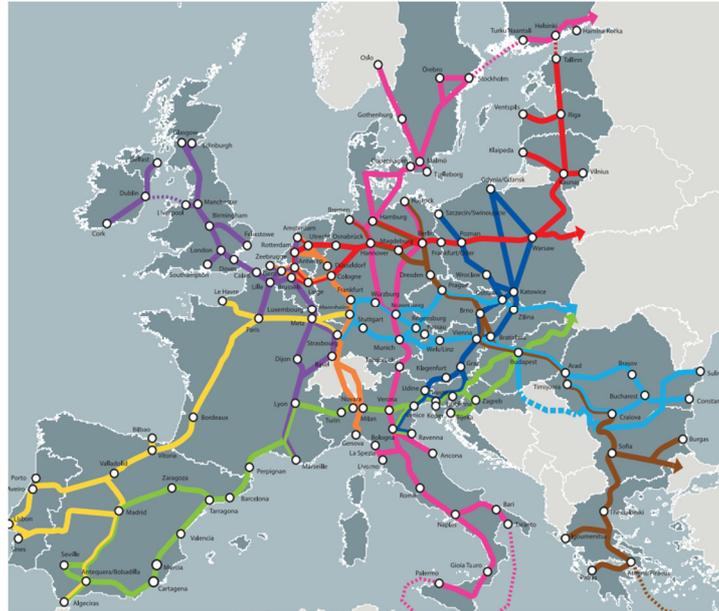
2.1. A LIMITED MARKET SCOPE

The Belgian market is strongly linked to the European market for more than 70% of the rail freight traffic (Eurostat, 2017). This cross-border opening can be explained among others by the location of two of the biggest European ports, Antwerpen and Zeebrugge. The latter are connected to three main corridors (North Sea – Mediterranean, Rhine – Alpine, Orient – East Med) of the European TEN-T network (Regulation n°1316/2013) and particularly to the rail network. Figure 5 shows the North Sea



– Mediterranean corridor in purple, the Rhine – Alpine corridor in orange and the Orient – East Med corridor in red.

Figure 5: Map of the Ten-T Core Network Corridors



Source: Regulation n°1316/2013 (EU)

With 7.3 billion ton-kms in 2012 (Eurostat, 2017), the market is shared by 12 rail freight operators. All of them are operating in two countries or more and only two have their headquarters in Belgium according to the section 1.2. One of them is the national incumbent, B Logistics (rebranded to Lineas, April 2017), privatized in 2011.

Considering these facts, a market analysis limited to the national market only would be incomplete. It is obvious that strategies from operators as business transcend the national borders. This assertion is especially right for the port of Antwerp, which is a gate not only for Belgium but mainly for the European market (see figure 6). It is linked to the corridor 1 (Antwerp, Duisburg, Basel, Genoa), the corridor 2 (Antwerp, Luxembourg, Lyon, Basel) and the corridor 5 (Antwerp, Duisburg, Poland, Lithuania).



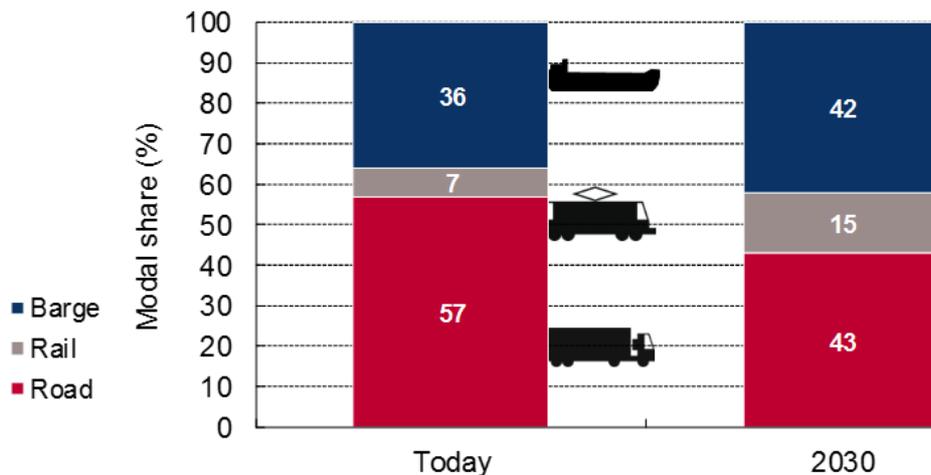
Figure 6: Main rail freight connections from the port of Antwerp to the rest of Europe in 2016



Source: Port of Antwerp, 2017

The port of Antwerp is also a driver for intermodal policy. According to figure 7, it has a strong objective to reduce the road modal share by 2030 in favor of the barge and rail. To support rail, freight, it plans mainly to extend the rail access and capacity by a better reliability and distribution system into the port network.

Figure 7: Modal share for freight in 2017 from the port of Antwerp and objective by 2030



Source: Port of Antwerp, 2017

Consequently, it is preferable to extend the market scope to the European area to provide a relevant analysis of the Belgian market.



2.2. AN IMPERFECT KNOWLEDGE OF THE MARKET

Market analysis needs robust data per operator about the firm size (sales, assets, employment, etc.) to compare and measure the level of concentration. Usually, there are two kinds of databases: national and international.

From a national point of view, data are sparse about the rail freight market. There are mainly two databases: the national rail freight regulator and the National Bank of Belgium.

The rail freight regulator provides a market analysis on its website². Unfortunately, this analysis is irregularly updated, the last one is based on data of 2014, and general. The main variables are the number of competitors, the aggregated modal share of newcomers against the national incumbent and the rail freight traffic in ton-kms. It is poor to give a deep picture of the market and its needs.

The National Bank of Belgium collects the annual accounts of nearly all legal entities active in Belgium and makes these accounts available for the public. Consequently, it is possible to collect financial data about the rail freight operators active on the Belgian market. Nevertheless, several limits must be considered in this database. First, the data are not always available. Second, there are only financial data and no data about traffic or material resources.

From an international point of view, the most common databases for rail freight market data in Europe are UIC and Eurostat.

First, the UIC database is a reference for measuring the efficiency of the main operators on the market. Nevertheless, this database is incomplete for two reasons. On the one hand, it is limited to its members who are mainly incumbents. On the other hand, recent data are very sparse since the liberalization. Consequently, the UIC database is only interesting to make an econometric test on long time series before 2007, but insufficient to describe the evolution of the freight market since 2007 and taking account the economic crisis.

Secondly, Eurostat gives interesting and frequently updated time series. Unfortunately, these are only at an aggregate level (Europe/countries) and mainly limited to traffic. Data on the market are restricted to the aggregate market share of new operators per country.

To conclude, existing databases, national or international, need to be adapted to provide a deep market analysis. At least, the number of active operators per country (a list of operators would be ideal) with key data to assess the firm size for all operators included in the top 20 or 30 (tons-km, tons, turnover, etc.) similar to the US rail freight databases should be published. Indeed, the US database produced by the Association of American Railroads (AAR, 2016) gives extensive data about traffic (weekly traffic by products), turnover, employment, number of competitors, etc. Another example from another sector is the database for the air industry produced by the International Air Transport Association (IATA, 2016). Extensive data and ranking between companies are available for traffic and fleet, employees and financial results.

² <http://www.regul.be/fr/content/chemins-de-fer/march%C3%A9>



Table 2: Minimum criteria for a database providing a deep market analysis

Operators	Qualitative data	Quantitative data
Name	Nationality, date of creation, subsidiary, etc.	Turnover, ton-kms, (<i>capital cost, labour cost, EBITDA</i>)

Source: Own composition

2.3. A WEAK ECONOMIC REGULATION OF THE MARKET

The Belgian organization follows the European way. Since the last reform³, the IM (Infrabel) is independent from the national operator SNCB. Furthermore, a regulatory body has been created (Regulatory Body for Railway Transport and for Brussels Airport Operations). However, some differences in the application are interesting to highlight.

THE CONTRACT OF PERFORMANCE

A first contract of performance has been drawn between the Belgian Federal State and Infrabel in 2008 for a period of 4 years (2008 – 2012)⁴. Since the end of this contract, no new contract has been designed. The previous one continues to run by Royal decree waiting for a new contract in 2016. The main reason for this delay is the new organization of the Belgian rail according to the unbundling between Infrabel and SNCB. Another reason can be the difficulty for the responsible authorities to write the contract and especially to fix the indicators, targets and incentives in case of non-achievement.

Concerning the latter, the last contract was very light in terms of objectives and indicators.

- For rail freight, one quantitative objective was established: + 35% ton-kms between 2006 and 2012. But no incentive or penalties were linked to it. The result is a decrease in the period by -12.7% (Eurostat, 2017).
- Concerning the indicators, only one was linked to penalties. It concerns the performance for passengers and was fixed in terms of minutes of delay in one year. In the case of non-compliant results, a financial penalty can be applied to the financial transfer from the Federal state to the IM. However, this system does not exist for rail freight.

The two objectives seem to be partially in contrast with each other. The IM can be tempted to give more priority for passengers than freight and decrease the performance for rail freight. The development of a similar indicator for rail freight in terms of delay would be a good instrument to reduce this unbalance.

To finish, there are no clear objectives in terms of pricing for infrastructure (Art. 11, 12, 13), except a principle (optimize the use of the network) and a better transparency in the framework. The control of the inflation and framework is attributed to the regulatory body according to the European law.

³ Loi portant le Code ferroviaire du 30 août 2013 (http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=fr&la=F&cn=2013083057&table_name=loi)

⁴ <http://ecms.infrabel.be/DMS/ds/fr/6619936>



THE INFRASTRUCTURE PLAN

A new plan for infrastructure investment is still in progress in 2016⁵. Nevertheless, investments for railway forthcoming are mainly:

- The interoperability and safety of the network by the implementation of the ERTMS (full migration in 2025).
- Modernization of the connection between Belgium and Luxembourg (axis 3).
- A better port connectivity by investment in access to Zeebruges (new line between Ghent and Bruges) and Antwerp.
- Modernization of the Brussels area network.
- A better traffic management by a reduction of the number of traffic centers from 350 in 2005 to 31 in 2017, then 10 in the long term.

These projects show three objectives. The first one is to improve the global safety of the network after some tragic accidents (2010, 2014). The external benefit for freight is the migration towards the new European signaling system, ERTMS. It improves the efficiency for traffic management and the interoperability with the European networks in the long term. The second objective is to improve the port connectivity to the European network. Investments are concentrated on the port access but also in the hinterland to increase capacity and traffic reliability (line Ghent– Bruges, line Belgium – Luxembourg on the EU corridor 2 North Sea – Mediterranean). Third, the modernization of the network and traffic centers should have a global positive effect on the system thanks to a better coordination between centers to manage the disruptions and increase the resilience. Consequently, these objectives and investments seem to be in the good way for a better efficiency of the Belgian network and a better integration to the European one.

Finally, the Federal state supports some specific segments on the national rail freight market through subsidies. They are for the combined traffic (€4,5 million) and the single wagon loads (€10,5 million). Amounts and traffic are very low but are essential to the persistence of some industries on the territory. The fund for subsidies is approved each year by the European Commission and the Federal State. However, the power of the Federal state in this field is limited and the probability of an extension to these subsidies to other market segments is very low.

THE REGULATORY BODY

The Belgian regulatory body is a new structure since 2013. Its main powers are limited to the control of the network statement and the market (2012/34/EU).

Concerning the network statement, its control is not restrictive for the IM. It can give advice but not force the IM to change its strategy. On this point, only the contract of performance can drive the strategy of the IM and the regulatory body does not have power on it. Consequently, the regulator cannot give objectives to the IM or develop a strategy for the market.

About the market, it has competencies to interfere in case of discrimination from one operator to another. Nevertheless, it has no competencies to interfere in case of abusive merger or acquisition and it is limited at the European level in case of abuse by an international operator between Belgium and another country. The European law requires international cooperation between national regulatory bodies, but in reality, good cooperation depends on the level of good will towards each other.

⁵ <https://www.infrabel.be/fr/projets>



Consequently, a European agency could be a good solution to ensure the regulation across the borders and on the core network.

To conclude this subsection, Belgium is on time with the European regulation for the global framework. Nevertheless, several first observations can be drawn for future improvement, as below. The analysis of other national organizations in the following sub-section will further update this list.

- Rail freight is currently a second priority for the IM in the contract of performance. The definition of a specific indicator similar to the one for passenger traffic (maximum number of minutes of delay in one year) could be a good lever to improve its priority for the IM.
- The regulatory body has limited power on the IM and market, while it is a key player in the system because of its independency and its intermediation. An extension of its skills to the definition of the contract of performance (with a validation from the Federal state) could be a good lever to improve the monitoring of the IM and the implementation on the market of the freight policy.

Table 3: Synthesis of institutional organization and levers for Belgium

LEVER	MAIN FACTS
Performance contract	Every 4 years, last period: 2008 – 2012 Objective for freight: +35% tons-km between 2006-2012 One indicator with incentive for passenger (max number of minutes for delay) No indicator with incentive for freight
Transport policy	Port connectivity: Antwerp & Zeebruges Safety and interoperability: full migration towards ERTMS in 2025 Modernization of the network: reduction from 350 traffic centers in 2005 to 31 in 2017 No plan for cross-border links
Network statement	Pricing according to the direct cost from a train service No advantage to the rail freight for access charges
Regulatory body	No restrictive control on network statement Limited control on the rail freight market because of the large share of international traffic
General facts	Rail freight modal share: 11%– 14% (2013) Rail freight traffic (ton-kms): 7.7 billion (2000) – 6.5 billion (2013)

Source: Authors



3. SCENARIO ANALYSIS: OLIGOPOLY AND MARKET MONITORING

The “medium scenario” discusses the risk of concentration through an oligopoly for the Belgian market. Section 3.1 interprets the scenario according to the current situation on the Belgian market. Section 3.2 discusses the risk for the market to move towards an oligopoly. Section 3.3 highlights the main challenge for Belgian authorities to consider the Belgian rail freight market in a multiscale perspective between the national and the European scales.

3.1. A NEED FOR A STRONG ECONOMIC REGULATION

The “medium scenario” is based on the assumption that the improvement for road and rail transportation by 2030 will be similar from an environmental and operational point of view (Table 4).

The result is a moderate increase for rail transportation in terms of volume (+64%) and a persistence in terms of competitiveness in comparison to the other transportation modes. Consequently, the attractiveness of the rail industry is maintained and the scenario forecasts a movement of concentration around four big players. This scenario has been validated by the sector in WP 1. Also, it is in line with the study from Gevaers et al. (2015) who highlights for the Belgian market a risk of concentration by 2030.

Table 4: Synthesis of the scenarios by 2030

PARAMETERS	MODE	S1 – BEST	S2 – WORST	S3 – Medium
Transport emissions	Rail	-40%	-10%	-20%
	Road	-20%	-40%	-20%
Energy consumption	Rail	-20%	-10%	-15%
	Road	-10%	-30%	-15%
Infrastructure and maintenance costs	Rail	-20%	+10%	-5%
	Road	-10%	+10%	-5%
Noise exposure	Rail	-30%	-10%	-10%
	Road	-30%	-40%	-20%
Operational costs	Rail	-30%	+20%	-10%
	Road	-10%	-10%	-10%
Independent operators		10	2	4
Rail ton-kms		+133%	+10%	+64%
Road taxes		+20%	0%	+10%

Source: own composition

Considering the fact that the rail freight competitiveness is constant, this section assumes that regulation is useful for the rail freight market because of its specific position in the transport ecosystem.

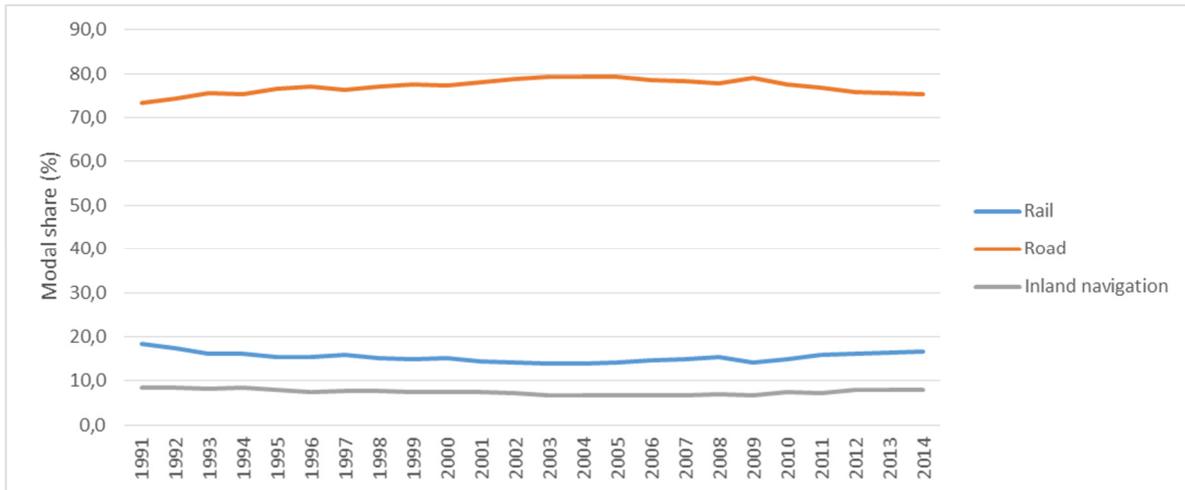
First, the rail freight sector is a very small sector in Belgium as in Europe. Laroche et al. (2016) show that the aggregate turnover for the rail freight industry in Europe is small, with around €15 billion in 2014, comparing to €300 billion for road transportation⁶. Also in traffic volume, road keeps a strong position in Europe, with 75% of traffic in 2014 (figure 8). This weak position in terms of turnover and modal share can be a first barrier to the weight of the industry against the policy makers mainly to

⁶ http://ec.europa.eu/transport/modes/road/news/road-haulage-report_en.htm



justify huge investments in infrastructure. Thus, it is necessary to consider not only the sector, but also its externalities in terms of opportunities for business or reduction of CO₂ emissions compared to road transportation. On these points, WP 3 and 4 show that externalities can be high and compensate for the relative weakness of this sector in terms of direct economic impact.

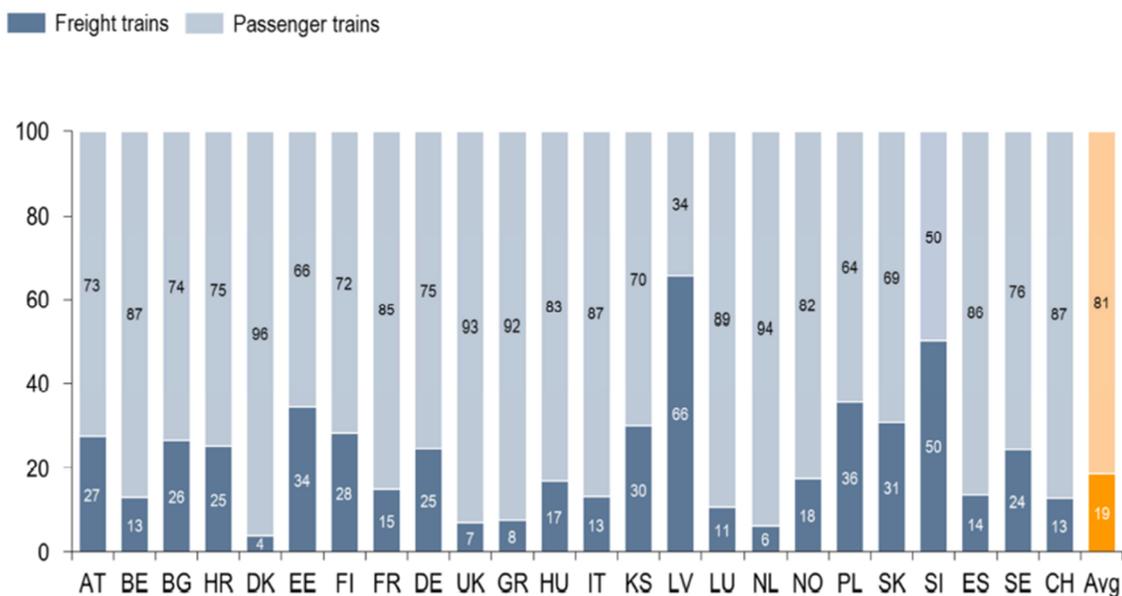
Figure 8: Modal share for freight transportation in EU-15 between 1991 and 2014 (%)



Source: Eurostat, 2017

Second, rail freight is only a small part of the railway traffic in Europe. Figure 9 shows that only 19% of the railway traffic concerns freight. Implications can be several. First of all, the rules for traffic priority are most often in favor of passenger traffic. Freight is always in a second order of priority in case of perturbation. These rules increase the risk of delay and the unreliability of traffic. Second, priority for investments in the network is most often given to the passengers. Exclusive investments for freight are very rare in Europe. During the last decade, only one new major infrastructure, totally dedicated to rail freight, has been built in The Netherlands (the Betuwe line).

Figure 9: Network use by type of traffic (% per train-km)

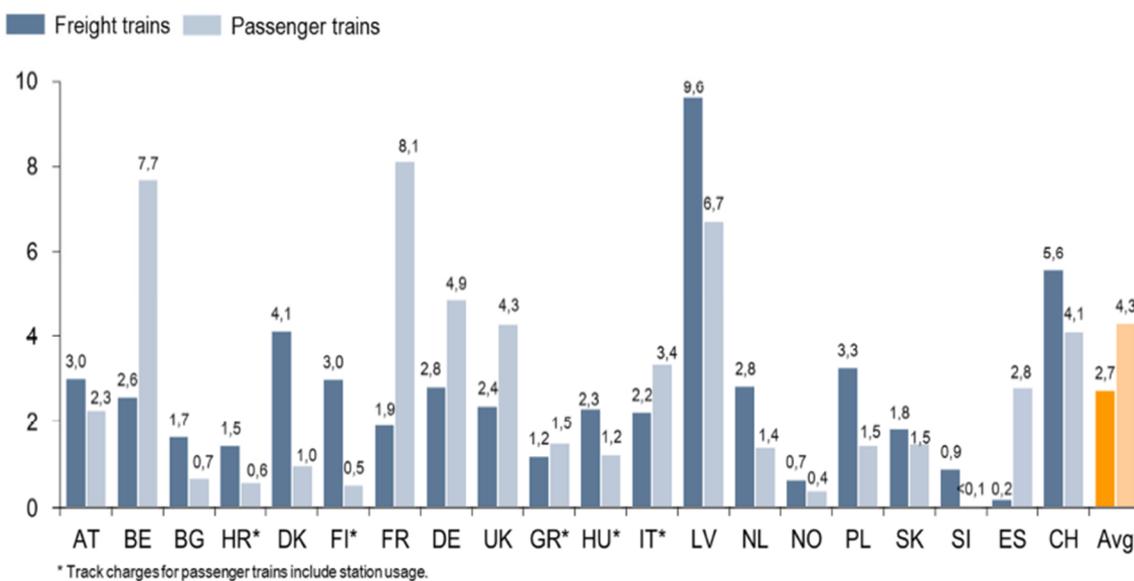




Source: IRG-Rail, 2016

To finish, the rail freight operators have a double constraint to access to the network. First, they have to pay access charges (figure 10) that are considerably higher compared to road transportation (ECA, 2016). Second, the railway market is still confronted with a monopoly organization because of the persistence of national monopolies for passengers (except for some countries like Germany, Sweden or Great-Britain⁷). Crozet (2010) assumes that for the French case, this situation can have a negative impact on the pricing for access charges. In the case of a monopoly by the dominant operator or a system of tenders with compensation from local authorities, the sensitivity of the incumbent to the access charges is less important than the sensitivity of new operators for passengers or freight⁸. Thus, in a network where traffic passengers are in monopoly, the rail freight operators can be collateral victims of a strategy from incumbent operators to support an increase of access charges and reduce the likelihood of having new rail passenger operators (Nash, 2009; Preston, 2009). This point has been also highlighted by Lang et al. (2013) who show that competition can have a positive impact on access charges. But one of the conditions is to have a large part of the market being opened up and not only a minor part as is currently the case.

Figure 10: Average revenue for network manager from track charges for the minimum access package (€ per train-km)



Source: IRG-Rail, 2016

Consequently, the rail freight market is facing a triple constraint in the transport ecosystem: the dominant road position, the dominant rail passenger position and the access charges to use the network. Regulation analysis needs to take into account these relative weaknesses and find levers to compensate for them.

⁷ Perennes (2016) shows that the biggest part of competition for rail passenger is for the market (tenders). Concerning the open access, only 34 experiences have been tested in Europe on the last decade in 7 countries (Austria, Czech Republic, Germany, Italy, The Netherlands, Sweden and the United-Kingdom). Most of them have been a failure (47%) and were operated for a national or regional market.

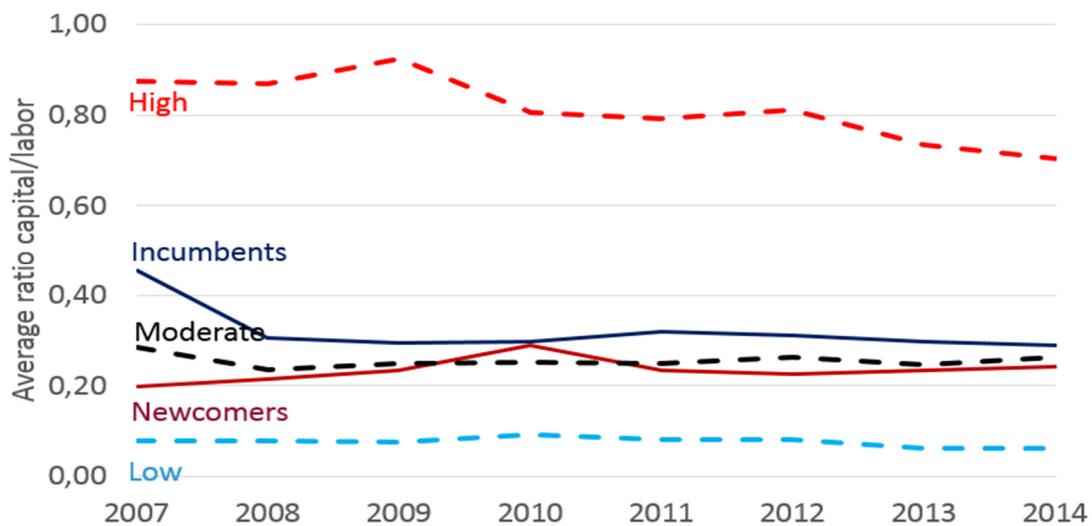
⁸ "It exists a third function of access charges [...], [...] more the access charges are high and less it is likely to have competitors on a high speed line" (Crozet, 2010, p.5)

3.2. A TREND TOWARDS AN OLIGOPOLY

The “medium scenario” forecasts a trends towards concentration on the Belgian rail freight market. This section proposes to discuss this assumption through the assessment of the economies of scale for the operators. It is a good indicator to know more about the barriers and the sunk cost to entry on a market.

The economies of scale have been calculated in Deliverable 5.3 for a panel of 34 active operators in Europe. Figure 11 shows that the rail freight industry is close to an industry with moderate economies of scale according to the test panel (between 0.2 and 0.4). Due to their larger size and to the composition of their assets, incumbents have higher economies of scale in comparison to newcomers.

Figure 11: Average ratio capital cost on labor cost for the rail freight industry



Source: Laroche et al., 2017

From a market point of view, most incumbents own their rolling stock and supply the maintenance, while newcomers use leasing and outsource the maintenance to reduce fixed costs. Nevertheless, an inflexion in the curve for incumbents in 2007 suggests that they are moving towards a rationalization of their productive model for more flexibility.

The market for leasing of rolling stock has strongly evolved during the last decade in Europe with an increase of the fleet by a transfer from incumbents to new companies specialized in the management of wagons and locomotives fleets (Vierth, 2011; Woodburn, 2014). Rail Cargo created in 2000 a leasing company to manage its fleet of wagons and locomotives (Rail Cargo Wagon). Maintenance is also provided, and in 2015, more than 30,000 wagons were managed by the company. The same process has been followed by SNCF-Geodis, which became shareholder at 100% in 2010 of the leasing company Ermewa (45,000 wagons and 320 locomotives), or DB Schenker with a renting service for professionals. Furthermore, the equipment industry is also involved in this new market with renting and maintenance as proposed by Siemens, which opened a new service center for locomotives in Munich in 2015, or Alstom, which offers contracts for maintenance.



Thus, the market moved from an internalized and opaque management to an outsourced and contractual management of assets for more flexibility and, consequently, better opportunities for newcomers to enter the market.

From a network point of view, the remaining of major barriers can explain the persistence of moderate economies of scale. One of the biggest barriers for international traffic is the lack of interoperability between networks (Vierth, 2011; Guihéry & Laroche, 2013; Crozet et al., 2014; Troch et al., 2016). In spite of the different Railway Packages from the European Commission, which tried to give common frameworks to allocate capacity or manage the infrastructure, rules and practices remain in fact diverse on each market, where network managers are considered a natural monopoly. In this way, there are different languages, signaling systems or electric voltage on the same corridors. This is a direct cause of over-cost for railway operators in terms of rolling stock and maintenance (complex locomotives) in addition to the worst reliability of travel time because of the high number of different actors to manage traffic and slots.

Consequently, if the market is evolving with new services and leasing, the incompleteness of the single European network can be a strong barrier to the development of the market and its competitiveness in comparison to road.

To conclude on the C/L ratio, results exclude a priori all possibilities to reach an overconcentration at least on the European market. Economies of scale are moderate and appear to be stable over the time period. Consequently, there are no reasons to reach a duopoly or a monopoly on the European market except if barriers (and sunk costs) are increasing. Nevertheless, these results do not exclude the risk of an oligopoly on the national market.

3.3. A MULTISCALE PROBLEM FOR COMPETITION

A paradox has been highlighted in the previous section. The level of concentration on the European market should be low/moderate but could be high on a national market like Belgium. Consequently, two questions are raised in this last section: 1) Should the difference between the national and the European market be considered as a failure of the market? 2) How to interpret this failure?

Concerning the first question, the theory of market contestability (Baumol et al., 1982; Tye, 1990) says that it is not a problem to have a high concentration on a market if barriers to entry/exit are low. The risk for the dominant player to see a new player enter on the market is enough to push it towards performance and efficiency. In the case of the rail freight market, the theory can be relevant in so far as the liberalization of the market and the existence of an adequate number of operators on the European market ensure contestability and competition. Nevertheless, the regulator has to be watchful concerning the goodwill of each national State to increase the contestability of their market and not reverse.

The interpretation of this fact needs to distinguish among different situations of concentration. There are at least two scenarios:

- Case 1: there is a duopoly or monopoly on the European market;
- Case 2: there is an adequate number of players on the European market but a high degree of concentration on the national market or a part of the European market.



Each case cannot be solved by the same actors and levers. Table 5 proposes a synthesis of the different action levels, authorities and levers involved in each situation.

Table 5: Reading for scenarios

Two cases	Concentration on the EU market	Concentration only on the Belgian market
Action level	European problem	Belgian problem
Problem	Industry attractiveness	Market attractiveness
Goal	Reduce barriers to entry (contestability)	
Authority	European Commission European Railway Agency	Federal State Regulatory agency
Levers	Competition policy Harmonisation/Standardisation Corridor policy	Competition policy Infrastructure quality/pricing Investments (corridors)
Tools	European observatory of the rail freight market	

Source: own composition

The concentration on the EU market is a global problem for the industry, which exceeds the national markets. It could be due to a lack of attractiveness from the industry and a political acquaintance in so far as section 3.2 showed that there are no economic reasons to reach a monopoly or duopoly. The main authorities involved at this level would be the European Commission (EC) for the economic regulation and the European Railway Agency (ERA) for the technical regulation. The levers for the EC are the competition policy to avoid excessive mergers and the corridor policy to drive the investments on the European network. The levers from the ERA are mainly concentrated into the interoperability policy through the technical standardization and harmonization of the different rules inherited from the national networks.

As opposed to this, when concentration is identified on the national market only, it is possible to assume that it is a national problem, which has to be solved by the national authorities under control of the European authorities. The absence of competitors on a specific market can originate from a lack of attractiveness of the network or from national rules in favor of the national incumbent. In the former case, the national state can improve the network by a better management by the infrastructure manager and investments to enhance quality and pricing for access. In the latter case, the independent regulatory agency has to promote competition and control the application of the European guidelines at the national level.

Finally, in the both cases, it is important to know the market and to have enough data to control the degree of competition. Consequently, the creation of a dedicated observatory with extended databases for the European rail freight market could be an interesting instrument to improve knowledge of the market and identify better its failures like the risks of dominant position or the bad willingness of some states to harmonize their rules mainly to protect their national incumbent.

In sum, it is important to highlight that there are no economic reasons to assume a monopoly or duopoly to materialize on the Belgian market, except if there would be a loss of attractiveness from the national market or a strong concentration at the European level. Nevertheless, the theory of the contestable market show that the most important is not the effective number of players on a market but the degree of opening of the market and the degree of competition between the players, even if some of them are operating alone on specific markets.

4. CONCLUSION AND RECOMMENDATIONS

The analysis of the rail freight market in Belgium shows an ambivalent situation for the sector, competitive on its market segment but inefficient to take modal share on road and inland navigation despite the liberalization and the international dimension of the market. According to the limits to analyze the market because of its high dependency on the international and the lack of databases, it is difficult to draw some specific perspective for Belgium. Nevertheless, considering the results from the “medium scenario” in terms of concentration and rail freight performance, it is possible to make some recommendations in conclusion.

First of all, the authors are convinced that a high potential exists for Belgium to improve its intermodal policy and the modal share of rail. The country has a strategic position as a gate for the European continent between France and Germany. Meanwhile, other criteria like institutional organization, transport policy or incentive scheme for pricing can have a strong impact on the market and need to be considered by the public authorities.

Second, the transport policy can be a key element to support the rail freight market face to the road. Several ways can be taken into account. **A first way would be to draw an exhaustive transport policy on the long term taking account not only the infrastructure investment but also the performance of the IM, the market conditions and the incentive schemes for the other modes.** This is maybe the most difficult to implement in a policy but also the most efficient to give a vision on the long term and drive investments. Beyond the political changes, a stable Federal agency for transport policy can be a first step towards the long term. The stability of the funds in the long term can be a second step. **Secondly, it would be good to consider the IM as a privileged way to implement a transport policy** by the definition of performance indicators with targets and corresponding financial penalties to push the IM towards a better productivity. To finish, **the regulatory body could be considered as a key lever to manage the IM and the market.** A major change in the regulatory body would be an extension of its skills to the definition of the contract of performance. This approach does not exist in Europe but the advantages could be high according to the independence of this institution. First, it is a perfect intermediate between the political vision and the reality of the market. Second, such organization would be a small revolution for a rail sector used to be driven by the government with the risks of public capture (Laffont & Tirole, 1991; Crozet et al., 2014). Third, it will be a guarantee to the stability of the IM monitoring on the long term. Concrete skills would be:

- A regular and deep market analysis similar to Austria (cf. Deliverable 5.2).
- The definition and the monitoring of the contract of performance according to the political orientations.
- A restrictive power on the pricing of access charges.
- An extension of the juridical fields to the consumer’s complaints similar to the Netherlands.
- An extension of the field of the regulatory agency to the other modes of transport similar to Sweden⁹.

⁹ This case has not been detailed in the benchmark but since 2009, the Swedish regulatory body (Transportstyrelsen) is the only in Europe to be intermodal.



Finally, the level of concentration on the market needs to be analyzed considering the multiscale problem. On the one hand, the regulator has to be careful about the degree of contestability of the market; on the other hand, the actors and levers would be different if the degree of concentration is high on the national or on the European market.

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