Europe Economics

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Research Study: Dominant Positions in National Railway Transport Services Markets

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Contents

1 Introduction

This research from Europe Economics responds to the request from the Authority for Consumers and Markets (ACM) to conduct an investigation to help them identify possible railway markets and the competitive conditions in these markets. The research does not aim to draw any definite conclusions but to be used as input in ACM's future research or decision making processes.

This research is initiated in anticipation of Dutch laws and regulation to be adopted in view of the implementation of EU Directive 2012/34/EU of the European Parliament and of the Council, of 21 November 2012, establishing a single European railway area[1] (hereafter: the Directive) into Dutch law. For the current research Article 13.3 of this Directive is most relevant. This article states:

"To guarantee full transparency and non-discrimination of access to the service facilities referred to in points 2(a), (b), (c), (d), (g) and (i) of Annex II, and the supply of services in these facilities where the operator of such a service facility is under direct or indirect control of a body or firm which is also active and holds a dominant position in national railway transport services markets for which the facility is used, the operators of these service facilities shall be organised in such a way that they are independent of this body or firm in organisational and decision-making terms. Such independence shall not imply the requirement of the establishment of a separate legal entity for service facilities and may be fulfilled with the organisation of distinct divisions within a single legal entity".

Annex II of the Directive states:

"Access, including track access, shall be given to the following services facilities, when they exist, and to the services supplied in these facilities:

(a) passenger stations, their buildings and other facilities, including travel information display and suitable location for ticketing services;

(b) freight terminals;

(c) marshalling yards and train formation facilities, including shunting facilities;

(d) storage sidings;

[…]

(g) maritime and inland port facilities which are linked to rail activities;

[…]

(i) refuelling facilities and supply of fuel in these facilities, charges for which shall be shown on the invoices separately."

[1] *Official Journal of the European Union*, 14 December 2012, L 343 pp. 32-77, at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0034&rid=1

Hence, once this Directive is implemented into the Dutch railway act (*Spoorwegwet),* operators with a dominant position on a national transport market have to fulfil certain obligations. This research of Europe Economics will serve as input for future research or decision making processes of ACM.

1.1 Approach to market definition

The objective of a relevant market definition exercise is to provide the basis upon which the analysis of competition and the assessment of dominant positions will be conducted. The purpose of this analysis is to prevent the creation or reinforcement of a dominant position as a result of which effective competition would be significantly impeded.[2] Competition is essential in order to encourage economic efficiency and innovation while at the same time reducing consumer detriment and expanding consumer choice. For that to happen, companies should engage in non-collusive decision making and be subject to the competitive pressures they exert on each other.

Market definition is used as a tool to identify and define the boundaries of competition between firms and serves as the framework within which competition policy is applied. The most commonly applied approach for market definition is the SSNIP test,[3] otherwise known as the hypothetical monopolist test. The basic idea of the SSNIP test is to identify the group of products/services and areas for which, when taken together, a hypothetical monopolist could increase their profits by raising prices (usually for the purpose of the test a 5 to 10 per cent price increase is considered) above the competitive level. The key is whether the fall in sales is offset by the increase in the price.

The analysis starts from the narrowest possible definition and works out until the price increase is offset by the reduction in sales. When this is the case the implication is that there are no substitutes to switch to and thus the relevant market consists of that product group and area. If it would not be profitable for the hypothetical monopolist to raise prices above the competitive level, then there must still exist substitutes which need to be included. When the next set of potential substitutes is included the test is conducted again. The process continues until the price rise is determined to be profitable.

To do this one must identify all possible substitutes for the target product or service and area. Substitution can take place on two dimensions, the product dimension and the geographic dimension. The definition of the relevant market must therefore be conducted along both the product and geographic dimensions. The relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use. The relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those areas.[4]

In both cases one must identify any demand-side and supply-side substitutes.

On the demand-side it is important to understand whether consumers *can* switch between products and if so whether sufficient consumers *would,* following a rise in the price of one. If consumers can switch and do, then the product or service they switch to would constitute a substitute. Similarly on the geographic dimension if consumers would switch to a supplier in a different area if the price of the product or service

[2] European Commission (1997), "Official Journal of the European Communities. Commission Notice on the definition of relevant market for the purposes of Community competition law", 97/C 372 /03.

[3] SSNIP stands for small but significant non-transitory increase in price.

[4] Commission Notice on the definition of relevant market for the purposes of Community competition law (97/C 372/03).

increased in the original area, the switch would indicate that the geographic market is wider than the original area.

On the supply-side the aim is to identify any suppliers that could enter either the geographic or product market in response to an increase in profits. This could be a provider from another geographic market or a supplier of a good in a neighbouring product market. The potential for another supplier to enter the market relatively quickly (normally within a year) and on a large scale in the event that the original supplier is able to profitably increase prices, will act as a competitive constraint on the original supplier, and therefore must be considered when analysing the relevant market. This would generally be the case where the products or services being supplied are relatively similar, or at least have similar production processes. If such supply side substitutability is realistic it may be appropriate to broaden the relevant market definition to include a broader range of products or services.

While the SSNIP test provides a useful framework for the analysis of the relevant market, it is rarely conducted mechanistically – it provides a framework to think about market definition. In addition to SSNIP test, other properties of the market can be considered, such as: characteristics of the potential substitutes (i.e. how the potential substitutes are used, what differences in quality they have, what costs are associated with using them etc.), and barriers and costs to switching (i.e. whether substitution is feasible and straightforward, how costly the process of switching would be etc.).

As indicated in the ACM's Request for research proposal, NS and DB Schenker are the two largest players in the market. Thus, a key issue in defining this market is the potential for these two operators to already enjoy market power. In the event that they do have market power, under a SSNIP test it may appear that they are unable to increase prices without consumers switching away from their services to alternatives, suggesting that these alternatives are within the same relevant market. In fact the reality could simply be that they are already exploiting their market power to charge monopoly prices, and therefore any increase above that level is unprofitable. As such the suggested alternatives would not actually be real alternatives and the result would be too broad a definition of the relevant market.[5]

At this stage it is important to remember that market definition is not an end in itself. It is supposed to enable further examination of market concentration. In particular it identifies the services that the analysis should focus on, allows the calculation of market shares, and excludes considerations irrelevant for the problem in question. However, due to challenges some industries present in the formulation of market definition, it might not be possible to establish market definition that could be reliably used in the subsequent dominance analysis. In such cases the role of market definition is more limited to ensuring that all basic features/products that are likely to constitute the market (e.g. possible demand-side and supply-side substitutes) are included. Also, it might be desirable in such circumstances to have two or more definitions which satisfy all the basic assumptions about the industry[6] and compare the final results of the analysis for each definition.

1.2 Approach to assessing dominance

Once the market is defined, the next step to determine whether any undertakings have formed a dominant position or have obtained substantial market power in that market.

Dominance is a legal concept defined by the European Court of Justice in the United Brands case (1978) as:

"a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power

[5] This is known as the cellophane fallacy.
[6] NERA (2001) "Analysing allegedly excessive prices charges by train operating companies", UK, March 2001.

to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers."

Assessments of dominance are used to establish whether the firm has amassed such levels of economic strength that it is able to act independently in the market and take pricing and similar actions largely without regard to its competitors, customers, or suppliers.[7] Such assessments take into consideration numerous factors, including the distribution of market shares across. Market share analyses are a useful first indication of the relative importance of each firm in the relevant market. When examining market shares, factors that are important include the distribution of market shares and notably the persistence of high market shares while other players in the market have persistently low shares. The volatility of market shares across time, however, can indicate that rivalry is present or that new smaller firms are able to grow. The European Commission's dominance assessment procedures indicate that market shares of less than 40 per cent are seen as unlikely to be dominant.[8]

Other factors to consider include barriers to enter or exit the market, which can lead to the formation and the maintenance of monopolies and undermine the contestability of the market, and the extent to which the company is present at several levels of production, also known as vertical integration.

In examining whether there is potential for the introduction of new competitors in the market one would need to examine the likelihood of entry. Entry barriers can be present in a market when special rights are held by current participants that cannot be obtained by new players. This scenario refers to absolute advantages enjoyed by incumbents (e.g. government grants, intellectual property rights etc.). Alternatively, incumbents can have strategic advantages which are generated by (among others) economies of scale, extensive network effects, brand power or switching costs. Moreover, players who are already in the market could engage in exclusionary behaviour (e.g. by imposing vertical restraints, loyalty rebates or exploiting their vertically integrated presence).

An assessment of the above considerations would include an examination of entry costs and the extent to which they are recoverable as well as the minimum scale at which they would be efficient. Furthermore, evidence of recent entry in the market or of any planned entry would be supporting of potential competition.

Lastly, buyer power could act to countervail the market power of a dominant seller. This would occur in cases where there are large, relatively well informed buyers and switching costs are low. Countervailing buyer power is more likely in cases where there is a wider choice of sellers, where buyers could possibly supply the product/service "in-house" or where buyers could potentially sponsor a new entry in the market. To assess whether there is evidence of countervailing buyer power is a rather challenging task and one that primarily relies on observing market outcomes rather than examining structural market features.

1.3 Research questions for this study

Within the context of this general framework for assessing the relevant market and analysing dominance, there are a number of key questions that must be considered to assess the Dutch railway transport services industry:

- What are the features of the Dutch transport system and how should this be reflected in defining the relevant markets? More specifically:

[7] Field Fisher Waterhouse (2010): EU Competition Law Article 101 and Article 102.
[8] European Commission: http://ec.europa.eu/competition/antitrust/procedures_102_en.html, visited on 01/05/2015.

  - What differences are there between transportation aimed at long distance travelling and short distance travelling and consequently are they likely to be in the same market (and thus should both a variety of long distance routes and short distance routes be covered in any analysis); and
  - What differences are there in and between geographical areas; in particular, how transportation services in different regions differ (e.g. between more rural and urban areas as well as between urban areas that are more or less densely populated) and the connectivity between different regions, which geographical areas can be distinguished and how do they differ from each other.

- To what extent do customers (passengers and freight customers) view rail services (on routes where more than one exists) as substitutes for one another (intra-modal substitutability) and to what extent do they view other forms of transport, such as road, bus, tram etc. as substitutes for rail (inter-modal substitutability)? How does this vary across different types of customers – particularly between commuters and leisure users in passenger rail services – and to what extent are services offered at different times considered (inter-temporal substitutability)? More specifically:
  - What differences are there between (i) characteristics and use of the service and (ii) price and price movements in national railway transport services aimed at leisure and business passengers;[9]
  - What are the differences between (i) characteristics and use of the service and (ii) price and price movements of (a) bus, (b) metro, (c) tram, (d) car or (e) possible other modes of transport in comparison to the different types of railway transport as mentioned above (e.g. canals for freight);[10]
  - How to measure differences in quality (waiting times, reliability, and comfort etc.) to account for differences in price between operators and their substitutes; and
  - What is the consumer churn between railway transport and the aforementioned modes of transport?

- To what extent are services offered in different geographic locations viewed as substitutes for one another (relevant geographic market)? More specifically what is the catchment area for a point of origin and destination point and how does this differ between different types of rail service (passenger versus freight) and the type of user (commuter versus leisure traveller)? What does this imply for the extent to which users view both other rail services and other modes of transport as substitutes for one another?
- To what extent are suppliers of transport services (both rail and other modes) potentially able to switch their service offering to replicate that of a service provider on a different route or operating in a different region or network (supply side substitutability across services)?
- To what extent do Nederlandse Spoorwegen (NS) and DB Schenker enjoy a dominant position in the markets in which they operate? More specifically, in each case:
  - What proportion of the market do they hold and how concentrated is the market?
  - Does their market share offer them competitive advantages over potential competitors (i.e. as a result of countervailing buyer power and the existence of economies of scale and/or scope)?
  - Do consumers face significant costs when switching between service providers in the relevant market?
  - What is the effect of granting (geographically limited) concessions for public passenger transport by rail on the competitive situation?
  - What is the difference between public concessions and private concessions on the competitive situation?

[9] These are often referred as off-peak and peak travellers, respectively, due to the time of travel of such trips.

[10] To note, bus, metro and tram have a common tariff structure. This means that if you travel from point A to point B, the price for bus, tram and metro will be equal.

- What barriers to entry/expansion to the relevant market exist (i.e. length of concessions, switching costs for users, access to technology etc.)?
- Do Nederlandse Spoorwegen (NS) and DB Schenker have a privileged position, for example control over infrastructure that cannot be duplicated easily, access to capital markets or financing, and/or superior technology?
- Do Nederlandse Spoorwegen (NS) and DB Schenker benefit from vertical integration?

These questions form the focus of our research.

In the remainder of the report we discuss passenger transport services and freight services separately. Each part is divided into two chapters: the first one contains analysis of the relevant market (Chapter 2 for passenger rail, and Chapter 4 for freight), and the second one contains a discussion on dominance in the market (Chapter 3 for passenger rail, and Chapter 5 for freight).

2 The Relevant Market for Passenger Rail

As described in the previous chapter, the objective of any market definition assessment is to identify those goods or services that represent close substitutes for the good or service in question. This requires consideration of both the relevant product and geographic market. The key dimensions within these two overarching considerations are the degree to which consumers consider the different options to represent viable alternatives (demand side substitutability) and the extent to which suppliers of alternatives could switch to offering the good or service in question (supply side substitutability).

Market definition related to passenger transport by rail has been examined by various competition authorities, mainly in the context of merger cases. With regards to product market definition, the main issue typically analysed is whether (and how) other modes of public transport constrain rail transport. Another question often analysed in product market definition is the purpose of travel. This is to account for the fact that market dynamics might work differently for passengers whom take necessary journeys (for business, or commuting to and from work, for example) as opposed to passengers who travel for other purposes (such as leisure, or meeting friends outside work hours).

In particular, if a provider is able to price discriminate significantly across different consumer groups, i.e. charge some customers a higher price than others where the price difference is not justified by higher costs of serving those customers, each of these groups may form a separate market. This could occur where customer demand differs according to time, e.g. demand for transport services at peak times is much less price sensitive than off-peak demand for the same service. Clearly this is particularly relevant in passenger transport, as an operator might be able to price discriminate between peak and off-peak customers. In this case, peak travel and off-peak travel might be in separate markets.[11]

Finally, the conclusions often depend on whether the case deals with inter-urban (i.e. between two separate urban centres) or intra-urban transport (i.e. within an urban centre).

Geographic definition has typically used two different approaches which relate to a consideration of the rail's network as a single market or consider routes as separate markets. In cases where markets have been identified as point-to-point journeys, the size of catchment areas has also been an issue of analysis (particularly when different modes of transport operate in different start-end locations).

To explore these questions we rely on a combination of desk research, information gathered from rail operators and the results of a survey of Dutch consumers that we commissioned. The survey combines conjoint analysis of the individuals' most frequent or most recent trip by train with more general questions relating to their travel preferences and habits.[12] We combine the evidence collected in the analysis below,

[11] There is also likely to be separate markets for peak and off-peak from a supply side point of view, as technical constraints may make it difficult to shift capacity between off-peak and peak.

[12] Conjoint analysis is often used in the context of transport studies. For example, it is discussed in "Recent Developments in Transport Modelling" (2008), ed. Ben-Akiva et al., p. 183-184; BSL (2008), "Joint Transport Research Centre of the OECD International Transport Forum"; Chiambaretto et al. (2013), "Measuring the willingness-to-pay of air-rail intermodal passengers", *Journal of Air Transport Management*, vol. 26, pp. 50-54;Pas & Huber (1992), "Market segmentation analysis of potential inter-city rail travelers", *Transportation* 19, 177-192; Farrell & Finer (2012), "Competition Commission investigation into the supply of local bus services in the UK", *The Transport Economist*, vol. 39, No. 2.

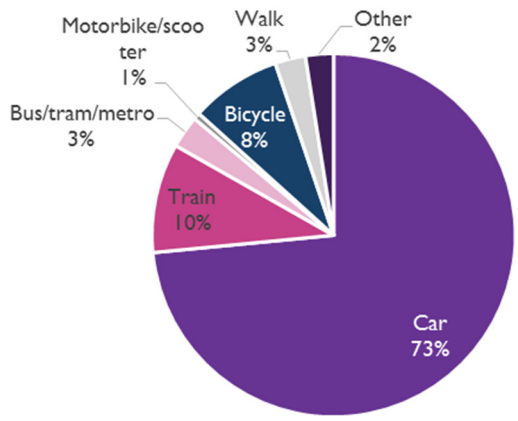
considering both the demand side substitutability and supply side substitutability for the relevant product market, and exploring the relevant geographic market.

The chapter is organised in four subsections. In the first one we provide a description of the different modes of transport, their characteristics and whether they can be potential substitutes for rail. The following two subsections look at the product and market definition. The last subsection concludes with key findings.

2.1 Overview of modes of transport

The main modes of passenger transport in the Netherlands are car, train, bicycle, bus, tram and metro. Public data suggest that the car represents the most commonly used mode of transport in terms of distance travelled, followed by the train and bicycle (see figure below). Even though the total distance travelled by rail has increased over the past ten years (from 14.5 billion in 2004 to almost 18 billion in 2013), the relative usage across modes of transport has remained largely stable.[13]

Figure 2.1: Share of distance travelled by different transport modes (2013)

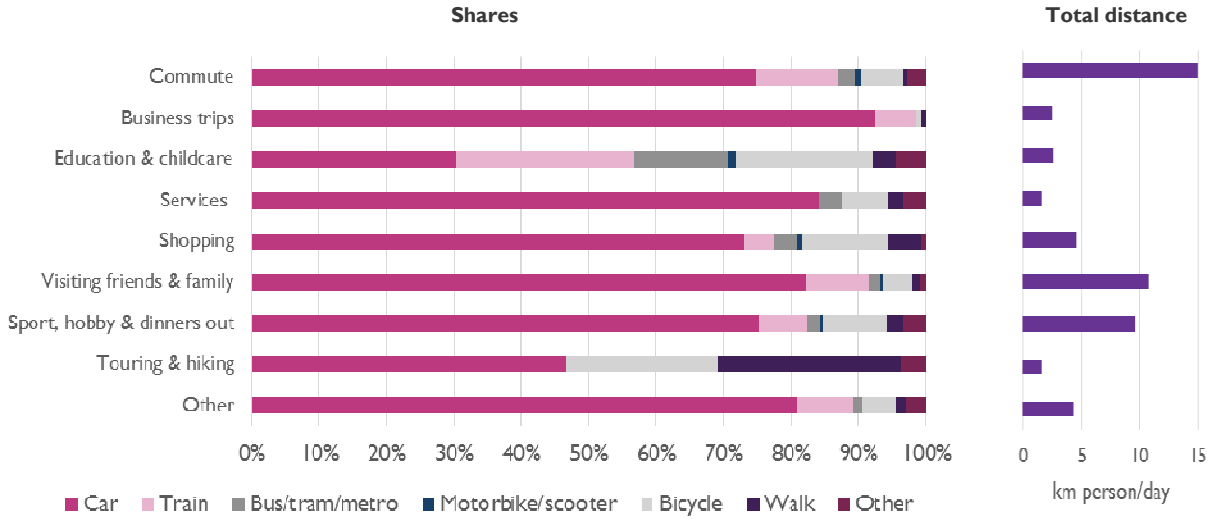


Note: Based on distance per person per day.
Source: CBS.

For all journey purposes, car has been the most important mode of transport between 2010 and 2013 (Figure 2.2, left). Car is dominant in commute, visiting friends and family, and sport, hobby and dinners out. All of these reasons represent the most often purposes of travel in general, in terms of distance travelled (Figure 2.2, right). Other forms of transport, and in particular train and bicycle, are more significant for journeys related to education and childcare, and for commuting to and from work (though even in those categories car still dominates any other individual mode of transport).

[13] KiM (2014) "Mobility Report 2014". This growth translates into an average annual growth rate of almost 2.5 per cent. The trend is also supported by CBS data on distance travelled per person per day by train.

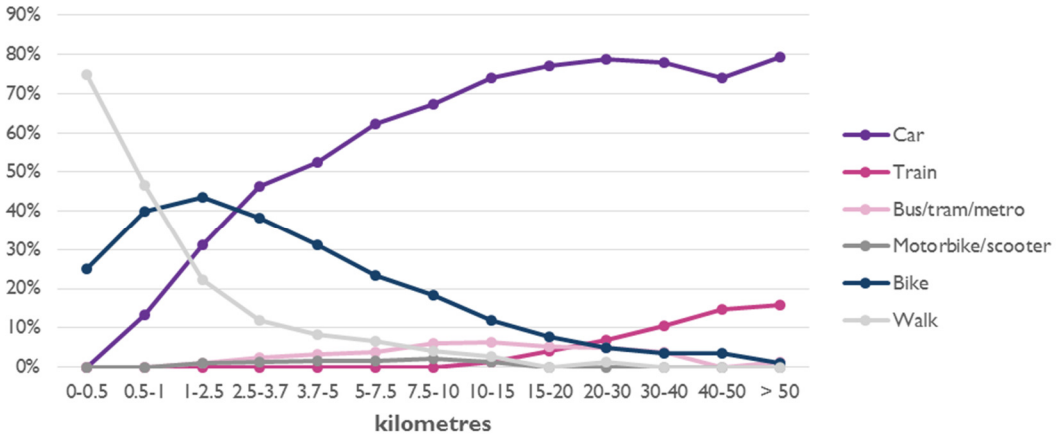
Figure 2.2: Travel purpose by mode of transport: 2013 (shares and total distance travelled/day)



Note: Based on distance per person per day.
Source: CBS.

Regarding distance, train and car are the only transport modes which are used for long distances. Figure 2.3 illustrates shares of distances travelled by different transport mode across journeys of different length. As we can see for journeys longer than 50 kilometres, 80 per cent of the distance is travelled by car and slightly more than 15 per cent by train. While car is generally used for journeys across a wide range of distances there are virtually no trips shorter than 15 kilometres made by train.[14] For shorter distances bus/tram/metro, bicycle, motorbike and travelling on foot are more common. Bus/tram/metro is also used for medium distance journeys between 5 and 40 kilometres.

Figure 2.3: Use of different transport modes by distance (2013)

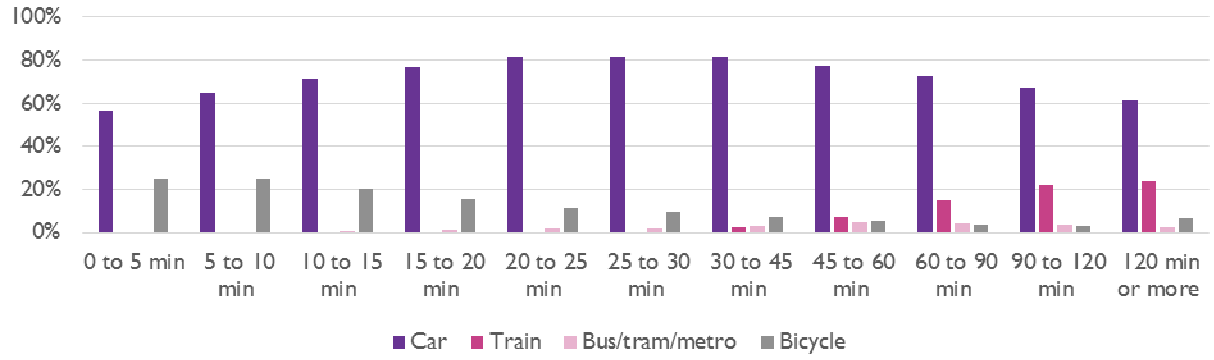


Note: Based on distance travelled per person per day.
Source: CBS.

A relatively similar pattern can be observed in terms of journeys of different duration. The train seems to be predominantly chosen for trips taking longer than 45 minutes, and its use is increasing with distance. On the other hand, the share of distance travelled by car in that range is decreasing.

[14] The CBS series "Mobiliteit in Nederland; mobiliteitskenmerken en vervoerwijzen, regio's", indicate that the distance travelled in journeys below 10 km is zero and the figure for distance travelled in journeys between 10 and 15 km is only 0.03 km per person per day.

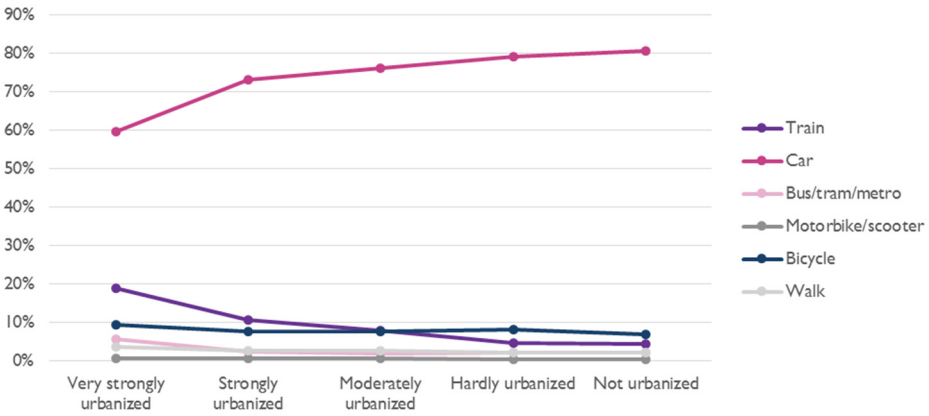
Figure 2.4: Shares of modes of transport in the distance travelled in trips of a given duration (2013)



Note: Based on distance travelled per person per day.
Source: CBS.

Regarding level of urbanisation, car (while dominant regardless of urbanisation level) is much less common in very strongly urbanised areas. The opposite is true for train where the distance travelled increases with urbanisation. To some extent the same relationship could be observed for bus/tram/metro, which might reflect the fact that both tram and metro are only available in a couple of largest cities in the Netherlands. The remaining modes of transport are used on a broadly similar level across regions.

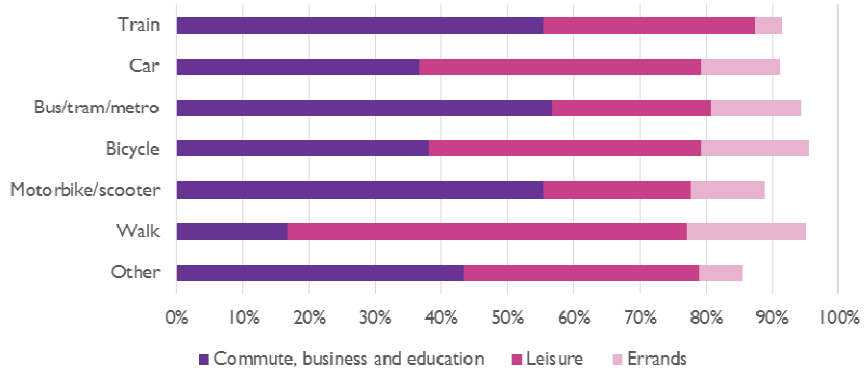
Figure 2.5: Use of different transport modes by urbanisation level (2013)



Note: Based on distance travelled per person per day.
Source: CBS.

Regarding journey purpose, train as well as bus/tram/metro are predominantly used for commuting and travels related to education. Car, on the other hand, is the dominant mode of transport for leisure purposes, obtaining services (e.g. going to a bank, hairdresser etc.) and shopping. This may suggest that the factors such as congestion during peak hours of travel and the difficulty of parking at the destination, make the car less attractive to customers.

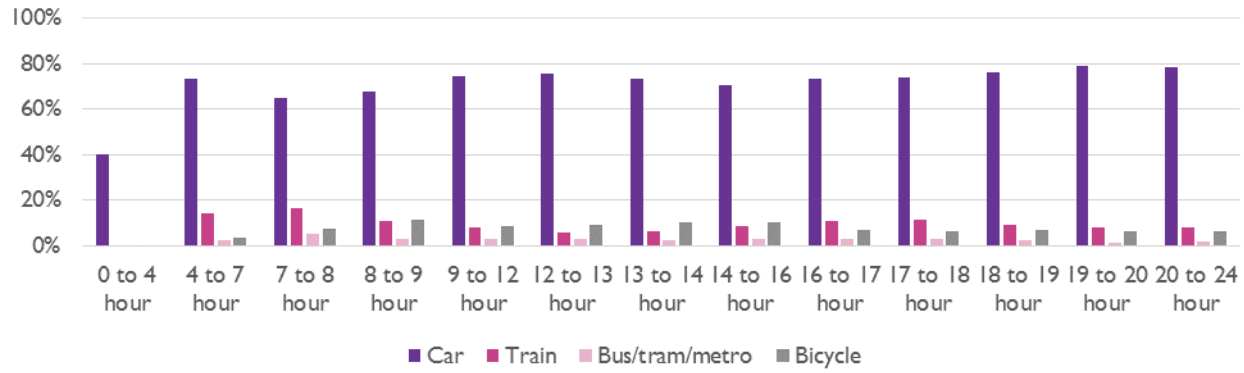
Figure 2.6: Use of different transport modes by journey purpose (2013)



Note: Based on distance travelled per person per day.
Commute, business and education combine: to/from work, business trip, to/from school/university and taking children to school/childcare; leisure combines: visiting friends and family, hobby, sport & dinners out, and touring & hiking; errands combine: shopping and obtaining services.
Source: CBS.

In terms of time of day, the shares of distance travelled by different modes seem fairly stable throughout the day. We can see in the figure below that the use of train as well as bus/tram/metro increases slightly in the early morning (mostly between 7am and 8am), but nevertheless the differences are very small.

Figure 2.7: Shares of modes of transport in the distance travelled in trips at given times of day (2013)



Note: Based on distance travelled per person per day.
Source: CBS.

2.2 Product market definition

We now consider, in the next three sub-sections, the extent to which other rail operators represent a substitute for NS services (intra-modal substitutability), the extent to which other modes of transport represent a substitute for rail transport (inter-modal substitutability) and the extent to which passengers preferences vary over different time periods (inter-temporal substitution).

2.2.1 Intra-modal substitutability

The extent to which customers perceive services provided by train companies as substitutes for one another will depend on the services they require (demand-side substitutability), the services offered by the train companies, and the ability for train companies to switch to offering alternative services (supply side substitutability).

In principle, passengers would not find it difficult to switch between operators as the tickets are generally compatible across networks.[15] However, in practice, switching between operators is limited by the structure of the concessions: because concessions give an exclusive right to operate certain lines, transport services are offered by one provider only. There is a small number of cases where substituting between operators could be possible by choosing a different route for the same origin and destination points. Some examples could be the trip Apeldoorn-Zutphen or Roermond-Nijmegen (although in both cases substitute routes are different and may involve different connections).

In terms of supply substitutability, in the Netherlands this is restricted by the framework of the concession system. Since concessions give an exclusive right to provide services on a given area for a period of time, there is limited possibility for supply side substitutability after a concession has been awarded (although operators may be able to compete in some point-to-point routes, as noted above). The supply substitution might however occur at the moment of tendering process as long as the concession is awarded competitively. A publicly tendering process gives the opportunity for entrants to challenge the incumbent operator, whereas in a privately awarded concession, as currently exists for the core network, competition between service providers is limited.

We also looked at ticket revenues per passenger kilometre, as provided by the different operators. It should also be noted that ticket prices cannot be freely chosen by NS (or other operators).[16] Nevertheless, NS seems to have **[confidential**: **]** ticket revenues relative to the total number of passenger kilometres than other operators. As Figure 2.8 illustrates, the average ticket revenues per passenger kilometre in 2014 has been around **[confidential:]** for NS, while the values for other operators range between **[confidential:]** and **[confidential:]**. This indicates that the average ticket revenue per passenger kilometre for NS is [**confidential**:] by **[confidential:]** per cent to **[confidential:]** per cent. Although, we should note that this could be a result of many factors, the findings seem to suggest that some operators' can sustain prices above their immediate competitors which would also suggest lack of substitutability between transport services by different operators.

[15] There are no differences when using an OV chip card for basic tickets (all excluding subscriptions), as these can be used across all train operators (this includes the two most common types of tickets: pay as you go and single ticket). While in general subscriptions differ from one operator to another, some of them can be used across operators (for example NS Dal Freedom subscription can be used for train services provided by NS, Arriva, Syntus, and Veolia).

[16] The concession system imposes some restrictions on price adjustments, with some types of tickets being regulated by the government. For NS, the protected ticket type is currently a one-way ticket, full-fare second-class. The adjustment can generally occur once every calendar year where price is adjusted for inflation. In certain circumstances the price can be adjusted based on other criteria.

Figure 2.8: Revenues from ticket sales relative to total number of passenger kilometres (2009-2014) [CONFIDENTIAL:

]

Source: Data obtained directly from the rail operators.

2.2.2 Inter-modal substitutability

In order to examine the extent to which other modes of transport represent close substitutes for the train, we first describe the characteristics of train transport and analyse how sensitive users are to changes in the prices of train. In the next subsections we compare the key characteristics of the train with other transport modes. The analysis is based on the findings from section 2.1.

Characteristics of train

Passenger train vehicles offer fast transport services, mostly for long distances. Trains travel between stations or depots, at which passengers may board and disembark. In most cases, passenger trains operate on a fixed schedule and have superior track occupancy rights over freight trains. According to CBS data, train accounts for 10 per cent of total distance travelled per person per day, the second most common transport mode after car.

As seen in the previous subsection, there are a few characteristics of trains:

- The main purposes of train travel are commuting and education.
- The use of train increases with urbanisation level, accounting for about 20 per cent of total distance travelled in very strongly urbanised areas.
- Train is used at all times of day between 4am and midnight, however (compared to other times of day) it accounts for a slightly larger share of distance travelled in the early morning and morning peak hours (between 4am and 8am).
- Train is predominantly used for journeys over longer distances: for journeys longer than 50 kilometres, more than 15 per cent of the distance is travelled by train; there are virtually no trips below 15 kilometres made by train.
- Train is predominantly used for journeys lasting longer than 45 minutes, and its share in total distance travelled increases with the duration of journey.[17]

How sensitive are train users to changes in attributes of train (prices and quality)?

We consider the extent to which passengers would substitute away from train travel (including switching to any other mode or deciding not to travel at all) in response to a small change in the price of the ticket.

[17] All the above figures come from the CBS database, and are for 2013.

This allows us to examine whether a train operator could act as potential monopolist in the market and, as such, whether it would be able to sustain prices above the competitive level (in line with the SSNIP test). If it cannot, then the switching behaviour reveals which other modes of transport constitute the most likely substitutes that could exert competitive pressure on the train operator.

The switching behaviour is reflected in the own-price elasticity of demand, which captures the percentage decline in the *demand* for train services as a result of a one percent increase in the *price* regardless of the mode of transport travellers decide to switch to (or whether they decide not to make the trip at all). The own-price elasticity therefore reflects sensitivity of consumers to prices.

We first report the results of different studies and then compare the evidence with our findings on substitutability based on our customer survey. To analyse the implications of the different estimates we analyse them in the context of the gain or loss in revenue as a result of a 10 per cent price increase (in the context of critical loss analysis). We also explore differences in the estimates according to other characteristics of the respondents (commuters, travelling for leisure and those running errands). We should bear in mind that the evidence on price-sensitivity estimates is based on the situation at current prices, which are not necessarily prices at competitive levels (this is discussed further below). At the end of this subsection we look at the responsiveness of respondents to changes in features related to the quality of the journey (duration and frequency of trains).

Existing evidence of price sensitivity

In the context of ongoing debate on VAT for public transportation[18] (to be increased from 6 per cent to 21 per cent), operators in The Hague and Amsterdam, and the NS have conducted research that shows that demand for train services will decrease by 9 per cent as a result of this VAT increase. Based on the 9 per cent decrease in demand and assuming that the demand curve is linear, this suggests an own price elasticity of -0.64.[19] Planbureau voor de Leefomgeving (PBL, 2010) argues that, based on other studies, own-price elasticity estimates in the Netherlands are likely to be between -0.3 and -0.7. In particular, 4Cast (2005) estimated the elasticity to be between -0.26 and -0.49, and MuConsult (2003) indicated an own-price elasticity around -0.5 (or between -0.3 and -0.8 depending on the type of traveller). Other studies conducted in different countries suggest broadly similar ranges of estimates (see Table 2.1 below).

[18] http://www.rijnmond.nl/nieuws/24-06-2015/openbaar-vervoer-straks-te-duur-voor-veel-reizigers.

[19] This is consistent with the estimate obtained in Andersson Elffers Felix (2012), "Advies ingroeiregeling gebruiksvergoeding spoorinfrastructuur", Utrecht, 9 november 2012.

Table 2.1: Short-term price elasticities for demand for train (point estimate and/or range)

	Country	Own-price elasticity	Method
4Cast (2005)	NL	-0.26 to -0.49	Study not available
MuConsult (2003)	NL	-0.5 (-0.3 to -0.8)	Compilation of data on revealed and stated preferences
NS VAT estimate	NL	-0.64	Compilation of previous studies and expert reviews
Jevons et al. (2005)	UK	-1.3	Time series on revealed preferences
Litman (2007)	US, Australia	-0.3 to -0.7	Compilation of estimates from a number of studies based on both stated and revealed preferences
OXERA (2004)	UK	-0.5 to -0.7	Compilation of estimates from a number of studies based on both stated and revealed preferences
Balcombe et al. (2004)	UK	-0.41	Several data sources including time series on both revealed and stated preferences
Indicative range for Dutch context (according to PBL)		*-0.3 to -0.7*	

Source: Andersson Elffers Felix (2012) and Planbureau voor de Leefomgeving (2010), "Effecten van prijsbeleid in verkeer en vervoer".[20]

Generally any elasticity larger or equal to one (in absolute terms) is considered to be high and to indicate high sensitivity of demand. It is less straightforward to determine the cut-off point for a low elasticity. As a reference point, the UK Competition Commission's "Local bus services market investigation" from 2011 described elasticities below 0.5 (in absolute terms) as "very low".[21]

Price sensitivity – switching rates

In order to assess the degree of substitutability between modes of transport we have collected information from Dutch travellers through an online survey, conducted by Ipsos MORI. The survey asked respondents to answer in relation to their most recent or most regular trip by train (in the last six months). In that context, they answered questions regarding their travel preferences when changing different attributes of the trip. Our investigation uses conjoint analysis to test the sensitivity of train users to changes in the *price* and *quality* of train services (details are provided in the technical appendix).

Having estimated the likelihood of the choices for different transport modes, the share of current train users that switch away from train and use other modes of transport was calculated assuming an increase in train prices of 10 per cent (and holding all other characteristics constant). We use these "switching rates" to establish the proportion of users that move away from train as a result of a 10 per cent price change.[22]

[20] Detailed references for the studies referred to in Planbureau voor de Leefomgeving (2010), "Effecten van prijsbeleid in verkeer en vervoer" are: 4Cast (2005), "Handboek Elasticiteiten voor het treingebruik afgeleid met het LMS", 4Cast, Leiden; MuConsult (2003), "Effecten prijsverhoging openbaar vervoer", MuConsult, Amersfoort; Jevons et al. (2005), "How do rail passengers respond to change?", Working paper N° 1014, Oxford University Centre for the Environment, Oxford, England; Litman, T.A. (2007), "Transit Price Elasticities and Cross-Elasticities", Victoria Transport Policy Institute, Victoria, Canada; Oxera (2004), "Literature Review of Elasticities", Oxera, Oxford; Balcombe et al. (2004), "The demand for public transport: a practical guide", TRL report TRL593.

[21] CC (2011), "Local bus services market investigation"; see: paragraph 7.28 for quality elasticities; paragraph 7.43 for cross price elasticities.

[22] The analysis of switching rates tallies with the SNIPP test for market definition, as it captures the share of consumers that would shift if a hypothetical monopolist (in this case supplying all train transport services) could increase its prices by 10 per cent.

Our analysis shows that a 10 per cent increase in price would result in a reduction in the demand for train services by 9.06 per cent. This estimate is a weighted average of the estimates for various types of travellers (details of the calculations can be found in the technical appendix). Our results imply that the own-price elasticity for train services is -0.906. This elasticity estimate is higher than the estimates based on other studies as reported in Table 2.1. We believe such a difference could be, at least partly, explained by several factors, which are discussed in the next section. In the section that follows we analyse whether the increase in revenue as a result of an increase in the price for train is offset by the decrease in demand for train as a result of this price increase.

Are the elasticity estimates from our consumer survey too high?

There are some other considerations that should be taken into account in the analysis of the elasticities estimated from our consumer survey.[23]

- As part of a sensitivity analysis we looked into the switching rates resulting from a 20 per cent increase in prices (the Competition Commission's local bus enquiry found that in the context of single bus fares 10 per cent is not perceived by travellers as a significant change, and thus they report their results based on price changes between 12 and 25 per cent). Results from the conjoint analysis show that a 20 per cent increase in prices would reduce the demand for train by 11.8 per cent: this translates into an own-price elasticity of -0.59 for a one per cent increase in price, which is lower than the elasticity calculated from a 0 to 10 per cent increase.[24]
- When constructing elasticities it is important that the price used is the competitive price. If the price is above the price that would prevail in a competitive market consumers will appear to be more sensitive to a change in the price than they would be in the absence of excessive pricing. This would result in a market definition that is broader than it should be (this is known as the cellophane fallacy). Specifically, if prices are already relatively high, any additional increase will cause consumers to switch to alternatives that do not in reality represent substitutes for the focus good or service. In principle, prices under the concession are regulated by the authorities (at least the full fare second class tickets, which according to our survey is the most commonly used). As such one would expect the price to reflect/approach a competitive outcome. In this case the cellophane fallacy would not be relevant. That said, we understand that the regulated price is not based on operator costs, but rather increases in line with consumer price inflation, whereas usually the regulated price for a firm will be derived based on the cost structure of the business and expectations surrounding efficiency gains over time. In the absence of such a connection with cost, the regulated price may not provide a good proxy for the competitive price. As such, although ticket prices are regulated, we have not established if these are above the competitive level. We, however, did find indications that suggest that they are. Figure 2.8 shows that NS's fares are **[confidential:]** than the fares of regional operators. Therefore, we cannot exclude the possibility that the cellophane fallacy is artificially inflating the switching rates.
- Our approach is based on stated preferences which may give higher results than estimations based on true behaviour since people tend to exaggerate their attitude towards a simulated price increase which

[23] Our survey used a representative sample of 2,000 members and was constructed using a standard population based sampling approach based on gender, age and region in line with the profile of the adult population aged 16-74. An online panel survey was conducted to allow the data to be collected in as short a time frame as possible. The survey was conducted between 10th of April and 21st of April. The respondents were not rewarded for participating in the survey. Details are provided in the technical appendix.

[24] Clearly, a 20 per cent increase in price will result in a larger decrease in demand than a 10 per cent increase. But when expressed in terms of elasticity, i.e. a percentage change in demand resulting for a one per cent increase in price, the reaction calculated on a wider interval might be smaller than the reaction calculated on a narrower interval. This indicates that train users are more sensitive to changes in price up to 10 per cent then for changes between 10 per cent and 20 per cent above the current level. This means that people have strong initial reaction to a price increase, but as price increases further their reaction weakens.

is not observed in reality. Thus, analysis based on stated preferences can lead to inflated results. One way of mitigating this problem is using conjoint analysis, which has been employed in this study. This approach is considered to be a more sophisticated way of learning people's preferences using a set of scenarios involving a range of characteristics rather than asking them directly about a price increase. Nevertheless, it is a less accurate source of information than data on the actual behaviour (revealed preferences) resulting from price changes.

- Because we wanted to estimate the reaction to prices, own-price elasticities have been estimated for the population of non-subsidised passengers (i.e. those paying in full or in part), and excluding subsidised travellers (i.e. those not paying at all). It is very likely that the bodies subsidising the subsidised travellers (government and employers) would still pay for the ticket fares after the price increase. This would imply that the subsidising bodies are less sensitive to price changes.[25] The implication is that it is likely that elasticity estimates would be lower once including all type of travellers. This is also suggested by the elasticities of the other studies which, at least where possible, do include all passengers. To assess the order of the impact of including subsidised travellers in our analysis we make several assumptions. Firstly, we might assume a zero elasticity for subsidised passengers.[26] Unfortunately, we do not know the weights for subsidised passengers, but we have made some calculations based on the following assumptions. We assume that about 50 per cent of all train users are subsidised,[27] and that all subsidised travellers are commuters, business or education (CBE) travellers. Given these assumptions and CBS data on the number of trips per person per day, we calculate that around 17 per cent of all train trips are done by non-subsidised CBEs, 50 per cent by subsidised CBEs, and 33 per cent by non-subsidised leisure travellers. The remaining categories (subsidised leisure travellers, and subsidised and non-subsidised travellers running errands) account for a negligible share of trips. Using these weights would give an average switching rate (after a 10 per cent increase in price) of -5.20 per cent, which is equivalent to the own-price elasticity of -0.520.[28]

For all the reasons stated above, it is likely that the estimated elasticities (and switching rates) obtained from our consumer survey are in the upper bound (in absolute terms) of the true population value. The demand responsiveness for the overall population is likely to be lower. It should be noted that price sensitivity varies by types of travellers – some travellers are likely to be more sensitive than the weighted average suggests (particularly those travelling for leisure or running errands), while others (such as, commuters, students, individuals travelling longer distances) would be less sensitive.

Elasticity estimates from other studies also suggest low. For these reasons, in our analysis we would also use an elasticity of 0.5, which is an average of the indicative elasticity range for Dutch context 0.3 to 0.7.

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[25] There are several reasons behind the assumption of subsidising bodies being much less price sensitive than individual travellers. In case of most organisations, employment benefits, such as subsidised public transport services, are often formalised in contracts and thus, more difficult to revoke. Just like a reduction in wages, revoking benefits is perceived as a very bad signal of performance (or even financial distress), which organisations and firms try to avoid. It might be argued that subsidies could be revoked if the employer could offer an alternative way of travelling, for example using private modes of transport. This, however, is likely to be logistically complicated – parking spaces are often scarce, higher risk of employees being delayed by traffic, driving car is perceived as not environmentally friendly, not everyone may have a driving licence etc. Moreover, firms and organisations are likely to be able to accommodate a slight increase in expenses more easily than individuals; this is especially true in case of large companies.

[26] This assumption might be viewed as too strong as some of the organisations currently offering full subsidies might reduce the extent of the subsidies. However, it can be shown that using alternative low switching rates (in the order of 1 or 2 per cent) does not change significantly the results.

[27] Based on the set of reports CROW-KpVV (2015), "Rapportage OV-Klantenbarometer 2014", Maart 2015.

[28] This uses estimated switching rates of -7.68 per cent, -11.81 per cent and -15.03 per cent for non-subsidised CBE, leisure and errands travellers, respectively; and a zero switching rate for all subsidised travellers. The weighted average can be calculated as follows: $17\% * (-7.68) + 33\% * (-11.81) + 0\% * (-15.03) + 50\% * 0 + 0\% * 0 + 0\% * 0$. For a more detailed description of the assumptions and calculations see Technical Appendix.

Implications of switching rates estimates: is a 10% price increase of train profitable?

In order to assess what elasticity estimates imply for profitability of a price increase, we analyse their impact on gross income. Gross income is a basic measure of profitability as it indicates how effectively a company can turn its revenue into profit. It is defined as the difference between company's revenue and the cost of providing the demanded volume of services. The effect of an increase in prices is the result of these two different parts.

Regarding the first part (revenue), there are two forces associated with a price increase: the first force reduces the demand because the product is now more expensive. This will bring the revenue down. The second force will bring the revenue up as consumers now pay more for the product. Thus, the question is how strong these two forces are compared to each other.

Regarding the second part (cost), for the purpose of this study we define the cost of providing the demanded volume of services as total variable cost.[29] Usually, a reduction in the output (the number of passengers, in this case) results in some cost savings. However, the extent to which those cost savings can be realised depends on the relative share of fixed and variable costs.[30] To illustrate, if the cost of producing ten units of output is entirely fixed, then a reduction in the demand from ten to nine would not result in any cost savings as the producer still has to pay the entire fixed cost to service the remaining demand. On the other hand, if the cost is entirely variable, then reducing production by one unit would mean that the producer bears only the cost of servicing the remaining demand. As such, the larger the share of variable costs in the total cost, the more cost savings the producer can realise after a price increase.

The concepts of fixed and variable costs are also related to scale effects in production. In the case of this study, the relevant scale effects are economies of density. When the share of fixed costs in the total cost is high, we might expect to observe economies of density as decreasing the number of passengers would imply a less than proportionate decrease in the total cost (with most of the costs being fixed, the total cost would not decline much). The opposite would be true if the share of fixed costs in the total cost is small. In this case the scope for economies of density is limited, as the total cost is closely related to the volume produced (the decline in the total cost will be proportionate to the reduction in demand). Thus, economies of density imply that the cost per passenger increases if the number of passengers declines (this could happen in a situation where the volume of passengers declines but the number of trains does not decrease proportionally, which would imply a higher cost per passenger).[31]

We believe it is likely that economies of density operate in rail transport but we do not know the extent or quantification of such effects in the Netherlands. As such, we analyse three simple scenarios:

- Case 1: extreme economies of density with the total cost being entirely fixed;
- Case 2: moderate economies of density with some fixed and some variable costs;
- Case 3: no economies of density with the total cost being entirely variable.

Below, we show that in all three cases with a reduction in the demand by 9.06 per cent (as implied by the switching rate estimated from our consumer survey) a train operator could profitably increase prices by 10 per cent. As part of our sensitivity analysis, we also provide the results for each of the three cases under

[29] This approach is analogous to the approach commonly used in critical loss analysis, where gross margin is used. More detailed discussion on the critical loss analysis is provided in Technical Appendix.

[30] Fixed cost is defined as a cost that is not a function of the volume produced. Variable cost, on the other hand, varies with output.

[31] For a more detailed discussion on the extent to which the Dutch train operators might benefit from various scale effects please refer to section 3.2.3.

the assumption of the switching rate being equal to 5 per cent.[32] In our analysis we follow the approach of critical loss analysis (details are provided in the Technical Appendix).

Let us begin with the case of extreme economies of density, i.e. when there are no variable costs. Before a price increase, an operator selling 100 tickets at €1 each would be making a gross income of €100, which, in the absence of any variable costs, is simply the revenue from the ticket sales. After a 10 per cent increase in the price, the operator would lose 9.06 per cent of the demand, i.e. would sell only 90.94 tickets. With the price being now at €1.1, this implies a gross income of €100.034 (=€1.1*90.94), which is higher than the initial gross income of €100. As such, the loss resulting from a reduction in ticket sales is smaller than the gain resulting from a higher price charged on the remainder of the sales. Therefore, it would be profitable for the operator to increase prices by 10 per cent (this is shown as Case 1 in Table 2.2).[33]

The second case illustrates a situation with more moderate economies of density. For our analysis we take an estimate of average variable costs of 40 cents per ticket, i.e. when 100 tickets are sold average variable costs are €40.[34] Taking again the switching rate of -9.06 per cent we can show that it would be profitable for an operator to increase the price by 10 per cent. The initial gross income in this case would be €60 (=(€1-€0.4)*100), whereas the gross income after the 10 per cent price increase and a drop in the demand to 90.94 tickets would be €63.658 (=(€1.1-€0.4)*90.94). As such, the total increase in the gross income resulting from a 10 per cent increase in price would be positive and equal to €3.658. In fact, it can be shown that as long as the loss in demand is below 14.3 per cent of the current demand, the increase in the gross income would still be positive after a 10 per cent increase in price.[35] This means that the elasticity estimate of -0.906 (implied by the switching rate of -9.06 per cent) and all the elasticity estimates in Table 2.1 indicate that it would be profitable for an operator to increase prices by 10 per cent (this is shown as Case 2 in Table 2.2).

Finally, let us analyse the case with no economies of density. With the unit variable cost being equal to the price of the ticket, the initial gross income is equal to €0 (as the ticket revenue is exactly equal the total variable cost). However, after a 10 per cent price increase the gross income becomes €9.094 (as the price is now higher than the unit variable cost and ticket sales can generate positive gross income). Of the three cases analysed in this section, the increase in the gross income is the highest in this case. This is because cost savings fully reflect the reduction in the demand. Therefore, with the switching rate of -9.06 per cent operators would be able to profitably increase prices by 10 per cent (this is presented as Case 3 in Table 2.2). [36]

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[32] A switching rate of 5 per cent is equivalent to the own-price elasticity of -0.5. This estimate has been chosen as it is the mid-point of the indicative range of own-price elasticity provided by PBL (2010). We believe this estimate is consistent with the parameter for a population including subsidised and non-subsidised travellers, as shown as part of our sensitivity analysis above.

[33] Note that this case does not assume that there are no costs of providing train services but rather that the costs are fixed, i.e. not related to the number of passengers. On the long run this is an extreme assumption, but on the short run and with relatively small changes in the demand it might be a good approximation of very strong economies of density.

[34] **[Confidential**:
] and the assumption that the regulated price is set at the level which allows for the recovery of fixed and variable costs.

[35] This limit can be calculated using the critical loss threshold, $L = \frac{X}{X+M}$, where X is percentage change in price (10 per cent, in this case), M is gross margin (60 per cent, in this case). L indicates the upper limit of the reduction in the demand that would not result in a loss, i.e. would make the price increase profitable. The calculation is based on the assumption that the average variable cost of producing one unit is equal to 40 per cent under the current price. More detailed critical loss analysis is provided in Technical Appendix.

[36] It could be noted that all three cases are very simple illustrations of the forces involved in a price increase. Most of all in each case we assume no new entrants who could charge price below the level set by the incumbent.

Table 2.2: Gross margin as a result of a 10 per cent price increase (under different cost assumptions)

	Formula	**Case 1** *Extreme economies of density*	**Case 2** *Moderate economies of density*	**Case 3** *No economies of density*
Price-elasticity of demand	(a)	-0.906	-0.906	-0.906
Firm increases price by…	(b)	10%	10%	10%
Price pre-increase (€/ticket)	(c)	1	1	1
Price post-increase (€/ticket)	(d) = (c) * (b)	1.1	1.1	1.1
Demand decreases by…	(e) = (a) * (b)	-9.06%	-9.06%	-9.06%
Sales pre-increases (passenger)	(f)	100	100	100
Sales post-increases (passenger)	(g) = (f) * [1+(e)]	90.94	90.94	90.94
Loss in passengers due to price increase	(h) = (f) - (g)	-9.06	-9.06	-9.06
Revenue pre-increase (€)	(i) = (c) * (f)	100	100	100
Revenue post-increase (€)	(j) = (d) * (g)	100.034	100.034	100.034
Share of variable costs (% of total costs)	(k)	0%	40%	100%
Unit variable cost pre-increase (€/ticket)	(l)	0	0.40	1.00
Unit variable cost post-increase (€/ticket)	(m)	0	0.40	1.00
Total variable costs pre-increase (€)	(n) = (f) * (l)	0	40	100
Total variable costs post-increase (€)	(o) = (g) *(m)	0	36.376	90.94
Gross income pre-increase (€)	(p) = (i) - (n)	100	60	0
Gross income post-increase (€)	(q) = (j) - (o)	100.034	63.658	9.094
Gross income increase (€)	**(r) = (q) - (p)**	**0.034**	**3.658**	**9.094**
Impact on profitability		**+**	**+**	**+**

Note: In line with the SSNIP test, we use a switching rate after a 10 per cent increase in price. Using a switching rate estimated using a 20 per cent increase produces a lower elasticity, which implies that in each of the three cases it would be even more profitable to increase prices (by 10 or 20 per cent).
Source: Europe Economics.

Clearly, for any elasticity estimate smaller in absolute terms than the one we used above (i.e. -0.906) the gross income increase would be even larger suggesting that increasing prices by 10 per cent would be more profitable. To illustrate this conclusion, we assume the own-price elasticity being -0.5. In the case of no variable costs (Case 1) the gross income increase would be equal to €4.5. In the case of moderate economies of density, where we allow the total variable costs to partially reflect a reduction in the demand (Case 2), the increase in the gross income would be €6.5. In the case of no economies of density (where the total variable cost declines proportionally to the reduction in the demand) the increase in the gross income would be the highest reaching €9.5.

To conclude, we have shown that regardless of the extent to which train operators in the Netherlands benefit from the economies of density it is likely to be profitable to increase train prices by 10 per cent given the switching rate of -9.06 per cent. It should be noted that in the first case the result is very sensitive on the margin. However, this case corresponds to the situation of extreme economies of density where the total cost is completely independent of the volume of passengers. We believe that such assumption is too strong, and that Case 2 is much more likely to capture the extent of economies of density in the Netherlands. Moreover, as the other studies and our analysis indicate, the switching rate estimate

of -9.06 per cent is likely to be the upper bound; a lower estimate would mean that the conclusion regarding profitability of a 10 per cent increase in price could be made even more firmly.

Price sensitivity for different types of travellers

We note that there are differences in switching rates estimated between different types of travellers as a result of a 10 per cent price increase. In particular, we can see that commuters (including also business travellers and journeys to/from school/ university/ childcare) are much less price sensitive than any other group (switching rate of -7.6 per cent which implies an own-price elasticity of -0.76). This is in line with previous estimates and consistent with our expectations: commuters are more likely to be time constrained and have less choice of switching or skip the trip altogether, which would imply a more inelastic demand. On the other hand, passengers travelling for leisure and those running errands (i.e. doing shopping and obtaining services) are much more likely to switch away from train (switching rates have been estimated at -11.81 and -15.03, respectively, see the technical appendix). However, according to CBS data the proportion of trips taken for leisure and errands is low in the Netherlands: 33 per cent and zero per cent, respectively, measured in trips per person per day by train on the population above 12 years old in 2014. This means that the higher rates for these two categories should be weighted accordingly when reading the results: as they represent a smaller proportion of the total population the overall average is likely to be lower (in absolute terms).

Sensitivity to changes in quality

In addition to price elasticities, we also examined responses to changes in more qualitative features such as journey duration and frequency of trains. The reasons for looking at these attributes is to be able to include switching behaviour for subsidised travellers (i.e. those not paying at all), as we recognise they are an important part of the passengers travelling.

With respect to journey duration, the estimated reduction in the demand after a 10 per cent increase in the journey duration is in the rage of -1.6 per cent and -2.2 per cent (depending on the types of travellers). On aggregate, a 10 per cent increase in the journey duration would result in a reduction of the demand by 2.0 per cent.[37]

With respect to frequency, a 15 minute reduction in the frequency of trains (meaning a reduction from having a train every 30 minutes to having a train every 45 minutes) would result in a reduction of the demand for train services between -4.6 per cent and -7.7 per cent. On aggregate, a 15 minute reduction in the frequency would result in a reduction of the demand by 4.8 per cent (see technical appendix).[38]

We have also looked at the switching rates for non-subsidised (those who pay in full or in part) and subsidised travellers separately. The switching rate after a 10 per cent increase in journey duration for those who pay themselves has been estimated at -0.95 per cent, while for subsidised travellers the estimate is -3.21 per cent. These results indicate that non-subsidised travellers are less sensitive to changes in journey duration than subsidised travellers.

[37] As part of our sensitivity analysis, we also looked into estimates for larger changes in journey duration. Even for a potential increase in journey duration by 50 per cent the estimates remain low. A 50 per cent increase in the journey duration would result on aggregate in a reduction of the demand by 16.4 per cent, which means that for every 10 per cent increase in journey duration only 3.3 per cent of train users would switch away from train.

[38] The 15 minute interval has been chosen as a significant change based on the fact that 96 per cent of our respondents reported that they have train at least every 30 minutes, with the most common frequencies being "every 30 minutes" (49 per cent of our sample) and "every 15 minutes" (30 per cent). For those two groups a 15 minute reduction in the frequency would mean a reduction by 50 per cent and 100 per cent respectively. We believe such changes to be very significant, and as such our estimates are likely to suggest higher sensitivity to frequency than it would be if we focused on smaller changes of 5 or 10 minutes.

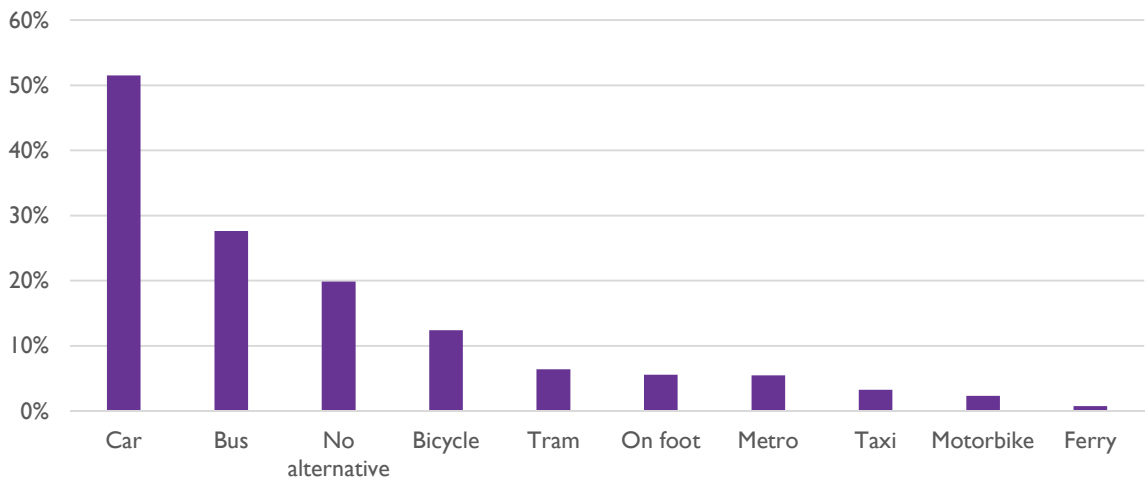
The switching rate after a 15 minute reduction in frequency for those who pay themselves has been estimated at -6.34 per cent, while for subsidised travellers the estimates is -3.54 per cent. This indicates that those who pay for train are more sensitive to changes in frequency than subsidised travellers.

While these numbers are lower than the estimates related to a price increase, it is difficult to draw any definitive conclusions regarding the profitability of reducing the quality of train services as there is no obvious scale against which these could be compared. For the same reason we cannot conclude on whether the differences between those who pay and those who are subsidised are significant. In order to do so more research would have to be conducted. This is out of scope for this study.[39]

Alternatives to train

We now look in more detail into the choices train travellers make after a price increase. In particular, we analyse which modes of transport passengers are most likely to choose if they switch away from the train. Data from our survey suggest a majority of the respondents who used train in the past six months has only one alternative of transport for the trip they have taken / have been taking (54 per cent); another 20 per cent stated they do not have any alternative, and the remaining 26 per cent have two or more. Among all train users, the most common alternative is car (52 per cent of the train users in our sample), followed by bus (28 per cent, Figure 2.9). We now focus our discussion on these two most common alternatives to train.

Figure 2.9: Types of alternatives available (2015)



Source: Europe Economics (2015).

[39] In theory, one would have to compare the amount of savings related to a reduction in the quality of services, with the reduction in the demand for train (volume of passengers). If cost savings were large and the reduction in demand small, then one could conclude that the operators could profitably reduce quality. If on the other hand, cost reductions are not significant, then even a small reduction in the demand might be deemed to be unprofitable. We also note that the CC's local bus enquiry does not draw any conclusion on their estimates with respect to frequency either. The argument is analogous to the one we provided above, i.e. that there is no scale against which these estimates could be compared (see Competition Commission (2011), "Local bus services market investigation", paragraph 7.28).

Is the car a close substitute for the train?

Car is the most commonly used transport mode in the Netherlands. Car ownership rates in the Netherlands are high, with almost three quarters of households owning a car in 2013.[40] The number of passenger cars in the Netherlands has been increasing steadily over a similar period; CBS data indicate numbers have increased from 6.3 million in 2,000 to around 7.9 million in 2012.[41]

Car is a private mode of transport and, as such, differs from the train in certain key characteristics. We describe some key differences related to direct accessibility, time flexibility, route flexibility, comfort, distance, urbanisation level, and journey purpose. We review them in turn.

In particular, car (assuming a direct access to a car from home) offers **direct accessibility**, there is no need to travel to a specific station or stop to access car as there is with public transport. However, accessibility is restricted to the extent to which users need to store the car at the destination, which may be difficult in urban areas or involve a significant cost for parking.

The car does not operate to a specific timetable, as such there is greater **flexibility in the time** of travel (though clearly for very frequent rail services this distinction is less pronounced). The absence of a timetable, however, can leave the car susceptible to congestion at peak periods of travel on certain routes. This may make certain types of travel or travel at certain times of the day less efficient by car. Traffic intensity, measured as the number of vehicles passing a certain point per unit of time, has been steadily increasing since 2000. The increase has been particularly strong for highways as opposed to provincial roads outside urban areas where traffic intensity has been lower.[42]

The car, unlike the train, is constrained only by the road network (whose total length was 139,295 km in 2012[43] compared to 3,016 km of the rail network[44]) which also offers greater **flexibility in terms of the route**.

There is likely to be less distinction between the train and the car in terms of **comfort** (the "on-board services" by train). Train could be perceived as more comfortable in the sense of availability of toilets, potentially internet access, leg room and electric sockets; but the most important difference between the train and the car seems to be that car needs to be driven (when not travelling as a passenger). As such, train might offer more possibilities for read, work or sleep while travelling.

Car is used across journeys of different length. However, its usage is increasing with the **distance** travelled. According to the CBS data for 2013, for journeys above 2.5 kilometres car accounts for the largest share of distance travelled per person per day among all transport modes. Its use steadily increases and for journeys longer than 15 kilometres the car accounts for almost 80 per cent of total distance travelled. In that respect car characteristics are similar to train characteristics, which is predominantly used for long distance journeys.

Regarding the **purpose of journey**, car is the dominant mode of transport for leisure purposes (sport, hobby & dinners out, visiting friends and family, touring & hiking), obtaining services (e.g. going to a bank, hairdresser etc.) and shopping. Compared to that, CBS data suggest that train is relatively more often used for commuting and for journeys related to education and childcare. This may suggest that the factors such as congestion during peak hours of travel and the need to park at the destination, make the car relatively less attractive to commuters.

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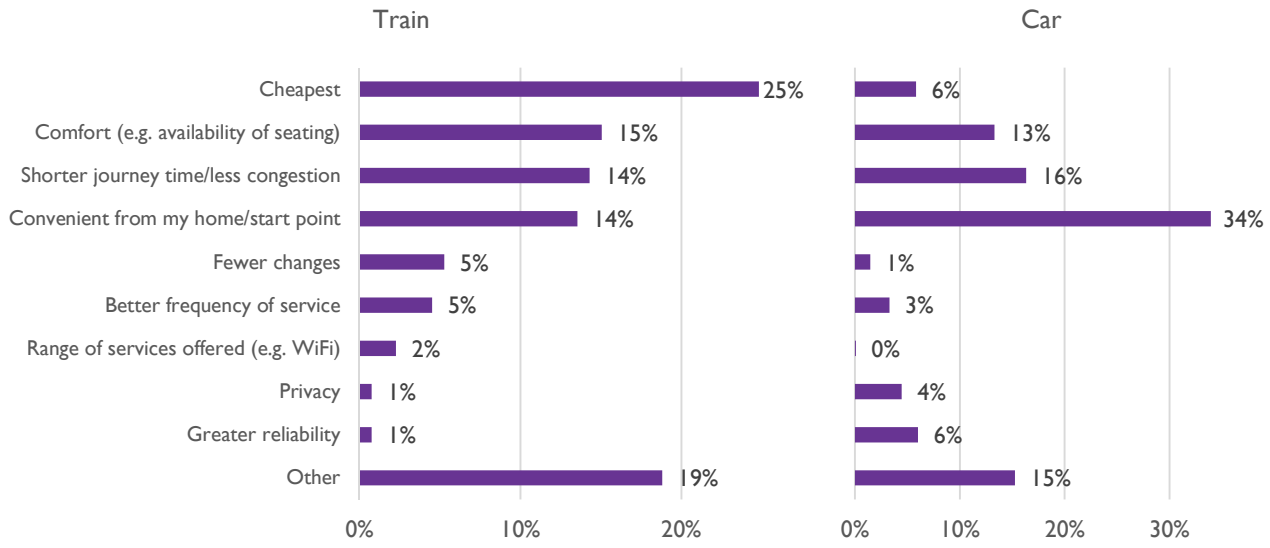
40 CBS data.
41 CBS data. Passenger cars as opposed to commercial vehicles like vans, trucks and buses.
42 Source: CBS. For more detailed information see Appendix 3.
43 Source: https://www.cia.gov/library/publications/the-world-factbook/fields/2085.html#nl
44 Source: World Data Bank. 3,016 km represents route-kilometres, and not track-kilometres (which seem less relevant for origin-destination possibilities).

Car is the most popular mode of transport across all **urbanisation** levels (measured in terms of distance travelled per person per day). However, according to the CBS data for 2013, its use is decreasing with the level of urbanisation, i.e. the more urbanised the area the less its population relies on cars. This suggests that, while car is widely used regardless of the urbanisation level, in the very strongly urbanised regions it is much less popular. As opposed to that, both in terms of distance travelled per person per day and number of trips per person per day, train is predominantly used in strongly or very strongly urbanised areas. This might tie in with the idea that the car offers a less attractive mode of transport in areas where parking may be difficult to find or involve a large cost.

Differences in the characteristics of car and train are also reflected in the reasons our respondents gave for choosing one or another on a daily basis. Of those who choose train as their primary mode of transport, 25 per cent stated they use train mainly because it is the cheapest available option. Other important characteristics are comfort (for 15 per cent of the respondents), journey duration (14 per cent) and convenience (14 per cent). While the same four factors seem to be among the most important ones standing behind the choice of car, the relative importance is reversed. Among those who use car on a daily basis, 34 per cent stated they do so because of convenience, 16 per cent because of shorter journey time, 13 per cent because of comfort and only 6 per cent because it is the cheapest available option.

Table 2.3: Reasons for choosing train versus car



Note: Based on a sample of 2,000 respondents.
Source: Europe Economics (2015).

In order to assess the degree of substitutability from train to car, Ipsos MORI used conjoint analysis to explore the likelihood of train users to switch to car as a result of a change in the price and quality of train services (the questionnaire included sets of travelling scenarios with various combinations of train travel characteristics and asked respondents to state their preferences regarding mode of transport as those characteristics varied). The responses were then used to estimate the switching rates (or the likelihood of choosing particular alternatives in response to an increase in price, journey duration, and reductions in train frequency[45]). The switching rates capture the proportion of the demand for train services that would shift to other transport modes as a result of a 10 per cent increase in prices, so they can be used to analyse which particular modes of transport are perceived as substitutes.[46] As such, they indicate whether there is,

[45] More detailed description of the method employed in this study can be found in the technical annex.

[46] The switching rates has been calculated using the demand simulated by Ipsos MORI in the conjoint analysis. In particular, the switching rate after a 10 per cent increase in price is calculated as follows

say, only one dominant alternative used by those who switch away from the train or whether the demand would split evenly among a few alternatives.

The aggregate switching rate between train and car after a 10 per cent increase in prices has been estimated at 4.1 per cent.[47] The switching rates between train and car show some variation across types of travellers: commuters seem less likely to switch to car than those running errands and travelling for leisure purposes.[48] However, regardless of differences between groups the estimates for all types of travellers are low: an operator increasing prices above 10 per cent would obtain less revenue. This suggests that while the car might be the closest substitute to the train it is not a viable option for a sufficiently large number of people to make a 10 per cent increase in the price of train service unprofitable.

Overall, we have found some significant differences in the different attributes and characteristics of train and car. The analysis of switching rates (estimates of the conjoint analysis) is also suggestive of car being in a separate market to train. Such differences are likely to be more pronounced in certain situations than others (for example switching rates are lower for commuters than leisure travel and people running errands).

Is the bus a close substitute for the train?

Bus services are widely offered throughout the Netherlands but with a relatively small role in passenger transport: nationally, bus, tram and metro account for around three per cent of the total distance travelled per person per day.[49]

Buses are a form of public transport, like the train. As such they have certain features in common and also some differences. We review similarities and differences in relation to routes, timetables and congestion, travel cards, and distance typically used.

Busses do not have the same accessibility as car, as they all run on **pre-determined routes** and have specific points of access, i.e. stations/stops.

Timetables are likely to be less important (frequency is normally sufficiently high to make timetables less relevant to passengers). Because buses use roads they are more affected by congestion than trains (although separate bus lanes may exist for buses, congestion is still higher than when using trains).

Regarding **distance**, busses are used less heavily for trips longer than 20 kilometres, but are chosen more often than train for trips below 20 kilometres where train is rarely chosen. The proportion of train and bus/tram/metro use is similar for trips of between 15 to 30 kilometres.

We can also see some differences in terms of the most important reason for choosing train or bus as a primary mode of transport. While, as discussed above in the context of car, the train is used mainly because it is the cheapest option available (25 per cent), the bus is much more often chosen because it is more convenient from the point of origin of the journey (47 per cent). Cost is, however, the second most important reason for using bus (for 20 per cent of the respondents). It seems that for regular bus users factors such as availability of seating and duration of journey are much less important than for train users.

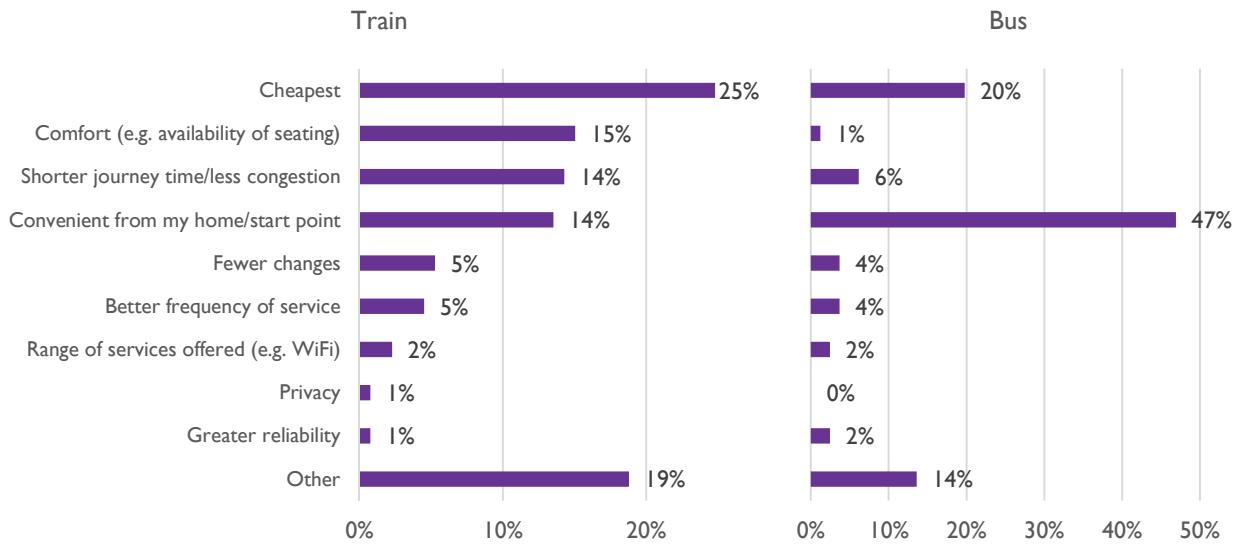
$sw_{10\%} = (D^i_{10\%} - D^i_{0\%})/D^t_{0\%}$, where $D^i_{10\%}$ is the demand for transport mode i (either car or bus) after a 10 per cent increase in price, $D^i_{0\%}$ is the demand for transport mode i at the current level of prices, and $D^t_{0\%}$ is the demand for train at the current level of prices.

47 The number of train users switching to car is small enough to make a 10 per cent price increase profitable. Assuming the gross margin being 60 per cent, initial number of tickets sold being 100 and price per ticket being €1, we can see that the initial gross income equals €60 (=100*€1*60%) and the gross income after a price increase is equal to €63.3 (=100*(1-4.1%) * €1.1 * 60%).

48 The switching rates for commuters, business and education travelers is 3.8 per cent, while for leisure travelers and those running errands it is 4.7 per cent and 5.9 per cent, respectively. Details are provided in the appendix.

49 In national databases (such as the CBS) the tram and metro tend to be considered in conjunction with the bus and are presented jointly.

Table 2.4: Reasons for using train versus bus



Note: Based on a sample of 2,000 respondents.
Source: Europe Economics (2015).

In 2005 various regions and operators adopted contactless **travel cards** (OV chip cards). These cards have now been adopted by all operators. As such, it seems that in terms of tickets switching from train to bus should not pose a problem as the same technology is used for both transport modes. However, for certain types of travellers, for example those with train subscriptions, changing mode of transport from train to bus might be costly (as the train subscription would be unused). There is also a potential difficulty in learning the ticketing strategy used by bus operators. Nevertheless, we should note that those difficulties would be largely irrelevant for a majority of train travellers, who pay for their travels on a pay as you go basis or use single tickets. As such, it seems that for most train users it would be relatively simple to switch to bus.

The extent to which particular modes of transport are perceived as substitutes can also be measured by the switching rates between train and bus after a 10 per cent increase in prices.[50] The differences between train and bus are reflected in very low switching rates. The aggregate switching rate between train and bus after a 10 per cent price increase has been estimated at 0.3 per cent. The rate is even lower for commuters, business and education travellers (around 0.1 per cent). The highest estimate has been obtained for leisure travellers (0.6 per cent). This indicates that, even for the most sensitive leisure travellers, the bus is unlikely to be perceived as a viable alternative to the train. As such, the competitive pressure on train operators from the bus seems insufficient to make a 10 per cent increase in the price of train services unprofitable.

Overall, there are significant differences in the different attributes and characteristics of bus and train. They appear to be used for different types of trips (length, purpose of the trip, etc.). Switching barriers are low but limited switching suggests bus transport is not in the same market as train.

[50] Switching rates have been estimated by Ipsos MORI using conjoint analysis to test the sensitivity of train users to change to bus as a result of a change in the price and quality of train services (the questionnaire included sets of travelling scenarios with various combinations of train travel characteristics and asked respondents to state their preferences regarding mode of transport as those characteristics varied). Details are provided in the technical appendix.

Are other modes of transport a close substitute for the train?

Other transport modes available are bicycle, motorbike or scooter, taxi, ferry, or travelling on foot.

Despite the popularity of bicycles in the Netherlands it is not likely to represent a substitute to trains as it is predominantly used over shorter distances.

Similarly, motorbike/scooter and walking are not suitable modes for transport for longer journeys. In any case, motorbike/scooter is an alternative to train for only a very small number of respondents.

Ferry could be excluded based on the fact that it is generally not available for routes similar to those offered by train operators.

Car rental and car-sharing schemes are also excluded substitutes. The costs of renting a car would seem disproportionate and car-sharing schemes, though widely available across the Netherlands and growing[51], seem at the moment a very limited option.

And finally, taxi often tends to be more expensive than train, and considered as an alternative to the train by only a small proportion of the respondents in our survey.[52]

Other supply-side arguments

Finally, we can note that other modes of transport do not seem to be imposing strong competitive pressure on train operators. It appears that the average ticket revenue per passenger kilometre for NS is **[confidential:]** than those provided by other operators (**[confidential:]** per cent to **[confidential:]** per cent, as seen previously in Figure 2.8). Although, we have noted that this could be related to many factors, the finding is consistent with the fact that the constraints of other modes of transport seem to be insufficient to prevent **[confidential:]** raising fares above the ones provided by other operators. This would be indicative of train services being in a separated market.

2.2.3 Inter-temporal substitutability

If customers do not consider travel at different times of the day as being substitutes, this would imply that there are distinct markets for rail travel based on the time of travel, i.e. peak travel could represent a different product market to off-peak travel.

Our survey shows that travellers are unlikely to change transport mode if they had to make the trip during a different time: 70 per cent of peak travellers and 61 per cent of off-peak travellers stated that they would continue to use train if their trip was made at a different time.

Although there might be some differences between switching behaviour of peak and off-peak travellers, for the purpose of this study it is not necessary to conclude whether peak and off-peak travels belong to the same or separate markets.

2.2.4 Conclusions

The scope for the demand-side substitutability seems limited. In terms of intra-modal substitutability, rail concessions give an exclusive right to operate on a given line which, together with the current distribution

[51] There were some 11,210 cars for sharing and 110,000 users in the Netherlands in 2014. CROW, "Dashboard duurzame en slimme mobiliteit: Autodelen", http://www.crow.nl/vakgebieden/verkeer-en-vervoer/bibliotheek/kennisdocumenten/dashboard-autodelen?Zoekterm=deelauto&publicatiedatum=_customdate:2013-10-01;9999-12-31,&page=1&searchsort=score&pagesize=10&parenturl=/Vakgebieden/Verkeer-en-Vervoer/ Bibliotheek

[52] For more detailed discussion on the characteristics of all the transport modes refer to Appendix 3.

of concessions and the geographical structure of the rail network, generally does not allow passengers to switch from one operator to another (although there may be specific route exceptions).

The proportion of passengers likely to switch away from train to other transport modes as a result of a 10 per cent price increase is under ten per cent. This indicates some switching may occur as a result of a price increase but we have shown that with such results it would be sustainable for an operator to increase prices. The results are sensitive to small variations on the elasticities, but we have shown that only in the most extreme situation of very strong economies of density (i.e. the scenario with no variable costs) our estimate gets close to the break-even threshold (i.e. the point where the gross income after a price increase is the same as the initial gross income).[53] Moreover, the elasticities provided by other studies are even lower and also support the conclusion of profitability as a result of a 10 percent increase in price.

Evidence from the survey and conjoint analysis shows that car and bus are not considered as close substitutes to train by respondents. Those who have chosen to use train for a specific journey do not seem to be keen to switch to either car or bus. The very low train-car and train-bus switching rates show that it is unlikely that a significant number of customers would be switching away from train as a result of an increase in prices. For some customers and types of journeys, the car is likely to represent an alternative to the train so that when the cost of train increases it might lead to some switching between train and car (especially for leisure passengers or those running errands). However, we do not think that the constraint from the car would in general be such that it could prevent any sustainable price increase in the train market.

In terms of inter-temporal substitutability, we note that for the purpose of this study it is not necessary to conclude whether peak and off-peak travels belong to the same or separate markets.

2.3 Geographic market

The definition of the geographic market aims to determine geographical regions within which the competition could be reasonably analysed. For example, regions which are too far or very distinct in terms of users or underlying characteristics should be examined separately as firms' activity in one region does not affect activity in the other. Factors which might help defining geographic market include: homogeneity of the area, geographic scope of operators' activities, barriers to trade (e.g. transportation costs, customer preferences, legal restrictions etc.), barrier to entry, and prices. Not all of these factors need to be considered in each case. Depending on the specificity of the industry / product / market some of the above factors might be irrelevant while others would give a strong evidence for a particular market definition.

The concession area

The Ministry of Infrastructure and the Environment is ultimately in charge of public transport. In 2001 the control over local public transport was given to regional Public Transport Authorities (PTAs). The boundaries between PTAs have changed over time in part due to an ongoing trend of consolidation between the authorities. As of January 2015 the PTAs is as shown in Figure 2.10 (left). One of the main responsibilities of regional PTAs is to allocate concessions[54] for provision of passenger public transport services (covering bus, tram, metro and regional rail).[55] Each PTA can award several concessions.

[53] For reference, see Case 3 discussed in section 2.2.2.

[54] This is done in competitive tenders, although some cities are exempt from this requirement.

[55] Concessions for regional transport can be awarded based on the principle of best service, and lowest cost. The best service relates to the total hours of transport services performed. The principle of lowest cost refers to the smallest amount of subsidies required by the regional transport authority to provide service at the given price. The most common form of rail concession is a net contract (67 out of 80 concessions between 2001 and 2013 were of this type), which specifies the lump sum amount to be paid by PTAs to the operators and grants the operators the fare box revenues. The fact that operators' revenues rely on ticket sales aims to incentivise them to

According to CROW – an independent research organisation – there were 39 area concessions and 13 line concessions as of 1st of January 2015.

Due to the decentralisation of the process of awarding concessions the terms at which the concessions for passenger rail services are granted are not homogenous for all regions and operators. Most of all, some concessions are awarded in public tenders while others are granted without any competition. Among those awarded privately is the concession for the core railway network (*Hoofdrailnet*), which covers around 90 per cent of the entire rail network in the Netherlands. The distinction between core network and the remaining routes was made in the process of reforms leading to the current concession system; while operating the majority of railway network, NS identified 33 unprofitable routes, which were subsequently transferred under the responsibility of regional authorities. The remaining routes constitute core railway network.[56]

The concession for core network has been awarded to NS twice since 2005 for 10-year periods. In terms of COROP regions, NS concession area covers 36 out of 40 regions (Figure 2.10, right). In a majority of them NS, as the incumbent operator, is the sole rail operator. Only four COROP areas are not serviced by NS: Zeeuws Vlaanderen, Delfzijl, South West Friesland, East Groningen. NS has a concession to operate on all intercity and fast routes.

provide high quality services. On the other end of the spectrum are gross contracts, which simply define a lump-sum amount of subsidies paid by PTAs to operators for providing given capacity. See Veeneman et al (2014) "Developments in public transport governance in the Netherlands: A brief history and recent developments". The most recent concession for NS also includes some performance incentives, i.e. bonuses for good performance and fines of up to €6.5 million in case NS fails to meet the performance requirements. International Rail Journal (2015), "Dutch concession: the ministry asserts control", http://www.railjournal.com/index.php/main-line/dutch-concessions-the-ministry-asserts-control.html?channel=524.

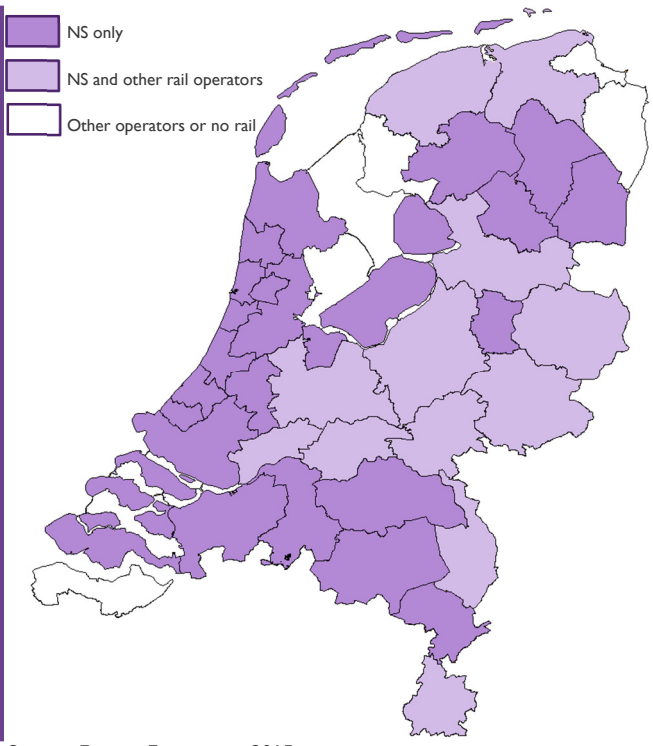
[56] International Railway Journal (IRJ), "Dutch concessions: the ministry asserts control", 04 March 2015, written by Quintus Vosman.

Figure 2.10: Map of Public Transport Authorities and concession area

Map of Public Transport Authorities (2015)

Note: 1. OV-bureau Groningen Drenthe (OVBGD) consisting of two provinces – Groningen and Drenthe; a. Flevoland (with two municipalities performing tasks related to public transport, namely Lelystad and Almere); b. Fryslân; c. Gelderland; d. Limburg; e. North Brabant; f. North Holland; g. Overijssel; h. South Holland; i. Utrecht; j. Zeeland; 2. Stadsregio Amsterdam.
Source: CROW.

NS concession area



Source: Europe Economics, 2015.

Market definition

In cases related to transport the most common approach is to base market definition on routes and/or transport networks.[57] Depending on the particular context route-based or network-based definitions might be more adequate. In favour of route-based definition is usually the fact that for many customers the relevant product is a trip from A to B, and so individual routes should constitute a framework for analysing demand side substitutability. However, there are some other factors which might indicate that a wider market should be considered. A "Review of methodologies in transport inquiries" published by the Competition Commission suggests that these factors include (in the context of a bus enquiry): "the geographical area over which bus services from particular depots operate; the potential for offering network tickets or multi-modal tickets; and the extent to which local authorities tender for bus services."

The first point speaks to the fact that operators can be internally organised in a way that allows them to easily switch vehicles/coaches within the area they operate in. The second point indicates that with network tickets customers are likely to substitute between routes/operators and transport modes (if the

[57] Relevant cases: by OFT – Govia Limited / South Central Rail Franchise (2009), Stagecoach Group plc / East Midlands passenger rail franchise (2008), Arriva plc / Cross Country Passenger Rail Franchise (2007); by DG COMP - M.5655 - SNCF/ LCR/ EUROSTAR (2010), M.5741 - CDC/ VEOLIA ENVIRONMENT/ TRANSDEV/ VEOLIA TRANSPORT (2010), M.5855 DB / ARRIVA (2010), M.5557 - SNCF-P/ CDPQ/ KEOLIS/ EFFIA (2009); by ACCC – Metro Trains Melbourne / Melbourne Train Franchise (2009).

network ticket covers more than one transport mode). Finally, the third point refers to administrative borders of public transport operations, which in turn have implications on the structure of the market.

On the one hand, the capability of some Dutch operators to internally organise their rolling stock to fulfil the demand in different locations would support the idea of a geographical area definition wider than route-based. At the same time, the organisation by way of concessions – either privately or publically awarded – gives an exclusive right to operators for transport services on areas which are likely to create boundaries for geographic market. Most of all, the core network constitutes a single concession area. That means that, in case of a competitive tender, suppliers could challenge the current core network operator only if they were able to challenge the entire concession area, i.e. they could not compete with the incumbent on a particular sub-region of the core network concession or on a particular route.[58] Moreover, competition from international routes which (partly) overlaps with routes in the concession area is constrained by economic regulation.

Since the concession system seems to be the major determinant of the geographic market, a likely relevant definition is the concession for the core network. Considering a broader definition of the relevant market including the whole of the Netherlands is unlikely to affect the conclusions on dominance (due to the large market share of NS).

2.4 Key findings

This chapter presented a discussion on relevant product market and relevant geographic market.

The evidence analysed in this chapter indicates that the relevant product market includes train services only – both those provided by NS and those provided by other train operators. Under this definition other modes of transport are not considered as close substitutes to train.

The main alternatives to train discussed above are car and bus. However, the scope for the demand-side substitutability seems limited. The very low train-car and train-bus switching rates show that it is unlikely that a significant number of customers would be switching away from train as a result of an increase in prices. For some customers and types of journeys, the car is likely to represent an alternative to the train so that when the cost of train increases it might lead to some switching between train and car (especially for leisure passengers or those running errands). However, we do not think that the constraint from the car would in general be such that it could prevent any sustainable price increase in the train market.

In terms of inter-temporal substitutability, we note that for the purpose of this study it is not necessary to conclude whether peak and off-peak travels belong to the same or separate markets.

The relevant geographic market is likely to be either the NS concession area or the Netherlands as a whole. Due to the large market share of NS it is unlikely that either definition will affect the conclusions on dominance.

[58] Although there may be few instances of potential substitutability, i.e. situations where two operators offering services from the same point of origin to the same destination point (via different route).

3 Dominance in Passenger Market

Drawing on the key findings in the previous section, the most likely definition of the relevant product market for rail is passenger rail services only. In terms of the geographic market, we have proposed to focus on the NS concession area and on the Netherlands as a whole.

We consider the scope for Nederlandse Spoorwegen (NS) to enjoy a dominant position under each of these proposed definitions of the relevant market. More specifically, in each case we will explore:

- What proportion of the market they hold and how concentrated is the market?
- Does their market share offer them competitive advantages over potential competitors (i.e. as a result of countervailing buyer power and the existence of economies of scale, scope and density)?
- What is the effect of granting (geographically limited and exclusive) concessions for public passenger transport by rail on the competitive situation?
- What is the difference between public concessions and private concessions on the competitive situation?
- What barriers to entry/expansion to the relevant market exist (i.e. length of concessions, switching costs for users, access to capital etc.)?
- Does NS have a privileged position, for example control over infrastructure that cannot be duplicated easily, access to capital markets or financing?
- Does NS benefit from vertical integration?

3.1 Core network concession area

3.1.1 Market share

Under the market definition including only the core network concession area clearly NS, as the only operator, has close to a 100% share of the market.[59]

3.1.2 Concession

The concession for the core network has been privately awarded to NS twice since 2005 for 10-year periods, and NS has not been subject to any competition at the point of award. As such, NS has not been subject to competition "for the market" (at the time the concession has been awarded).

Differences between publically and privately awarded concessions might manifest themselves in prices and/or quality. Alexandersson and Hultén (2006) argue that in the Netherlands the competitively tendered concessions resulted in "either a gain in quality, quantity or rolling stock, or substantially lower subsidies (20-50%) for the same level of supply". For comparison, according to the same article, the gains in directly awarded concessions were only around 10 per cent.[60]

[59] The market share is likely to be slightly less than 100% as Arriva has been recently awarded the concession of the Limburg province, which includes train services alongside intercity services run by NS under the core concession (in "Roermond - Sittard - Maastricht Randwijck stopping trains", and "Sittard – Heerlen stopping trains").

[60] Alexandersson and Hultén (2006), "Competitive tenders in passenger railway services: Looking into the theory and practice of different approaches in Europe", European Transport, n. 33 (2006): 6-28.

3.1.3 Countervailing buyer power

When assessing the extent to which a firm enjoys market power, it is important to consider whether the existence of a large counterparty (i.e. buyer) may act to limit the market power of the firm. In the context of the Dutch railway sector clearly customers, who are dispersed and individually have no bargaining power over NS, are not likely to have such a countervailing power. However, due to the concession system, the role of a buyer is also played by the national government.[61]

In privately awarded concessions with a number of different operators, authorities can have a high degree of countervailing buyer power. This is because a large buyer could have a better bargaining position vis-à-vis multiple large rail operators. The extent to which such bargaining power exists, however, is determined by the structure of the market: with fewer suppliers the buyer might not be able to credibly use its buying position to achieve favourable outcomes (reduction in prices).

The countervailing buyer power of the authorities in this Dutch context may be limited by the fact that there are currently no real viable alternatives to NS to run the core network. Although there are potentially many operators who could operate the core network (among them, current players who would like to increase their market share), the extent to which they would be able to put forward a bid for the entire network is less clear. This is because such undertakings would require an enormous investment, which is a significant upfront cost even for large international companies.

Another difficulty might be increasing labour force. At first sight it seems that providing enough labour force should not pose a problem as, due to trade unions negotiations, if the concession is awarded to a different operator, the new operator "has to take over the operational staff from the former operator".[62] However, there are doubts in the sector as to whether such labour force would be able to fit into the business models and culture of the new entrants.[63] With that in mind it might be argued that the actual number of outside (buying) options for the national government is also severely limited, and might include only large operators with sufficient capital to match up the scale of the core network.[64]

The evidence suggests, therefore, that while there may be some scope for countervailing buyer power, it is likely to be limited by the need for a sufficiently large operator to rival NS.

3.1.4 Conclusions

The main barrier preventing outside firms from challenging NS's position is the private award of concessions which currently does not allow for competition *for* the market.[65] While on a very few specific routes the competition *in* the market might in theory be possible (as two different operators offer the same

[61] Final consumers of transportation services are the ultimate buyers but the concession system introduces a more complex structure where the transaction between buyers and suppliers is intermediated by the grantor of the concession. The countervailing buyer power therefore occurs at the point of the award of the concession.

[62] Passenger Transport Executive Group (PTEG) (2010), "Public Transport Tendering in the Netherlands", July 2010.

[63] Dutch rail operators interviewed, mentioned the "lack of adequately qualified" labour force as one of the main barriers to expanding their services.

[64] One option to introduce competition would be to divide the core network into smaller concession areas, which would be more manageable for other rail operators. There has already been an instance of such strategy on a very small scale when services included under the concession for the core network were publically tendered (stopping services on routes Roermond – Maastricht Randwijck and Sittard – Heerlen). While the scale of this tender was limited it has been the first incidence of competition for the market within the core network.

[65] As already indicated, there may be cases where substituting between operators would be possible by choosing a different route which goes from the same origin and destination points (example would be Apeldoorn to Zutphen with NS via Deventer or Arriva connection, see Figure 3.1). However, most of these routes would involve train connections or longer trips thus, it is unlikely that passengers will find these suitable substitutes.

origin-destination services) the extent to which customers actually perceive these services are substitutes has not been examined in this report.

Moreover, the position or performance of NS is not likely to be counterbalanced by the government's buyer power. While in theory there could be other operators willing to operate on the core network, given the scale of the operations, the options currently seem to be very limited.

As such, under the market definition covering only the core network concession area, NS is very likely to have significant market power.

3.2 The Netherlands as a whole

There are five main train operators providing services within the country: NS, Arriva, Syntus, Connexxion (including operations under the name Breng), and Veolia. In the figure below, NS covers all routes in dark blue and NS international the route in dark pink. Meanwhile Arriva covers the turquoise routes.

Figure 3.1: Train routes serviced by different operators (2015)

Source: NS (2015) "Explore Holland by train".

3.2.1 Market share

Data referred to in the CERRE (2012) paper on regulatory challenges in Europe's rail sector indicate that the dominant operator (i.e. NS) in the Netherlands for passenger rail had 86 per cent of the market share

in 2008/2009. As could be observed in the table below, among countries included in the study, only in France the incumbent had a higher market share than in the Netherlands.

Table 3.1: Market shares in passenger kilometres of dominant railway operators in Europe (2008/2009)

	Passenger Rail Dominant Operator
Netherlands (NS)	86%
Sweden	82%
UK	26%
Germany	80%
France	100%

Note: Shares based on passenger kilometres or tonne kilometres.
Source: CERRE (2012) "Competition and cooperation, organisations and markets: how to deal with barriers to entry and market power?", IBM (2011) "Summary of the Study Rail Liberalisation Index 2011".

Based on the information collected from the rail operators in the Netherlands we calculated market shares with respect to three variables: passenger kilometres[66], train kilometres[67], and revenues. Regardless of the variable chosen for the calculations, NS has a very large market share, which ranges between **[confidential:]** per cent and **[confidential:]** per cent. The second largest operator is Arriva with a market share considerably lower than NS (between **[confidential:]** and **[confidential:]** percent on different metrics). Market shares of Connexxion and Veolia are much smaller (in some instances are close to zero per cent; shares use data reported by operators).

Table 3.2: Market shares based on passenger kilometres, train kilometres, and revenues (2014)

[confidential:

	Passenger kilometres	Train kilometres	Revenue
NS			
Arriva			
Connexxion			
Veolia			
Syntus			**]**
Total	100%	100%	100%

Source: Europe Economics.

Moreover, the shares have not seemed to be decreasing drastically over the past 6 years, and this reflects the situation of the concessions. For some variables the shares have been relatively stable (e.g. market shares based on passenger kilometres and revenues); for some the shares have been decreasing but only slowly (e.g. market shares based on train kilometres). In all cases the company that seems to be increasing its market share steadily is Arriva. Nevertheless, its share remains very small compared to NS. The detailed results are presented in tables below.

NS's dominance is strongest in terms of passenger kilometres. Based on this variable NS has over **[confidential:]** per cent share in the market. Despite a slight decline in the share it remains at a very high level.

[66] Number of kilometers travelled by passengers in a given unit of time.
[67] Number of kilometres covered by trains in a given unit of time.

Table 3.3: Passenger kilometres: total and market shares (2009-2014)

[confidential:

	2009		2010		2011		2012		2013		2014	
	total	*share*	*total*	*share*	*total*	*share*	*total*	*share*	*total*	*share*	*total*	*share*
NS												
Arriva												
Connexxion												
Veolia												
Syntus												
Total		100%		100%		100%		100%		100%		100%**]**

Note: Passenger kilometres are in billion kilometres.
Source: Europe Economics.

Similarly to passenger kilometres, the train kilometres shares have marginally decreased from **[confidential:]** per cent in 2009 to **[confidential:]** per cent in 2014.

Table 3.4: Train kilometres: total and market shares (2009-2014)

[confidential:

	2009		2010		2011		2012		2013		2014	
	total	*share*	*total*	*share*	*total*	*share*	*total*	*share*	*total*	*share*	*total*	*share*
NS												
Arriva												
Connexxion												
Veolia												
Syntus												
Total		100%		100%		100%		100%		100%		100%**]**

Note: Train kilometres are in billion kilometres.
Source: Europe Economics.

NS's share in terms of revenue has been fluctuating between **[confidential:]** per cent and **[confidential:]** per cent (Table 3.5).

Table 3.5: Revenues: total and market shares (2009-2014)

[confidential:

	2009		2010		2011		2012		2013		2014	
	total	*share*	*total*	*share*	*total*	*share*	*total*	*share*	*total*	*share*	*total*	*share*
NS												
Arriva												
Connexxion												
Veolia												
Syntus												
Total		100%		100%		100%		100%		100%		100%**]**

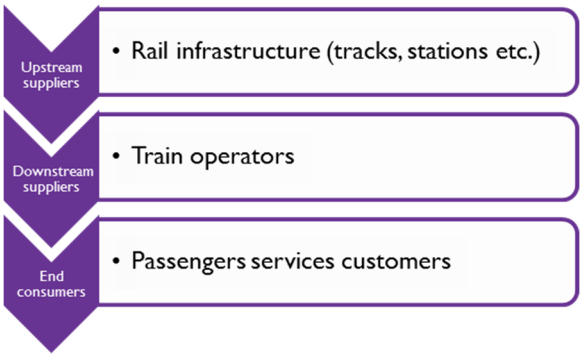
Note: Revenues are in billion euros.
Source: Europe Economics.

Thus, regardless of the choice of the variable used for the calculations of market shares, NS has a dominant position in the market defined as train services in the Netherlands as a whole.

3.2.2 Vertical integration

In its simplest form a supply chain consists of upstream suppliers and downstream suppliers. When suppliers from both levels form one organisation the structure can be called vertically integrated.

Figure 3.2: Simplified scheme of vertical supply chain.



Vertical integration may result in a reduction in competition. In the case of rail, a vertically integrated supplier that has some control over rail infrastructure might impose limitations on other train operators in the downstream market (e.g. by charging higher fees for access to infrastructure, limiting access on particular times of day etc.).

While the Dutch Railway Act (*Spoorwegwet*) introduced a separation between responsibilities related to infrastructure and other transport services in the rail industry, there are elements of the infrastructure owned or managed by the core network incumbent. In order to ensure a good coordination of the entire rail system consisting of many train operators and a separate infrastructure administrator, the Dutch government assigned information management to one entity, namely NS. NS also manages stations (including properties on and around stations such as parking places, ground around tracks and buildings on stations) and owns all ticket machines at all stations. Other services controlled by NS (as reported by other rail operators) include: access to pause locations for staff, customer service points, emergency button facilities in and around stations, travel information, and assistance for disabled passengers. Many of the passenger train operators in the Netherlands stated that for most of these services there is no alternative to NS services. Although there were no major issues mentioned in relation to most of these services, there are instances where information management and ownership of ticket machines services have shown to give NS advantage over other operators.

- Due to owning ticket machines and then allocating revenues among rail operators, NS has direct access to information on ticket revenues for all competitors, and operators suspect that it may use it to its own advantage (for example when bidding for other concessions being awarded privately).
- There are complaints in the lack of transparency in the process for determining the fees for NS services and infrastructure access: several rail operators claimed that they are not aware of how the calculations are made, and some of them indicated that the costs are neither transparent nor cost oriented. Since, according to the rail operators, some of the fees account for a significant share of their fixed costs (in particular, the cost related to ticket vending machines has been mentioned by several companies in this context) this has a significant impact on operators' profitability.

[Question for consultation: Are the parts of the infrastructure held or managed by NS crucial for the entry/expansion of other operators? If yes, which parts are they?]

[Question for consultation: Are there any other significant advantages NS has as a result of its access to those parts of the infrastructure? If yes, what are they?]

3.2.3 Impact of being a large provider

In some industries being a large provider can offer firms a competitive advantage. This is particularly the case where there are large fixed costs involved in the production or supply of the product or service. To explore whether being a large provider in the relevant market does offer such benefits, we consider:

- the scope for economies of scale;
- the existence of economies of scope; and
- the potential for economies of density.

Economies of scale

Economies of scale are the cost advantages that a business can exploit by expanding their scale of production. Economies of scale describe a situation in which average cost decreases with output, i.e. as a firm's production output increases, it can achieve lower costs per unit. Traditionally it has been assumed that this is typical of industries such as rail, which require large upfront investments or which are characterised by a high level of sunk costs. However, in cases of separation between operations and infrastructure (like in the Netherlands) the presence of economies of scale is less likely (infrastructure sunk costs are separated and controlled by the infrastructure manager).

Economies of scope

The railway sector is often considered to be a multi-product industry: it offers services on different routes, to different types of customers, at different times of the day, week and year. Providing all those products involves substantial joint costs which cannot be accurately allocated to any particular service. Since many of these costs are likely to be fixed in the short-term, large providers (i.e. those offering many different products) might have an advantage over smaller ones who provide only a few products. With lower number of products provided, fixed costs would account for a larger share of total costs, and thus, would affect profitability. This type of economies of scope seems less relevant in the Dutch context as concessions restrict the geographical scope of operations, but generally do not prevent operators from providing services to different types of customers, at different times etc.

In the case of NS, it seems that their access to information (including other operators' revenues) might contribute to a better coordination and strategic planning. Moreover, through their subsidiary NS Financial Services Company, NS might benefit from relatively simple access to additional rolling stock which is suitable for the Dutch railway system. Relative to other operators who do not have such direct access, this might improve NS's efficiency in the management of rolling stock.

Economies of density

Economies of density exist where a higher density of traffic on a network reduces the average cost. The existence of economies of density would confer a competitive advantage on those firms able to provide a higher density of traffic, or on those firms that operate in more densely populated areas.

In that respect, NS seems to have an advantage over other train operators as it has a concession on all intercity routes between major cities in the Netherlands and in some of the most densely populated areas of the Netherlands it is the sole train operator. Driessen et al. (2006) seem to suggest that traffic density, which is likely to be higher in more densely populated regions, is highly significant in explaining efficiency of the railway sector.[68]

[68] Driessen et al. (2006), "The impact of competition on productive efficiency in European railways", CPF Discussion Paper No. 17, September 2006.

Earlier research found considerable economies of density in the case of NS (see Andrikopoulos et al., 1998).[69] Several studies conducted in the United States suggest that economies of density might be crucial for short lines as higher density allows to spread fixed costs over a larger number of passengers or tonnes transported (see for example Fischer et al., 2001[70]). As density increases the average cost per passenger declines, but at the same time congestion and maintenance costs increase. Thus, it might be argued that taking advantage of economies of density is possible, but only up to a certain point. However, the extent to which economies of density exist is not entirely clear. A recent academic research conducted in the Dutch context does not seem to find evidence of costs savings associated to higher traffic density (see Pels et al., 2004).[71] Since we have not examined this issue in the context of NS and the existing research conducted in the Netherlands is not unequivocal, we conclude that while from the theoretical point of view economies of density are likely to exist in the railway sector, we do not have enough evidence to make any definitive statements.

3.2.4 Barriers to entry/expansion

When examining dominance it is important to analyse the existence of barriers to entry and expansion. Competition is created not just by the existence of actual competitors in a market, but also by the potential for firms to enter the market and/or existing firms to grow their business. If barriers to such activities exist this can reinforce the position of an incumbent firm. We consider the barriers to entry (and/or expansion) related to: concessions; access to capital markets; and incumbency advantages.

Concessions

A primary barrier to entry in the rail market is the existence of the core network concession (and its allocation). In general, concessions could be awarded via public tendering or privately (i.e. to a chosen operator without the tender process involving other operators). The two types of concessions have different implications on competition in the market. Operators who are awarded concessions as a result of private negotiations avoid any competition with other operators. In the case of public tendering, while there is no competition "in the market" after the concession is awarded, there is competition "for the market", which in principle should ensure that the best combination of low price and high quality is obtained.

The concession for the core passenger rail network is awarded privately for the period of 10 years. It was granted in 2005 to NS, and then renewed for the next 10 years in 2015[72] (the new concession also covers the domestic high-speed service on HSL South). That implies that in over 90 per cent of the rail market there is no competition "in" or "for the market".

Moreover, according to the Dutch legislation, a potential entry of a supplier of an international train route could be tested using an "economic equilibrium test". This test is meant to protect the concession in the core network and also regional concessions against too much competition from suppliers of international routes. Suppose that an operator (not the same one as the existing awardee of a concession) wants to start

[69] Andrikopoulos et al (1998), "Cost structure and productivity growth in European railway systems", Applied Economics, p. 1625-1639.

[70] Fischer et al. (2001), "Analysis of economies of size and density for short line railroads", October 2001.

[71] Pels et al (2004), "Returns to Density in Operations of the Netherlands Railways".

[72] The period for which a concession in granted is a key element in ensuring an efficient provision of services. Due to the capital intensity and high fixed operating costs of rail industry, the terms of concessions need to balance two effects – if the duration of concession is too short then firms do not have enough time to recover costs incurred by entering the market or find it unprofitable to make necessary ongoing investments; if the duration is too long, then firms can operate as a de facto monopolist in the market unchallenged by other firms. In both cases, there is little incentive for operators to work efficiently and improve services provided (either by increasing quality or decreasing prices).

a train service from The Hague to Brussels and vice versa. If that operator decides to stop the train at intermediate stations in the Netherlands (for example Rotterdam, Dordrecht, Roosendaal) this can put competitive pressure on NS. In that case, NS can ask the ACM to investigate if the economic equilibrium of the core network is disturbed. Result of the investigation can be that the international train operator is not allowed to stop at one or more intermediate stations or cannot start the route at all.

Access to capital

Another barrier for any entrant in the market, especially given the scale of required initial investment, might be access to capital markets. While private companies (meaning not owned by a government) often have access to capital via stock market companies, public ownership might allow access to capital at low cost (governments are usually able to borrow large amounts of money at relatively low cost). To the extent to which this mechanism is exploited in the Netherlands, NS might have an advantage over other private operators.

Further, some rail operators noted that the fact that NS is state-owned creates another advantage, as it is very unlikely that it would become insolvent or go bankrupt (again, lower capital costs derived from lower probability of insolvency).

Incumbency advantages

As discussed in relation to countervailing buyer power, an incumbent providing services on the core network would also benefit from owning or already being in a leasing contract for rolling stock and locomotives necessary to operate on such a large area. The longer the incumbent has been operating on the core network the more the investment in the rolling stock has been spread over time and the largest portion of its value has been already depreciated. Given the fact that rolling stock account for a large share of rail operators' costs, this gives the incumbent a clear advantage as the revenue required to break even is likely to be much lower than for potential entrants.

In the Dutch context, the barrier resulting from high costs of rolling stock might be further aggravated by the fact that NS provides train leasing services. According to some Dutch rail operators, in certain instances NS is the only train leasing company providing rolling stock suitable for the Dutch railway system. This indicates that the short term leasing system is not fully operating as in certain circumstances operators are completely relying on rolling stock provided by NS's subsidiary (although this may be less of a problem in the long run if operators are able to buy or lease additional rolling stock elsewhere).

Further, due to the size of the core network it might be easier for NS to bid for other, smaller concession areas. As some rail operators argued, the scale of NS's operations in the core network allows them to increase the rolling stock and locomotives on better terms when NS (or its daughter companies) compete for other areas. This, according to operators, gives NS an advantage when bidding for tenders (especially in tenders awarded in a short time frame, for example, in those replacing an operator in the middle of the concession as a result of some unexpected circumstances).

3.2.5 Conclusions

Based on the information from the rail operators, even under a broader market definition which includes the Netherlands as a whole NS has a very significant share of the market ranging from 85 per cent to 95 per cent in 2014.

Further, NS is likely to have an advantageous position due to its status regarding some relevant elements of rail infrastructure with the most important aspects of it being the ownership of ticket vending machines, and the management of travel information. These might improve NS's ability to bid for other concession areas, and potentially impact other operators' profitability.

Finally, private award of the core network concession prevents potential entrants from negotiations and bidding for the market. Also, the scale and size of operations required on the core network might prove to be a barrier for most other entrants. As rail operations impose high fixed costs, scaling operations to cover the entire core network might be a challenge even for large operators. The scale of NS's operations might also give NS an advantage when bidding for other concessions, as increasing its rolling stock to operate on a relatively small area delineated by a regional PTA is unlikely to pose a problem.

As such, even under a broader market definition, NS is likely to benefit from significant market power.

3.3 Key findings

Under both relevant market definitions NS is likely to have significant market power.

The concession for the core network is awarded privately and does not allow all operators to enter the negotiations. This represents a barrier to entry and a limitation of potential competition *for* the market. The competition *in* the market is also limited as there are very few routes where more than one operator offers the same origin-destination services (the extent to which travellers perceive these services as substitutes is however unclear).

Moreover, due to the size of the core network, switching operators on the core network would require from a potential entrant substantial investments. This, on the one hand, reduces the number of outside options (i.e. other rail operators) for the government when awarding the core network concession. And, on the other, it might create a barrier to entry, especially for those operators who claim to be dependent on NS with respect to leasing rolling stock.

Further, the fact that NS has advantageous access to certain elements of rail infrastructure might improve its ability to bid for other concessions, put other operators at disadvantage in terms of accessing the infrastructure, and benefit NS's business strategy.

As a result, NS has very high market shares (using different metrics). This is a reflection of the current concession allocation system.

4 The Relevant Market for Freight

As described in section 1.1, the objective of any market definition assessment is to identify those goods or services that represent close substitutes for the good or service in question. This requires consideration of both the relevant product and geographic market. The key dimensions within these two overarching considerations are the degree to which customers consider the different options to represent viable alternatives (demand side substitutability) and the extent to which suppliers of alternatives could switch to offering the good or service in question (supply side substitutability).

The definition of the relevant market for rail freight transport has been examined by various competition authorities over recent years in the context of proposed mergers. With regards to product market definition, a key issue typically analysed is the extent to which transport services form part of the same market as freight forwarding[73] and logistics. A distinction has also been made between inland transportation services and rail traction services. Distinctions between and the substitutability of different modes of freight transport (i.e. rail, road, barge etc.) are often considered, particularly in the context of freight forwarding, and even the need for different categories of goods and volumes being transported.

- In 2007, the European Commission examined the competition concerns arising from the proposed sole acquisition of English Welsh & Scottish Railway Holdings Limited ("EWS", United Kingdom) by Deutsche Bahn AG ("DB", Germany) by way of a shares purchase.[74] Based on its market investigation, the EC concluded that there is a clear separation between the market of transport services (relevant to this study) and the market for freight forwarding. As far as the means of transport is concerned, the conclusion was that the breadth of different circumstances necessitates a "case-by-case" treatment. According to their analysis, there were indications that rail's characteristics made it more relevant for the transportation of bulk and heavier goods, over longer distances and for customers who had rail access. In light of this and in line with previous Commission decisions it was concluded that there were "strong indications" of a possibility of a rail only market as opposed to a market covering all modes. The Commission also identified that potential product market subdivisions could be made concerning national or international services as well as single wagon versus full wagon load services. However, these different product market definitions were left open as they were not seen to influence the final decision. Hence, the relevant product market was decided to be the market for rail freight transport with an allowance for the possible subdivisions mentioned above.
- In 2008, the Commission issued a decision on the proposed acquisition by DB Schenker of Transfesa, a Spanish-based logistics operator primarily active in rail and road freight forwarding and logistics services.[75] The markets affected by this transaction where freight forwarding, logistics and transport services in the European Economic Area (EEA), Spain and Germany.[76] In this case, the EC reiterated the considerations described above regarding the relevant market for the provision of transport services. A rail only market was considered possible in particular circumstances (as with the EWS

[73] A freight forwarder is a person or company that organises shipments for individuals or corporations to get goods from the manufacturer or producer to a market, customer or final point of distribution. Forwarders contract with a carrier to move the goods. A forwarder does not move the goods but acts as an expert in the logistics network.

[74] Case No COMP/M.4746 DEUTSCHE BAHN / ENGLISH WELSH & SCOTTISH RAILWAY HOLDINGS (EWS), Notification of 14 September 2007 pursuant to Article 4 of Council Regulation No 139/2004.

[75] Case No COMP/M.4786 - DEUTSCHE BAHN/ TRANSFESA Notification of 12 February 2008 pursuant to Article 4 of Council Regulation No 139/2004.

[76] Particularly so with regards to the automotive industry.

acquisition) but a narrowing of the definition was not considered necessary for the purposes of the Transfesa case.

- In 2009 the EC examined the potential acquisition of PCC Rail S.A., PCC Rail Rybnik S.A. and Trawipol Sp. (together "PCC Logistics") in Poland by DB Schenker.[77] PCC Logistics was engaged in mainly freight railway transportation, freight forwarding and other railway and logistics activities including train haulage, terminal and sidings management. The company was nearly exclusively active in Poland generating between 90-100% of its turnover in the state. The proposed transaction concerned mainly the rail freight industry and specifically between Poland and Germany. With regard to freight transport services it was noted that: "Each mode of freight transport has different characteristics in relation to timing, prices and cost structure and geographic availability."[78] With this statement, the EC supported the notion that distinctions between the different modes of transport might be necessary. However, while the market investigation confirmed this notion, the transaction did not raise serious concerns under any of the alternative product definitions. Along the same lines, further subdivisions into single wagon and full trainload services or for last-mile services were not seen as necessary for the purposes of the assessment.
- The last case examined was a decision by the Italian competition authority (AGCM) regarding the acquisition of NordCargo, a rail company controlled by Ferrovie Nord Milano. It provided freight transportation services, primarily on international routes. AGCM identified the following potentially relevant product markets: Inland transportation market; and Market for railway traction services. AGCM noted that the inland transportation market is characterised by a significant degree of demand substitutability. More specifically, customers have a range of transportation methods at their disposal (e.g. railway transport, road transport, and combined transport) which are comparable in terms of transport time and overall costs. They also noted that the market for railway traction services is different from the market for the rental and purchase of locomotives. The rental / purchase of a locomotive provides only access to locomotors, whilst the provision of traction services also includes the supply of locomotive operators, and additional services such as maintenance, repairs, and backups.

To summarise, in the cases examined, there was no need, for the purposes of market analyses, to narrow down the division of potentially relevant product markets. However, the EC has repeatedly identified the potential relevance of identifying a separate freight transportation market, which would cover rail only and this would depend on circumstances such as the transportation specifications and the customers' profile (e.g. location and access to rail infrastructure). Moreover, these cases have revealed the merits of considering the separation of single wagon services and full trainload services.

The geographic definition has typically focussed on the cross border nature of freight transport within Europe. The key question arises as to whether the market for freight transport is, therefore, national or international. In previous mergers cases, the geographic dimension has focused on the geographic coverage of the merging firms. The distinction may also vary depending on the type of service under consideration and the nature of the market investigation; in one instance, the competition authority concluded that the relevant geographic market for traction services was a national one, while for freight forwarding an international definition may be more appropriate.

- In the earliest of the examined cases (EWS), the following conclusion was drawn: "Taking into account the existing technical, procedural barriers (e.g. lack of interoperability, homologation requirements for locomotives, national safety certificates) and the need for specially trained staff (with language skills and licences) to provide cross-border services, the relevant geographic market for rail freight transport seems to be national, with the possibility of becoming larger than national, in particular on certain

[77] Case No COMP/M.5480 – Deutsche Bahn/ PCC Logistics Notification of 5 May 2009 pursuant to Article 4 of Council Regulation No 139/2004.

[78] These variables are used in our product and geographical market definitions.

international routes forming part of a corridor or having special characteristics due to the market liberalization and the removal of barriers."

- In the Transfesa case, the EC reiterated its conclusion, drawn on the EWS case (that rail transport markets are national), and added that, if one were to consider the relevant geographic market for road transport services, then there are indications that the market could be wider than national and potentially EEA- wide. As the proposed concentration was not cause for concern under any alternative definition, however, the issue was left open. Similarly, while the EC acknowledged its previous geographic market analyses in the PCC case, the proposed concentration did not raise significant concerns under the alternative geographic market definitions.
- In the case reviewed by AGCM, the relevant geographic markets were found to be either national or international (for the inland transportation product market) while they were found to be national for railway traction services. The international dimension of the inland transportation market was defined by using an Origin and Destination (O&D) approach.

In summary, all cases identify the important national dimension of geographical markets which is imposed by interoperability concerns. However, the potential for wider than national markets is recognised in all cases, particularly in relation to international freight corridors.

The remainder of the section focuses on the provision of rail freight transport services in the Netherlands. Train Operating Companies (TOCs, the companies that move the freight) are of relevance to this study. They provide traction and rolling stock and in some cases also modal transfer and product loading/unloading facilities. Some TOCs can offer additional services beyond rail haulage such as multimodal transport services, or even act as logistics operators to coordinate a full 'door to door' service. Alternatively, some TOCs may operate primarily (though not necessarily exclusively) in specialised or niche areas, such as last mile services or cross border services. As such, TOCs may interact directly with end customers or logistics coordinators, or their customers may be other TOCs.[79]

In conducting this analysis, we have drawn on desk research and a programme of structured interviews with Dutch rail freight operators and representative bodies.

4.1 Product market definition

The starting point of our product market definition is the provision of railway freight transport services in the Netherlands. An important factor to consider when defining a relevant market is the extent to which customers perceive other rail providers (intra-modal substitutes), other modes of freight transport (intermodal), and other transport times by rail (inter-temporal substitutes) as close substitutes for rail freight.

To assess these premises, one needs to determine the demand side substitutability or the extent to which customers for freight transportation by rail can and would switch to using a different rail freight provider, other modes of freight transport (such as road or inland waterways) or change the timetable they operate to, in response to a relative price change.

In addition, we must consider the supply side substitutability or the possibilities for other rail operators to switch to providing either other types of rail freight services (intramodal supply side substitutability) or the possibilities for suppliers of freight transport using other modalities than rail transport, to enter the rail freight market (intermodal supply side substitutability).

In this section we consider the potential of substitution:

- between rail operators (intramodal substitutability);

[79] Information from this paragraph is based on the conducted interviews.

- from rail to an alternative mode of freight transport; and
- across time periods for freight transport.

4.1.1 Intra-modal substitutability: can rail operators offer substitutes to different services provided?

The extent to which customers perceive services provided by train companies as substitutes for one another, will depend on the services they require (demand-side substitutability), the services offered by the train companies and the ability for train companies to switch to offering alternative services (supply side substitutability).

A key distinction in the service offering of rail companies is single wagon load traffic and full train load traffic and other specialised services (such as last mile services or transport with specialised wagons). Below, we consider the possibility of a further distinction between these additional services.

Single wagon and full train load

Single wagon load traffic is comprised of a number of different discrete wagon consignments of freight. Single wagon trains are formed after assembling different customers' wagons in a marshalling yard in an origin region from where they are transported to a marshalling yard in a destination region where they are disassembled back to single wagons to be transported to their final destination. [80] This may imply that every wagon being transported by a locomotive belongs to a different customer (or a combination of customers) with different start points and/or destinations, or that wagons are specialised containing different types of goods. Full train load traffic, on the other hand, means that customers commission rail transportation services for a full train load between two points. This type of traffic requires no (or minimum) shunting and is thus very efficient in terms of time.[81]

From a customer point of view (demand side substitutability), there is a clear market distinction for full train load and single wagon load, as the services provided are very different. Although it is possible that consumers of single wagon load services can group orders (perhaps with other customers) to make use of a full train load (improving the scope for intramodal substitutability) this may not be possible in many cases. For example: businesses unable to store the freight, face certain time constraints or deliver in single wagons to different destinations.

From a supply point of view, there is also a relevant distinction between full train and single wagon load, as operators offering whole train load services may find it difficult to switch to offering single wagon load services (though single wagon load providers may be able to offer whole train load services at competitive prices). The lack of supply substitutability is due to different operating models for single wagon and full train load traffic. Single wagon operations typically rely on a "hub and spoke" model where freight is transported, by rail, from numerous secondary locations to one central terminal, where different shipments are classified and re-organised based on their final destination. This process involves a number of locomotives being used, in order to bring the various parts of the shipment together to the "hub" of the system (vice versa). It also requires access to specialized infrastructure, such as customer sidings marshalling yards, terminals, sidings and parking or storing space to store freight waiting for transport to its final destination.[82]

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[80] This definition is provided by the European Commission in COMP/M.4746.

[81] Deregulation in the rail industry has primarily created competition in this type of traffic because the only requirements in terms of fixed costs are those related to operating a locomotive and obtaining the necessary wagons. Source: http://www.railfreightportal.com/Block-Train-Full-Train, visited on 01/05/2015.

[82] Single wagon traffic is defined considering rail as the only mode connecting the hub with the spokes.

Our interview respondents indicated that these operations also require advanced technical know-how and handling experience which would require additional investment, which makes supply substitutability difficult between single wagon and full train load.[83] In addition, respondents indicated that the large operational scale required to operate such model implies that, while all TOCs are generally able to offer full train load services, there is only one operator (DB Schenker) offering single wagon load services within the Netherlands. It should, however, be noted that Locon will participate in a joint venture with B logistics that will commence offering single wagon services as of mid-June 2015.

For reasons primarily related to intramodal supply side substitutability (explored in the paragraphs above) we consider single wagon and full trainload services as separate product markets.

Other specialised services (and possible sub-markets)

Sometimes TOCs engage in specialised types of activities which can suggest that narrower subdivisions within the rail freight market would be possible. Our interviews with operators have indicated two different possible specialised services:

- Provision of "last mile" services and;
- Transportation of products requiring specialised wagons.

These are described in the next paragraphs.

Some operators have specialised in niche parts of the supply chain, in particular "last mile" services, covering transport in the very dense networks (such as port areas).[84] Interviewees have indicated that specialised services of RRF in the port of Rotterdam might be required due to safety specification reasons (e.g. need for specialised equipment), for logistical issues (quick turnaround required in the port area) and financial reasons (price offering of RRF providing the last-mile might be more competitive)[85]. As these services require specialisation and capital investments they can be hard to substitute from a demand point of view. From a supply point of view, we note that they can also be offered by other, non-specialised operators and would not be considered as separate product markets.[86]

The wagons used to transport particular goods can be specialised and, as such, be more difficult to procure. Typical examples of specialised wagons include those carrying chemical substances, e.g. acids or toxic chemicals, automotive freight (a high value finished good) and steel. In cases where there is relative scarcity of wagons then companies that already own the wagons, rather than lease them, are at a very strong position to compete. The same applies to companies that are able to secure favourable (better than market) leasing arrangements, e.g. by leasing through affiliated companies. Hence, both for reasons of competitiveness and due to possible inability to procure the scarce wagons, substitution between rail operators' services can be difficult. However, respondents indicated that it is quite common for the end-customer to provide the requested wagons themselves. In cases where wagons need to be sourced by the rail operator, respondents have indicated that it can be challenging to compete with companies that already have access to the wagons, but they have not suggested that only companies which can readily access wagons compete for this type of business.[87]

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[83] Feedback from our interviews indicated that the provision of single wagon load services requires: an extensive network and scale of operations;expertise and experience in operating single wagon systems; special storage infrastructure; and a "hub and spoke" model which needs operating multiple locomotives (this can increase costs substantially).

[84] RRF would be an example of a specialised operator as part of their business is to pick up trains at the entrance of the port of Rotterdam and deliver it to the terminal.

[85] Mentioned by respondents (not confidential information).

[86] Respondents did not mention any issues that would represent barriers to entry into this market segment.

[87] Respondents have not identified any factors that would imply the wagon leasing market is not well functioning.

We do not consider these specialised to represent a separate product market mainly due to the supply side considerations examined above.

Switching barriers

The scope of intra-modal substitutability may be determined by the presence of switching costs. One of the most obvious switching cost factor are the costs associated with the tendering process that the customer may require in order to assign the business to a new operator.[88] In this regard, most respondents have indicated that it is quite typical for customers' tendering processes to occur on an annual basis. This relatively high frequency of tendering would indicate that costs of tendering are not that high for customers.

Respondents have also indicated that contract cancellation costs exist but we do not consider this a significant parameter as a typically annual tendering frequency is high enough to act as a mitigating factor. Moreover, no respondent has indicated that such cancellation fees have created any issues in the past.

Access to infrastructure terminals has not been quoted as an issue for the operation of the full train load business model by the interviewed organisations, with the exception of challenges arising when delays occur. Access to infrastructure is considered to be open but often proves challenging especially when operating close to capacity or when delays occur. However, one of the interviewed TOCs indicated that terminal capacity is often secured by the end customer and is thus not a concern for the TOC's operations.

Our interviews with rail operators and organisations in the Netherlands has produced no evidence to suggest that switching costs are likely to be a significant impediment to substitutability between different rail operators.

4.1.2 Inter-modal substitutability: which other modes of freight transport are substitutes for rail?

In order to examine the extent to which other modes of freight transport represent close substitutes for rail freight transport, we must first develop an understanding of the characteristics of rail freight transport. In the next headings we analyse the key characteristics of rail freight transport, and compare with other transport modes: waterways, road, pipelines, maritime and air transport.

Characteristics of rail

The key attributes that are significant for rail freight transportation are: type of cargo transported; weight of cargo; coverage; distance; price; speed and reliability; and environmental concerns/attributes. We will review them in turn.

In principle, rail is capable of transporting all **types of freight**. A first indication is provided by examining CBS data on the breakdown of total weight of goods transported by rail from and to the Netherlands by type of good. According to CBS data, during the period of 2010-2013 unidentifiable goods[89] have been an important part of rail freight in terms of total weight transported (ranging from 34 to 40 per cent). Bulk goods such as "coal, lignite and crude petroleum" along with "ores, peat and other minerals" were the only

[88] The higher the switching costs are for a customer, the more unlikely switching is going to be and the more attractive the offering of the new operator that will be required to incentivise the switch. Where customers are locked into longer term contracts with operators they could also face cancellation costs for premature termination. At this stage, we only consider intra-modal substitutability as intermodal considerations are explored in the next sub-section.

[89] Unidentifiable goods cover those transported by containers and can include: chemicals, dangerous goods, flowers, automotive parts, beer, water …

two other reported categories. These categories of goods represented more than 15 per cent of the total weight of transported freight in 2013, together accounting for around 43 per cent.[90]

Rail is be able to transport orders of different sizes and **weight** as operators can offer a variety of full trainload, single wagon load and intermodal solutions (e.g. "rolling highway" where entire trucks are carried by rail).[91] However, weight restrictions impose an upper limit on the aggregate weight that can be transported by each train.[92]

A very important characteristic of rail freight in the Netherlands is its international **coverage** with the bulk of rail freight - in terms of weight - being international cargo.[93] Between 2010 and 2013, domestic freight accounted on average for only 11 per cent of total transported cargo weight by rail. Over the same period, the amount of international freight (89 per cent) has been constantly increasing; 2013 levels are 15.8 per cent higher than 2010 levels.[94]

- Germany is the main origin for rail freight within the Netherlands, representing over half of rail freight in 2013. Together Germany and Belgium, the Netherlands' neighbours, account for approximately two thirds of total tonnage, with Italy accounting for 18 per cent of aggregate incoming tonnage.
- Germany is also the primary destination for rail freight in the Netherlands. Most of the rail freight is directed to Germany (81 per cent) with Italy having the second highest share of 7 per cent.[95] Moreover, almost all of Germany's demand for coal from outside Europe (around 15 million tonnes) is transported from the ports of Rotterdam and Amsterdam. Most of this amount is transported by waterways (10.5 million) but a very significant portion (4.5 million) is transported by rail.[96]
- Hence, the majority of rail freight moves to or comes from outside the Netherlands, the most important destinations and origins of rail freight being Germany, Belgium, the Czech Republic and Italy. Moreover, as Germany and Belgium are the only countries with which the Netherlands shares borders, they play a crucial part in reaching international destinations, as any route will need to cross through these two countries to reach the Netherlands.

Rail freight transport can be used over different **distances**; it is only limited by the existence of tracks and stations between the point of origin and the destination. That said, interviewees have indicated that rail cannot be competitive in short distances: the minimum efficient distance is generally agreed to be at around 200km according to interviewees. Rail transport becomes a highly competitive transport solution over longer distances (definition varies by respondent, e.g. greater than 500km or 750km).[97] Rail operators fixed costs are indicated to be at 56 per cent over a one year period by one respondent. This means that the use of longer distances can help them reduce the incidence of such costs on their profitability.

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[90] Source: http://www.cbs.nl/. Data used: total weight of transported freight to and from the Netherlands for the periods 2010-2013 accessed on 24/04/2015.

[91] Source: http://www.railcargo.nl/railgoederenvervoer/rollende_landstrasse, seen on 19/03/2015

[92] In its Network Statements, ProRail specifies weight limits on different tracks (in terms of axle loads and load per unit of length) and also specifies a maximum length for freight trains. A train's length, including the locomotive, cannot exceed 740 metres and in some cases where border crossings are involved, this is even more restricted as for example: via Oldenzaal – Bad Bentheim: maximum 590m; via Zevenaar – Emmerich: maximum 690m; and via Venlo – Kaldenkirchen: maximum 650m (ProRail Network Statement 2016, p.27-28).

[93] It should be noted that the coverage that rail offers is restricted by the available tracks/routes. For a rail service to be considered door-to-door the customer needs to be content with the fixed locations at which rail freight can be delivered. If a customer requires a bespoke delivery location outside the rail network then this would necessitate the usage of other modes in order to reach the desired point.

[94] Source: http://www.cbs.nl/.

[95] Source: http://www.cbs.nl/.

[96] Francke, J. and van Ooststroom, H. (2007), "Marktontwikkelingen in het goederenvervoer per spoor 1995-2020", KIM Publication, 19th November 2007

[97] The same respondent indicated that the leasing costs for locomotives were considered fixed as they covered a minimum of one year periods.

Price competitiveness is nowadays an important feature of rail transport. Available evidence before the financial crisis supported the paramount importance of reliability for rail freight, even more important than price. However, the situation changed after the financial crisis with a sharp increase in the percentage of customers considering price competitiveness the most important factor.[98] This is supported by evidence collected during the interviews, where all interviewees highlighted that price was the most important consideration.

Rail can offer a high **speed** option with only very few local routes imposing speed limits as low as 80km/h and trains running on the Betuweroute being able to move with speeds in the range of 80 to 124km/h. However, its high speed is confounded by the following reliability concern. Rail operators have to work to a specific timetable which is agreed with passenger rail services and maintenance requirements. Rail freight that is delayed by more than three minutes, loses its scheduled timetable and has to apply for a new timetable to continue its route. This can potentially result in substantial delays, as mentioned by some of the interviewed organisations[99].

Lastly, rail also has important **environmental** credentials.[100] As evidenced by data presented in a CER report, rail has the lowest levels of CO_2 emissions and energy consumption compared to other inland modes; only maritime transport has lower levels of specific CO_2 emissions in terms of grams/tonne kilometre.[101] However, the same report identifies that environmental considerations are not among the highest priorities for rail customers.

[Question for consultation: are there any other important characteristics of demand for rail freight transport? What is the volume (share) of customers?]

Are waterways a close substitute for rail freight?

In the Netherlands, a significant amount of freight is transported through inland waterways; more than 350 million tonnes in 2013. This is significantly higher than rail freight (less than 40 million tonnes). As is the case with rail, there is no evidence to suggest that waterways are not able to transport any particular type of freight.

Below, we will investigate different characteristics pertaining to the transportation of freight via waterways and explore how each one contributes to making waterways a substitute to rail. These will be integrated into a set of conclusions in the end of the sub-section. The characteristics explored are: type of cargo transported; weight of cargo; distance; route coverage; cross-border limitations; speed; reliability; environmental; and other considerations.

In terms of **type of cargo** transported, the profile of products transported by waterways is very similar to those transported by rail, and this shows that waterways have the capability to transport the same goods being transported by rail[102]: "Ores, peat and other minerals" accounted for 29 per cent of transported weight in 2013, and "Coal, lignite, crude petroleum" and "Unidentifiable goods" accounted for 12 per cent each. "Coke and refined petroleum products" accounts for around 20 per cent of waterway cargo weight (while it only accounts for two per cent of rail cargo weight).[103]

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98 CER (2013), "Rail freight status report: Rail freight after a decade of EU rail policy", April 2013, p.15.

99 No indication of the length of delay was given.

100 In fully assessing the environmental impacts of modalities one should account for all types of externalities created, such as noise, and should also account for the probability that accidents might happen which could cause environmental catastrophes such as spillages.

101 To be more specific, rail required an energy consumption of 33,000 megajoules (resulting in 0.75 tonnes of CO_2 emissions) to transport 100 tonnes of freight from Basel to the port of Rotterdam compared to 58,000 for waterways and 75,000 for road (resulting in 4.15 and 4.95 tonnes of CO_2 emissions, respectively).

102 If waterways had a zero share of transported goods it could be considered a poor substitute.

103 Source: http://www.cbs.nl/.

As far as **cargo weight** is concerned, waterway transport lends itself well to heavier loads and volumes. Indeed, the cost structure of waterway transport suggests that smaller loads would be inefficient to carry. Our interviews with TOCs and freight organisations suggest that for heavier shipments (i.e. over 200 tonnes) waterways compete strongly with rail on price terms. Equally, interviewees indicated that barges also face fixed costs, which implies that they operate more competitively[104] when longer distances are involved (e.g. greater than 200km or greater than 300km). Feedback from our interviews suggests that waterways offer a cheap alternative to rail for such loads.[105] Thus, waterway transport can offer a good alternative to rail where heavy loads and large distances are concerned.

With most rail freight moving outside the Netherlands, it is important to explore whether waterways offer cross-border **coverage of destinations** to a similar extent as rail does. In comparison to the routes covered by rail, the waterway network is similarly dense around the port areas of Rotterdam and Amsterdam and offers good coverage linking Rotterdam to and across the German borders (similar to the Betuweroute's functionality). Though waterways can be restricted when passing a bridge is involved, mass dry bulk such as coal can be easily transported from Rotterdam on the river Rhine or by parallel canals. Waterways offer less of a direct access to the Belgian border, as the available options include either going on the far southeast side through Maastricht via the river Meuse, or going through the far southwest side. Moreover, the waterway network does not offer direct access from the centre (e.g. Utrecht) to the north, as available river access to Zwolle does not follow a direct, straight path. This is illustrated in the figure below which shows the links from the port areas of Rotterdam and Amsterdam to Germany and to Belgium (in a more indirect manner going through the Southeast part of Netherlands). Moreover, the North-Northeast part of the country has canals that go through to Germany.

In cases where waterways do not offer a parallel border crossing to rail, they will not pose a viable substitute. Such cases can be identified where the network is less dense and where it does not offer direct access to the borders such as the Northeast part of the country (with Germany) or the Southern part of the country. The coverage and potential substitutability of waterways is examined further as part of the geographical market definition.

[104] Engaging with barge operators was beyond the scope of our research. As such we do not have data on the main costs and fixed costs facing barge operators. Our evidence on prices and cost differences derive solely from the feedback from the rail freight operators and representative bodies we interviewed.

[105] In particular interviewees noted that there are potentially significant differences between rail and waterways in the costs they face. While rail operators must pay an access fee to use the infrastructure (i.e. tracks), barge operators do not face access charges to access the waterway network. This may allow them to operate at a lower cost to rail. Equally, the less pronounced interoperability issues might suggest that the costs associated with cross border transport would be lower for barge operators than rail operators. Waterways also enjoy international tax benefits.

Figure 4.1: Map of inland waterways in the Netherlands

Note: Canals are shown in blue colour while rivers are shown in red colour.
Source: http://www.eurocanals.com/Waterways/netherlandslarge.html, seen on 01/05/2015.

Like rail freight, barges can provide freight transport over all possible **distances**, only limited by the existence of waterways between the points of origin and destination. This would imply that, as long as the distance covered is between points where both rail and waterway infrastructure exist, barges can be used as an alternative to rail. For very long distances (i.e. greater than 800km) the scope for intermodal substitutability to waterways may be more limited, due to a lack of suitable rivers and/or canals.[106]

As a reflection of the waterways **cross-border** network, the majority of freight carried by waterways was international in nature (again: like rail). Freight moving by inland waterways that had both a domestic origin and destination point, accounted for less than 30 per cent of total weight transported by inland waterways within the Netherlands during 2010 to 2014.[107] The majority of freight transported by inland waterways through the Netherlands was either directed to or originated from other countries: primarily Germany

[106] Note that very long distances (greater than 800km) affect coverage negatively (as it might be less likely that the route is covered) but long distances in general have operational advantages for barge operators (due to decreasing fixed cost incidence). There is a trade-off between operational benefits and the likelihood of coverage.

[107] Source: http://www.cbs.nl/. Data used: total weight of transported freight to and from the Netherlands for the periods 2010-2014 accessed on 24/04/2015.

(56 per cent) and Belgium (37 per cent), again: much like rail, with very small amounts moving to and from France.[108]

In terms of **speed**, waterway transport cannot compete with rail, primarily because barges have to move through water.[109] However, the importance of speed is likely to vary across types of goods. In particular, for those goods for which only a small fraction of the overall trip, which usually starts with a long (sea-) shipping voyage, is represented by rail, speed is unlikely to play as significant a role. Feedback from the interviews showed mixed product requirements: speed is not a primary concern for some customers. The focus lies mainly on price and reliability. Nevertheless, speed can be an important consideration for others due to the high value of transported goods or due to their operational needs.

[Question for consultation: What is the volume (share) of customers that require freight transport services delivered fast (high speed)?]

Where **reliability** is a primary concern, an interviewee indicated that rail transport would be hard to substitute for a waterway alternative. However, there is no evidence to support this claim. Indeed, the fact that waterways do not need to engage in a timetable system to access the infrastructure, would suggest that they may face fewer reliability obstacles compared to rail. In particular, the absence of scheduled timetables means that waterway transport is not subject to potentially lengthy ad hoc timetable applications and extended delays caused by initial minor delays, resulting from the loss of their pre-agreed timetable. Respondents indicated that train delays of more than three minutes can result in trains missing their allocated slot, thus necessitating the usage of the ad hoc allocation system. This creates operational concerns for rail operators and can result in significant delays if ad hoc allocation is not possible at the time. Waterways do not face similar issues according to the respondents of the interviews, although, they can face potential issues in accessing terminals e.g. container terminals owned by other private companies.

Regarding **environmental** considerations, recent data compares rail and waterways emissions of CO_2 (in grams over tonne kilometres) and finds that inland waterways have significantly higher levels than rail.[110] Based on that source, substitutability for customers who place importance on environmental credentials would appear to be limited between rail and waterways. However, the same source providing the emissions data presents customer survey information which reveals that environmental considerations are one of the lowest priorities for rail customers. This was confirmed in the interviews with train operators a number of which indicated that customers are not willing to pay a premium for environmental reasons.

Finally, **another consideration** would be if a customer has an operational rail terminal on site (but no direct access to a waterway on site). In this case, the comparable cost of using waterways may actually be higher than for rail, as the use of waterways would involve a need to change their haulage model to a multimodal model, with road haulage required for the last mile of the transport.[111] This could indicate that waterways are no alternative for full train loads.

Due to the fact that waterways provide less geographic coverage than rail (hence, excluding many possible rail destinations), they are not considered a substitute for single wagon load services.

[108] Waterway freight crossing to different countries does not face interoperability constraints of rail and this improves its competitiveness. The fact that barge operators do not need to change vessels or vessel captains when they move to different countries has positive implications on their cost structure and can thus make them a more attractive alternative, according to respondents.

[109] The fact that waterways are a slower (but cheaper) alternative to rail was mentioned by one of the interviewed TOCs.

[110] CER (2013), "Rail freight status report: Rail freight after a decade of EU rail policy", April 2013, p.12.

[111] The significance of on-site rail facilities was also recognised by the European Commission in the cases involving DB Schenker's acquisitions that were explored earlier.

Based on the above analysis of the different characteristics of waterway freight transportation, we draw the following conclusions regarding full trainload services:

- waterways can substitute rail in terms of types of the main products transported by rail ("Ores, peat and other minerals"; "Coal, lignite, crude petroleum" and "Unidentifiable goods"[112]);
- they cover a very wide network in the Netherlands (comparable to rail) but cannot always cover the areas that rail does, depending on the final destination of cargo;
- they represent a strong substitute to rail for large distances of over 200/300km (as long as a destination is within their range of coverage);
- they are only considered a good substitute where bulk (heavy) loads are concerned;
- waterways are not a good substitute for where speed is of primary concern (e.g. high-valued goods); or for customers who have operational rail terminals on site.

[Question for consultation: are there any other important characteristics of demand for rail freight transport that cannot be supplied by waterways? What is the volume (share) of customers?]

Is road transport a substitute for rail freight transport?

For road transport, we examine the following characteristics: flexibility; type of cargo transported; weight of cargo; distance; cross-border limitations; speed and reliability; and environmental concerns.[113]

There are about 12,000 companies involved in the road freight business in the Netherlands with 80 per cent specialising in international transport. Trucks drive for up to 180,000 km a year, and offer a competitive advantage due to their flexibility in terms of routes and drivers.[114] Road transport offers maximum **flexibility** with regards to route coverage, as it leverages the very extensive road networks that are available. There is no evidence that indicates that road cannot transport particular **types** of goods. However, with roads passing through populated areas, restrictions related to hazardous goods are generally more severe.[115]

Load **weight** limits for individual trucks mean that, for heavier loads, a number of trucks are required. This is likely to make road a relatively cost inefficient mode for heavier (bulk) loads. Feedback from our interviews suggests that road is more competitive in price terms for smaller shipments, generally of less than 100 tonnes.

Road haulage companies do not face the same high fixed costs as rail operators.[116] This means that road can be efficient over shorter **distances**. In line with this, the rail operators and freight organisations we

[112] Unidentifiable goods are those that cannot be classified under groups 01 to 16 of the NST (2007) statistics. These categories include agricultural products, raw materials, food, chemicals, machinery, manufactured goods and waste.

[113] Although road may be seen as a bad substitute for rail because of the different product characteristics it can offer (small amounts on short distances) the evidence from our interviews indicate the opposite. This is reviewed in the next paragraphs.

[114] Source for the entire paragraph: Laurent Guihéry (2008), "European Transport Conference", Leeuwenhorst Conference Centre, Noordwijkerhout, Netherlands 6-8 October 2008, International road freight transport in Germany and The Netherlands Driver costs analysis and French perspectives

[115] Legislation on hazardous materials has been in place since 2013 in the Netherlands. This legislation sets out ceilings for the volume of hazardous materials that can be transported by the individual modes of transport. The ceiling for rail and waterways are higher than for road. However, the extent to which these ceilings are met (or even breached) is unclear as there is no single authority that monitors these ceilings across the available modes of transport. As such we have no evidence to indicate that hazardous materials cannot be transported by road as well as rail.

[116] While we do not have data on the cost structure of road haulage companies, feedback from rail freight operators indicates that locomotives represent a significant fixed cost for them. Such fixed costs account for over half of

interviewed, indicated that road is more competitive vis-à-vis rail over shorter distances.[117] Road's lack of competitiveness over longer distances is due to the fact that road does not benefit from the same efficiency advantages compared to rail, the result of lower fixed costs[118], and faces issues of mandated driver resting times and maximum allowed distance to be covered within a day.

As in the case of waterways, roads do not face the same **cross-border** interoperability issues as rail. This has implications for the cost of moving freight across borders by road. More specifically, it would suggest that road offers a cheaper alternative to rail in cross border activities. Equally, road haulage companies do not face access charges for use of the infrastructure as rail operators. However, road haulage firms may face road taxes and tolls. Their main cost consideration is, however, fuel prices which are highly dependent on the state of energy markets.

Interview respondents highlighted that, while road does not face the same timetabling constraints as rail, the **speed** and **reliability** of road transportation is highly dependent on actual conditions faced on the road and can be significantly affected by congestion. Where speed and reliability is of importance to customers, road may not be a good substitute for rail. This may also include transportation over longer distances, which results in higher likelihood of congestion along parts of the route. For that reason, substitutability of road cargo may be limited to shorter distances in situations where there are any speed and reliability concerns.

Lastly, road transport performs less well on **environmental** grounds. Recent estimates indicate that road emits eight times more CO_2 than rail. Road also suffers from congestion problems and directly affects more densely populated areas.

Based on the analysis presented above, road offers itself for the transportation of lighter loads and is a very flexible mode in terms of coverage; as such it is considered a substitute for single wagon load services.

In assessing whether road can be a good substitute to full trainload services we draw the following conclusions:

- it can be competitive in transporting lighter loads (e.g. less than 100 tonnes);
- it is not a good substitute for heavier loads;
- it is a strong substitute for shorter distances (close to 200km to 300km) and becomes less competitive as distance grows;[119]
- other aspects show that road transport is a very good substitute in terms of route coverage and flexibility; it can be a limited substitute where the transportation of hazardous goods is required; and it is not a good substitute when speed and reliability are required (particularly for longer distances).

Is pipeline a close substitute for rail freight transport?

Similarly to rail pipelines transport a significant amount of crude oil products (however, crude oil is part of a larger goods category in the available data so the exact amount is unclear) and move primarily to Germany and Belgium. This suggests that in terms of gases and liquids pipelines may represent a substitute

their total costs. It is important to also note that even when a rail company leases a locomotive, leasing costs are accounted for at the beginning of the financial year and as they represent commitments of annual periods they are considered as sunk costs.

[117] The definition of short distance varies by respondent but less than 200km to 300km has been identified as a road-only range.

[118] Our evidence on prices and cost differences derive solely from the feedback from the rail freight operators and representative bodies we interviewed.

[119] The distance cut-off point above which road becomes uncompetitive depends strongly on fuel prices. Respondents have indicated that this distance could be at approximately 750km to 800km.

for rail transport. That said, in our interviews with rail freight operators pipelines were not generally cited as representing a close competitor to rail.

Is maritime transport a close substitute for rail freight transport?

Around half of the freight transported by maritime is to destinations outside Europe which indicates that large distances are concerned. Approximately half of the transported freight moves to other European destinations (51 per cent in 2010), while the other half is moved to other continents, primarily Asia and America.[120] Approximately one fourth of maritime freight in 2010 (26 per cent) moved to continents where a rail connection from the Netherlands would not be an option (Oceania, America and Africa).

The coverage of maritime transport is limited by the existence of ports and cannot serve inland European destinations. Hence, while a maritime route connection exists between the Netherlands and Germany (e.g. the port of Hamburg), this leaves a significant number of German destinations that are not near the sea without coverage (unless different transport modes are used). Given that Germany is the most frequent destination and origin of rail freight, this would imply limited substitutability in this dimension.

Based on the route profile it is likely that rather than representing a substitute to rail, maritime transport in general is considered to be a complementary service, with customers employing a multimodal approach to freight transport of maritime and rail, rather than choosing between rail and maritime as competing options of freight transport.

Is air transport a substitute for rail freight transport?

Air transport is the least used mode of freight transport in weight terms.[121] The main types of cargo currently transported through the busiest Dutch airport include goods such as food and flowers, fashion items, pharmaceuticals, live animals, hi-tech items, automotive as well as aerospace related materials.[122] The common characteristic of such goods is that they are high value, finished products that would incur high opportunity costs if not sold or used as soon as possible. This contrasts starkly with the profile of freight products transported by rail.

Air is well equipped to cover long distances and would be expected to be competitive over longer distances which would decrease the incidence of fixed costs. Hence, in principle it could represent a substitute for rail over longer distances. However, transporting large volumes or weight would be problematic for air freight where weight restrictions would be binding. This would result in the need for multiple trips, which would involve breaking down the cargo and substantial costs. This would be likely to render it uncompetitive in price terms vis-à-vis rail transport.

Given the distances involved, and the types and weights of products being transported by rail it seems unlikely that air transport represents a close substitute for rail freight transport.

Summary

We have seen a number of attributes and characteristics of different transport modes. Consumer choice depends on a number of different conditions including type of transported goods, volume, weight, distance flexibility, environmental and whether goods are classified as dangerous goods. Table 4.1 shows the advantages of the main modes with regards to the characteristics of freight transportation.

In our product market investigation, we considered the market for single wagon load as a separate product market to the market for full trainload.

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[120] Source: http://www.cbs.nl/. Data used: total weight of transported freight to and from the Netherlands for 2010 accessed on 24/04/2015.

[121] Source: http://www.cbs.nl/. Data used: total weight of transported freight to and from the Netherlands for the periods 2010-2013 accessed on 24/04/2015.

[122] http://www.schiphol.nl/B2BRedirect/Cargo1/CargoServices.htm

As far as single wagon traffic is concerned, road is likely to be the main substitute due to its operational flexibility. The mode of choice depends on a number of different conditions, but in interviews with operators we have seen that generally:

- Rail and road are substitutes in situations where road is competitive. These mainly involve shorter distances and lighter loads;
- In other remaining situations rail is likely to be the relevant market (this may include heavy loads or long distances).

In full train loads, the analysis is more complicated. Building on the information on the relative advantages of different modes in servicing particular freight transportation specifications (Table 4.1), and having rail full trainload services as a starting point, we consider road and waterways as rail's main competitors. This is due to similarities in the types of goods transported (which is a significant restriction for pipelines) and the route coverage limitations of air and maritime (which would necessitate the usage of multi-modal solutions).

Table 4.1: Modal competitiveness advantages across different transport specifications

Specifications	Rail	Road	Waterway
Heavy load (>100 tn)	+	-	+
Light load (100 tn or less)	- (except single wagon)	+	-
Distance >750km	+	-	+ (if coverage)
Distance 200-750km	+	o	+
Distance <200km	-	+	-
Types of goods	+	+ (except bulk goods)	+ (mainly for bulk goods)
Coverage	+ (network limitation)	+	- (network limitation)
Flexibility	+ (single wagon)	+	- (network limitation)
Reliability	+	-	+
Speed	+	+	-
Environmental	+	-	-
Hazardous goods	+	+ (limited)	+ (limited)

Note: "+" indicates that the mode is competitive, "-" indicates that it is uncompetitive and a "o" indicates that the mode's competitiveness is not significantly influenced by the specification or that information is not sufficient to determine.
Source: Europe Economics analysis.

4.1.3 Inter-temporal substitutability

In terms of preferences regarding the time of day during which cargo will be transported, it has been indicated by interview respondents that night slots and off-peak day slots are only available for freight transport (since passenger traffic is prioritised by law[123]).

[123] In case of conflicting requests for rail capacity. Capacity for freight is, however, reserved on the Dutch network in the form of a minimum number of rail freight paths per hour. Such reserved freight paths do not conflict with requests for passenger traffic, as they are scheduled not to conflict.

There is no evidence to suggest, however, that certain types of freight or customers would have a specific preference for transport at a certain time of day (time window). As such inter-temporal substitutability is unlikely to be a key factor in determining the relevant market.

4.1.4 Summary of product market definition

In our product market investigation, we suggest considering a market subdivision for single wagon load and full trainload.

As far as single wagon traffic is concerned, road is likely to be the main substitute due to its operational flexibility. The mode of choice depends on a number of different conditions so an analysis of a case-by-case may be useful. However, in interviews with operators we have seen that generally:

- Rail and road are substitutes in situations where road is competitive. These mainly involve shorter distances and lighter loads;
- In other remaining situations rail is likely to be the relevant market (this may include heavy loads or long distances).

Demand for full train loads is also likely to depend on a number of conditions (weight, size, distance, coverage, speed …). Again, a case-by-case analysis could identify such particularities. However, after having looked at the main characteristics of freight transport we are able to provide some general findings.

Where weight and distance are considered primary determinants, road and waterways are likely to be the main substitutes.

- Due to their nature, waterways are likely to compete with rail in heavy load transports. However, a very important aspect that needs to be considered is that waterways will not always cover the same routes as train and, in such cases, they will not be a viable substitute to rail. This will limit the market to rail only in cases where there is no waterway access (this is likely to be more prevalent for distances greater than 750km).
- Road is likely to compete with rail in light load transports. Given its flexibility it is likely that road will be easily accessible, but it may be less of a substitute in particular cases involving long distances (where rail is more competitive). Depending on the characteristics of the transport required (distance, volume, etc.) there may be other situations where rail does not face competition from road. Although a case-by-case analysis may be required, the general evidence from interviews suggests this may not be a very significant number of cases.

Table 4.2 summarises the above information on the primary determinants of substitution between modes of transport.

Table 4.2: Relevant product markets for full train

	200km to 750km	**Greater than 750km**
Heavy load (>100 tonnes)	Rail + Waterways*	
Light load (100 tonnes or less)	Rail + Road	Rail

Note: * Waterways will only be part of the relevant product market definition if they can reach the required destination/origin.
Source: Europe Economics analysis.

Further aspects that are relevant for intermodal substitution were examined, such as speed, environment and rail facilities on customer sites. The demand for transport services may be specific to different conditions. Given that there was insufficient evidence regarding their significance and the extent to which customers demand them, we expect the share of these services to be small.

[Questions for consultation:

How important are speed requirements when tendering or requesting a transportation quote?

What volume of freight requires services with speed requirements as detailed above?

What volume of rail freight is currently handled by rail specific facilities in customer sites? By which customers? What is the volume per customer?

For which types of goods are environmental concerns a key consideration? What is the volume share of these goods?]

4.2 Geographic market

Having explored the possible product markets, we now consider the relevant geographic markets. The geographic market refers to the geographic area that is relevant for the provision of the services. This will be influenced both by the nature of demand across different regions (demand side substitutability), that is, the geographic area relevant for customers using the services, and the scope for operators from other geographic regions or areas to enter the market to offer the relevant services (supply side substitutability).

Different approaches to the geographic market definition can be adopted for rail transport; options typically involve focusing on specific routes (an origin and destination (O&D) approach), and then considering wider networks or regions such as countries or jurisdictions.

To examine the scope for demand side substitutability across different geographic areas we start by considering different origin and destination routes. This is because customers demand particular transport services which include an origin and destination point and according to certain specifications (size, weight, speed, etc.). Interviewees have also indicated that the transport services provided are typically defined by a start and end point, consistent with a route delimitation of the market. So, in principle, the analysis of demand substitutability should look at the extent to which routes (or different destinations) can be seen as substitutes.

Although the geographical markets could be defined at the level of the route from a demand point of view, from a supply point of view, the markets may include any supplier who is capable of providing such service, either in rail or using other modes of transport, provided there is suitable infrastructure. This is because, as we explore in the next paragraphs, depending on the product market in question, the barriers for provision of the different routes can be low. There will, naturally, be cases where barriers are not low and where substitutability is not possible, such as, for example, waterways covering a rail route where there is no available river.

[Question for consultation: Are there any rail-route pairs (Origin & Destination) which cannot be serviced by waterways? How important are these (volumes, share)?]

The discussion of the geographical dimension of the product markets identified in section 4.1.4 is presented below for single wagon, full train load and each one of the subdivisions identified.

4.2.1 Single wagon services

For single wagon services rail and road have been identified during our investigation as being substitutes. However, this will not always be the case and there will be exceptions in which rail will be the only relevant mode. Our research has indicated that factors that might be causing such exceptions are transportation specifications that relate to heavier loads and longer distances (which make road less competitive). These two alternative scenarios are explored below.

Road can be a strong substitute for single wagon traffic, given its flexibility and its competitiveness when carrying smaller order sizes (such as the ones relevant for single wagon load). In such cases the geographical market can be considered broader than national. This is because road operators act as competitors to rail and there is no barrier for foreign road operators to engage in offering such competitive services in the Netherlands.

There are cases where road is not competitive and the relevant market is likely to be rail only. In such situations, the scale of operations required, specifically the number of locomotives, means that it is likely to be harder for foreign rail firms to enter the market. This would suggest a national geographic market definition. However, international freight (the majority of traffic, primarily related to Germany) makes it possible that a substantial part of the complicated single wagon operations take place in another country. In this case, foreign single wagon providers (mainly rail incumbent operators) would be substitutes to DB Schenker, enlarging the relevant market to broader than Netherlands.

4.2.2 Full train load

In Table 4.2 we identified the various possible product market variations and how these depend on the key dimensions of distance and weight transported. A rail only product market was identified as possible where heavy loads were concerned but waterways did not provide coverage, and where light loads and long distances were involved. For shorter distances (200km to 750km) rail and waterways (for heavy loads) and rail and road (for light loads) were identified as two separate product markets. While we attempted an investigation along these key dimensions, exceptions to the described situations are likely to exist

Geographic dimension of rail only

In the rail freight industry, any rail operator can provide a full train load route service, according to respondents. This is because rail infrastructure is organised via an open process and any operator can access the timetable and specific routes.[124] This serves as evidence of supply side substitution that can be provided, in theory, by any number of foreign operators.

Such potential entrants may be based in the Netherlands or in another country and may be able to operate in the Netherlands as long as they fulfil two conditions: dispose of the required rolling stock and drivers with adequate qualifications to comply with Dutch regulations.

- The key issue for foreign firms entering the Dutch rail freight market is interoperability of the **rolling stock**. Unlike other industries, where capital stock is transferable across jurisdictions, differences in safety management systems in rail mean that locomotives used in France, for example, are unlikely to be compliant with Dutch regulations[125]. This means that they cannot be used in the Dutch market without modification.[126]
- Equally, drivers cannot be transferred seamlessly across countries, as drivers are required to be licenced in each jurisdiction separately and must speak the national language of the relevant jurisdiction in which they operate. There are strict regulations in place as to both the qualifications of the driver as

[124] There is no evidence in the responses that foreign operators would be restricted in obtaining track access due to the open access nature of the application process.

[125] One of the freight operators interviewed indicated that there is substantial variation in the types of locomotives that can be operated across different countries.

[126] This implies that a different "package" needs to be chosen when locomotives will be operating in different combinations of countries (e.g. Netherlands and Germany versus Netherlands, Germany and Poland). This is confirmed by other respondents who indicated that the majority of wagons that could be used in the Netherlands and Germany faced challenges when they needed to be operated in Belgium.

well as the language requirements which differ by country. Hence, depending on the combination of countries that the trains will be moving through, the requirements for the **drivers** can change.[127]

Interviewees have reported interoperability issues which are consistent with a national market definition.[128] However, while the presence of such interoperability issues is undisputable, we do not consider them insurmountable, given the evidence that the vast majority of rail freight traffic in the Netherlands is international as it crosses into the borders of other countries, in particular Germany.

There are other operational costs for full train load TOCs such as those associated with obtaining, either through purchasing or leasing, the required locomotives. Interview respondents have indicated that the norm in the industry is to lease locomotives, with only very few exceptions. We do not have any evidence to suggest that foreign firms would be unable to access through the leasing market Dutch-compatible locomotives.[129]

Finally, given that access to rail tracks is open and customers thus have the ability to choose among different operators, one would need to examine the capacity that other operators have to supply additional routes. Our interviewees have indicated that operators currently have spare capacity and this information indicates that they would be able to supply any route within the Netherlands if it was demanded. In cases of short term demand, interviewees have indicated that their companies can respond by rescheduling maintenance, hiring extra locomotives and drivers and by fully utilising their current personnel.[130]

The demand for freight services depends on a number of characteristics and in some occasions, the demanded characteristics may result in rail being the only realistic alternative (for example in situations involving very heavy loads over long distances that waterways might not cover). Transport in this group categories would imply that the relevant geographic market would be at least the Netherlands, and possibly broader than the Netherlands to include Germany.

However, there might be particular characteristics that generate exceptions by restricting supply side substitution. For these types of exceptions the geographic market could be defined by the relevant O&D.

Geographic dimension of rail and waterways

For heavy loads concerning routes that can be covered by waterways, a rail and waterway product market has been suggested.

Interviewees have indicated that, given their transport requirements, they view the different modes of transport as substitutes: particularly road and waterways. There are, however, supply side considerations which limit the scope for substitutability, especially in routes that are not covered by waterways.

We consider these exceptions to be limited, given the distribution of demand for rail freight moving through the Netherlands. In particular, between 2010 and 2013, domestic freight accounted on average for only 11 per cent of total transported cargo weight by rail. Waterways provide good coverage within the Netherlands, as they have a very dense network and can thus theoretically represent a viable substitute.

The majority of freight traffic demanded, however, is of an international dimension and is associated with the port of Rotterdam and, to a lesser extent, the ports of Amsterdam and Zeeland (Vlissingen, Terneuzen). Moreover, in 2013, 81 per cent of freight leaving the Netherlands went to a German

[127] For example, a train moving from the Netherlands through Germany and then Poland will need to be driven by a licensed driver who is able to speak each of the languages used to operate trains in each of the three countries.

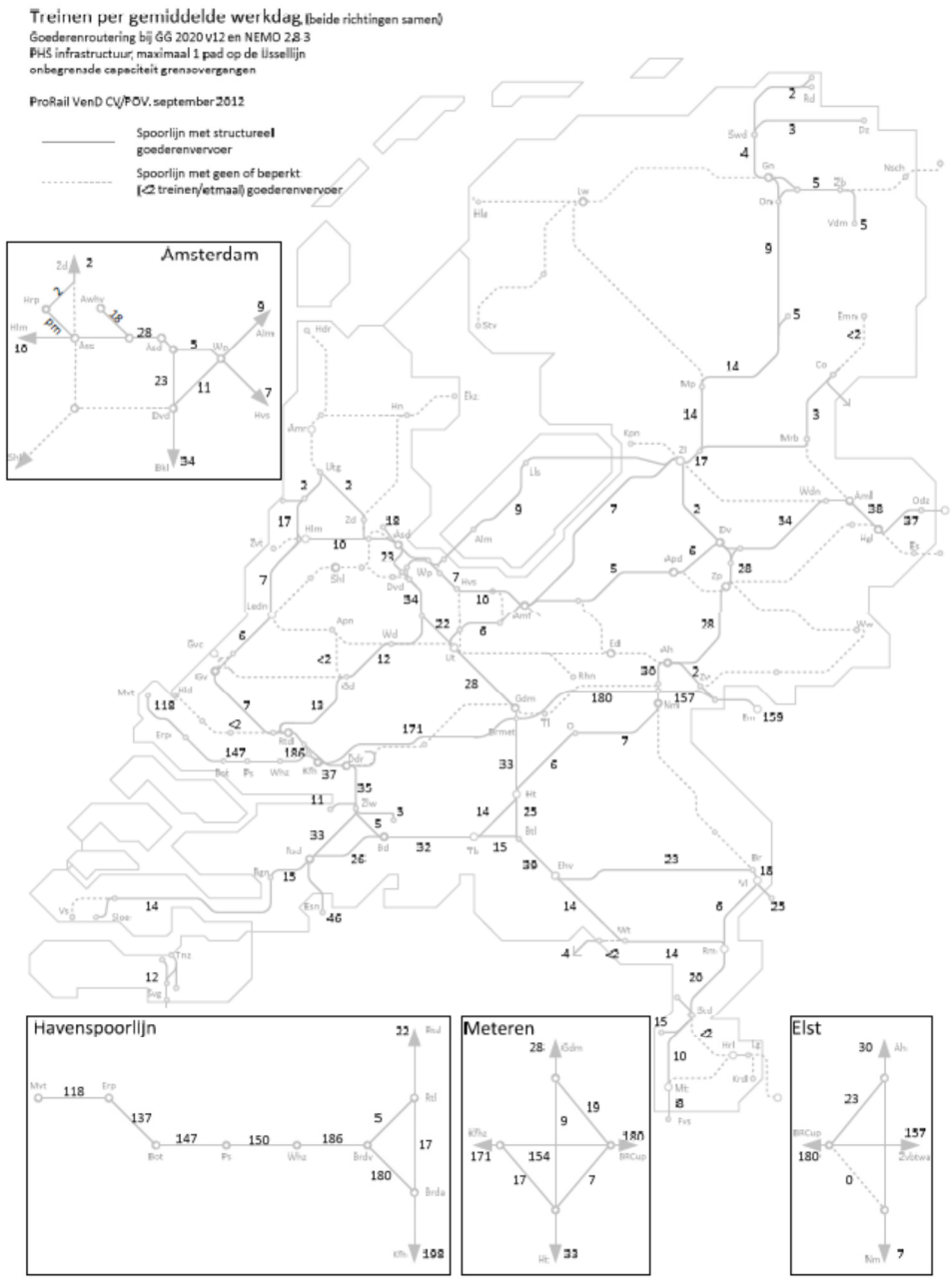
[128] Interoperability issues are perceived as barriers preventing foreign operators from "seamlessly" supplying cross-country services and as such narrow the boundaries of the relevant geographic markets.

[129] Indeed on the most common international routes, i.e. Netherlands-Germany, certain freight operators indicated that they used locomotives that are compatible across both jurisdictions. All operators we spoke to were able to transport freight between the Netherlands and Germany as a minimum.

[130] Two operators have provided specific figures of spare capacity of 10 and 30 per cent.

destination and 56 per cent of freight arrived at the Netherlands from a German origin. The number of freight trains on routes going to Groningen from the two main port cities (Rotterdam and Amsterdam) where waterway access may be more limited is in the order of less than 10 trains a day (Figure 4.2).

Figure 4.2: Number of freight trains per day



Source: ProRail (2013), "Verwerking herijkte goederenprognoses PHS". 22 March 2013.

Traffic from Rotterdam to Germany is almost entirely diverted via the Betuweroute and Emmerich (center) or Brabantroute (south) variant, and only 1% uses the Bad Bentheim north variant. For all rail routes in the centre and south, there are waterways moving in parallel directions crossings into Germany and are moving into similar areas. This is less so for the Brabantroute, even though the Rhine and the Meuse rivers are in

proximity, as shown in the figure below. Because the Betuweroute is considered representative of the majority of freight transportation demand associated to the Netherlands[131] the proximity of waterways to the routes that cross into Germany using the Betuweroute indicate that it provides a viable alternative (at least for a part of the destinations).

Figure 4.3: Breakdown of rail traffic leaving Rotterdam using the Betuweroute

Source: Keyrail (2014), "NDL Seminar, Verandering", Presentation by Max Philips, 20 November 2014.

For all rail routes in the centre and south, there are waterways moving in parallel directions crossings into Germany and are moving into similar areas. This would suggest strong substitutability between rail and waterways at a route specific level. For situation where the market is comprised of rail and waterways the relevant geographic market would include the part of Germany relating to these areas.

There are, however, caveats to considering the border crossings as the main dimension on which to conduct coverage comparisons: the longer the distance between the O&D pair, then the larger the comparative advantage of rail will be compared to other modes.[132] This indicates that a rail-only market may be appropriate for some routes. Given the large share of O&D pairs going through the Betuweroute, it seems that the number of cases including rail only may be limited.

[Question for consultation: Are there any relevant rail-route pairs outside the Betuweroute which cannot be serviced by waterways? How important are these (volumes, share)?]

Geographic dimension of rail and road

For the transportation of lighter loads over short distances (i.e. less than 750km) the relevant product market is rail and road. Road faces no country- or route-specific limitations that would impede it from providing a supply-side substitute to rail both at a national, international or route specific level. As such, there would be no national or route specific geographical limitation to a rail and road product market. Thus the geographical dimension of a rail and road market is likely to be broader than national.

[131] This is in line with data presented by ProRail on the breakdown of the number of tonnes transported through each border crossing, which shows that the most significant border crossing was at Zevenaar-Emmerich, 90 per cent of which was covered by the Betuweroute. Source: ProRail (2015), Ontwikkeling spoorgoederenverkeer In Nederland, p.24.

[132] Ideally, data on each specific O&D pairing would be used but given the lack of such data, information on the Betuweroute is used as a proxy of statistics on the main flows of freight.

4.2.3 Conclusion

In the market for single wagon services, the presence of road as a very flexible and relevant substitute is supportive of a broader than national level market. In cases where road does not present an alternative, national traffic would be best represented by a national market while when international traffic is concerned, the market can become larger than national (if supply is possible by incumbent operators from another country).

For full train load services, different product markets may exist depending on some dimensions (mainly weight and distance). Depending on weight and distance road and waterways are likely to compete with rail in some situations. In some other cases rail does not face competition from road or waterways (depending on characteristics of transport). The implications of these different product markets on the relevant geographical market are listed below:

- For a rail only product market the geographic market would be at least the Netherlands; there are, however, exceptions that could necessitate an O&D specific definition due to restrictions on supply side substitution.
- For a rail and waterways product market the relevant geographic market would include the Netherlands and the parts of Germany where the waterway network connections are denser.
- For a rail and road product market the geographical dimension is likely to be broader than national.

Due to limitations on the information on the freight market, it is not possible to be sure whether there are some national or international route-level relevant markets. Therefore, the analysis will focus on the potential for DB Schenker to be dominant in the alternative possible relevant market combinations (i.e. rail only, rail and waterways and rail and road) which is explored in the next chapter.

4.3 Key findings

This section outlines the main conclusions drawn from our research regarding the relevant product and geographical markets.

4.3.1 Product market

This section presents the various, potentially separate freight markets, as suggested by product differentiation.

Single wagon load traffic is likely to represent a separate market to whole train load traffic. A division between single wagon and full train load services was accepted as a possibility, but was left open in the European Commission's decision regarding the DB Schenker and PCC Logistics merger in Poland.[133]

As far as single wagon traffic is concerned, road is likely to be the main substitute due to its operational flexibility. However, in cases where road is not a competitive alternative to rail, then the market for single wagon traffic can be rail only.

For full train load services, we suggested three cases of different transport specifications that could represent separate markets:

- For bulk goods with heavy loads (e.g. over 100 tonnes):
    - the market is likely to be rail and waterways (although for distances with no or limited waterway coverage the market would be likely to be rail only).

[133] Case No COMP/M.5480 – Deutsche Bahn/ PCC Logistics Notification of 5 May 2009 pursuant to Article 4 of Council Regulation No 139/2004.

- For lighter loads (e.g. less than 100 tonnes) being transported over:
    - distances <750km, the market would include rail and road;
    - distances >750km, the market would include rail only.

The potential for additional subdivisions based on customers' speed and environmental requirements as well as for customers having a rail terminal on site was acknowledged for special cases, but lack of information did not allow for an assessment of its significance.

Inter-temporal preferences do not appear to be an issue as far as rail freight is concerned.

Our product market analysis is supported by regulatory precedent. Regulatory precedent based on the relevant European Commission's decisions, has indicated that the different modes of transport are not all "generally" substitutable and that, as already reflected in our analysis, substitutability will depend on the customer's location and the transportation specifications.[134] This rationale supports the potential existence of separate markets as presented above.

- According to a 2007 case: "There are indications that rail presents certain characteristics which may make it most suitable/economically feasible for the transport of goods under certain conditions, i.e. in particular for bulk and heavy goods (coal, iron, oil), larger amounts and longer distances and customers with rail access."[135]
- In two competition cases related to DB Schenker acquisition activity, the market investigation indicated that at least partial substitutability exists between rail and road. The factors mentioned to be limiting road as a substitute to rail were the size of the order, the transportation of hazardous goods and environmental considerations.[136]
- However, a common theme among the examined precedent set by DB Schenker competition cases regarding its freight activities is well reflected: "[…] there are strong indications that, depending on the geographic and other circumstances, a separate market for rail freight services may be distinguished."[137]

4.3.2 Geographic market

The relevant geographic market analysis focuses on supply side substitution, i.e. whether any supplier is capable of providing such service, either in rail or using other modes of transport. This is because, depending on the product market in question, the barriers for provision of the different routes can be low. There will, naturally, be cases where barriers are not low and where substitutability is not possible.

An origin and destination approach was initially explored and its potential was recognised; while a number of routes can be covered by more than one modality (or by more than one rail operator) there can always be exceptions where supply side substitution may not be possible. In such cases route-specific markets may be considered as relevant markets. As there is insufficient information to assess the frequency and significance of such cases the relevant geographic market analysis focuses, primarily, on the geographic

[134] This is mentioned in a number of cases that link to each other such as: Case No COMP/M.5480 – Deutsche Bahn/ PCC Logistics Notification of 5 May 2009 pursuant to Article 4 of Council Regulation No 139/2004; Case No COMP/M.4746 DEUTSCHE BAHN / ENGLISH WELSH & SCOTTISH RAILWAY HOLDINGS (EWS), Notification of 14 September 2007 pursuant to Article 4 of Council Regulation No 139/2004; and Case No COMP/M.4786 - DEUTSCHE BAHN/ TRANSFESA Notification of 12 February 2008 pursuant to Article 4 of Council Regulation No 139/2004.

[135] Case No COMP/M.4746 DEUTSCHE BAHN / ENGLISH WELSH & SCOTTISH RAILWAY HOLDINGS (EWS), Notification of 14 September 2007 pursuant to Article 4 of Council Regulation No 139/2004.

[136] Case No COMP/M.5480 – Deutsche Bahn/ PCC Logistics Notification of 5 May 2009 pursuant to Article 4 of Council Regulation No 139/2004 and Case No COMP/M.4786 - DEUTSCHE BAHN/ TRANSFESA Notification of 12 February 2008 pursuant to Article 4 of Council Regulation No 139/2004.

[137] Case No COMP/M.4746 DEUTSCHE BAHN / ENGLISH WELSH & SCOTTISH RAILWAY HOLDINGS (EWS), Notification of 14 September 2007 pursuant to Arwticle 4 of Council Regulation No 139/2004, p.5.

dimensions of the key market subdivision suggested by our product market investigation, between single wagon load and full trainload.

In the market for single wagon services, the presence of road as a very flexible and relevant substitute is supportive of a broader than national level market. In cases where road does not present an alternative, national traffic would be best represented by a national market while when international traffic is concerned, the market can become larger than national (if supply is possible by incumbent operators from another country).

For full train load services, different product markets may exist depending on some dimensions (mainly weight and distance). Depending on weight and distance road and waterways are likely to compete with rail in some situations. In some other cases rail does not face competition from road or waterways (depending on characteristics of transport). The implications of these different product markets on the relevant geographical market are listed below:

- For a rail only product market the geographic market would be at least the Netherlands; there are, however, exceptions that could necessitate an O&D specific definition due to restrictions on supply side substitution.
- For a rail and waterways product market the relevant geographic market would include the Netherlands and the parts of Germany where the waterway network connections are denser.
- For a rail and road product market the geographical dimension is likely to be broader than national.

5 Dominance in Freight Market

One of the key findings of the relevant market analysis was that, depending on the variation of the transportation specifications[138] and the customer profile, only few different relevant product market definitions can be relevant. The approach to assessing dominance in each of these markets would be to get a complete breakdown of different operators' operational data in each of these market segments. However, the data we have available only relates to aggregate information regarding rail freight transported through the Netherlands and to company-specific data obtained from Dutch rail freight operators (e.g. relating to their aggregate annual accounts).

The analysis presented below will make use of the available data, which will provide an indication of the competitive situation between rail operators in the Netherlands. This analysis can be used to draw information on the competitive forces that are in play and can be used to reflect on their implications for each of the considered relevant markets. However, as the analysed data does not cover the specific market subdivisions that have been identified, implications of the analysis on these specific markets is formulated cautiously.

We consider the scope for DB Schenker to hold a dominant position in the Netherlands under a rail only, a rail+waterway and rail+road scenario. This consideration is motivated by the fact that DB Schenker is the largest player in rail freight in the Netherlands. Each of these scenarios will be relevant for some of the relevant product market definitions. In doing this we will explore:

- What proportion of the market they hold and how concentrated is the market?
- Does their market share offer them competitive advantages over potential competitors (i.e. as a result of countervailing buyer power and the existence of economies of scale and/or scope)?
- What barriers to entry/expansion to the relevant market exist (i.e. length of concessions, switching costs for users, access to technology etc.)?
- Does DB Schenker have a privileged position, for example control over infrastructure that cannot be duplicated easily, access to capital markets or financing, and/or superior technology?
- Does DB Schenker benefit from vertical integration?

5.1 Rail only

As identified in section 4, there are certain markets where there are unlikely to be close substitutes for rail freight transport and as such the market would be covered by rail only. In particular, our research suggests that the following rail-only markets are possible:

- light loads (less than 100 tonnes) over long distances (greater than 750km); and
- heavy loads (more than 100 tonnes) to destinations that waterways do not cover.

In this section we explore whether DB Schenker might enjoy a dominant position in these two markets. Due to the lack of more granular data, however, our exploration will be based on data related to the aggregate rail freight market in the Netherlands.[139]

[138] Specifications refer to factors such as the type of cargo, the mode of transport and the destination of cargo.

[139] We have also identified that potential subdivisions also exist where transport specifications may lead to a market being rail only but that would be a case-by-case consideration. In particular, these additional rail only subdivisions could include: a market for high-speed transports; a market for transports with environmental credentials; and a

5.1.1 Market share

Market share analyses are a useful first indication of the relative importance of each firm in the relevant market. When examining market shares, factors that are important include the distribution of market shares and, notably, the persistence of high market shares while other players in the market have persistently low shares. The volatility of market shares across time, however, can indicate that rivalry is present or that new smaller firms are able to grow. The European Commission's dominance assessment procedures indicate that market shares of less than 40 per cent are seen as unlikely to indicate dominance.[140]

Table 5.1 presents information on DB Schenker's market share in the Dutch rail market during 2011 to 2013 and has been obtained from IRG Rail. The information presented covers DB Schenker's market shares using three different measures: its percentage of Dutch train-kilometres, its percentage of Dutch gross tonne-kilometres and its percentage of the total access charges paid. All figures relate to total traffic in the Netherlands, they are therefore inclusive of national and international (incoming, outgoing and transit) freight transport.

Since liberalisation of the rail market in 1995, and starting from a single player in 1998 to more than 12 in 2007, new operators have been successfully entering the Dutch market. As a result of this, DB Schenker's divestment in national traffic[141] and DB Schenker's bundling of single wagon services, national market share has decreased substantially: from 82% in 2006[142] (67% in 2008) to 48% of gross tonne-kilometres in 2013. In the period for which IRG data is presented, total tonnage of freight transported has been dropping indicating that competitors have been capturing market share that previously belonged to the incumbent.

Table 5.1: DB Schenker market share (for rail only market in the Netherlands)

Measure of market share	Tonne-kilometres (gross) %	Track charges paid %	Train kilometres %	Total tonne-kilometres transported in the Netherlands (millions)
2011	63	59	58	6,378
2012	62	56	56	6,142
2013	48	51	49	6,078

Source: IRG Rail, February 2015.

Desk research and the feedback from interviewed organisations identified the following notable operators in the Dutch rail freight market: DB Schenker, B logistics, Captrain, ERS, Locon, RheinCargo, and RRF. Information collected from our interviews, conducted in early 2015, indicated that the industry has been consolidating around fewer players, and it is expected to consolidate even further. This has resulted, according to one interviewee, to DB Schenker holding the majority of the Dutch market in terms of domestic revenue (55-60 per cent), and Locon representing the next biggest firm (with around 15 per cent of domestic revenues) with another three companies each having roughly another 10 per cent of revenues

market for transports where the customer has a rail terminal on site. Because these are likely to be small, they are not considered in this part of the analysis.

[140] European Commission: http://ec.europa.eu/competition/antitrust/procedures_102_en.html, visited on 01/05/2015.

[141] IRG (2015), "3rd Annual market monitoring report", Independent regulators' group – Rail, p.14 and p.33.

[142] CER (2013), "Rail freight status report: Rail freight after a decade of EU rail policy", April 2013, p.43.

each, according to industry estimates (Table 5.2).[143] An important characteristic of TOCs operating in the Netherlands is that they are all subsidiaries of foreign or international companies.[144]

Table 5.2: Market share data collected from interviews

[confidential:

Operator	Turnover (2013) (€ million)	Share of turnover** (%)
DB Schenker		[55e-60e]**
Captrain		
RRF		
B Logistics		
Locon		**]**

Note: DB Schenker's turnover figure is for their rail operations only. ** This is an estimate provided by interviewees and reflects their latest understanding of the market.
Source: Data provided by the firms themselves.

To conclude, DB Schenker retains a significant share of the Dutch rail freight market (covering international and having recently decreased its activities in national routes): approximately 50 per cent based on IRG data and around 60 per cent based on interviewees' responses. The decline in the firm's market share is noticeable and could indicate a high degree of competitive pressure from other rail operators. Moreover, additional evidence examined, such as the number of active operators and feedback from interviews, has suggested that entry in the market is possible and a number of companies have been successful in entering. In particular, the example of Locon, entering the market in 2011 and managing to capture 15 per cent of the market share, would suggest that entry and subsequent growth in the market is possible.

There is an important consideration to be made when using these figures for the analysis of the rail market. If single wagon services are excluded (because they are seen as representing a separate market) DB Schenker's rail-only market share estimates shown above would have to be corrected. But even assuming that single wagon accounts for **[confidential:]** of DB Schenker's activity [145], its market share in 2014 would still be quite high: **[confidential:]**. The market shares of competitors only active in full train loads would be higher than shown above.

[Question for consultation: What is the approximate share of rail freight volume that was transported via single wagon?]

5.1.2 Entry or expansion barriers

As indicated above, the first years of liberalisation witnessed a number of new entrants to the Dutch rail freight market. Between 1998 and 2006 eleven inland and foreign operators entered the Dutch rail network market. This would suggest that there were no significant barriers to entry for firms wishing to start operating in the rail freight market. Some additional evidence is provided in the Rail Liberalisation

[143] This is based on one interview response where the market mentioned was understood to be a Dutch market for rail freight.

[144] RRF is owned by Genesee & Wyoming (a US company), Captrain is owned by SNCF Logistics (France), DB Schenker Rail Netherlands is part of the international DB Schenker group, B Logistics is largely owned by SNCB Logistics and a private investor and Locon is the Dutch subsidiary arm of the German Locon entity.

[145] **[Confidential:]** of the DB Schenker's wagons are used for single wagon services , according to industry sources.

Index developed by IBM: in 2011[146] shows Netherlands in the group of advanced countries along with Austria, Denmark, Germany, Sweden, and the United Kingdom, which is indicative of a comparatively position of low barriers to entry for the Netherlands when compared with other countries.[147]

However, in order for new entrants to become an effective competitive constraint they would need to be able to attain a large enough scale in the market in order to have a competitive impact on the undertakings that were already in the market. To that end, barriers to expansion (which are strongly associated with barriers to entry) are also an important consideration.

In this section we consider the following key potential barriers to entry in the Dutch rail industry:

- access to infrastructure;
- access to capital stock; and
- tendering processes.

Access to infrastructure

In the previous paragraphs, we described how the track capacity allocation system is operated and highlighted the role of the timetable process. TOCs that finalise their business arrangements after the annual timetable allocation deadline[148] are hence faced with the following options: rely on the ad-hoc allocation system and only apply after the business opportunity is secured; or apply for a slot during the annual timetabling process which they can either exploit later if successful or cancel if unsuccessful.

While this system can generate uncertainty for the TOCs' planning process and can create issues when there are multiple competitors who request allocation prior to securing the business opportunity, access to specific freight routes does not appear to be a key concern. The system of "authorised applicants", where the end user of the rail services is able to apply for capacity which is then allocated to the TOC of their choice, can also help to reduce such uncertainties. Ultimately, there is little evidence that the allocation process itself creates barriers to entry for train operators.

Of greater concern is the ability to access the track during certain time periods, on routes that also carry passenger traffic. In routes that are not freight specific (i.e. all routes, except the Betuweroute), freight traffic has to compete with passenger traffic for track allocations. One of the interviewees indicated that there is no discrimination for getting access to the infrastructure and that the challenge lies primarily in getting a specific time and route allocation because of conflicts with passenger traffic. The same source indicated that there are sometimes issues with accessing intermodal terminals in Rotterdam, but did not indicate that this would disproportionately affect the entry of new players.

Access to capital stock

TOCs need to have access to two vital components in order to be able to operate: locomotives and wagons. In many cases wagons are provided by the customers but when this is not the case TOCs need to be able to cover this customer need. As is the case with production means in general, wagons and locomotives can either be leased or purchased.[149]

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[146] This index is comprised primarily (80 per cent of its value) by an assessment of various barriers to entry (administrative and operational barriers) and of the share of the market that is considered accessible; and an assessment of infrastructure managers' and rail users' vertical separation and an examination of the regulatory framework governing market access and the power of market authorities (20 per cent). IBM (2011), "Summary of Study. Rail Liberalisation Index 2011", Brussels, April 2011, and CERRE (2014), "Development of rail freight in Europe: What regulation can and cannot do", CERRE Policy Paper, December 2014.

[147] The country-specific breakdown of components of the index is not publicly available.

[148] As indicated by one of the respondents.

[149] Purchasing a locomotive has elements of a sunk cost, i.e. a cost that has already been incurred and is not considered recoverable.

In terms of access to locomotives via the leasing market, generally there was the consensus that this was reasonably easy, with a number of firms offering such services.[150] Access to locomotives was cited as more problematic when multiple countries were involved in the route, as this means that locomotives must comply with regulations across a number of jurisdictions, which can make them harder to obtain, or in any case, more costly to obtain.

In terms of wagons, all operators indicated that leasing wagons is necessary for their interactions with some clients, but only one operator indicated that access to specialised wagons can be a significant issue, particularly in cases of specialised chemical wagons. The companies in the locomotive leasing business also offer wagon leasing options and there are two major players, operating in both the Netherlands and Europe, who specialise in wagon leasing: AAE (Ahaus Alstätter Eisenbahn AG) and GE Capital Rail Services.

There is limited evidence to suggest that new entrants or current operators would have any difficulty in accessing the required capital stock to offer rail freight services in the Netherlands. **[Confidential:**

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Tendering processes

Our interviews with TOCs and rail freight organisations indicated that contracts for full train load traffic are often put out to tender on an annual basis, which suggests that contracts are awarded on a competitive basis. It has also been indicated that customers are in general loyal to their preferred TOCs (having established long-term relationships) which make contracts unlikely to be terminated unless there are issues with the fulfilment of a contract or a competitor offers a substantially lower price. However, this was mentioned by only two of the respondents.[151] It was also mentioned by one operator that offering lower prices is practically difficult as current competitors for full wagon load traffic face very similar costs and they would be unable to undercut prices to a significant extent.

Conclusion

A number of freight operators have succeeded in entering the full train load market since its liberalisation. This would suggest that the barriers to enter the rail freight market in the Netherlands are not prohibitive, at least in some segments of the market (particularly for large businesses already active in similar markets in other European Member States). As such, a credible threat to entry can be perceived as a constraint on the market power of any one firm. Moreover, a significant number of other rail freight operators continue to operate in the market, even if that is only in the full train load service area (to include received information on ERS entry and exit). **[Confidential:**

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5.1.3 Implications of being a large operator

This section explores how being a large provider can offer competitive advantages that are merely achieved because of the size of the entity. These comparative advantages, if excessive, can impede both current and

[150] There is currently a competitive locomotive leasing market across Europe with a number of key players offering leasing services to train operating companies. It should be noted that most of these companies offer wagon leasing options as well. Some of the key players in the market are: Mitsui Rail Capital Europe BV (MRCE); CBRail (Ascendos Rail Leasing); Akiem SA; Railpool; Alpha Trains.

[151] These two respondents amass a joint **[confidential:]** per cent of the Dutch rail only market in terms of revenue based on market share estimates provided by another interviewee.

potential competition. For example, even if there are no barriers to entry, if larger operators enjoy a comparative advantage, this may be sufficient to dis-incentivise entry and allow a firm to hold a dominant position.

Economies of scale

Economies of scale are relevant for companies that experience a decreasing average unit cost for larger levels of production. In the context of competition analysis, if economies of scale are present, then large operators, such as DB Schenker gain a substantial comparative advantage relative to smaller operators, who have to face a relatively higher cost structure.

Based on feedback from our interviews (and as indicated earlier), the norm in the industry is to lease locomotives and, where necessary, wagons, from leasing companies. Indeed, even DB Schenker's rail operator leases its locomotives from DB Schenker Deutschland. As such, because these costs are incurred upfront (i.e.: they are sunk), any benefit of being a large operator would only arise to the extent that larger operators can negotiate better rates from leasing companies, or they can make more efficient use of the rolling stock they lease.[152]

[Confidential:

].[153]

There is some support for economies of scale being present in rail freight in the literature, but the importance of size is typically placed not on the number of locomotives and wagons, but rather on the length of the train that is used (with the longest possible trains being the best utilisation option)[154]. However, we have seen no evidence that larger operators are better placed to maximise the utilisation of a locomotive.

One interviewee indicated that, for distances greater than 800km, the frequency in container shuttle trains must be more than one train a day in order for companies' offering to be competitive. It was also mentioned that one of the main challenges for intermodal shuttle trains is that they need to have at least 80 per cent of all slots on the trains fully booked in order to cover the operational costs., These issues, however, are experienced both by large as well as smaller operators.

In the context of the Dutch rail freight market, there is therefore limited evidence to suggest that a larger operator would benefit from any economies of scale in full train load traffic at least. The only exception would be the capacity of DB Schenker to influence the leasing market by effectively reducing the available supply of locomotives (based on one interviewee, and mentioned as a barrier to capital stock).

Countervailing buyer power

In a market where one undertaking may have significant power, countervailing buyer power can serve to constrain the undertaking's market power.[155] This type of buyer power essentially refers to the ability of buyers to counter behaviours that source from a company's dominant position.

Our interview with DB Schenker Rail Netherlands did not allow us to make any assessments its types of customers. Our completed interviews with smaller operators indicated that their customer base was a dispersed one. Although customers could use logistics operators who are likely to be relatively large

[152] Leasing costs are incurred at the beginning of financial years for the entire period and as such they represent a "sunk" cost of a fixed nature.

[153] **[Confidential:]**

[154] Pienaar, W. J., "Salient Economic Features of the Modes of Freight Transport for Consideration in the Formulation of National Transport Policy", Department of Logistics, Stellenbosch University, South Africa

[155] Countervailing typically is used to describe the ability of large buyers in concentrated downstream markets to extract price concessions from suppliers.

organisations and can therefore provide a degree of countervailing buyer power, the limited evidence is suggestive of lack of countervailing buyer power.

Conclusion

There is some evidence to suggest that a large provider operating in the Dutch rail freight market would enjoy a dominant position, which, in DB Schenker's case, were to happen through its influence on the locomotive leasing market. However, most respondents have not expressed significant concerns about the leasing market, albeit that they accept the significant leasing costs to be part of their total cost basis.

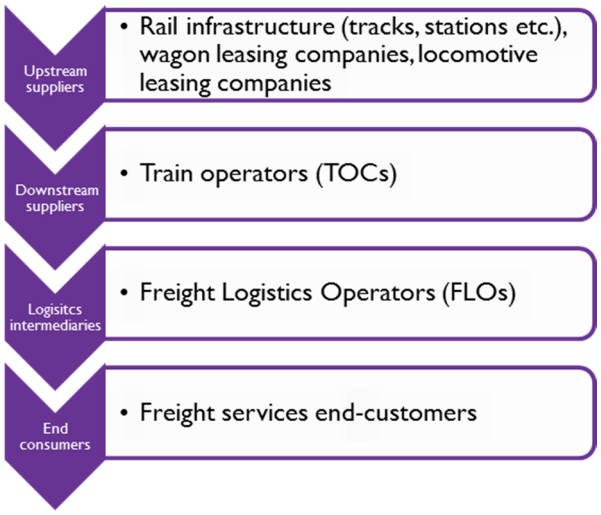
On the other hand, economies of scale do not appear to confer upon DB Schenker a significant advantage over its competitors.

5.1.4 Implications of vertically integrated structure

The figure bellow illustrates a simplified version of the rail freight supply chain. The rail freight industry comprises infrastructure providers and leasing companies, train operating companies, and logistics companies. When suppliers from each level form one organisation the structure can be called vertically integrated.[156]

When companies are vertically integrated, competition can be limited if these entities are dominant enough in other parts of the supply chain in order to affect their competitors' access conditions. Dominant entities that monopolise parts of the supply chain have the power to exploit their position and impede competition.

Figure 5.1: Simplified scheme of vertical supply chain.



DB Schenker is present in the upstream supplying segment since it has been given the right to exploit the economic value of the service infrastructure, and as such, they may manage it de facto. The management of the service infrastructure in the Netherlands is currently regulated ex post and is to be regulated – at least partially - ex ante in the future by ACM which serves as implicit recognition that DB would, in theory, be in a position to discriminate in providing access to other operators. To this end, they are required by regulation to provide non-discriminatory access to the service infrastructure.[157] Our interview with DB

[156] Many vertical agreements may be beneficial or benign, especially if there is effective competition at both the upstream and downstream levels. However, vertical integration may affect entry barriers. For example, a manufacturer might have a series of exclusive purchasing agreements with most retailers in a particular geographic market. This might limit the ability of a new manufacturer to operate on a viable scale in that market and therefore deter entry.

[157] This is governed by *Spoorwegwet* (the Dutch Railway Act), articles 1 and 67.

Schenker did not allow us to determine which parts of the service infrastructure they are responsible for managing.

However, interviewees have provided very limited indication of access issues to service infrastructure, so we consider the first segment of the supply chain to be of limited relevance for a finding of dominance.

In relation to the leasing market for locomotives and wagons, one respondent indicated that they are not able to lease wagons through DB Schenker, as it is their company policy not to lease to competitors. **[Confidential:].** Other respondents have noted that they own locomotives and that they are able to lease additional ones without referring to any issues with accessing the leasing market.

The DB Schenker group is also active in the logistics segment of the supply chain. We would consider the logistics market for freight transport to be a relatively mature and competitive market, but we have not been able to find proof in our interviews with various operators.

Conclusion

DB Schenker's market position appears enhanced by the group's presence in both the upstream and downstream parts of the supply chain. However, despite their presence at these levels of the supply chain there is limited evidence that this position results in creating barriers for potential entrants or competitors who require access. **[Confidential:].**

[Question for the consultation: In general, there are no substantial indications of vertical integration issues; we would, however, like to know more about issues with accessing the service infrastructure and the leasing markets.

We would also like to know whether DB Schenker's vertical integration brings it to an advantageous position compared to other operators.]

5.1.5 Conclusions

In rail only markets, the following factors suggest that DB Schenker may have some degree of market power in a rail only market:

- It still retains a significant share of the Dutch rail freight market (covering national and international routes): approximately 50 per cent depending on the measure used. Although this market share estimate is likely to be inflated (as it includes single wagon services, which belong to a separate market) with and assumption that single wagon account for **[confidential:]** of DB Schenker activity, its market share in 2013 would still be quite high: around **[confidential:]**.
- **[Confidential:]**[158];
- **[Confidential:]**[159] and
- the vertical integration of the business with respect to the service infrastructure.

- On the other hand:

[158] **[Confidential:]**
[159] **[Confidential:]**

- A number of freight operators have entered the market since liberalisation, suggesting that barriers to entry are not too high. One operator has managed to secure 15% of total turnover in just four years (entered the market in 2011);
- Other rail freight operators continue to operate in the market, even if only the whole train load service area.
- DB's market share has been stable at its lowest recent levels (according to data collected from the consultations) and while this has coincided with an economic crisis, the volume of rail freight more broadly has increased since 2009.
- Given the separation of infrastructure and operations there are no substantial benefits of being a large provider.

5.2 Rail and road

There are certain markets where road haulage is likely to represent a close substitute for rail freight transport. Our research suggests this would be the case in:

- single wagon rail services; and
- transportation of light loads (less than 100 tonnes) over not too long distances (shorter than 750km).

In this section we explore whether DB Schenker might enjoy a dominant position in such markets.

We note that while it would be more appropriate to consider the market for single wagon load traffic as a separate market, in the absence of data on the share of revenue from single wagon load versus full train load, we have not been able to estimate the market shares of these distinct products.

We do, however, know that DB Schenker is the sole operator in the Dutch market offering single wagon load services (although there are indications of new players entering this market). As such, DB Schenker has one hundred per cent of the rail part of the single wagon load market (whose size is undefined) but it is unclear what share of the market DB Schenker has of the whole market for single wagon load traffic when single wagon load rail is considered in conjunction with road freight.

Although we have no market data of DB Schenker in the road market, if the market share is small (for example below 20 per cent), because of the large size of the road market, this would imply that the aggregate market share of rail and road would be considerably closer to the road levels rather than the rail levels.

5.3 Rail and waterways

Based on our findings in section 4, there are certain markets where waterways are likely to be represent a close substitute for rail freight transport. In particular, our research suggests that as long as waterways provide coverage the market for heavy loads (over 100 tonnes) is likely to be rail and waterways.[160]

Our current understanding is that DB Schenker is not active in providing inland waterway transportation and, given the relative size of the waterway freight market compared to rail, it is unlikely that DB Schenker would have substantial market share and therefore any significant market power.

5.4 Key findings

In rail only markets, the following factors suggest that DB may have some degree of market power.

- It still retains a significant share of the Dutch rail freight market (covering national and international routes): approximately 50 per cent depending on the measure used. Although this market share estimate is likely to be inflated (as it includes single wagon services, which belong to a separate market) with and assumption that single wagon account for **[confidential:]** of DB Schenker activity, its market share in 2013 would still be quite high: around **[confidential:]**.
- the vertically integrated nature of the business with respect to leasing of rolling stock (**[confidential:]**);
- there is some evidence that their presence in the locomotive leasing market has been restricting supply and driving up prices for competitors; and
- the vertical integration of the business with respect to the service infrastructure.

On the other hand:

- A number of freight operators have entered the market since liberalisation, suggesting that barriers to entry are not prohibitive.
- Other rail freight operators continue to operate in the market, even if only in the whole train load service area.
- DB's market share has decreased or at least remained been stable at its lowest recent levels (according to data collected from the consultations) and while this has coincided with an economic crisis, the volume of rail freight more broadly has increased since 2009.
- Given the separation of infrastructure and operations, there are no substantial benefits of being a large provider.

The presence of significant market power is more likely in the single wagon load market (where currently no competitors are active in the Netherlands), but because of the relative size of road market (and given that approximately no operator holds more than 20 per cent in the road market) the market share of DB Schenker is likely to be small, even after considering a geographic market defined as international or Dutch-German market. This is indicative of no existence of significant market power.

[160] Further subdivisions of this market were explored in the product market definition section (e.g. for speed, environmental or rail facility on site reasons) but were left open.

Lastly, there is limited scope for DB Schenker to have significant market power, where the market is comprised of both rail and waterway modalities, i.e. where these modalities overlap in terms of functionality.