

Market power in infrastructures: regulation versus competition law¹

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Abstract

Since a number of years, sector-specific regulation has been implemented in network industries as electricity, gas, railways and telecommunications all over the world. In several of these industries, questions have arisen whether the regulation has to be extended even more, while in others the issue is whether regulation can be phased out, restricting the supervision of the market entirely to antitrust and merger control. In order to answer these questions, one has to analyse whether structural (exogenous) entry barriers exists in addition to the costs and benefits of specific regulatory measures. We apply this framework to five different network-industries in the Netherlands: gas, electricity, airports, railways and telecommunication. In all of these industries, competition is restricted because of (different types of) entry barriers, limiting the effectiveness of competition law. We find, however, different conclusions on the merits of (additional) regulation. Regarding airports, we see indications that in particular OD-passengers benefit from price regulation, while in the energy wholesale markets regulation should focus on entry conditions. Extending regulation in the railway industry towards the relationship between the main-network operator and the regional operators might benefit the latter without, however, raising consumer welfare. In telecommunication, the emergence of alternative infrastructures reduces the dominant position of the incumbent but regulation of some markets seems still to be efficient.

1. Introduction

Because of the micro-economic paradigm that a decentralised organisation of the economy results in better welfare outcomes than a centralised one, it is often said that ‘competition is the best regulator’ (see Baldwin et al., 1999). However, competition fails, or markets may not even exist, in the case of public goods, externalities, information asymmetries and market

¹ The views expressed in this paper are those of the authors and do not necessarily reflect those of the NMa; in addition, they do not constitute any obligation on the NMa.

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power. In all these cases, government intervention might be efficient. In this paper, we focus on market power as one specific cause for such intervention.

Market power might result from several factors, to be divided into natural monopoly, legal monopoly and other factors.⁴ A natural monopoly is a monopoly that is the result of subadditivity of costs. A legal monopoly follows from the legal privilege to be the one and only producer of a certain product.⁵ Other sources of market power are superior competition, mergers and agreements on the one hand and ‘imperfect competition’ on the other. In all these cases of market power, except for ‘imperfect competition’ there can be adverse effects on consumers that can theoretically be remedied by government intervention.⁶

The general method to intervene in markets in order to restore adverse effects of market power is applying competition law. Competition law generally prohibits abusive behaviour by dominant firms⁷ or the creation of market power by agreements between firms (generally by competitors) or the creation of (additional) market power by mergers. The application of competition rules has been effective, as is shown by calculations for a number of countries. The OFT (2005), for instance, estimated total consumer benefits of approximately 750 million pound in British markets for the period 2000 – 2005. For Dutch markets, Kemp et al. (2011) estimated that consumer welfare increased by approximately 100 million Euro as result of application of competition rules in 2010⁸.

Despite these significant positive effects, competition law is not suited to improve competition in all circumstances. Competition law is not equipped to regulate behaviour effectively or efficiently. This holds true in particular in the case of natural monopolies in network infrastructures, where strong economies of scale hamper the entry of new firms, giving the incumbents a structural dominant position. In such cases, regulatory measures have been implemented in many countries. These measures are meant to restrict the (pricing) behaviour of the incumbent as well as to enable market players on related upstream or

⁴ Market power can be simply defined as the ability to raise prices above marginal costs.

⁵ Note that exclusive legal production rights can also be given to a limited amount of firms in which case there is no ‘monopolist’.

⁶ If competition is ‘imperfect’, prices are likely higher than marginal costs. Although this also leads to welfare losses, generally speaking, it is not warranted to remedy these welfare losses as the costs of intervention probably exceed the benefits.

⁷ Dominance being “considerable market power”, or loosely speaking, the absence of effective competition for a considerable amount of time.

⁸ This *outcome* consists fully of direct effects of interventions through merger assessments and antitrust measures. As indirect effects like deterrence effects and dynamic effects are excluded, the real outcome can be much higher.

downstream markets to use the network infrastructure of the incumbents.⁹ As industries and markets evolve over time, the need for and efficiency of sector-specific regulation may change. Technological developments, for instance, may reduce economies of scale making an incumbent less powerful on its markets. The latter also happens if consumer preferences change, reducing the economic damage of an old incumbent abusing its market power. On the other hand, if changes in supply or demand conditions make general competition rules less effective, introducing regulatory measures might have positive net benefits for consumers

Several factors influence the optimal choice between regulatory intervention and applying general competition rules (see Armstrong et al., 2006).¹⁰ Resource constraints limit a regulator in gathering important information and monitoring the regulated firm, which renders applying competition monitoring more attractive. On the other hand, there are a number of potential benefits of regulation as compared to applying competition law only (Oxera (2004). A regulator can be more proactive, taking action before a problem arises. It can also focus on consumer interests or public interest without necessarily promoting competition. A regulator may have more options to intervene in the market, while a regulator may also have a role in stimulating competition where no actual competition exists. Finally, a regulator generally has greater sectoral expertise and more information about the industry than the competition authority. Regulatory intervention, however, may create significant costs, not only administrative costs, but also indirect costs consisting of market distortions.¹¹ Therefore, the final decision on to regulate or not should, economically, depend on these costs and the benefits of regulation compared to the counterfactual where just general competition rules are applied (see Oxera, 2004; Tirole, 2011).

In this paper we define a framework which will be applied to a number of network industries: wholesale gas market, wholesale electricity market, airport, railways and telecommunication. In all of these industries, one or more firms have more or less a dominant position, enabling them to charge prices above competitive levels. We will analyse whether the current choices regarding regulatory intervention versus applying competition rules are still efficient. We start

⁹ Note that sometimes also regulated behaviour has been subject to competition law; see e.g. Deutsche Post and Telefonica.

¹⁰ Note that competition and regulation can also be complements (Brennan, 2003). This is the case if regulation of one market enables competition in other markets (for example access regulation of an electricity network enables competition in the electricity retail market).

¹¹ See for instance Guash and Hahn (1997) stating “regulation aimed at controlling prices and entry into markets that would otherwise be workably competitive is likely to reduce the average standard of living.”

by exploring the theoretical concepts of competition policy and regulation in Section 2. Afterwards we apply the theoretical framework to five network industries in Section 3. Section 4 concludes.

2. Theoretical framework

2.1 Objectives and benchmarks

Competition authorities and market regulators are generally assumed to pursue maximum social welfare or consumer welfare.¹² In standard-microeconomic theory, the notion of ‘perfect competition’ describes the conditions for maximizing welfare. These conditions include a decentralised economy where agents are free to decide, based on full information, on production and consumption. This notion of perfect competition is not meant as a description of actual markets, but as the ultimate benchmark for welfare in the static sense. In reality, markets are never perfect. So, optimal competition deviates from perfect competition because of the existence of many imperfections, like for instance imperfect information.

If markets do not enable people to engage in mutually beneficial transactions in a satisfactory way, market failures may exist. It is, however, important to realise that economic agents are innovative in overcoming market imperfections, by finding private solutions or public solutions to market failures (see e.g. Teulings et al., 2003). A private solution to uncertainty, for example, is the specification of contracts that determine the outcome of transactions for various contingencies. Contracts are thus ways of dealing with uncertainty. Contracts are in particular important in the case of investments in infrastructures because of the long-lead time and asset-specificity: long-term contracts are a means to solve the hold-up problem. An example of a public solution to free-riding problems (originating in case of the provision of public goods) is the creation of a tax system from which public goods are financed. A common feature of solutions is that they may be imperfect themselves. Each solution generally has its own drawbacks: a tax may distort optimal production and consumption decisions and is costly to impose, a contract is costly to specify and, if the contract is between firm and consumer, it might protect the firm against competition which gives rise to the extraction of rents from the consumer.

¹² Both standards often lead to the same decisions, because consumer welfare is often served in a dynamic sense by letting firms make a profit (Motta, 2003). Note that this is called the normative approach to regulatory economics (Viscusi et al. (2005). It appears that this theory does not perform well in explaining actual regulation. More effective approaches to explain existing forms of regulations are the capture theory and, in particular, the economic theory of regulation developed by Stigler.

Because ‘perfect competition’ is a theoretical notion, that in reality will not give an answer to the question of how to intervene effectively and efficiently, we prefer to use the concept ‘workable competition’ as benchmark.¹³ Workable competition is the absence of a firm that may unilaterally determine the outcomes (prices, quantity, quality, innovation etc.) on a market, and that is able to exclude (weaker) competitors or delay/prohibit entry. In other words, workable competition is a situation in which government intervention is highly unlikely to lead to welfare improvements.

2.2 Market power, dominance and anticompetitive behaviour

Competition law is not directed at market power in itself, but at anticompetitive behaviour. Market power might follow from different sources, such as superior products, heterogeneity (Bertrand competition), Bertrand competition with discrete cost differences, Cournot competition, high fixed costs or high uncertainty about success. In each of these cases, prices can be higher than marginal costs, indicating the existence of market power.¹⁴ This is however neither a sufficient nor a necessary condition for being a problem from the point of view of competition law. Competition law applies to those types of behaviour that impedes, harms, inhibits or restricts competition (and entry), so that by applying competition law workable competition will be restored.¹⁵ In general three mechanisms that stifle competition can be distinguished:

1. agreements between firms (especially between competitors) which eliminate competition among them with (additional) market power as a consequence;¹⁶
2. mergers, especially between competitors;
3. a firm that is not subject to workable competition (i.e. a dominant firm), may use its market power to exclude its (weaker, remaining) rivals or delay/prohibit entry.¹⁷

¹³ Notice that ‘perfect competition’ as benchmark, would require that all markets are characterized by homogeneous goods, many suppliers, many customers, perfect information etc. Besides it would only constitute a benchmark with respect to static efficiency. It is therefore highly unrealistic and (if only with respect to dynamic efficiency) unwarranted to use the perfect competition model as benchmark for intervention.

¹⁴ The common measure to measure the degree of market power is the Lerner-index, which is (price – marginal costs)/price (see Elzinga, et al., 2011).

¹⁵ Note that the effectiveness of applying competition law needs to be determined in a dynamic context: guarding the competitive process has to serve both current and future consumer interests. This principle is the reason for the expression that competition law should protect competition (as a process), not competitors. See e.g. European Commission (2009).

¹⁶ Section 6(1) of the Dutch Competition Act (DCA hereafter) states: “Agreements between undertakings, decisions by associations of undertakings and concerted practices of undertakings, which have the intention to or will result in hindrance, impediment or distortion of competition on the Dutch market or on a part thereof, are prohibited.”

Agreements and mergers, especially between competitors, run the risk of eliminating competition among the firms involved.¹⁸ If this has an impact on the market in the sense that output may be restricted and/or prices rise, this is clearly a situation that must be corrected by competition law. In fact, some agreements and mergers have as their main effect or even as a specific goal, to increase prices by eliminating competition among the firms involved.¹⁹ Competition-restricting agreements or mergers need not establish a dominant position in order to invoke competition law. Most competition-restricting agreements are forbidden as long as they can be said to be ‘appreciable’.

Mergers are slightly more complicated, because they generally change the structure of the market and the way the firms involved used to operate individually. Mergers, therefore, cannot be assumed in general to being undertaken solely in order to create (additional) market power. So, an ‘appreciable’ effect in the sense of competition restricting agreements, cannot be presumed to be almost always present. This has led to the concept of ‘considerably lessening competition’. This concept is akin to establishing dominance, but also comprises the possibility of creating a collectively dominant position.

A merger may establish a collectively dominant position (or ‘joint dominance’), while in an existing market context implicit collusion may be an equilibrium situation. Both are equivalent in the sense that they capture the situation in which unilateral output restricting decisions are taken in the knowledge that the other firms will also decrease their output, due to the fact that all firms involved realise that this is in their best interest. It is in their interest not only because of the resulting price rise, but also because they realise that by increasing output in order to gain from decreased output by others, the others will retaliate. From a dynamic perspective, long-run profits from collectively restricting output are higher than from competing fiercely. In economic terms: implicit collusion exists. Such a situation, generally speaking, cannot be captured by competition law, since it consists of unilateral decisions which are not forbidden. Explicitly coordinating actions is of course illegal.²⁰ Competition

¹⁷ Section 24(1) of the DCA states “Undertakings are prohibited from abusing a dominant position.”

¹⁸ For a comprehensive analysis and discussion of the concept ‘horizontal agreement’, see Kaplow, L. (2011).

¹⁹ European Commission (2004) and European Commission (2008).

²⁰ For a comprehensive analysis of these and other important concepts in Antitrust, see Kaplow, L and C. Shapiro (2007).

law also applies if a proposed merger would create a market structure that may be prone to implicit collusion (i.e. collective or joint dominance).

A firm that does not face competitive pressure is said to have considerable market power or to be dominant. A monopolist is generally a dominant firm.²¹ Dominance is a situation, in which a firm is able to unilaterally determine market outcomes (prices, quantities, level of innovation), with which their competitors (necessarily weak competitors) have to comply. For instance, dominance is a situation in which a firm may unilaterally decrease output without having to fear that the resulting price rise will be undermined by increased output by competitors or entry.²² By definition, a dominant firm must have a sustainable position, hence 'entry barriers' must exist.²³

The source of dominance is important to know in order to assess potential impact on competition.

- If dominance is the outcome of a competitive process with *superior competition*, and this dominant firm increases entry barriers in order to sustain its position that otherwise would be eroded by entry or improved competitive power by (weaker) competitors, this behaviour may constitute an abuse. Competition law can be applied, and there is no reason for additional measures in order to improve the competitive situation; the competitive process may take its due course, after entry barriers have been removed.
- If dominance is not due to the competitive process, but due to *legal measures*, it is much more complicated to apply competition law. In case of a legal monopoly, constraining (abusive) behaviour, does not give way to a competitive process. Applying competition law becomes *de facto* sector specific regulation.
- If dominance is due to a *natural monopoly*, the same type of reasoning may apply as with respect to a legal monopoly. In general, a natural monopoly that will be sustainable by the nature of its monopoly, cannot be subject to competition (possibly not even by a potentially more efficient entrant, at least not in a reasonable amount of time). Hence, applying competition law would become *de facto* sector specific regulation.

²¹ A monopolist may be constrained by the threat of entry so that it is effectively subject to competition.

²² E. Elhauge, *Defining better monopolization standards*, Stanford Law Review, vol. 253, November 2003, pp. 253-344; Azevedo J. and M. Walker, *Dominance: meaning and measurement*, European Competition Law Review, issue 7, 2002.

²³ E.g. Carlton (2004), McAfee et al (2004), Schmalensee (2004).

It is clear that in the end market power is about exploitation: customers pay more than they need owing to a lack of effective or workable competition. This does not mean, though, that all instances of lack of effective or workable competition should be corrected by competition law. Part of the competitive process must be that high prices can be asked and high profits generated which drives the engine of the economy. What it must mean is that exploitation as a consequence of agreements, mergers or exclusionary behaviour by dominant firms should be forbidden, but that exploitation resulting from the market structure (oligopoly or monopoly) should not be interfered with.²⁴ If market power is caused by the characteristics of the industry, such as natural monopoly or exclusive rights granted by the government, application of competition law to behaviour by such firms would boil down to sector-specific regulation.²⁵

2.3 Structural entry barriers and regulation

In general, entry barriers can be seen as anything that protects incumbents from entry in a reasonable amount of time (see McAfee et al. 2004; Carlton, 2004; Schmalensee, 2004). Entry barriers may result from information asymmetry, absolute cost advantages, switching costs and economies of scale. In case of entry barriers, a market is not contestable. A market is called contestable if incumbent firms are disciplined to behave efficiently by the threat of entry.²⁶ This does not imply that the existence of entry barriers is a problem from a welfare point of view. Incumbent firms may compete vigorously, or they may need some protection in order to keep incentives for innovation and investments. The key question is whether entry barriers delay or prohibit competition to come about. This is generally the case if entry barriers following from fundamental industry conditions which are independent from behaviour of firms. Examples of these so called *structural entry barriers* are economies of scale, network externalities and legal monopolies. In these circumstances, sector-specific regulation is a potential welfare-enhancing intervention. This does, however, not hold in the case of *strategic entry barriers*, which follow from behaviour of existing firms. Examples of such behaviour is raising rivals' costs (standard setting, exclusive contracts), limit pricing, overinvestment in capacity, predatory pricing, bundling/tying, rebates and product differentiation. These type of barriers are subject to competition law.

²⁴ Especially in the context of innovation, see Evans, D. and K. Hylton (2008). See, in reaction, Baker, J. (2008).

²⁵ See for instance, Geradin (2007), RBB Economics (2002) and Evans and Padilla (2004).

²⁶ Note that in terms of dynamic welfare, contestable markets, especially in the sense of 'hit and run'-markets, can be inefficient as well, even if they are highly efficient in the static sense. This not only stems from the fact that incumbent firms may compete vigorously, but also because raising entry barriers may be warranted from the point of view of dynamic efficiency in case of high fixed costs and asset specificity

Although the need for regulatory intervention might be clear when structural entry barriers exist, the way regulation should be implemented is less clear as intervening in firms' decisions might cause significant costs. The difficulty in defining the optimal type of intervention follows from the existence of information asymmetry between regulator and regulated firms. This asymmetry is related to information about the precise characteristics of the firm as well as information about its precise behaviour.²⁷ It is impossible (or highly expensive) for a regulator to acquire the same level of information and knowledge as regulated firms have about their activities. To overcome the information problem, there are regulation strategies that avoid the need of accurate and equal information. In order to deal with the information asymmetry, the regulator can design contracts which are *incentive compatible* and satisfy the *participation constraint* of the manager. That is, the contract is such that the manager is induced to reveal information truthfully. At the same time the contract is better than the manager's outside option. Usually the regulator pays an information-rent but still this is generally an improvement upon unregulated monopoly.

Another argument, besides the information asymmetry argument, for giving operators freedom of operation follows from the fact that ex ante neither the regulator nor the operators know what technique will appear to be the most efficient one. Prescribing one technique, therefore, creates the significant risk that this technique would appear not to be the best or the most efficient one. If each operator is able to make its own technological choice, the benefits of a decentralised organisation come to the fore (see Kay, 2005). This means that there is a higher chance that ex post the best technique will be chosen (or developed) by at least one of the operators.

In searching for the best regulatory measures, different types of regulatory measures exist: price regulation, entry/exit regulation, quantity regulation, quality regulation and input regulation (Viscusi et al., 2005). Although all these types have been applied in network industries, price regulation and entry regulation are generally seen as key measures.

²⁷ This first component is called hidden information, which in this case means that the firm tries to convince the regulator that it operates more efficiently than it actually does. This principal-agent problem is also called adverse selection which is the general name for situations where agents have private information on its characteristics (Laffont et al., 2002). The second is called hidden behaviour and may result in moral hazard, which means that the regulated firm is less inclined to do its utmost if the regulator is unable to monitor and reward that behaviour sufficiently.

Regarding price regulation, three main types are relevant (see e.g. Cambini et al., 2010). Rate-of-return regulation, which gives operators ex ante certainty over the rate of return on their investments, is viewed to be most suited to foster investments in new infrastructure. Pure price-cap regulation, where the operators have certainty about the revenues but face all the risks related to the costs, gives maximum incentives to foster efficiency. Cost-plus regulation, where the revenues of the operator are directly related to its costs (including capital costs), realises that network users pay no more than the realised costs. Regarding entry regulation, one can distinguish measures to establish third-party access to the natural monopoly and measures to improve the allocation of bottleneck infrastructures among users.

In order to determine whether introducing a specific regulatory measure in a specific industry is welfare enhancing, a cost-benefit analysis may be conducted. Each of the abovementioned types of price regulation also have some disadvantages (i.e. costs). Rate-of-return regulations are likely to result in too high a level of investments (from a welfare-economic point of view) while incentives to operate productively efficient are soft. Pure price-cap regulation is generally seen as a disincentive for investments in new infrastructure, as investments increase (capital) costs while the revenues of the firm are constant and independent of the realised costs (i.e. equal to the price cap). In addition, pure price-cap regulation might result in positive economic profits for the operator, implying that grid users pay more than is needed to recoup the actual costs. Cost-plus regulation, finally, gives weak incentives to the operator to be efficient, because of the absence of the option to make additional profit, while the incentives for investments are not necessarily high.

In analysing the welfare effects of regulation, attention has also to be paid to the risk of regulatory capture, which means that a regulator implements policies that further the interests of the firm at the expense of the social interest (Armstrong et al., 2006). Factors influencing capture are, for instance, the level of expertise and resources available to the regulator and employment opportunities within the regulated firms. Note that interest groups might have a strong incentive to lobby (Dewey (2000)). This incentive depends on the relative gain of lobbying. The group with the highest relative gain will lobby more and has a higher probability of winning. So, while regulation can be effective in overcoming certain market

failures, the implementation of specific measures generally suffers from imperfections making it valuable to analyse the costs and benefits of regulatory intervention case by case.²⁸

3. Market power in network industries

3.1 Introduction

Recent developments in network industries call for an reassessment of the existing approach to monitoring competition. In the energy wholesale market, it appears that one or a small number of firms frequently have dominant positions due to pivotality, enabling them to charge above competitive prices, in spite of a large number of regulatory measures to connect national market into regional European markets which have been taken in recent years. Would it be effective to use competition law more stringently in these markets, or to change the character of existing regulations? Sections 3.2 and 3.3 will deal with these questions for the wholesale gas market and the wholesale electricity market, respectively. In the aviation industry, recent experiences with environmental taxes have given more insight into the price sensitivity of travellers, suggesting that the economic market power might be lower than assumed in the past. Section 3.4 analyses the consequences for current regulation. In railways, we have more experience with the relationship between different types of operators, in particular between the main-network operator and several regional operators who appear to be dependent on the former one. Section 3.5 goes into the consequences for regulation. Finally, Section 3.6 analyses consequences of the emergence of a kind of infrastructure competition for the regulation of the incumbent operator of the copper network.

3.2 Wholesale market for gas

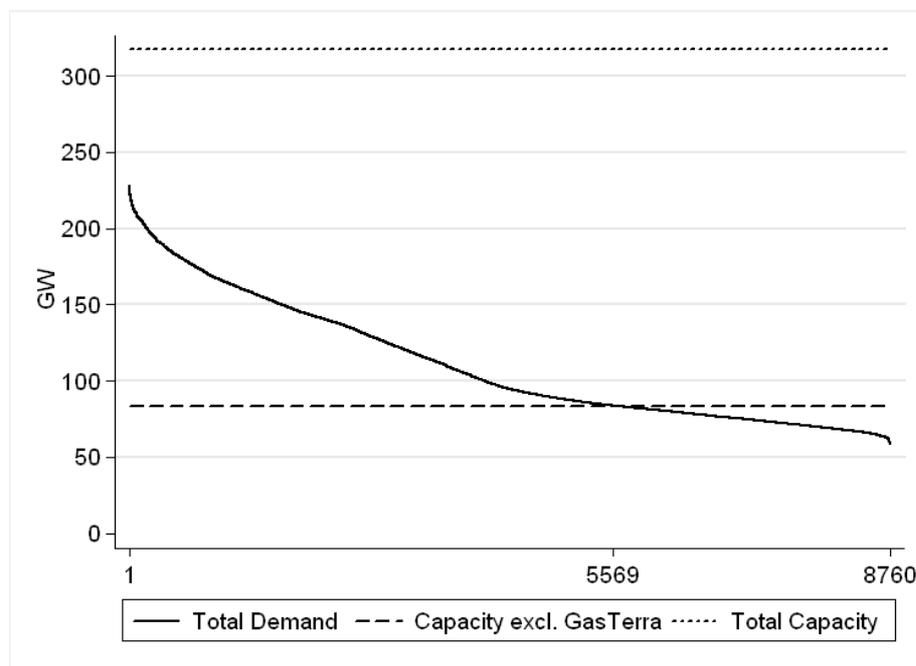
The wholesale market for gas in the Netherlands is characterised by a high degree of concentration at the supply side. During about 2/3 of the year, one player appears to have a dominant position due to pivotality.²⁹ The degree of pivotality fluctuates strongly within the year, particular due to the seasonal effect in gas demand (see Figure 1). The concentrated supply results from structural entry barriers for producers of low-caloric gas, owing to geological conditions, as well as restrictions in the availability of infrastructure for transport,

²⁸ In order to reduce the risk of regulatory capture, the role and position of regulators have to be defined carefully. Oxera (2004) mentions a number of principles which define ‘good regulation’, such as clarity of role, independence from government, transparency, accountability and proportionality.

²⁹ The pivotality of a specific player *i* is measured by comparing the total demand with total capacity of the other players in the market, both on an hourly basis. If total demand exceeds total capacity of the other players, player *i* is viewed to be pivotal.

storage and quality conversion capacity, (NMa, 2011a). The latter restrictions have, however, recently been reduced by a number of regulatory measures.

Figure 1 Total demand, total capacity and pivotality of GasTerra, 2009



Source: NMa (2011a)

Regarding the performance of the Dutch gas market, it appears that the gas price is related to the degree of pivotality, measured by the residual supply index (RSI)³⁰ (see NMa, 2011). The lower the RSI, the higher the gas price, albeit that this relationship might be affected by the overall scarcity in the market.³¹ In addition, evidence has been put forward that the gas price is above competitive levels from time to time, although the price is not viewed to be excessive, i.e. structurally higher than prices in a competitive market (Frontier Economics, 2008).

Although the gas market is of course subject to competition supervision, effectively applying competition law to deal with possible abuse of dominance faces several problems. These difficulties are related to both the analysis and the design of effective measures. From Figure 1, it follows that dominance in the gas market is a volatile parameter, implying that no firm

³⁰ The RSI of a specific producer is defined as the ratio between aggregated production capacity of the other producers and total demand. Hence, a RSI below 1 means the producer has a pivotal position.

³¹ Correcting for the influence of scarcity in a statistical analysis appears to be complicated because of multicollinearity between scarcity and pivotality (NMa, 2011).

has a permanent dominant position. During the periods a firm can be viewed as dominant, it may behave like a monopolist charging monopoly prices. Although such behaviour can possibly be viewed as exploitative behaviour, using competition law would not be effective as it would not restore competition. Hence, intervention would look like taking regulatory measures to restrict the behaviour of the *de facto* monopolist. In case, however, of exclusive behaviour, competition law can be effective as forbidding such behaviour can be expected to improve competition. The same holds when firms make mutual agreements (on e.g. prices or distribution of regional markets) to restrict competition.

When prices are high as consequence of market dominance and exploitative behaviour, regulatory measures are likely more effective. Measures directed at prices, however, might negatively affect entry (in the long run), reducing the competitive threat to the pivotal player. Moreover, price regulation in a volatile market like the gas market is prone to the risk that the price is set at a too low or too high level. In the first case, the intervention would cause inefficiencies and possibly financial problems for firms involved, while in the second case, the intervention would be ineffective.

The alternative and likely more effective route to improve competitive conditions in the wholesale gas market is to reduce remaining barriers to enter the market. As geological conditions cannot be changed, these measures should focus on access to infrastructure, such as improving schemes for the allocation of transport and storage capacity and introducing secondary markets for capacity. It appears that significant arbitrage benefits can be realised if the cross-border transport capacity would be used more efficiently.³² These benefits can be realised without investing in additional transport capacity, but by improving the method of allocating existing capacity among users.³³ Although implementing these measures are complicated and time-consuming processes, in particular because of the different stakes involved, it is likely more effective and efficient than applying competition law to restrict the (pricing) behaviour of incumbent players being dominant from time to time because of structural barriers to enter the market.

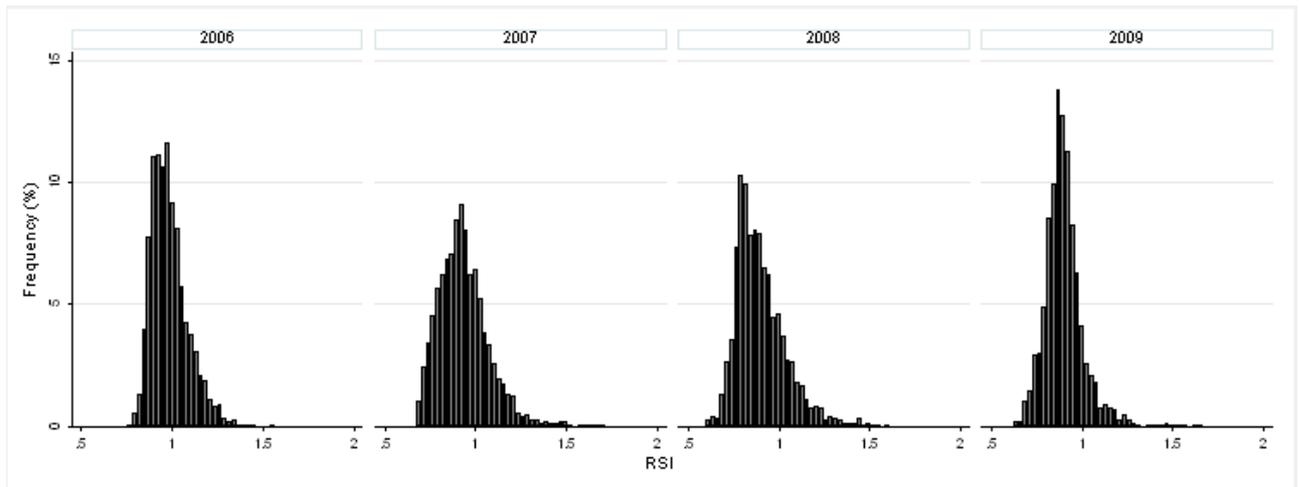
³² Mulder et al. (2008) estimated these benefits for the Dutch market to be approximately 20 million euro per year.

³³ These type of measures are discussed in the current European debate on the gas target model (see CEER, 2010).

3.3. Wholesale market for electricity

As in many other countries, the wholesale market for electricity in Netherlands still has a concentrated supply of electricity. A small number of firms produces the majority of the electricity, while many small firms together with import supply the remaining electricity.

Figure 2 Histogram of RSI in the Dutch electricity market, 2006 - 2009



Source: NMa (2011a)

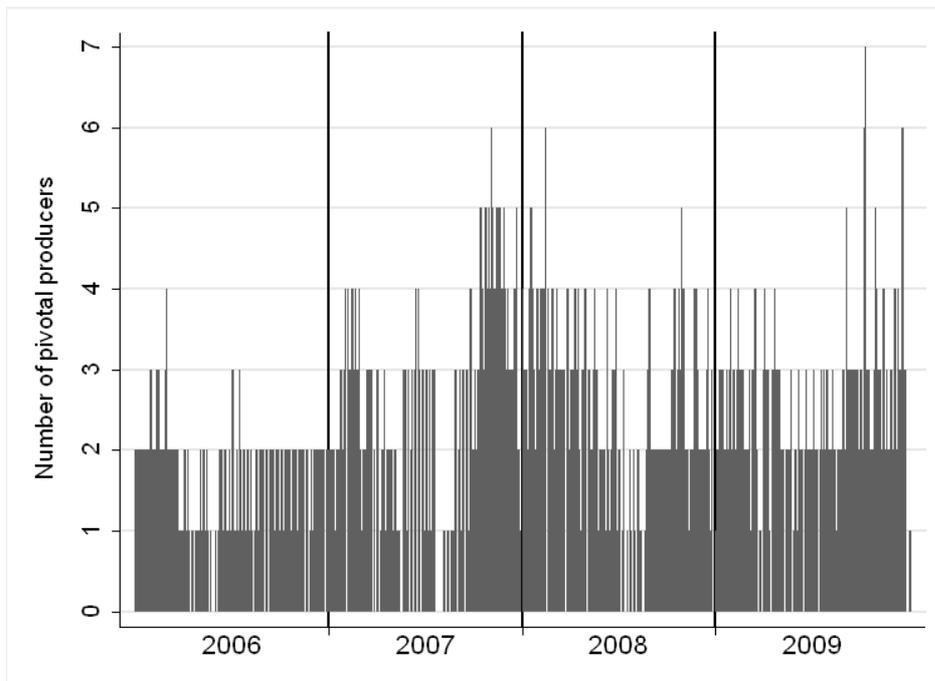
This concentrated supply is reflected in low values for the residual supply index (RSI) during many hours of the year. In recent years, the frequency distribution of the RSI moved to the left, meaning that the pivotality of producers has even increased, in spite of a number of regulatory measures to connect the Dutch market to neighbouring markets (see Figure 2).

A remarkable aspect of the concentrated supply is the presence of several pivotal players (2 to even 7) during many hours (see Figure 3). This implies that, during these hours, more than one player are more or less able to behave independently of others. Consequently, these players can be viewed to have temporarily joined market power. It appears that this market power enables players to make more profit on electricity production. From a statistical analysis of the impact of market power and scarcity on the markup of the marginal producer, it follows that both factors have an statistically assignable effect (Mulder, 2011).

The temporary market power of the electricity producers results from short-term restrictions at the supply side combined with the volatile demand for electricity. The restrictions at the supply consist of permitting procedures for building new plants, but also the lead time of the

investments themselves. Generally it takes a significant number of years before a new plant is made fully operational. Other restrictions refer to the capacity of import lines. These restrictions have been reduced in recent years by the introduction of market coupling on the Dutch-Belgium border and the Dutch-German border.

Figure 3 Number of pivotal players in the Dutch electricity market, 2006-2009, per hour



Source: NMa (2011a)

Although competition in the wholesale electricity market is hindered by the presence of severe entry barriers, competition between the current producers does exist. This follows from the fact that the relative high profits of electricity producers in the past has triggered a number of producers to expand their production portfolio. As a result, applying competition law is useful in monitoring competitive behaviour, while regulation of electricity prices or behaviour of electricity producers (e.g. dispatch restrictions) would easily distort this competitive process.

Regulation on top of applying competition law can be effective if regulatory measures are directed at removing barriers for production or trading. Examples of such barriers are insufficient available capacity of networks for connecting new power plants to the grid, inefficient allocation of cross-border transport capacity or lack of transparency about available

transport capacity and prices (see NMa, 2011a). The benefits of such measures for end users can be significant. The annual benefit of the introduction of market coupling on the Dutch-German border, for instance, is estimated to be approximately 15 million euro, which result from the enhanced options for price arbitrage between these two countries (Mulder et al., 2008).

3.4 Airport Schiphol

In a study on the market position of the Airport Schiphol, GAP (2010) concluded that this airport has economic market power in the markets for aviation activities as well as the market for activities closely linked to that market.³⁴ In both markets, the airport is viewed to be able to raise prices structurally above competitive levels as airlines have only limited substitution possibilities while entrance at the supply side is hindered by barriers.³⁵ The low demand elasticity results from the restricted capacity at airports in the neighbourhood of Schiphol as well as the high investments which airlines have to make in order to move to another airport. The entry barriers on the supply side consists especially of legal barriers (licenses) as well as environmental and spatial restrictions.

Another indication for the perceived ability of the airport to raise prices above competitive levels follows from recent experiences after the introduction of an environmental tax (see SEO, 2009). In response to this introduction, the size of O-D traffic at Schiphol decreased by 3.6%. As a result, total turnover reduced by approximately 90 million euro. However, the total tax revenues for the government were 260 million euro. Hence, if the airport would not be subject to tariff regulation, it could profitably raise the airport prices.

The effectiveness of the competition law to deal with inefficiencies following from the use of market power depends on whether competition between airports in the above markets can be expected to take place in the foreseeable future. As the abovementioned entry barriers seem to be structural, we expect that competition in the above markets will be seriously hampered by lack of entrance of new airports, although regional airports for short-distance flights might grow further (NMa, 2011b). Hence, applying competition law competition would boil down to imposing measures to restrict the behaviour of the airport having a dominant position. For

³⁴ This market includes concessions for the supply of fuel for airplanes and concessions for the supply of catering to airlines.

³⁵ This holds in particular for the market for Origin-Destination (O-D) travellers, while in the market for transfer passengers, airlines likely have more substitution options.

instance, it would be possible to use competition law to monitor prices in order to prevent the airport to charge excessive prices. Because of the presence of structural entry barriers, such monitoring should be continued permanently, what would look like price regulation. Moreover, the effectiveness in terms of price reductions compared to a laissez-faire situation is likely limited as the level of excessive prices, which is used in competition analysis, is generally significant above the level of efficient costs which is frequently applied in regulation. Hence, competition law cannot be viewed as an effective approach to reach efficient prices for using airport facilities.³⁶

Whether regulation is a more effective and efficient alternative approach depends on the design of regulation. The current regulation of the tariffs of Schiphol airport has appeared to generate positive welfare effects. A conservative estimate of the aggregated annual effect of regulation on tariffs is 10 million euro (NMa, 2011b).³⁷ The total annual administrative costs of regulation are estimated at approximately 2 million euro (Ecorys, 2010). Hence, the overall effects of the current regulation for consumer welfare are positive, as no indications exist of a trade-off between current regulation and quality of service. The welfare effects of the regulation might, however, be increased by improving the design. In the current system, tariffs are based on a cost-plus system implying that incentives to raise productive efficiency are modest. The latter incentives can be increased by making allowed revenues more independent from realised costs. In such a system, of course, careful attention has to be paid to prevent adverse effects on quality of services (see e.g. Sappington, 2005).

3.5 Railways

In the Dutch railway market, the operation of the tracks is fully separated from supply of transport services. As the former is viewed to be a natural monopoly, this activity is subject to (economic) regulation directed at fostering access to the tracks by third parties and realising efficient tariffs. In the market for transport services by trains, two forms of competition exist. In freight transport, competition *on* the tracks has successfully been introduced, while in passenger transport on regional lines suppliers compete *for* the tracks. In passenger transport on the main lines, however, the concession is not publicly tendered but privately allocated to

³⁶ See also Geradin (2007) who concludes that competition authorities in a number of countries hardly have been able to prove the presence of excessive prices.

³⁷ This estimate is based on reductions in tariffs after intervention by the NMa. This is a conservative measure as the benchmark for the counterfactual is not based on the monopoly prices which a non-regulated entity would charge, but on the tariffs which the airport initially has proposed to airlines. One can assume that expectations about intervention by the regulator are included in these proposals.

the incumbent. The objectives and conditions for both types of concessions are arranged in contracts between governmental bodies and the concessionaires.

It appears that the regional players are dependent on the concessionaires of the main network for the supply of a number of inputs (NMa, 2011c). This holds for instance for information for travellers, sale of tickets and monitoring of travel behaviour which is used to allocate revenues among concessionaires. As the carrier on the main network is the sole supplier of these services, it has a legal monopoly. Therefore, the government has made this relationship subject to a number of rules. However, these rules are at a fairly general level, merely prescribing that the main-network carrier should offer the products against 'reasonable' conditions. Up to now, no mechanism exist to closely monitor the reasonableness of the conditions actually asked, while regional concessionaires discuss the reasonableness of these conditions. Note that the main-network carrier hardly has an incentive to deliver the products demanded by the regional concessionaires at prices which are not allowed to exceed the related costs.

The relationship between the main-network concessionaire and the concessionaires of the regional lines, therefore, can be characterised as unequal due to legal rules. Dealing with possible inefficiencies resulting from this legal monopoly through competition law is not effective, because of the impossibility of competition. Introducing regulation might be more efficient, provided that the administrative costs are significantly below the benefits. However, as the tariffs of passenger railway tickets are set at national level, efficiency improvements realised by regional operators do not result in lower tariffs. Hence, the benefits of introducing the above regulation likely results in higher profits for the regional concessionaires or the regional governments, but consumer welfare will probably increase. Consequently, one may expect that regulating this market would mostly result in distributing of welfare instead of creating net-welfare benefits.

3.6 Telecommunication

In the Dutch telecommunication market, the incumbent operator, KPN, who owns the fixed copper telephony network. KPN is, however, losing market share.³⁸

³⁸ "The total number of fixed telephony connections fell compared to the previous quarter (from 7,138,000 to 7,232,000). KPN is losing market share, both with regard to low-capacity connections (one or two telephone lines per connections) and high-capacity connections (three or more telephone lines per connection). KPN's

KPN's main competitors are Tele2, Ziggo and UPC with an aggregated market share of at least 30%. Tele2 uses KPN's fixed network (copper), through access regulation, while Ziggo and UPC are unregulated cable network firms (coax). All cable companies together by and large cover the Netherlands with coax, just as is the case with the copper network.

It is expected that competition in the market for fixed telephony will intensify further. The number of fixed telephony via copper (using the traditional technology) is declining as mobile and digital technologies offer competing telephony services. Besides, these technologies enable the supply of other services like television (also digital) and broadband, while KPN is able to offer broadband also (via the copper network), as well as digital television by yet another technology. KPN is upgrading the copper network and is also investing in glass fibre. The competing cable companies upgrade their networks as well. In addition, competition also take increasingly place with respect to bundled services like 'telephony, television and broadband' (triple play) or 'television and broadband' (dual play). Moreover, there is a tendency to use the internet for telephony.

From the competition point of view, these developments lead to a number of questions:

1. in the absence of regulation: does KPN have an incentive to exclude current users of the local loop;
2. in the presence of regulation: will KPN (or any other player) have enough incentives to invest in a comprehensive fibre network;
3. how are these incentives currently related to the competitive forces of dual and triple play services, the increasing use of broadband for traditional services like telephony, and (hence) the competitive forces of mobile and coax technologies.

These questions may be simplified by the question: are at least two types of competing players, KPN and cable companies, enough for workable competition.?

In order to answer this question, one has to distinguish different types of customers: on the *retail level* the customers include households, small and medium sized firms (SME's) and

market share in the low-capacity segment fell from between 60% and 65% to between 55% and 60% and in the high-capacity segment from between 70% and 75% to between 65% and 70%. Tele2 is gaining market share on both markets." (<http://www.opta.nl/en/news/all-publications/publication/?id=3463>)

big(ger) firms while on the *wholesale level* the customers are suppliers of retail services, like Tele2, that make use (of part of) KPN's network.

Individual households generally have ample choice among mobile telephony suppliers and coax. From that perspective wholesale access might not be needed anymore in order to supply individual households with the retail services they want. This may be different for firms. As they may have a greater need yet for fixed telephony, the main question becomes whether the alternatives are a sufficient competitive restraint. If so, obligatory access may be lifted. If not, the question is whether alternatives are able within a reasonable amount of time.

The answers to these questions are complicated because of the uncertainty about technological developments. A complicating factor here is that currently KPN is the largest investor in glass fibre, so may possible gain a competitive advantage to coax in the future, hence re-establishing a dominant position with respect to telecom services and therefore effectively carrying over a dominant position on copper to fibre. If this will be the case, continue to regulate seems to be the most efficient option. However, possible adverse effects of regulation has to be addressed. Regulation might negatively interfere with investment incentives for all types of players in (for instance) fibre, as empirical work suggests (see. De Bijl, 2011).

From the point of view of competition law, the key topic the competitive pressure that is (and will be) exerted by alternative technologies. If this pressure is not high enough, or when this will not be high enough in the future, current or future competition policy will presumably not be able to adequately tackle the consequences. Consequently, some regulation might be needed in order to give just enough incentives while retaining some of the (future) benefits for consumers.

In the light of current market positions, OPTA still wants to regulate KPN, while KPN heavily disputes this.³⁹ All in all, much uncertainty exists with respect to the question whether or not 'two is enough' and even whether future infrastructure competition may be an equilibrium outcome. From that perspective some form of regulation, periodically revised, may be warranted.

³⁹ <http://www.opta.nl/nl/actueel/alle-publicaties/publicatie/?id=3480>

4. Conclusions

1. In determining the potential welfare effects of imposing sector-specific regulatory measures on top of general competition law, a number of aspects has to be taken into account:
 - a. In the absence of structural barriers, the basic question to be tackled is: is competition hampered by an agreement, a merger or behaviour by a dominant firm? If so, competition law may be applied to forbid anti-competitive agreements or merger or exclusionary behaviour by a dominant firm.
 - b. Markets have to be assessed from a long-term perspective, as short-term inefficiencies might be solved by market forces. Prohibiting behaviour, agreements and mergers on the basis of a rather static point of view runs the risk of false positives (i.e. incorrectly intervening), which will stifle competition. A dynamic point of view is, however, administratively more costly and might lead to false negatives (i.e. incorrectly not intervening).⁴⁰ On the other hand, false negatives also imply that customers and/or competitors of the firms involved in anti-competitive actions do not try to incite the competition authority to get into action. This could mean that false negatives might be the lesser problem.⁴¹
 - c. In case of *tacit collusion*, there is no way of inducing the firms to compete: tacit collusion is a Nash-equilibrium. Besides, it will be extremely difficult to investigate tacit collusion, let alone to define the proper 'price level'. It does not seem effective or efficient to try to apply competition law.
 - d. In case of a *dominant firm*, one should generally only worry about exclusionary behaviour. Exploitative behaviour, resulting in inefficient market outcomes in the short term, should not count as abusive, unless very specific circumstances exist. This is only the case if there is virtually no competitive process to protect, i.e. if structural

⁴⁰ Wright (2009): "An antitrust regime that ignores dynamic efficiencies and innovation and focuses solely on static product market competition is unlikely to improve consumer or total welfare. A regime paralyzed by the fear of deterring innovation such that it fails to intervene in product markets where consumers are threatened by anticompetitive conduct would not fare any better. Accounting for dynamic efficiencies in antitrust analysis is consistent with current antitrust law and policy objectives and would be a desirable goal if such an accounting could be carried out in a manner that the benefits outweigh the sum of administrative and error costs."

⁴¹ Not necessarily though; if, for instance, SME's fear retaliation by dominant suppliers if they would complain, a possibly large false negative may arise/exist. For a discussion of false positives and false negatives in case of abuse of dominance, see Gates, S (2008).

Then, regulation might come in. Regulation can be welfare improving either by i) preventing inefficiencies from firms using their structural market power (e.g. by price regulation) or ii) reducing entry barriers in order to create and/or facilitate competition.

2. Regarding the network industries analysed, we find different conclusions on the efficiency of regulation although all industries are more or less characterised by dominant firms.
 - a. In the wholesale gas and electricity markets, dominant players exist due to pivotality. It appears that the pivotal positions are fairly constant from year to year, albeit that within years the degree of pivotality fluctuates strongly owing to seasonal effects in demand on the one hand and supply restrictions on the other. Using competition law to deal with the inefficiencies following from the market power appears to be ineffective as it will not be able to restore or introduce competition.
 - b. Introducing price regulation in such markets would create the risk of setting prices at too high or too low levels. In such markets, regulation directed at removing entry barriers to these markets is likely more efficient. Benefits of specific measures to improve the availability of existing cross-border capacity in Dutch energy markets, for instance, are roughly estimated to be tens of millions of euro per year, which significantly exceed the costs of this type of regulation.
 - c. Regarding the airport Schiphol, economic dominance exists in specific submarkets, in particular the market for Origin-Destination passengers. Because of the presence of structural entry barriers, competition law is ineffective here, while the benefits of price regulation appear to be much higher than the costs of this regulation. The welfare effects of regulation can likely be increased by giving more incentives to improve productive efficiency.
 - d. In railways, the main-network operator appears to have a dominant position regarding the operators of the regional lines. Introducing regulation might result in more efficient transactions between these operators, but the impact on consumer welfare is likely negligible as the ticket prices are set at national level.
 - e. Finally, in the telecommunications industry the efficiency of regulatory measures is under pressure as a result of the emergence of infrastructure competition. In specific submarkets, such as the market for fixed telephony, a number of customer groups have limited substitution possibilities, making regulatory supervision here still efficient.

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