The Principle of Indirect Pricing Constraints in Market Analyses

Drawn up for:
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OPTA

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Content

Summary

This report explores the possibilities and limitations of the application of the principle of indirect pricing constraints in defining the market of wholesale broadband internet access. The findings in this report are based on a review of relevant literature, as well as several cases in which the European Commission and National Regulatory Agencies addressed the issue. The main motive for conducting this review is the case presented in the market definition of wholesale broadband access by Dutch NRA OPTA (hereafter referred to as OPTA).

Theoretical considerations on indirect constraints

For a comprehensive insight of the principle of indirect pricing constraints, sound understanding of both wholesale and retail markets is necessary. In the analyses of markets and their competitiveness the key explanatory variable is the elasticity of demand. In a market in which several products are close substitutes, the price elasticity of demand of these products is likely to be high. A slight raise in price of one of these goods, would cause customers to switch to one of the substitutes. The high price elasticity of demand can be considered a *direct constraint* on the pricing behaviour of suppliers.

The theory of *indirect pricing constraints* states that in upstream markets, even in the absence of close substitutes, price elasticities of demand can be high. This can be explained by competitive downstream markets, that pose an indirect constraint on the price level in the upstream market. A raise in price in the wholesale market would cause downstream customers to switch to another product, causing demand for not only the finished good, but also for its inputs on the wholesale level to fall.

Our review suggests that there is little discussion on the working of indirect constraints as such. There is discussion however, on the effectiveness of indirect constraints. So if indirect constraints can be found in wholesale markets, the question is how effective these constraints actually are and which factors explain the elasticity of demand in the absence of direct constraints. According to Inderst and Valetti (2007), in assessing indirect constraints the following factors should be taken into account:

- The price elasticity of demand for the wholesale based retail product;
- The cost share of the wholesale input in the overall price of the wholesale based retail product;
- The rate in which a change in the wholesale price affects the retail price;
- The importance of self supply in the market;
- The degree in which the quantity of the input that is sold through the wholesale market changes with total retail sales.

Since the correct analysis of indirect constraints depends highly on the particular circumstances that characterize the market at stake, no single standard economic model has been developed yet. Nevertheless, omitting indirect constraints can over- or underestimate the actual degree of competition that prevails on the market.

Indirect constraints applied to the Dutch broadband market.

In the various articles on indirect constraints, it is argued that it is not so much the question whether or not to take into account indirect constraints, but rather when: either in defining the market or in assessing the market power. At the same time, it is shown that the answer to that latter question is that this does not matter for the outcome of the market analysis. Furthermore, in a technologically fast moving environment, competitive constraints may be more dynamic than in regular markets. Thorough insight in these constraints, that may very well be indirect, therefore seems to be a necessity.

OPTA (2005) has given indirect constraints an important role in the market definition of wholesale broadband access. Although the number of wholesale broadband access providers is small[1], the incumbent is supposedly not in a position to exert market power because of indirect constraints caused by cable operators active on the retail market.

In general, the European Commission admits that indirect constraints, where found to exist, should be taken into account when assessing if the incumbent DSL operator has significant market power on the relevant market. In the specific Dutch case, it states that more attention needs to be given to:

- The precise reaction of ISPs after being confronted with an increase in its input price;
- The degree of competitiveness in the retail market: would ISP retail customers indeed switch towards cable broadband internet access after a price increase caused by a price increase in the wholesale market, and not to the retail arm of the incumbent?

Confronted with the theoretical framework presented above, these two aspects indeed play an important role in the effectiveness of indirect constraints and need to be looked at more closely, be it in defining markets or in assessing market power.

[1] Only three DSL-operators offer wholesale broadband access (including the incumbent) and a number of small cable operators. Of the retail broadband connections more than 90% is realised through self-supply of either DSL-operators or cable-operators. On the total retail broadband internet connections, 93% is realized through captive sales of WBA by the incumbent, a DSL-operator or a cable operator. From the 7% internal supply of WBA some 85% is over DSL and the remaining 15% over cable. The incumbent is according to OPTA not in a position to exert market power because of indirect constraints caused by cable operators (and the other DSL-operators) on the retail market

1 Introduction

Recently a discussion has arisen between the Dutch National Regulatory Authority (NRA) for telecom and postal services (hereafter referred to as OPTA) and the European Commission regarding the definition of the market for broadband access. This discussion focuses on the principle of indirect pricing constraints and the role OPTA has attributed to it. To enhance the understanding of the working of indirect pricing constraints, this report presents a review of relevant literature on the issue.

OPTA is required by law to define relevant markets and to assess whether or not any specific supplier has significant market power on the defined relevant markets. If there's evidence that there is indeed a dominant firm that is in a position to exercise its market power, OPTA's can impose regulatory measures. To impose measures, the Dutch Telecommunications Act requires evidence that a possible market power problem is likely to sustain the coming three years.

In this perspective, OPTA has given a crucial role to the importance of indirect pricing constraints in defining the (wholesale) broadband markets (OPTA, 2005). OPTA argues that indirect pricing constraints from the retail market level, resulting from supply of broadband access by cable suppliers and other vertically integrated firms, are assumed to be influencing the wholesale broadband markets in such a level that regulatory measures are unnecessary.

Example: the impact of taking indirect pricing constraints into account in defining relevant markets

OPTA states in its analysis of the wholesale broadband market that if self supply from the incumbent DSL and cable operators were not considered part of the same relevant market, the biggest wholesale company would be a firm that only has 5-10% market share on the retail level. The integrated firms that self supply, such as the incumbent DSL provider and cable operators have much larger market shares (up to 40-50%) on the retail level[2]*. This illustrates the different possible outcomes in market definitions, where indirect pricing constraints are taken into account or not.*

Comprehensive insight in the efficacy of economic competition theory on actual markets is a necessity for the ability to define markets thoroughly and correctly. The aim of this paper is to make clear what the role of indirect pricing constraints might be in market analyses. This is done by means of providing an overview of the relevant economic literature.

The following questions will be addressed successively:

A. Theoretical analyses of the principle of indirect pricing constraints (chapter 2)
B. The role of indirect pricing constraints in the definition of the relevant (wholesale) broadband market (chapter 3)

[2] OPTA (2005), p. 56.

C. Comments on Cave, Stumpf and Valletti (2006) (chapters 2 and 5)

Thereby, we give:

D. Insight in which situations indirect pricing constraints are a relevant factor in the definition of the relevant (wholesale) broadband market, and in which situations indirect pricing constraints do not play a (significant) role (chapters 2 and 3);
E. Insight in the relevant factors that influence and/or lead to the presence of indirect pricing constraints (chapter 2);
F. A practical translation of the theoretical concept of indirect pricing constraints to the wholesale broadband market of (i) ULL (KPN) and (ii) WBA (chapter 3);
G. An indication of the range in which the wholesale price makes up for the retail price of internet access, so that a sufficient degree of indirect pricing constraints from the self-supplying cable operators apply to the wholesale market for WBA (paragraphs 2.2 and 3.1)
H. Examples of other markets in which indirect pricing constraints may play a (significant) role (chapter 4).

In the next chapter a general overview of the principle of indirect pricing constraints in theory is presented. Successively, the conclusions of these insights are applied to the (wholesale) broadband market in chapter three. In chapter four, the working indirect pricing constraints in other types of markets is discussed. Conclusions are given in the last chapter.

2 The Principle of Indirect Pricing Constraints

In this chapter a theoretical overview of the working of indirect pricing constraints is presented. The principle of indirect pricing constraints will be discussed on basis of the work of Cave, Stumpf and Valletti (2006) and Inderst and Valletti (2007) on the subject. The former paper gives a general theoretical outline of the principle, the latter deals with a more in-depth analysis.

One of the first conclusions already is that so far, little economic research on indirect pricing constraints has been done. Only recently, the concept has been suspected to play a relevant role in the process of either defining markets and/or in the assessment of (significant) market power.

2.1 Cave, Stumpf and Valletti (2006)

In 2006 Cave, Stumpf and Valetti published their report 'A Review of certain markets included in the Commission's Recommendation on Relevant Markets subject to ex ante Regulation'. In this paragraph we will discuss the passages that deal with indirect pricing constraints.

2.1.1 Assumptions

In their independent report, Cave, Stumpf and Valletti focus on certain markets that might be subject to *ex ante* regulation with respect to the European Commission's Recommendation. They base their approach on the idea of a 'representative member state' of the EU.

Cave, Stumpf and Valletti (2006) work broadly within the framework of the existing criteria concerning markets that might be considered for *ex ante* regulation. For their precise interpretation, see pp. 5-8.

2.1.2 Relevance of self-supply for definition of wholesale markets

For considering this relevance, three possible situations are presented:

1. Wholesale services do not (yet) exist;
2. The incumbent is the only provider of the wholesale service, but other operators are able to offer a similar type of wholesale service through their current self-supply;
3. The incumbent is the only provider of the wholesale service, but self-supply offers other operators a possibility to compete at the retail level.

These three situations are discussed on the assumption of absence of *ex ante* regulation.

Absence of a wholesale market

Based on that premise, the first case applies to situations where the incumbent is not forced to provide (wholesale) access on its infrastructure. The authors argue that it is likely that in a number of European countries, incumbents would indeed not have provided access unless they would be regulated. On the other hand, it could be that in a competitive wholesale market, commercial wholesale offerings were likely to develop. In that case, one could construct a so called *notional* relevant wholesale market in which the

captive sales of cable operators may be included in the relevant product market of wholesale broadband access.

Concrete possibilities for a wholesale market to develop: direct constraints

The second case refers to a situation in which wholesale supply substitution may be possible. In short, the former situation is extended in the sense that cable operators may indeed offer access to their network. This can be based on the idea that where alternative operators may supply inputs for themselves, they might as well be able to market them on a wholesale level. In turn, this possibility leads to the existence of *direct constraints*.

The following issues are identified as essential for the cable operator in order to perform a strong direct constraint in the wholesale market:

- The geographical coverage of the network has to be comparable to that of the incumbent;
- The amount of spare capacity on the network has to be sufficient;
- The switching costs of a downstream customer is small (that is, for retail customers it is quite easily to switch from supplier);
- Wholesale billing and account management have to exist.

Cave, Stumpf and Valletti argue that only if these conditions are fulfilled, "*supply substitution appears to impose a strong enough pricing constraint on the existing wholesale products. In this case the rival firm's self provided inputs could be included in the same relevant wholesale market together with incumbent's wholesale offerings*" (p. 17).

An additional remark that can be made, concerns the time frame in which the four conditions can be fulfilled. Although they might not all be present at the same time, the fast moving environment of the telecommunication sector might provide enough prospects that these terms will be satisfied in a foreseeable time horizon. Madiega (2006) deals with this aspect, which will be addressed in the next chapter.

Presence of retail demand and the relevance of self-supply: indirect constraints

This situation differs from the other two in the sense that:

- The incumbent is the only provider of the wholesale service;
- There is no direct constraint on the wholesale market because of absence of wholesale supply substitution.

Nonetheless, there may still be a constraint present on the wholesale market, albeit an indirect one that operates through the retail market. The basis of this finding is presented by Cave, Stumpf and Valletti as follows (pp. 17-18).

Retail prices can be regarded as being composed of a number of input costs. Intuitively, if the incumbent raises its wholesale price level, the retailers using this input have to raise prices as well as a consequence (on the assumption that it is a competitive market). In turn, if the customers on the retail market interpret cable based internet access as a substitute for DSL based internet, they may switch to the former. On the

wholesale market for DSL based broadband internet access, this leads to a decreasing demand. Hence, via the retail level, the incumbent is *indirectly constrained* in his possibilities to exert possible market power.

As the authors remark, the outcome of the process indicated above crucially depends upon the fact whether or not the retail demand substitution is strong enough to prevent a hypothetical monopolist from profitably raising the wholesale price.

In order to deal with this question, one would have to compare the concrete loss of revenue that the incumbent would face by raising his wholesale price, with the maximum loss in revenue he is willing to take by increasing his price.

Cave, Stumpf and Valletti call these aspects the *actual* and the *critical* loss respectively:

- The *critical loss* is the wholesale volume loss that would make an increase of the wholesale price unprofitable. Critical loss depends on the wholesale price-cost margin. According to Cave, Stumpf and Valletti (2006) the wholesale price-cost margin in the case of local access related wholesale products is large[3]. This makes a relatively small percentage loss in wholesale volume already unprofitable for the supplier.
- The *actual loss* is simply the loss that results from the price increase on the wholesale market. Based on the assumption that no substitution possibilities exist on the wholesale market, the main idea of Cave, Stumpf and Valletti (2006) is that the impact of this increase is diminished by the implications it has on the retail level. In other words, the specific situation on the retail market is explanatory for the consequences the wholesale price increase have.

Therefore, it is necessary to break down the actual loss in explanatory factors. These are:

- The *price elasticity of demand* for the wholesale based retail product.
  In this respect, the wholesale based retail product (being broadband internet access based on DSL), faces competition from the self-supplied retail product (cable-based broadband internet access). Generally applied to the broadband market, it holds that:
  - the more possibilities for substitution at the retail level between cable and DSL based broadband access,
  - the higher the price elasticity of demand for the wholesale DSL broadband access, the higher the reduction of demand for wholesale DSL broadband access by an price increase on the wholesale market,
  - and consequently the higher the actual loss at the wholesale level.
- The *cost share of the wholesale input in the overall price* of the wholesale based retail product.
  Among other cost shares, the retail price is mainly based on the wholesale input price. OPTA (2005) assessed that in the case of WBA this cost share is around 70%[4]. At this high cost share it holds that:
  - the higher the increase in the retail price after a wholesale input price increase,

[3] Cave Stumpf and Valetti (2006), p. 18.

[4] Cave, Stumpf and Valletti (2006) indicate that the indirect constraints can be effective if this cost share exceeds 50%. This is discussed further in paragraph 3.1

- the higher the loss of demand for the retail product that is based on the wholesale input,
- and consequently the higher the actual loss at the wholesale level.

The demand for wholesale input is positively correlated to the demand of the retail product. The same goes for the price elasticities of demand on the two markets. The article of Inderst and Valletti (2007), which is discussed below, deals with this notion in more detail.

Summarizing, the insights that Cave, Stumpf and Valletti (2006) give can be applied to the market for broadband internet access as follows.

1. For customers on the retail market, cable based broadband internet access generally forms a good substitute for broadband internet access over the cable. This means that the retail elasticity for DSL based broadband internet access is high.
2. The other explanatory factor the authors use is the cost share of the wholesale input to the final retail price. For the market under investigation, this share is also high.

Consequences for the definition of the market are discussed in the next chapter.

2.2 Inderst and Valletti (2007)

In 2007 Inderst and Valetti published *A Tale of Two Constraints: Assessing Market Power in Wholesale Markets.* The scope of this article can be summarized as follows:

- Comment on the pros and cons of using only wholesale market shares or also retail market shares, i.e. whether or not to incorporate indirect constraints in the analysis;
- Give insight in the correct treatment of direct constraints (which is less straightforward in the presence of integrated firms with self supply)

These two aspects are discussed below. Conclusions from these considerations are given successively.

Assumptions and definitions

The following assumptions[5] underlie the analysis:

Assumption 1	Suppliers and buyers interact in a market in which an uniform market price prevails. This holds for both the wholesale and the retail market.
Assumption 2	If present, market power of suppliers shows up in higher prices and lower quantities. Market power of buyers (monopsony) is not present.

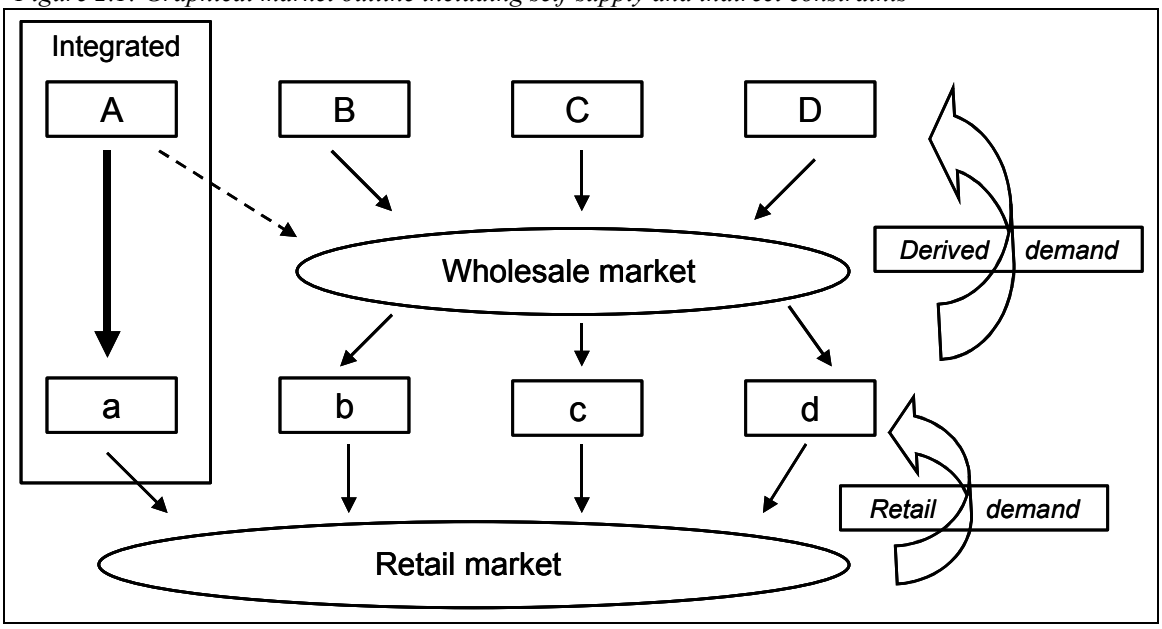
[5] In fact, a two-stage Cournot competition model underlies the analysis. See Inderst and Valletti (2007) note 8, p. 6. In short, the model assumes that each firm aims to maximize profits, based on the expectation that its own output decision will not have an effect on the decisions of its rivals. Total output of others is thus seen as given by each firm. The model thus describes a situation in which the market contains only a few suppliers, which has consequences on the competitive behaviour of them.

As the authors argue, this outline is most suitable to markets in which all suppliers of the wholesale market are relatively undifferentiated. This makes the framework applicable to the rather homogeneous market for wholesale broadband market access.

Assumption 3 Upstream firms A, B, C and D supply downstream firms a, b, c and d. Firm A is not active on the intermediate wholesale market since it only supplies to its own retailer a (*self supply*). The downstream firms a, b, c and d sell on the retail market.

The following figure summarizes this market outline.

Figure 2.1: Graphical market outline including self-supply and indirect constraints



The principle of indirect constraints

In this framework, the working of the principle of indirect constraints can be presented by confronting two different types of market outlines: one excluding, and the other including a vertically integrated firm.

<u>Market outline 1: No vertically integrated firm [A, a]</u>

I. Suppose that the non-integrated firms {B, C, D} impose a higher wholesale price P^w on the wholesale market

II. Assuming a competitive retail market, all retailers {b,c,d} will equally be affected by this price increase.

III. Under assumption 1, the retail price P^r will be affected[6] but the relative market shares remain the same.

Market outline 2: presence of vertically integrated firm [A, a]

IV. Again, suppose that the non-integrated firms {B, C, D} impose a higher wholesale price $P^w_{\{B,C,D\}}$ on the merchant market

V. The retailers {b,c,d} face the following:
   a. the higher P^w, which they have to make up for by increasing P^r: $P^r_{\{b,c,d\}}$ rises
   b. the competitor a, which is not confronted by any price increase for its input: $P^w_{\{a\}}$ remains the same

VI. We have thus: $P^r_{\{b,c,d\}} < P^r_{\{a\}}$ and hence $Q_{\{a\}}$ rises at the cost of $Q_{\{b,c,d\}}$ (that is, retailer a takes away market share form retailers b,c,d)

VII. This means that retail price P^d changes until a single price prevails on the retail market (following assumption 1)

Elasticity of demand

It has been shown that, under the same set of assumptions, the presence of a vertically integrated firm in the market can significantly alter the outcome of the market. Inderst and Valletti (2007) conclude that the derived demand on the wholesale market (derived from the retail market) becomes more responsive in the presence of vertically integrated firms.

This increase in elasticity in market outline 2 with respect to market outline 1 can be seen by confronting III with VII. Market shares (on the retail market) respond more to price changes in the presence of the self-supplier [A,a] than in the case without a vertically integrated firm.

Inderst and Valletti (2006), the technical paper that underlies Inderst and Valletti (2007), give a mathematical explanation of how indirect constraints are appropriately taken into account via the elasticity of derived demand. Thereby, they comment on concentration measures on both the wholesale and the retail market. Also, insights are given into when indirect constraints may be more or less important compared to direct constraints. Discussing this formal analysis goes beyond the scope of the current report.

However, by means of discussing the formula for elasticity of derived demand Inderst and Valletti (2006) give, some useful insights can be given in the principle at stake. The decomposition of elasticity of derived demand is:

$$\textbf{[1]} \qquad \boldsymbol{\varepsilon^w = \varepsilon^r \, \delta \, \tau \, \kappa \, \nu}$$

with:

[6] Implicit in assumption 1 is the competitiveness of the markets. When confronted with an increase in $P^u_{\{B,C,D\}}$, retailers are thus not in a position to hold equal $P^d_{\{b,c,d\}}$ at the cost of profits (since these do not exist).

ε^w	the elasticity of derived demand (applies to the wholesale market)		
ε^r	the elasticity of final demand (applies to the retail market)		
δ	the 'dilution factor' (the ratio of wholesale to the retail price)	[2]	$\delta = P^w / P^r$
τ	the pass through rate (how a change in the wholesale price affects the retail price)	[3]	$\tau = dP^r / dP^w$
κ	the ratio of total quantity to quantity without self supply (the importance of self supply in the market)	[4]	$\kappa = Q_{\{a,b,c,d\}} / Q_{\{b,c,d\}}$
ν	the quantity pass through rate (how the quantity of the input that is sold through the wholesale market changes with total retail sales)	[5]	$\nu = dQ^w / dQ^r$

Note that in a market without self-suppliers, $\kappa = \nu = 1$. Hence, $\varepsilon^w = \varepsilon^r \delta \tau$.

A quantitative example of how the formula [1] might work out for different market outlines is given below on the next page. Thereby, the possible impact of different dilution factors and elasticities is assessed.

Starting point: Retail market

Suppose now that the competition on the retail market increases by the entrance of self-supplying firm [A, a][7]. This means that indirect constraints become stronger.

- In terms of formula [2]: the more competitive market leads to a decrease in P^r, hence δ increases;
- In terms of formula [3]: likewise, the change in retail price increases compared to the change in wholesale price (moreover, the latter is assumed to remain the same)
- In terms of formula [1]: as δ and τ increase, also ε^w increases.

We have thus concluded that the entrance of a vertically integrated firm [A,a] has caused the elasticity of derived demand to rise. The larger the elasticity of derived demand, the more competitive the wholesale market is. Large elasticities of demand indicate that a small change in price, leads to a large change in demand.

[7] In general, the situation remains the same except for the increasing competition on the retail market. Formula [4] indicates that the factor κ becomes larger, i.e. >1, but in a competitive market ν becomes smaller (< 1) $\kappa * \nu = 1$.

Starting point: Wholesale market

The above conclusion is based on an analysis in which the starting point has been a change in the level of retail competition. However, if one starts out by assuming a change in the wholesale market, another conclusion arises. Namely, both weak direct constraints as well as strong indirect constraints can cause δ to increase. Therefore, a large value of δ in itself does not provide enough evidence on the true nature of the wholesale market.

Suppose that the level of competition in the wholesale market decreases. In other words, direct constraints become weaker on the wholesale market. In that case:

- The wholesale suppliers compete less, i.e. P^w, increases
- Consequently, δ is likely to increase, *although this does not work out in a higher elasticity (and thus more competition) on the wholesale market* because limited competition in this market was assumed to prevail in the first place.

In other words, the starting point of this reasoning has been the assumption that the *direct* constraints on the wholesale market alter. One has to be careful not to confuse *strong indirect* constraints with *weak direct* constraints in investigating the market shares. As Inderst and Valletti (2007) put it: "*high retail market shares of integrated firms at the expense of non-integrated suppliers may be indicative of either strong indirect constraints or weak direct constraints. Consequently, a naive use of retail market shares can be highly misleading*" (p. 10).

This means that if ε^w appears to be low (i.e. demand is not very responsive to price changes) it holds so *regardless* the indirect constraints that may exist. The latter does not exclude the existence of the former.

Possibilities to exert market power: the proper use of the dilution factor δ and pass through rate τ

If we suppose that the wholesale part of total price is small, the dilution factor δ is small too. The lower δ, the lower ε^w and thus the more possibilities wholesale producers have to impose a larger profit share on their price. For example: if input price is only 10% of total retail price, a 5% increase of the input price leads only to a ½% increase of the retail price, if all other factors remain the same. It may safely be assumed that final demand only decreases slightly in that case. In other words, it is profitable for the wholesaler to increase the price by 5% in this example. There are thus possibilities to exert market power in this case[8]. This implies that if δ is large, it would be less easy for a wholesaler to exert market power. However this also depends on the pass through rate **τ** and the elasticity on the retail level $\boldsymbol{\varepsilon}^r$. If demand on the retail level is inelastic, retailers would be able to 'pass through' the increase in price (**τ** would be equal to 1), again leaving the wholesaler in a position to exert market power**.**

Inderst and Valetti (2007) further argue that less competition on the wholesale market will lead to a larger value of δ. This is indeed the case when the supplier on the wholesale level is able to exert market power and charge prices above a competitive level. On the other hand they suggest that a small dilution factor in

[8] OPTA has taken this principle into account in their Market Analysis of the wholesale broadband market. Information supplied by parties suggests that the dilution factor in this market would be around 0,7. See also paragraph 3.2.

itself *may* be evidence of lack of SMP. However this need not be the case if the cost of the inputs was relatively small to the price of the final product in the first place.

Inderst and Valetti (2007) conclude with a warning: how informative the 'dilution factor' δ and the pass through rate τ may be, one should be cautious with using them, by not confusing strong indirect- with weak direct constraints.

2.3 Discussion

Cave, Stumpf and Valletti (2006) introduced the concept of indirect constraints, as being a possible explanatory factor in market behaviour in markets where self supply is (potentially) present. In doing so, they made a distinction of three possible situations, which can be referred to as a situation in which captive sales are absent, one in which retailers can rather easily switch from supplier, which causes direct constraints on the wholesale market, and one in which the presence of the self supplier on the retail market plays a significant role. However, the question remains how the concept in this latter situation can be made explicit.

By analyzing the concept at stake in a formal way, as is done in Inderst and Valletti (2007), more light is shed on this aspect. However, the pitfall of a mathematically soundly based analysis is that it might not be directly applicable on the actual situation. Inderst and Valletti (2007) refer to this problem as follows:

"In general, the correct (formal) analysis of intermediate goods industries depends on the particular circumstances, potentially more so than in an industry where firms sell directly to final consumers. In the economic literature, this manifests itself in the absence of a single "workhorse" model to analyse intermediate goods industries" (p. 5)

Nevertheless, the proposed method offers a possibility to take into account the effects that result from the presence of an integrated firm. If one would omit to do so, one runs the risk of over- or underestimating the actual degree of competition that prevail on the market. Inderst and Valletti (2007) explain this as follows:

"The extent of such an error (that is, not taking into account the possible effects that result form indirect constraints, Decisio*) in case indirect constraints are not adequately taken into account is made clear by the following result: for a broad range of specifications indirect constraints are even more effective than direct constraints in the sense that, compared to a situation where firm A would not be integrated and would fully participate in the wholesale market, the equilibrium price in the wholesale market is strictly lower if firm A integrates forward and completely withdraws from the wholesale market. In light of this result, it is thus generally misleading to argue that indirect substitution is less effective as its effects are cushioned by additional layers in the vertical chain. Quite to the contrary, the effectiveness of indirect constraints stems precisely from the fact that it does not work directly through the wholesale market, in particular in case wholesale competition is less intense than retail competition".* (p. 7)

In general, it is obvious that there is an effect of the intensity of downstream competition on the willingness-to-pay and, hence, price elasticity of demand of retailers when buying in the wholesale market[9]. However, the question is why this should be treated differently than any other impact on ε^w and market power in the upstream market. Therefore, one suggestion for a *clear (economic) principle on how indirect constraints should be treated* could be that one should not treat indirect constraints specifically. Instead, it is only important *whether or not* ε^w is high[10], but *not why* that is the case. In other words, market power and its potential use does not depend on the reasons for its existence, only on the constraints it faces.

In addition to that, one should be cautious not to double count the effects that may result from taking indirect constraints into account. Inderst and Valletti (2007) assert that the right way to deal with indirect constraints is through the elasticity of derived demand. Indirect constraints make derived demand more elastic and are thus accounted for when considering derived demand elasticity. If the market power was assessed on the base of derived wholesale demand then no further account of the structure of the downstream market is needed. In the opposite case one risks double accounting.

[9] That is, Bertrand competition on the retail market means that retailers have to be very price sensitive, hence ε will be very high in the wholesale market, too.

[10] i.e. the relevant question is how the demand curve is shaped in the wholesale market

3 Possibilities and limitations of taking into account indirect constraints in the Dutch broadband market

This chapter discusses the applicability of the above presented principle on the Dutch broadband market. In the first section, some theoretical considerations are given. The second section presents the point of view the Dutch NRA OPTA, regarding the question at stake. In section three the position of the European Commission is presented. This chapter concludes with some general considerations.

3.1 Theoretical considerations

Applying the theory to the real situation

The two explanatory factors for the elasticity of demand on the wholesale market Cave, Stumpf and Valletti (2006) distinguish, are the elasticity of retail demand and the wholesale input cost share. Taken together these factors strengthen each other. More specifically, the authors mean that "*only where the share of the wholesale input in the retail price is over 50%, the indirect pricing constraint appears to become large enough. This may be the case, for example, for ULL and WBA*" (p. 19).

Concerning the broadband market, the cable operators are not the only providers that rely on self-supply. This is obviously also the case for the retail unit of the incumbent and three out of the four large DSL operators. Only one DSL-operator has a wholesale-strategy, which holds only a small retail market share compared to its wholesale supply[11]. Therefore, both should be included in the relevant market according to Cave, Stumpf and Valletti (2006)[12]. Otherwise, by relying on the analysis that shows that the cable operators self-supply should be included in the wholesale market, excluding the self-supply of the incumbent at the same time leads to an underestimation of its market power. The reason is that the market share of the incumbent is not properly reflecting the two roles the incumbent has, being supplier on a wholesale market as well as self-supplying firm.

In their paper, Inderst and Valletti (2007) focus on the treatment of wholesale markets from the perspective of market definition and assessment of market power. Thereby they make clear that "*(the) question is not so much "whether" indirect constraint and self-supply must be considered in the market analysis but rather "when", at the stage of defining the relevant market or in the subsequent stage of market power assessment*". Indirect pricing constraints and self-supply are thus understood as playing a key role in defining markets.

[11] Only three DSL-operators offer wholesale broadband access (including the incumbent) and a number of small cable operators. Of the retail broadband connections more than 90% is realised through self-supply of either DSL-operators or cable-operators. On the total retail broadband internet connections, 93% is realized through captive sales of WBA by the incumbent, a DSL-operator or a cable operator. From the 7% internal supply of WBA some 85% is over DSL and the remaining 15% over cable. In her market analysis of 2005, OPTA stated that the incumbent was not in a position to exert market power because of indirect constraints caused by cable operators (and the other DSL-operators) on the retail market.

[12] See p. 19

Based on that premise, they argue that "*in principle, all approaches should lead to the same outcome as eventually all relevant competitive constraints have to be taken into account in order to correctly assess market power*" (pp. 4-5). This means that if one takes into account all relevant factors and if the applied economic model is the correct one, then the procedure by which one analyzes the problem should not matter. However, as is in general the case in the science of economics, "*neither the "right" economic model to assess market power is known nor is typically all the required data available in due time. The precise procedural steps may thus matter, in particular with regards to the use of market shares as a pre-screening device*" (p. 5).

Time horizon of technological progress

Madiega (2006) stresses the importance of a forward –looking approach in defining markets. In a (technologically) fast moving environment, competitive constraints may be more dynamic than in regular markets.

The central message of the article is that *"under a forward-looking approach to market definition, demand-side substitution must address the competitive constraints imposed by the emerging services and that, in assessing supply substitution, regulators should take into account the likelihood of potential competitors to enter the market within a reasonable time frame. Accordingly, potential competition must be addressed in defining market (and not subsequently when assessing market power) whenever the financial ability and the profitability for potential competitors to enter the market is established".*

In general, a dynamic market analysis allows the regulatory institutions to incorporate the impact that innovational processes have on the limitations of markets, to avoid markets to be defined wrongly. The Commission has expressed this point of view in several cases[13]. Considering that technological progress can play a role, Madiega (2006) states that "*regulators must then carefully consider the degree of substitutability on the supply side of the market in order to comply with the "technological neutrality" principle (i.e. they must neither impose nor discriminate in favour of the use of a particular type of technology), (…) Accordingly, market regulation must be based on the nature of the products or services provided, and not on the technological platform used to provide them.*" (p. 5). Thereby, the author refers to the fact that the European Commission has constantly recalled taken this core principle of the EU electronic communications regulation[14].

Concerning the broadband access markets, Madiega (2006) points on the somewhat inconsistent manner that the Commission has applied the principle. The author quotes the 2003 market review "*At the current time, upgraded cable systems are not sufficiently widely developed or deployed although the situation*

[13] For example, see Madiega (2005) p.5: "*the Commission made clear to the British regulator (Oftel) that 2G mobile services and 3G mobile services that are not distinguishable from a demand-side perspective "at present" and in the "near future" are deemed to be part of the same relevant product market*" (p. 5). See EC, SG (2003) D/231466.

[14] See Commission Communication 'Mobile broadband services', COM(2004) 447; Commission Communication 'Connecting Europe at high speed: recent developments in the sector of electronic communications' COM(2004) 61 final. See also EC, SG (2003) D/231466.

might change in some parts of the Community (.....). Consequently the only reasonable widespread means of supplying the end user is over local access network loops of the PSTN" (p. 6). In other words, cable operators are not assumed to exert relevant constraints on the DSL broadband access market.

Under what Madiega (2006) calls a 'prospective market analysis' (that is, one that takes into account technological progress and hence potential competition) NRA's are *indeed* expected to take into account considerations concerning "*technical, practical and economic feasibility for alternative operators to deliver broadband services equivalent to those provided by the traditional communications operators*" (p. 6). More specifically, the author concludes that: "*Therefore, at present, under a forward-looking approach to market definition, the regulators should consider, in defining the broadband access market, whether broadband access via cable networks competes with broadband access via the traditionally public switched telecommunications network in view of both supply side as well as demand side substitutability considerations*" (p. 6)

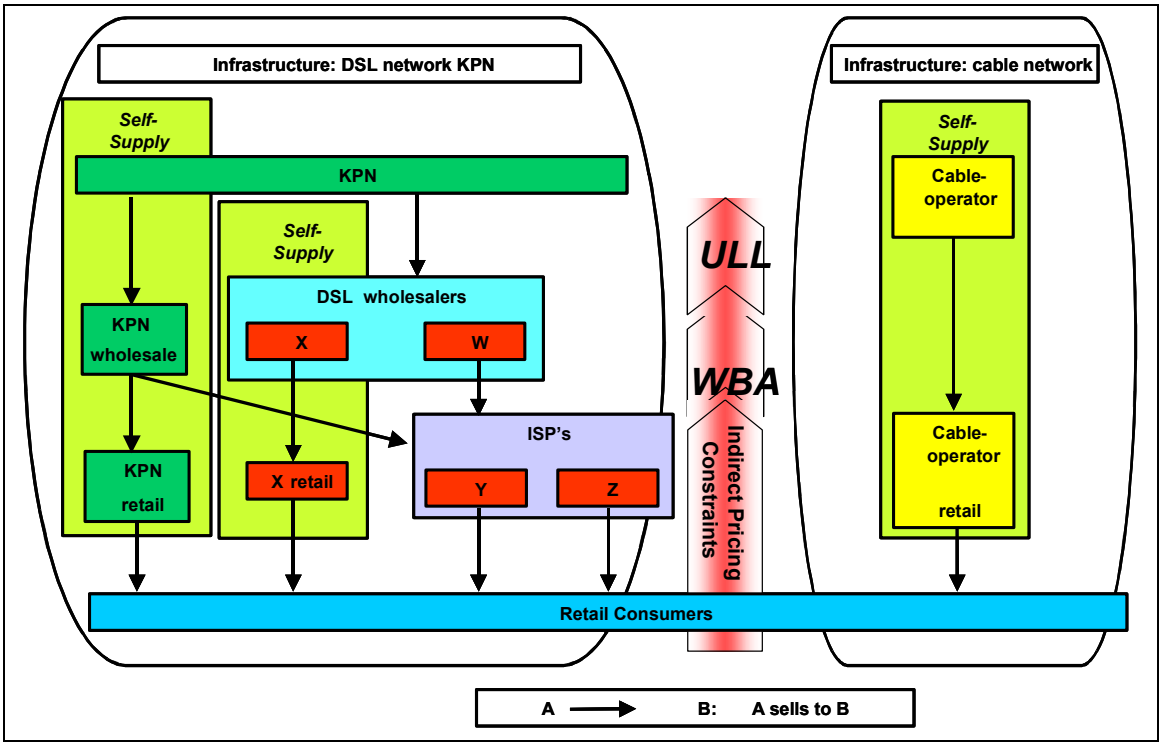
The central message of the paper is that an indirect constraint that results from products based on a technological platform that does not currently provide a direct substitute for certain products or technologies, may nevertheless be very relevant in exploring the boundaries of that market. To quote Madiega (2006): "*the inclusion of cable access in the wholesale broadband access may have a direct impact on the implementation of the remedies* (i.e. regulation, Decisio). *In particular, it follows from the principle of technological neutrality that access regulation imposed on to a PSTN-network operator must be imposed equally to a cable network operator if such an obligation is considered proportionate and justified*" (p. 8).

Other papers also refer to the importance of taking into account time horizons of technological progress. Williams, Visser and Algera (2006) state this as follows: "*Where difficult competition issues do arise, to adopt formalistic market definitions based on historic assumptions or technical descriptions or 'average' conditions across Member States is to miss out on the key contribution that the process of market definition and competitive assessment can offer. Done properly, but only if done properly, this process enables the accurate identification of competition problems, facilitating the implementation of targeted and effective remedies. Crucially, in an industry such as telecoms for which convergence is an on-going source of market dynamics, it also allows us to identify areas where the role for sector specific regulation has run its course, and where markets should be allowed to develop free from artificial constraints.*"

3.2 The interpretation of OPTA of indirect pricing constraints

In this paragraph we present an overview of the interpretation of OPTA of the principle in the broadband access market, as used in the market definition. In figure we present a graphic representation of the ULL WBA and retail markets.

Figure 3.1: The market for broadband internet access in the Netherlands and the possible pricing constraints



In its market analysis of the wholesale market OPTA starts with an analysis of the products that are sold on the retailmarket. Cable based retail products have a relatively low quality. The highest quality broadband is only possible over DSL. However 97% of all broadband products sold on the retail market is of the lower quality that both cable and DSL technologies deliver.

The combined networks of all cable operators reach 88% to 90% of Dutch households. The two main operators hold about 85% of all cable connections. OPTA (2005) concludes that there is some wholesale supply, but mostly to self controlled retailers. Only one cable operator supplies access to independent ISP's. Alternatively some ISP's buy wholesale-access via DSL and via cable[15].

In assessing the practical workings of the indirect constraints, the geographical scale should be taken into account. In the Netherlands cable operators operate on a different geographical scale than the incumbent. When considering both infrastructures as (indirect) wholesale substitutes the combined networks of several cable operators should be taken into account in assessing the market.

15 These two parties did not allow other ISP's on their network, as the figure suggests. The other parties that form the remaining 15% allowed either the retail unit of the two main cable operators on their network, or they supplied access to a non-integrated ISP (like Y and Z in this figure). See OPTA (2005), N^{O} 142.

On wholesale prices OPTA concludes that price differences between cable and DSL are not bigger than price differences between different suppliers of DSL. The percentage of wholesale access in the retail price is around 70% and the retail market is said to be very competitive.

3.3 Indirect pricing constraints and self supply in the view of the European Commission

In its draft recommendation of 2006 the European Commission (EC 2006) addresses the issue at hand. Regarding the role of self supply in defining markets, the European Commission makes a distinction between including self supply of the incumbent or including self supply of other parties. The latter should only be taken into account when alternative firms also self supply the necessary inputs. Only when there is such an alternative, third party access seekers could potentially move their business to these operators. The European Commission (2006) states that[16]:

"(…)*this potential is normally limited by capacity constraints, the potential lack of ubiquity of these networks, and the likelihood of the alternative providers entering the merchant market quickly*".

And concludes:
"*In general self supply by alternative operators will only be considered where these constraints are not present, which is unlikely in practice.*"

Note that this passage of the Commission only reflects on direct (potential) substitution on a wholesale level. On direct and indirect constraints between DSL and cable networks the commission makes a distinction between ULL and wholesale broadband access.

ULL
According to the Commission barriers to enter the local loop market are high and non-transitory and there is no tendency towards effective competition. Cable networks are considered to have a limited coverage[17] and the unbundling of cable networks is not considered technologically possible, or economically viable at this stage. The European Commission concludes that the local loop market meets the criteria to be susceptible to ex ante regulation.

Wholesale broadband access
From the point of view of the Commission wholesale broadband access indeed is a separate market form ULL. The latter is situated upstream from the former. According to the commission the effectiveness of competition on the WBA market differs not widely from that on the ULL market in most member states. In some member states however, this situation may be different. Referring to the situation in the Netherlands the Commission recognizes that the market for wholesale broadband access *may* tend towards effec-

[16] EC (2006), p. 15.
[17] In practice, this does not apply to the Dutch cable network.

tive competition, where both broadband penetration and unbundling rates are very high, and where alternative operators have started to provide wholesale broadband access services in large parts of the country in competition with the incumbent.

Based on the limited coverage of cable networks across the EU and the limited possibilities for direct substitution on a wholesale level the EC concludes that inclusion in the same product market is not justified: *"For existing wholesale customers, migrating from DSL based access to cable-based access would cause substantial switching costs so that switching is unlikely to occur in reaction to a small but significant non-transitory price increase. Suppliers would also be in a position to price discriminate between existing wholesale customers and wholesale customers that have not committed yet to a particular technology so that existing customers would not benefit from any constraining effect of uncommitted customers"* p.30, footnote 31.

On indirect constraints the commission states that: "*the presence of cable in a given Member State may, however, exercise an indirect constraint on the provider of DSL based wholesale broadband access, through the substitutability between both products at retail level. Such indirect pricing constraint, where it is found to exist, should be taken into account when assessing if the incumbent DSL operator has SMP on the relevant market"* pp.30-31.

The Commissions comments on OPTA's resolution on the market for wholesale broadband access
The Commission reacted on OPTA's finding of a single wholesale market for DSL and cable based bitstream products on an assumed indirect pricing constraint derived from substitutability between cable and DSL at the retail level. It stated that:

"*such an indirect competitive constraint should not have been taken into account at the stage of the definition of the relevant market. Moreover, for the theory of indirect pricing constraint to be applied at all, it would have to be shown that*

- *i) ISPs do not absorb such a price rise at the wholesale level but were forced to raise prices at the retail level,*
- *ii) even in case ISPs pass on the price increase, all or most of the customers of the ISPs forced to raise prices would switch to retail cable operators and not, for example, to the retail arm of the WBA provider, in particular if the latter does not raise its own retail prices .*

This has not been demonstrated by OPTA" (European Commission (2005) page 6)

The first remark is translated by Inderst and Valletti (2007) in the term pass through rate. In their framework, this item does indeed play a crucial role in explaining the elasticity on the wholesale market on basis of the elasticity in the downstream market. Further attention on the true extent of this aspect therefore seems to be appropriate. On the other hand, the hypothetical monopolist test OPTA performed in her market consultation (2005) shows that 70% of the costs of broadband internet access results from the costs of input from the wholesale market (paragraph 144 *uncommitted customers*). Therefore, in combination with the fierce competition on the retail market, OPTA (2005) concludes that it is *likely* that these costs will be passed through. Apparently, pointing at the likelihood of this result does not provide the obligatory

proof that the current framework of the Commission asks for. More insight in the pass through of costs seems to be necessary to address this question thoroughly.

The framework of Inderst and Valletti (2007) does not seem to give insight in how to answer the second remark. Their theoretical model does not allow for two types of self supply (namely by the incumbent and by de cable operators). Nevertheless, it does seem to be an informing item on the extent in which indirect constraints are working out in practice. Actually, if one supposes that the competition on the retail market is strong, which can be proven by unveiling high elasticities, there does not seem to be any indication that in case of a price increase of the independent ISP's, their customers will indeed switch towards the retail arm of the incumbent instead of the retail arm of cable operators. The very existence of a strong competition in the retail market, indicated for example by a high elasticity, does not give any indication that retail consumers would prefer the retail arm of the incumbent above that of the cable operator. A high degree of retail competition does simply not allow for (large) retail price differences between cable-retailers and the retail unit of the incumbent. Although in her market analysis OPTA (2005) does point at indications that the competition in the retail market seems to be severe, a quantitative indication is not given yet.

With respect to the Commissions comments, it can be concluded that in order to shed more light on the true content of the principle of indirect constraints, more insight seems to be necessary on:

- The pass through of a price increase on the ISP's;
- The true extent of competition in the retail market and consumer reactions after (hypothetical) price increases.

However, the relevance of the Commissions claim that in case of a wholesale price increase, all retail customers would have to shift to the retail arm of the cable operator, can be questioned. It has already been argued that the existence of (fierce) competition on the retail market has explanatory power in the sense that it is likely that in case of the wholesale price increase, retail customers would switch equally towards the retail unit of both the incumbent and the cable operators. It is then the question, whether the loss on the supplying activities on the wholesale market (thus supposed to be 50% here) is larger than the gains these additional retail customers (also 50%) deliver the incumbent.

Reference case: Malta

An interesting reference case is the market review of MCA (Malta Communications Authority), the Maltese NRA and the reaction of the Commission on it.

In its market review, MCA (2006) defines the market 'broadly', i.e. including all self-supplied wholesale broadband products over all existing networks, as well as all wholesale broadband access products and services provided to third party ISPs[18]. Furthermore, MCA states that absent the current access regulation, Maltacom would have a strong incentive to discontinue its wholesale offer and take over the DSL broadband lines currently provided by the independent ISPs.

[18] The only Maltese cable operator is active on the market of broadband internet access. It holds a retail market share of 44% of this broadly defined market, the incumbent DSL operator holds a market share of 27% and independent ISPs that operate on the DSL network, together hold a market share of 30%.

On basis of a number of factors, MCA concludes that the incumbent and the cable operator together should be designated as having jointly (collective) significant market power in the wholesale broadband access market. In other words, this would lead to a duopoly. One of these factors includes the limited elasticity of demand in the wholesale market. Regarding this aspect, MCA (2006) states that:

"*The DSL incumbent Datastream also faces an inelastic demand since its downstream provider Maltanet is able to access the necessary inputs without any problems whilst the third-party ISPs have no other choice than purchasing the wholesale access products that Datastream provide. As a result, the DSL ISPs are captive clients of Datastream and therefore they are not able to pose any constraints on Datastream in the absence of an alternative wholesale supplier. The lack of elasticity of demand is therefore conducive to coordination at wholesale level.*" (p. 50-51)

It seems thus, that indirect constraints resulting from competition in the retail market are explicitly not taken into account by the MCA. The elasticity on the wholesale market is assumed to be inelastic, although a soundly based argumentation is not given by the MCA. That is, factors such as the elasticity of retail demand, the pass through rate and the dilution factor are not addressed by it, whereas in the presented theoretical framework discussed in Chapter 2 they play an essential role in explaining the wholesale elasticity of demand.

In her reaction, the European Commission (2007) stated that "*Further factual evidence should, however, have been provided on the capacity of cable wholesale broadband access to offer comparable critical product characteristics as provided by DSL wholesale broadband access, notably in terms of service management. The MCA could also have investigated further whether product differences may render it difficult for an ISP to switch from a DSL wholesale broadband provider to a cable provider, independent of the possible technical substitutability. In this respect MCA could have provided further evidence that modem replacement and reconfiguration are not significantly limiting the incentive for an ISP to perform a wholesale migration from DSL to cable, in particular with respect to the cost of this migration (...).*" (p. 6)

For these reasons, "*the Commission has some concerns as to whether wholesale broadband access provided over cable and DSL form part of the same market.*" (p. 6)

Besides the critique the Commission has on MCA's market definition, it expresses serious doubts as to whether the incumbent and the cable operator hold a position of collective dominance on the defined market. Other comments include the following:

1. The Commission argues that several factors indicate at a competitive situation at the retail market, in spite of MCA's findings. Among others, the retail arm of the cable operator is claimed to undercut its retail prices and make low profits. This would point at strong retail competition;
2. Therefore, tacit coordination is supposed not to occur;
3. The supposed danger of the occurrence of a duopoly that exerts significant market power, is not assumed to be very concrete. "*If Maltacom* (i.e. the incumbent, Decisio) *would cease to provide*

access to ISPs it may carry the risk of losing wholesale revenues from these operators without a guarantee of gaining the retail customers. These customers may switch to cable or emerging platforms … The Commission services do not believe that the MCA has provided conclusive evidence that Maltacom could secure the operation (i.e. the supposed duopoly, Decisio) *and ensure it retained the majority of alternative ISPs' subscribers without incurring significant churn to cable (especially taking into account the alleged equivalence of DSL and cable products at retail level).*" (p. 8).

4. Finally, the Commission has doubts on the absence of competitive constraints on the alleged tacit coordination between the cable operator and the incumbent. According to the Commission, it is necessary to examine these constraints in more detail, especially under a forward-looking approach.

These concerns seem to be consistent with the Commissions comment on the market review of OPTA (2005). Also for the Maltese situation, the Commission doubts if wholesale access over DSL and cable can be identified as one market. Also, the third aspect noted above is consistent with the Commissions comments on OPTA (2005). Interestingly, the Commission points at the constraints resulting from other techniques such as BWA, that may be exerted on the possible duopoly. It seems that these constraints have to be interpreted as operating directly, that is, on the retail market. From the reaction of the Commission it can not be concluded how these constraints would work out in the wholesale broadband access market, which would have to be interpreted as indirect constraints.

3.4 Considerations in general

One might argue that in analyzing markets one should only take into account supply, demand and the resulting distribution of market power, irrespective of the question where potential market power comes from. Fierce competition in broadband retailing can lead to fierce competition in the broadband wholesale market, i.e. high elasticities. But there are other sources for fierce broadband competition too, e.g. overcapacities. Both factors have an impact on the existence and distribution of market power in the upstream market. Still, within the legal framework, defining markets is crucial to assessing market power in the first place[19]. So the question remains whether DSL and cable both should be included in the market for wholesale broadband access. The fact that the retail products are competing strongly, and that both DSL and cable serve as an input for broadband internet access retailers suggests that indirect constraints should indeed be considered in the Dutch market for wholesale broadband access. See also (Inderst and Valletti (2007), p. 3-4). On this point, there seems to be a consensus of opinion between OPTA and the EC.

[19] From the economic point of view, defining relevant markets is an intermediate step only. It is not strictly necessary to do this step. Modern approaches in antitrust attempt to assess market power directly without going through the intermediate step. This is also because of the conceptual problems involved in market definition. In defining a market, one has to make a zero-one decision: a product is in or out. This rigidity is not fully reflecting economic reality. Direct assessment of market power does not suffer from this drawback and, therefore, might be preferable. Of course, there are aspects of legal certainty as well; market definition should, perhaps, not be fully abolished. But its limitations should not be forgotten, certainly not in cases like these.

Several authors agree that the effectiveness of an indirect pricing constraint depends on the amount of the retail price that is accounted for by the wholesale price. But it is not the only explanatory variable on the effectiveness of the indirect constraints. The elasticity on the retail market, combined with the 'pass through rate' (the amount of a price change that is passed through from the wholesale market to the retail market) should also be taken into account.

The pass through rate and retail price elasticity are also the key elements according to the European Commission. In order to use the theory of indirect pricing constraints. Evidence must be produced that:

- ISPs would pass through an increase in price to the retail products;
- Faced with such an increase in price retail, customers would switch to cable based retail products.

According to the EC OPTA's market definition lacks sufficient evidence on the latter point. However this latter point seems to suggest that all customers should switch to cable operators, for indirect constraints to become effective. This need not be the case as is argued on page 19.

When considering the elasticity of retail demand, the time in which retail customers are able to respond to a change in price might also play an important role.

4 Indirect Pricing Constraints in other markets

In this section the concept of indirect pricing constraints in other markets is discussed. The principle of indirect constraints is a key issue in a number of telecom cases, including the cable/ADSL cases (market 12: broadband access, and also market 11: unbundled local loop). In others, it seems to have played a more implicit role.

According to Inderst and Valletti (2007) a survey of competition case law concerning indirect constraints and captive sales is: *Ofcom, Indirect Constraints and Captive Sales Overview of Regulatory Practice and Competition Case Law with Regards to Indirect Constraints and Captive Sales in Market Definition and Market Power Assesment, Report by CRA for Ofcom, May 2006.*

The next paragraph deals with a concrete example in which indirect pricing constraints have actually played a role in the decision of the European Commission in the case of a proposed merger.

4.1 Indirect pricing constraints in practice: the case of the merger of Schneider Electric SA and Legrand SA

The electrical devices manufacturers Schneider Electric SA and Legrand SA proposed to merge, but were not allowed to in first instance by the European Commission. However, the Court of First Instance (CFI) overruled this decision by stating that the Commission had not properly treated the indirect constraints in its analysis.

Schneider Electric is a producer of electrical systems that other firms use as input, the same goes for Legrand. For these products, other companies as ABB and Siemens only competed through self-supply on the retail level. Nevertheless, in its analysis the Commission did not incorporate the market share of ABB and Siemens at the downstream market. Thereby, CFI argued that "*the Commission underestimated the economic power of the merged entity's two main competitors and correspondingly overestimated that entity's strength*" (Inderst and Valletti (2007) p. 3).

This is a clear case of indirect constraints, where the firms proposing to merge were active on a wholesale level. By merging they reduced the amount of direct competition on a wholesale level. However, CFI ruled that they were not able to exert market power because they were indirectly restrained from doing so by the effective competition on a retail level form ABB and Siemens.

This case differs with the market structure at stake (i.e. broadband market access) in the sense that the competitors of Schneider and Legrand *only* self-supplied. Schneider and Legrand are both active on the wholesale market as the only non-integrated suppliers.

4.2 Indirect pricing constraints in practice: the case of Hugin vs. the Commission

A case that has more resemblance with the broadband access market is one in which the firm at stake does not only supply on the wholesale market, but is also active on the retail market. Such a case is cash register supplier Hugin vs European Commission.[20] It dealt with the question whether Hugin occupied a dominant position on the market for cash registers, which is very competitive. The Commission took the view that Hugin had a monopoly in spare parts for machines made by it, and that therefore it maintained a dominant position for the maintenance and repair of Hugin cash registers in relation to independent companies that need to be supplied by Hugin for their spare parts.

In other words, in the competitive market for cash registers Hugin competed on the retail market with other cash register companies and did not supply to independent service providers. We have thus a similar situation as graphed in Figure 3.1, with Hugin taking the place of the incumbent DSL operator, (direct) competitors that of the cable operators and the independent service providers that of the ISP's.

More specifically, the case dealt with the fact that one of these independent companies, Liptons, was in no union member state allowed to buy spare parts form Hugin. Consequently, the Commission claimed that Hugin was affecting free trade in the union and should therefore be prohibited to do so. Hugin contested the validity of this point of view by stating that "*the supply of spare parts and maintenance services is certainly not a separate market but is an essential parameter of competition in the market for cash registers as a whole*" (paragraph 4).

In other words, Hugin 'internalized' the competition on the retail market in its decision not to supply on the wholesale market. Eventually, recapitulating the central question of the case, the Court decided that Hugin's behavior did not distort the free movement of products in the union. Consequently, it was not forced to supply her products on a (potential) wholesale market.

Hugin defended itself with the arguments that in line with her commercial policy, it wishes to preserve its own technical- and service departments to maintain its good reputation for its products. This seems to point at competitive elements, resulting from the retail market, that played a significant role in the decision how to operate on a (potential) wholesale market.

[20] European Court (1979), Case No. 22/78

5 Conclusions

Regarding the three central themes of this paper, the following conclusions can be drawn.

A. Theoretical analyses of the principle of indirect pricing constraints

A theoretical analysis of the principle showed that the degree in which indirect pricing constraints could play a significant role depends crucially on the following factors:

- The market shares of
  - the incumbent;
  - the ISP's;
  - the cable operators that may exert the indirect constraints;
- Pass through rates of price increases in the wholesale market;
- Elasticity of demand in the retail market;
- Relative changes in market shares in the retail market that follow price changes
- Relative changes in wholesale prices

These elements form the key to get a thorough insight in the elasticity of demand that prevails in the wholesale market. Consequently, this elasticity has explanatory power on competitive behaviour and potential significant market power in the wholesale market. In this investigation, one has to make a strong distinction between weak direct constraints and strong indirect constraints. This may be crucial in defining the market.

B. The role of indirect pricing constraints in the definition of the relevant (wholesale) broadband market

In the process of defining the market, one has to proof that at a higher wholesale price, the former retail ISP customers switch to cable operators and not to the retail unit of the incumbent if one asserts that indirect constraints play a significant role in the market.

Besides, in investigating the potential role of indirect constraints, a thorough insight in how the above mentioned factors work out in reality is crucial. Another item that might be relevant in defining the market could be the time frame in which technological developments may lead to new market structures.

With respect to the Commissions comments, it can be concluded that in order to shed more light on the true content of the principle of indirect constraints, more insight seems to be necessary on:

- The pass through of a price increase on the ISP's;
- The true extent of competition in the retail market in the sense consumer reactions after (hypothetical) price increases.

C. Comments on Cave, Stumpf and Valletti (2006)

The article of Cave, Stumpf and Valletti (2006) does not provide a clear method how to deal with indirect constraints in defining markets and/or assessing market power. In their analysis they consider

the case of how indirect constraints may operate in the market of a 'representative' EU member state. Thereby, the concept is clearly in development in the economic literature. Inderst and Valletti (2007) recapitulate these remarks by arguing that the correct (formal) analysis depends on the particular circumstances and that this is manifests itself in the absence of a single economic 'workhorse' model.

Interesting concluding remarks on the subject include the following:

- Stumpf, Cave and Valletti (2006). conclude on defining the market:
  "*If the indirect pricing constraint from retail demand substitution is found to be strong enough, self supply of competitors and the incumbent should be included in the relevant wholesale market. If the competitors' self supply were included in the market, and at the same time self supply of the incumbent excluded, the resultant market share of the incumbent would underestimate its market power. The actual market power of the incumbent is only properly revealed once wholesale and self supplied inputs of the incumbent are aggregated. We note that, if the indirect pricing constraint from short-run retail demand substitution is not strong enough to be reflected in the market definition, it may still have to be taken account of in the market analysis as a factor limiting the market power of incumbent operator*" (p. 19)

- Williams., Visser and Algera (2006) conclude the following:
  "*Where difficult competition issues do arise, to adopt formalistic market definitions based on historic assumptions or technical descriptions or 'average' conditions across Member States is to miss out on the key contribution that the process of market definition and competitive assessment can offer. Done properly, but only if done properly, this process enables the accurate identification of competition problems, facilitating the implementation of targeted and effective remedies. Crucially, in an industry such as telecoms for which convergence is an on-going source of market dynamics, it also allows us to identify areas where the role for sector specific regulation has run its course, and where markets should be allowed to develop free from artificial constraints*".

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