

A Tale of Two Constraints: Assessing Market Power in Wholesale Markets*

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1. Introduction

This paper focuses on the treatment of wholesale markets from the perspective of market definition and assessment of market power. As is well known, under competition law, the purpose of market definition is to identify the economic arena in which to evaluate the existence of market power of a given undertaking. In a wholesale market, that is a market where intermediate goods are bought for the purpose of producing and selling some other good to final consumers, the competitive constraints faced by the input suppliers are particularly challenging to ascertain in an appropriate manner. A supplier to the wholesale (or upstream) market is constrained “directly” by other firms that operate at the same level. The supplier may, in addition, be “indirectly” constrained by competition on the retail (or downstream) market. Precisely, the supplier may not be able to raise his price substantially above the competitive level as this would make its customers less competitive on the retail market and would thus reduce their retail market share and ultimately their purchases from the supplier.

The consideration of such indirect constraints, which work through the retail market, is of particular importance in the presence of vertically integrated firms. In fact, if vertically integrated firms are not active on the wholesale market then they will only exert competitive pressure via the retail market. Moreover, their own “captive” production, which is the amount that a vertically integrated firm sells directly in the downstream market, will not show up in a narrow analysis of the wholesale market.

The analysis of markets where indirect constraints and captive sales play a non-negligible role poses two types of challenges: i) choosing the appropriate framework for the general (formal) economic analysis, and ii) choosing the appropriate procedure in order to conduct the practical analysis. Regarding the second challenge, one of the key practical questions that have repeatedly come up in cases is whether indirect constraints should already be taken into account at the stage of market definition or only at the stage of market power assessment. While European competition case law clearly prescribes that indirect constraints at the retail level must be taken into account, it currently seems to provide no clear guidance as to whether indirect constraints should already affect the delineation of the relevant market.

Treatment of Indirect Constraints under European Competition Law

The respective guidelines of the European Commission are not sufficiently clear in this respect. In particular, the European Market Definition Notice¹ seems to put the

* We thank Tambiama Madiaga (EUI), Tanja Salem (Ofcom) and Valter Sorana (CRA) for extremely useful discussions and comments. The views expressed in this article are those of the authors alone.

¹ Commission Notice on the Definition of Relevant Market for the Purposes of Competition Law (OJ C 372, 9.12.1997).

emphasis more on direct constraints, namely on interchangeability and substitutability, and not so much on overall competitive constraints.²

A recent, very prominent case is provided by the proposed merger of Schneider Electric SA, a producer of products and systems in the electrical distribution, industrial control and automation sectors, and Legrand SA, a producer of electrical equipment for low voltage installations. While Schneider and Legrand were not vertically integrated, other firms competed only through self-supply at the retail level (of panel-board components, which use low voltage electrical equipment as produced by Schneider and Legrand as input). The merger was blocked by the Commission, whose decision was subsequently overruled (without appeal) by the CFI.³ The CFI argued that by not incorporating ABB's and Siemens' market shares at the downstream market (namely, that of panel-board components) "the Commission underestimated the economic power of the merged entity's two main competitors and correspondingly overestimated that entity's strength". According to the CFI, the Commission should have included captive sales into market shares in defining the market definition.⁴

Treatment of Indirect Constraints for the Regulation of Electronic Communications

A careful consideration of indirect constraints and captive sales must also play a key role in the analysis of markets where, due to technological incompatibility, some upstream firms are not even in a position to supply to particular retailers. The (captive) supply of these firms can thus only exert an indirect constraint on the wholesale price. This is descriptive of some markets for electronic communications which are to be analysed under the New EU Regulatory Framework. The typical example is the provision of broadband services. Broadband services, which form part of the same relevant retail market, are provided over different technologies at the wholesale level (ADSL, cable, fibre, etc.). The controversy which has arisen between the Commission and some National Regulatory Authorities (NRAs) with regard to the definition of the wholesale broadband access market (Market 12 of the Commission Recommendation) illustrates the

² A possible exception is the Vertical Restraints Guidelines. (Commission Guidelines on Vertical Restraints (2002/C 291/01). While it is explicitly recognised that final consumers' preferences influence the degree of substitutability at the level of distributors (Par. 91), to calculate market shares under the Block Exemption Regulation only sales through the wholesale market (and thus excluding captive sales and self-supply) are considered (Par. 98).

³ CFI Judgement of 22.10.2002 on case T-310/01: *Schneider v. Commission* (Application for the annulment of Commission Decision C(2001)3014 of 10.10.2001 on case COMP/M.2283 - *Schneider-Legrand*). The *Schneider* case is an exception in that evidences are brought that there actually is a market at retail level on which the self-supply products can be traded. The Commission seems to more generally address the competitive constraints exerted by self-supply products in assessing SMP and not at the market definition stage. For instance, in *Endemol Entertainment Holding BV v Commission*, the CFI agreed with the Commission's market definition and concluded that the independent production of Dutch-language television programmes was a separate market from the market for in-house productions of the public broadcasters (Case T-221/95). Similarly, in *Alcoa/Reynolds*, the Commission distinguished between alumina used captively and alumina sold to the merchant market and refused to include the former in the relevant market (Case COMP/M.1693).

⁴ For a survey of recent competition case law concerning indirect constraints and captive sales, see: *Indirect Constraints and Captive Sales: Overview of Regulatory Practice and Competition Case Law*, Report prepared by CRA for Ofcom, May 2006.

methodological problem at issue. The 2003 Market Recommendation defines very broadly the wholesale broadband access product market, which is said to cover DSL bit-stream access technology as well as alternative technologies, if and only if they offered facilities equivalent to bit-stream access.⁵

Based on this definition, all NRAs have generally included DSL bit-stream access in their market definition. But their analysis has differed substantially with respect to the inclusion of other technologies, such as cable TV networks that have been upgraded to provide a return path, satellite TV networks, or wireless technologies. While some NRAs (such as RTR, BNetzA, ComReg, Anacom and Ofcom) have considered that cable-based services formed part of the relevant market, other NRAs supported by the Commission (such as NITA, Arcep, NCAH and PTS) have excluded those services in defining the market and have chosen to assess pricing constraints at the subsequent stage of dominance assessment.⁶

The divergence of views was due in particular to a disagreement on whether to assess the indirect constraints exercised at the retail level. The Commission and the NRAs who did not include cable in the relevant market generally started their analysis at the wholesale level. And, since cable networks currently do not provide wholesale access and cannot easily enter the market in the short term, cable-based services cannot be included in the broadband access market. There is simply no “direct” constraint on DSL wholesale broadband access products. Consequently, cable’s competitive impact was to be taken into account in the analysis of dominance in terms of “potential competition”. In contrast, those NRAs that did include cable in the market, focused first on competition at the retail level. They concluded that, from the demand side, at the retail level all broadband access services belong to a single product market, whatever the platform used at the wholesale level. They also concluded that the indirect pricing constraints exercised by cable-based services at the retail level have a sufficiently significant impact at the wholesale level to justify its inclusion in the wholesale broadband market.

Scope of this Paper

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. Clearly, 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. In other words, if all relevant factors are contemplated and if the applied economic model is the correct one, then the particular procedure should ultimately be irrelevant. In practice,

⁵ Commission Recommendation on Relevant Product and Service Market within the Electronic Communications Sector, OJ [2003] L 114/45.

⁶ See Madiega, Tambiama, 2006, Innovation and Market Definition under the EU Regulatory Framework for Electronic Communications, mimeo, European University Institute. See also Cave, Martin, Stumpf, Ulrich and Valletti, Tommaso, Review of the Commission’s Recommendation on Relevant Markets Subject to *ex ante* Regulation, Report prepared for the European Commission, July 2006. It should also be said that the Electronic Communications SMP Guidelines explicitly recognise the importance of broader competitive constraints when commenting on the need to consider substitution possibilities between different technologies (Commission Guidelines on Market Analysis and the Assessment of Significant Market Power under the Community Regulatory Framework for Electronic Communications Networks and Services (2002/C 165/03), Par. 67).

however, 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.

We thus comment in this paper, in particular, on the pros and cons of using only wholesale market shares or also retail market shares. Since, in practice, readily observable indicators are typically employed to assess market power, we also discuss the function and the information contained in pass-through rates, which measure the responsiveness of retail prices to changes in the wholesale price, and dilution factors, i.e., the ratios of wholesale to retail prices.

Our discussion also extends to the correct treatment of direct constraints, which is less straightforward in the presence of integrated firms that may supply also to the wholesale market. We provide an analysis of integrated firms’ incentives to sell to other retail firms and comment on potential pitfalls when deriving projections for integrated firms’ sales and thus the strength of the direct constraints.

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. One, if not the main, distinction refers to the most appropriate way how to capture the interactions between suppliers and buyers. In the technical work that underlies this paper,⁷ we suppose that suppliers and buyers interact in a market, with the particular implications that there exists a uniform market price and that the exercise of (seller) market power shows up in a higher price and lower quantities. This framework is most suitable to markets where all suppliers of the wholesale market are relatively undifferentiated.⁸

2. Incorporating Indirect Constraints and Captive Sales into the Economic Analysis of Market Power

2.1 Setting the Stage

For concreteness suppose four upstream firms, called A, B, C and D compete in a wholesale market to supply input to four downstream firms, denoted as a, b, c and d. Also

⁷ We refer the reader to a more technical paper for a formalisation of the arguments and for a proof of all our claims. See Inderst, Roman and Valletti, Tommaso, 2006, Market Analysis in the Presence of Indirect Constraints and Captive Sales.

⁸ The formal apparatus on which our analysis relies, namely that of two-stage Cournot competition on the two market levels, makes the following two key assumptions: First, on each market level, market power is exercised by influencing a uniform market price; second, market power is exercised only by the respective sellers. (For the seminal analysis of this framework see: Salinger, Michael A., 1988, Vertical Mergers and Market Foreclosure, Quarterly Journal of Economics 103, 345-56.) Though these assumptions are quite standard in the economic literature, they may not always be appropriate. A different framework posits that individual supply contracts are bilaterally negotiated and allows for both differentiated goods and individual discounts. It may then no longer be always meaningful to take into account simultaneously direct and indirect constraints for the whole market given that for some suppliers only one of the two constraints may become binding. For a discussion of the differences between the two frameworks, as applied to the exercise of buyer power, see: Inderst, Roman and Shaffer, Greg, The Role of Buyer Power in Merger Control, chapter for the ABA Antitrust Section Handbook, Issues in Competition Law and Policy (W.D. Collins, ed., in preparation).

imagine one upstream supplier, namely A, is integrated forwards, that is, A self-supplies to a. This is illustrated in Figure 1.

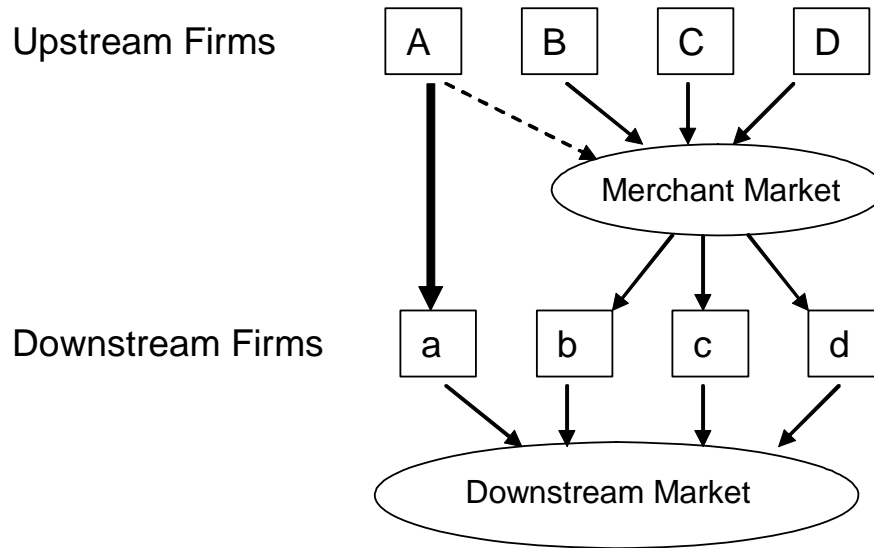


Figure 1: Illustration of a Market Structure with Direct and Indirect Constraints

To fix ideas, there is a proposed merger of two non-integrated suppliers, say B and C. How should this merger be treated? For the sake of simplicity, imagine that all three non-integrated upstream firms, B, C and D, have symmetric costs. Absent other differences that may affect their conduct in the market, we should thus expect that each one of them controls one third of the wholesale market. Taken together, firms B and C, which plan to merge, will then have jointly two thirds of the wholesale market. This number is unaffected by whether there is an additional upstream firm, A, that only supplies to its own downstream affiliate, a. When relying solely on market share thresholds that do not differentiate between whether or not there is competition on the retail market from a backwards integrated firm, the analysis would risk over- or underestimating the true extent of competitive constraints.

The extent of such an error 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.

2.2 How Indirect Constraints Affect the Wholesale Market

Economic analysis shows that the adequate way to deal with indirect constraint is through the elasticity of *derived* demand, which is the demand faced by suppliers to the wholesale

market. Derived demand is obtained by aggregating the individual demand of all retail firms that have to purchase in the wholesale market. In turn, each retail firm's individual demand derives from the equilibrium that is played out in the retail market.

We now argue that indirect constraints affect the market power of upstream firms by making derived demand *more* elastic. To see why, suppose that non-integrated suppliers were to push up the upstream price. If there was no vertically integrated firm, all competing downstream firms would be equally affected by this increase in their costs. In contrast, if one or more downstream firms can rely on self-supply, then these firms will now have a competitive advantage because they do not face the same price increase. They thus take away market share from non-integrated firms following an increase in the wholesale price. Derived demand on the wholesale market becomes more responsive (that is, more elastic) in the presence of vertically integrated firms.

Which factors affect the elasticity of derived demand? In our work, we find that the higher the elasticity of final demand, the higher will also be the elasticity of derived demand. This is intuitive and holds both with and without indirect constraints. Moreover, indirect constraints become more effective the more competitive the retail market is. If, say, market conduct becomes more aggressive or if products are less differentiated, then following an increase in the wholesale price an integrated firm will take away a larger market share from non-integrated firms, thereby making derived demand more responsive.⁹

It is interesting to note that in the aforementioned Schneider/Legrand case, the Commission argued that the high level of downstream competition (in this case, among wholesalers that were supplied by the two merging firms) actually increased upstream market power. This is the opposite of our finding. The Commission's argument was that competition would undermine the buyers' ability to exert countervailing power so as to "constrain prices in any acceptable way" (Par. 195). Our analysis suggests the opposite, namely that more competition at the retail level imposes more constraints on suppliers.¹⁰

Indirect constraints are also relatively more effective the *less* competitive the upstream market is, both in terms of the number of competing firms and in terms of how fiercely they compete against each other. If the upstream market is very competitive, the input price would be very close to marginal cost and indirect constraints do not have a large residual role to play. It is instead when the direct constraints on the upstream price are weak that indirect constraints become relatively more effective.

⁹ It seems important to note that for this argument it is crucial that some retail firms are integrated backwards. In fact, if all retail firms were equally affected by a higher wholesale price, then our analysis shows that we should *not* expect the prevailing wholesale price to be systematically affected either by how differentiated goods are at the retail level or by how competitive the retail market is.

¹⁰ When suggesting that countervailing power could "constrain prices", the Commission may have had in mind a different model than ours. An alternative model could be one where also buyers can exert monopsony power. In this case it could be true that if there are fewer buyers, then each individual buyer has more incentives to withhold demand in order to put downward pressure on the wholesale price. If this was, however, the Commission's picture of the market, then it is unclear why the presence of such monopsony power, which should rather tend to coalesce upstream market power instead of providing a countervailing force, would constitute a possible defence. (In fact, the Commission's own merger guidelines explicitly refer to this "negative" aspect of buyer (countervailing) power: European Commission, Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings, [2004] OJ C 31/5, Par. 60.)

2.3 How Informative are Market Shares?

In our example of a proposed merger, the joint market share of firms B and C would be two thirds of the overall retail market share of all *non-integrated* downstream firms, b, c, and d. This share would be lower if firm a is included as well. Such a measure would be in line with a broader definition of the market that takes into account also captive sales of integrated firms.

How informative are retail market shares about the competitive constraints that suppliers face in the wholesale market? To answer this question, it is helpful to conduct a comparative exercise. Suppose two retail markets differ (only) in the level of competition. As we noted previously, a more vigorous retail competition will make indirect constraints more effective. To be more precise, recall that the more competitive the retail market, the more business would be diverted away from non-integrated downstream firms in case their wholesale price increases. Though in equilibrium the wholesale price will also be lower if the retail market is more competitive, our analysis shows that overall the market share of integrated firms will still increase. We can thus conclude that the more competitive the retail market, the larger the market share of integrated firms and the more effective will be indirect constraints. Hence, according to this comparative analysis, retail market shares would be indeed informative about the competitive pressure that suppliers face through indirect constraints. An inverse relationship is predicted between the retail market share of integrated firms and the upstream price.

Importantly, however, the previous argument relied crucially on a particular comparative variation, namely that in the competitiveness of the retail market. If we were to vary, instead, the level of competition that prevails in the wholesale market, then the *opposite* result would obtain: A smaller retail share of non-integrated suppliers is now indicative of less (direct) competitive constraints on the wholesale market. Intuitively, if there is less competition on the wholesale market, then this will result in a higher wholesale price and in a deterioration of the competitive position of non-integrated retail firms. Consequently, their integrated rivals will be able to control a larger share of the retail market.

Summing up the two preceding arguments, 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. Moreover, as we argued above, that the elasticity of derived demand accounts already for indirect constraints. If this elasticity was known, or estimated with sufficient precision, then information on the wholesale market, such as costs of individual suppliers and some measures of their competitive conduct, would be sufficient to obtain a full picture of the market. In this case, incorporating captive sales of integrated firms by calculating retail market shares would not be necessary. What is more, a reliance on these additional measures may run the risk of “double counting”.

To illustrate this, imagine that, in the absence of sufficient reliable data to conduct a full-scale estimation, an analyst collects various measures of how responsive wholesale and retail demand are to changes in prices. Importantly, for the wholesale market these measures already incorporate indirect constraints. Consequently, whether non-integrated suppliers have low or high retail market shares should not be used as a means to correct

these findings. If survey evidence suggests that wholesale demand is not very responsive to price changes, then this clearly holds *despite* the presence of indirect constraints.

Overall, our arguments suggest that the analysis should focus squarely on the wholesale market where possible, taking only carefully into account additional information from the retail market, such as retail market shares, the elasticity of final demand or the competitiveness of the retail market (see also the following Section). We are certainly aware that, in practical terms, this may imply a risk of overestimating market power, provided that “raw” wholesale market shares are used as a *prima facie* indicator. Also, in regulated market there may be a risk of asymmetric regulation. In the case of electronic communications, which we discussed at some length in the Introduction, incumbent operators, which supply wholesale products, may end up being treated differently from new technologies supplied by alternative operators because these are excluded from the regulated market defined according to established technologies.¹¹

2.4 The Use of “Short-hand” Information on Derived Demand

Besides the use of market shares, also some other indicators have been proposed as a way of assessing SMP in the presence of indirect constraints, most importantly the dilution factor and pass-through. To analyze the usefulness of these and other measures, in our formal work we have provided a decomposition of the elasticity of derived demand, denoted as ε^u , into several components in the following manner: $\varepsilon^u = \varepsilon^d \delta \tau \kappa \nu$, where ε^d denotes the elasticity of final demand and the other parameters are now explained. δ denotes the dilution factor, i.e., the ratio of the upstream to the retail price; in formal terms $\delta = p^u/p^d$. τ denotes the pass-through rate, that is, how a change in the wholesale price affects the retail price; in formal terms $\tau = dp^d/dp^u$. κ describes the importance of captive sales and is calculated by taking the ratio of total quantity (with captive sales) and total quantity without captive sales. Finally, $\nu = dq^u/dq^d$ denotes the quantity pass-through rate, i.e., how the quantity of the input that is sold through the wholesale market changes with total retail sales.¹²

Our formal analysis suggests a careful use of this decomposition, while warning against the potential fallacies and misuses. We show that in the presence of vertically integrated firms indirect constraints may indeed affect the upstream elasticity via the dilution factor and the pass-through rates in the way suggested by the decomposition above. That is, as indirect constraints become stronger, e.g., given that the retail market becomes more competitive, the pass-through τ and the dilution factor δ may increase together with the elasticity of derived demand ε^u . However, in analogy to the use of retail market shares, a change in τ and δ may not follow from changes in the retail market but

¹¹ Clearly, the case of regulated markets is somewhat specific due to the direct connection between market definition and *ex ante* remedies.

¹² Notice that, without any vertically-integrated firm, we have $\kappa = 1$ and $\nu = 1$, and the decomposition of the upstream elasticity simplifies to $\varepsilon^u = \varepsilon^d \delta \tau$. It should be recalled that the elasticity of the upstream market is an important indicator of the possibility of exerting market power. For instance, a well-known formula for market power is the Lerner index, which computes the percentage mark-up above cost. The upstream Lerner index in a Cournot setting (that is, a market setting where firms compete by delivering quantities to the market) is inversely related to the elasticity of derived demand. This “inverse” elasticity rule says that the lower ε^u the higher will be the ability to set mark-ups above production costs.

from changes in the wholesale market, in which case τ and δ may move in the *opposite* direction as ϵ^u .¹³ We show this next for the case of the dilution factor.

From the decomposition one could conjecture that generally the lower is the dilution factor δ the lower is ϵ^u and therefore the higher the upstream mark-up above costs will be. This may in turn rest on the argument that when the upstream share of the total cost is small, any changes in the upstream price will be diluted downstream, giving the respective suppliers more market power. For instance, if an input accounts only for 10% of the final price, a 10% increase of the input would increase the final price by only 1%. Thus final demand would be reduced only mildly and the 10% input price increase would be profitable. This reasoning would tend to derive very narrow markets for inputs, with a strong presumption of SMP in each one of them, especially - and somewhat paradoxically - if they account only for a small share of the final price. However, the fact that the dilution factor is small may be in itself evidence of lack of SMP. In fact, if there was SMP then its exercise would push up the input price and, consequently, also δ would go up.

To make this point more forcefully, take a simple example that ignores issues arising from vertical integration. Imagine there is a single upstream supplier with cost equal to 1. This supplier sells this input at a price p^u to downstream firms that are perfectly competitive and, in addition to this input, also pay 5 on extra inputs. As the downstream firms are perfectly competitive, the retail price is $p^d = p^u + 5$. We also imagine that the ability of the upstream supplier to increase the input price is only constrained by the supply-side substitution from more inefficient suppliers. Suppose these alternative (less efficient) suppliers can produce the input at a cost of $c > 1$. Then the more efficient supplier will set $p^u = c$ (minus 1 cent) and remain the sole supplier. The dilution factor is simply $\delta = c/(c + 5)$ while the upstream mark-up (Lerner index) is $(p^u - 1)/p^u = (c - 1)/c$. It is clear that, the less competitive the potential upstream rivals are, the greater will be both the Lerner index and the dilution factor. If $c = 1.2$, dilution is less than 0.2 and the upstream mark up is 20%, while if $c = 5$ the dilution factor increases to 0.5 and the mark up to 400%!

In sum, akin to retail shares, also other indicators such as the dilution factor or pass-through must be used carefully. While they may be informative on the strength of indirect constraints, they risk confounding strong indirect with weak direct constraints.

2.5 How to Correctly Treat Direct Constraints under Vertical Integration

The presence of vertically integrated firms makes also the treatment of *direct* constraints on the wholesale market more challenging. As we argue next, a naive treatment of the captive sales of integrated firms may, depending on circumstances, risks either to over- or to underestimate market power in the wholesale market.

Absent technological constraints, the decision of a vertically integrated firm to sell in the wholesale market is a strategic one. While there may be profitable opportunities to be exploited in the input market, the decision to sell compromises retail profits through making rival retail firms more competitive. In other words, an integrated firm's true costs of supplying to the wholesale market must include the opportunity costs

¹³ A more general criticism advanced in our formal paper is that all parameters in the decomposition are endogenous and determined simultaneously in a market equilibrium. Hence, variables on the "left-hand" side of $\epsilon^u = \epsilon^d \delta \tau \kappa \upsilon$ can not be treated as exogenous when conducting a comparative analysis.

of lost profits on the retail markets. A clear understanding of integrated firms' incentives to still supply rival retail firms is important for projections of the market outcome under different decisions made by regulatory or antitrust authorities.

Which factors affect an integrated firm's incentives to supply rival retail firms? Intuitively, incentives are higher if there are fewer other (non-integrated) suppliers as this would, *ceteris paribus*, simply lead to a higher wholesale price. Even when trading this off against the lost profits on the retail level, this makes sales on the wholesale market more attractive. This suggests that, in our example, incentives for A would increase *after* a merger of B and C. On the other hand, we find that, holding now the number of suppliers fixed, as suppliers compete more aggressively, incentives for the integrated supplier to participate actually increase. This is, at first, admittedly counterintuitive, given that more aggressive competition will reduce the prevailing upstream price. However, the main mechanism occurring here is that, when upstream competition is very intense, the integrated firm can "displace" the upstream rivals sufficiently to make participation profitable at the expense of the rivals' sales. Finally, on the retail level our analysis shows that there are different, possibly conflicting forces at work, which in general do not allow, without deriving the precise details, to obtain unambiguous comparative results.¹⁴

If integrated firms currently *do not* sell on the wholesale market, and if this is incorrectly assumed to be the case also after a change in market structure, the direct constraint exerted by integrated firms would be *underestimated*. If, instead, a vertically integrated firm *already* sells on the wholesale market, then the level of its supply can be used to obtain an estimate of its current opportunity costs from doing so. This can in turn be fed into a projection of the firm's supply under a different market structure following, for instance, the envisaged merger of two non-integrated suppliers. Our formal analysis shows, however, that unless this estimation is grounded in an appropriate model of the underlying vertical structure, then it is likely to be biased. Precisely, we show that in this case a naive procedure will *overestimate* the extent to which integrated firms will exert a direct constraint after the merger.¹⁵

3. Summary and Conclusions

The main messages delivered by this paper can be summarised as follows.

1. Wholesale market shares must be carefully interpreted in the light of the overall competitive pressure, which must include the presence and effectiveness of

¹⁴ At first, it would seem that the more competitive the retail market, the lower the margins that the integrated firm wants to protect and thus the larger its incentives to sell into the wholesale market. However, this tends to ignore two other effects. First, with indirect constraints a more competitive retail market will translate into less market power in the wholesale market and will thus imply as well a lower wholesale price. Second, our analysis leads to the intuitive result that if there is more aggressive competition on the retail market, then this will lead to a higher pass-through. (Again, this would not be the case without indirect constraints from vertically integrated firms.) But then a reduction in the wholesale price will lead to a larger reduction of the retail market price, thereby reducing the integrated firm's retail profits by more.

¹⁵ Formally, we show that current opportunity costs are likely to be lower than those prevailing after the merger. This dampens the expansion of integrated firms' sales to the wholesale market after a merger of rival suppliers. While our comments provide some qualitative insights, our technical paper provides a formal quantification.

indirect constraints. Indirect constraints show up in a more elastic derived demand. This suggests that, if applied to merger policy, in the presence of vertically integrated firms a more lenient standard would be called for.

2. Indirect constraints are particularly effective if the retail market is highly competitive. Moreover, compared to a market without vertically integrated firm, they become relatively more important than direct constraints if the upstream market is relatively less competitive compared to the retail market.
3. Retail market shares may be informative on the effectiveness of indirect constraints, though only if the level of competition on the wholesale market is factored in correctly. Otherwise, one risks confounding competitive retail markets, which are indicative of effective indirect constraints, with non-competitive wholesale markets and thus non-effective direct constraints. This caveat on the use of retail market shares extends also to the use of other potential indicators of indirect constraints, such as the dilution factor or the pass-through.
4. Relying on retail market shares next to information on the wholesale market may run the risk of “double counting”. If an analysis of the wholesale market suggests a low or high responsiveness of sales to changes in prices, then this already incorporates indirect constraints (via the underlying elasticity of derived demand).
5. With vertically integrated firms for which it is technologically feasible to sell on the wholesale market, it is important to correctly identify their incentives to do so. Our results suggest that a merger in the upstream market may create sufficient incentives for an integrated firm that previously only served the retail market through captive sales to start selling also to rival retail firms. Consequently, if currently the integrated firm does not participate in the wholesale market and if one naively keeps this assumption also after a merger, then this would lead to an overestimation of the likely effects from the merger.
6. If integrated firms currently sell on the wholesale market, then to project future sales after a change in market structure it is necessary to understand their true opportunity costs, taking into account lost profits on the retail level. We argued that a naive estimation may now overestimate the level of direct constraints exerted by integrated firms.

In this article we warned against an approach that relies too mechanically on market share thresholds, irrespective of whether they are calculated for the wholesale or the retail market. We also argued in favour of a conceptual separation between direct and indirect constraints. Indirect constraints should be taken into account through the assessment of the elasticity of derived demand. Direct constraints should be taken into account through the determination of actual and potential participation in the wholesale market, based on an analysis of both technological possibilities and incentives. Although additional research needs to be done, we think that this approach would represent a clean way to think also about a host of other important topics that we left untouched, such as whether and how indirect constraints from other integrated firms affect the incentives of a vertically integrated firm to “squeeze” out other non-integrated downstream firms.