PRICE SQUEEZES, FORECLOSURE AND COMPETITION LAW

PRINCIPLES AND GUIDELINES

Pietro Crocioni & Cento Veljanovski[*]

Case Associates

Abstract

This article looks at the definition, conditions and evidence necessary to establish that a price squeeze is an exclusionary abuse, and thus an infringement of EC competition law. It shows that the necessary conditions are demanding, and that the empirical test for a price squeeze must be carried out carefully. It offers practical guidelines for determining whether an exclusionary price squeeze is present, and particularly on the appropriate calculation of downstream margins (the "imputation test") that should be employed.

1. INTRODUCTION

A price or margin squeeze is an exclusionary practice used by a vertically integrated firm to leverage its market power in the upstream market to squeeze the margins of its downstream competitors. Competition law investigations on alleged price squeezes have been few, relatively unsuccessful, and largely confined to raw materials. However, with the increasing application of competition law to network industries, the number of price squeeze allegations has increased.[1] The issue looms large in regulated industries where a network

---

[*] Snr. Economist, and Managing Partner & Associate Research Fellow, Institute of Advanced Legal Studies, University of London respectively, Case Associates (Competition and Regulatory Economists www.casecon.com). Both authors have assisted on price squeeze investigations including the EC Commission Article 82 investigation on behalf of KPN (Case No. COMP/C-1/37.704 – *KPN Mobile Termination Rates*). The views expressed here do not necessarily reflect those of Case's clients. Contacts: Cento Veljanovski (cento@casecon.com) and Pietro Crocioni (pietro@casecon.com).

[1] EC Commission, *Directive on a common regulatory framework for electronic communications networks and services* 2002/21/EC, 2 April 2002.

operator is often vertically integrated and the service sector has been opened to competition. The EC Commission has also recently initiated several investigations in the telecommunications sector,[2] and national competition and regulatory authorities have examined allegations of price squeezes in the telecommunications[3] and energy sectors.[4] The EC Commission has also imposed undertakings to prevent possible margin squeezes in access undertakings as part of its merger clearances.[5] Indeed, there is growing concern that in network industries where the incumbent is vertically integrated and dominant in the provision of network access, price squeezes will and have been used to inhibit downstream competition, with some commentators calling for vertical separation to foster increased competition.[6]

---

[2] The EC Commission has opened investigations into alleged prices squeezes against French Internet high-speed provider Wanadoo, Deutsche Telekom's charges for unbundling of the local loop (ULL) and KPN for termination charges for its mobile virtual network fixed-to-mobile tariff components. See EC Commission's Press Releases, *High-speed Internet access: Commission suspects Wanadoo (France) of abusing its dominant position*, 21 December 2001; *Commission suspects KPN of abusing its dominant position for the termination of calls on its mobile network*, 27 March 2002; and *Commission suspects Deutsche Telekom of charging anti-competitive tariffs for access to its local network*, 8 May 2002.

[3] Oftel which has opened a number of price squeeze cases has yet to conclude that one was in existence; Oftel, *NTS outpayments from Call & Access customers* (CW/00387/02/01), *Cross subsidy of BT Cellnet Genie* (CW/00368/12/00), *BT Openworld special offers* (CW/00471/10/01), *Competition Bulletin*, 23, December 2001; Oftel, *ADSL margin squeeze* (CW/00304/11/00), *Competition Bulletin*, 24, March 2001. Also Oftel, *Investigation by the Director General of Telecommunications into the BT Surf Together and BT Talk & Surf Together Pricing Packages* under the Competition Act 1998, 4 May 2001. The Dutch Competition Authority (Nederlandse Mededingings Autoriteit or NMa), also rejected a complaint from Talkline, a Dutch mobile service provider that KPN Mobile had squeezed its downstream margins, NMa, *Talkline v KPN*, Case No 1657, 12 March 2001. On the other hand, the Italian Competition Authority, Autorita' Garante della Concorrenza e del Mercato (AGCM), *Tiscali-Albacom/Telecom Italia*, No. 8482 (A280), 13 July 2000, fined Telecom Italia for a price squeeze against other fixed telecom operators.

[4] See G. Brunekreeft, "Regulation and Third Party Discrimination in the German Electricity Supply Industry", 13 *European Journal of Law and Economics* 203 (2002). For US cases see L. J. Spiwak, "Is the Price Squeeze Doctrine Still Viable in Fully-Regulated Energy Markets?" 14 *Energy Law Journal* 75 (1993).

[5] In Case No COMP/M. 1795 – *Vodafone AirTouch/Mannesmann* (2000) the EC Commission imposed a mandatory access requirements on the merged entity to guard against a price squeeze. The EC Commission regarded the merging parties as the only mobile operator in the EU with the network coverage capable of supplying a *"seamless pan European corporate service"*, and therefore prospectively dominant. Thus, it was the alleged non-replicability of Vodafone's geographical footprint in the short run which led to the conclusion that it enhanced pan-European network would be an "essential facility", and that the merged entity would have the incentive and the means to engage in a vertical "margin squeeze" against mobile operators with more limited coverage.

[6] C. Lapuerta & B. M. Moselle, "Network Industries, Third Party Access and Competition Law in the European Union", 19 *Northwestern Journal of International Law & Business* 454 (1999).

In this article the nature, conditions and detection of price squeezes under EC competition law are discussed with reference to existing case law. The discussion below is organised as follows. Section II discusses the definition, types and basic nature of a price squeeze. This is followed in Section III with a discussion of the economic conditions under which a price squeeze would be a feasible strategy. Section IV provides an analysis of how to correctly approach an allegation of price squeeze behaviour under EC competition law. Section V looks at how to detect a price squeeze through an imputation tests drawing on the EC *Access Notice*. Section VI deals with the *ex ante* regulation of price squeezes under sectoral regulation.

2. WHAT IS A PRICE SQUEEZE?

2.1. Definition

A price squeeze arises when a vertically integrated undertaking, with market power in the provision of an "essential" upstream input,[7] prices it, and/or its downstream product or service, in such a way and for a sufficiently long period of time to deny an equally or more efficient downstream rival a sufficient profit to remain in the market. As this definition makes clear, a price squeeze is concerned with downstream margins, the impact on entry and exit of downstream firms, and not with the price level of the upstream input *per se*. While excessive prices could in some circumstances be considered as an abuse of dominance under EC competition law,[8] they do not imply a price squeeze.

EC Commission decisions and notices,[9] and case law, do not offer a precise definition of a price squeeze. The only legal definition of a price squeeze is in *Industrie des Poudres Spheriques* where the European Court of First Instance stated:

> "*Price squeezing may be said to take place when an undertaking which is in a dominant position on the market for an unprocessed product and itself uses part of its production for the manufacture of a more processed product, while at the same*

---

[7] While this article discusses price squeezing where a vertically integrated firm attempts to leverage its upstream market power downstream, similar considerations apply where a vertically integrated firm has market power downstream i.e. a monopsonist rather than a monopolist. A vertically integrated monopsonist would buy from non-integrated upstream suppliers at a price that it too low (below their cost of production) for them to earn an adequate margin.

[8] R. WHISH, *Competition Law*, 635-637 (Butterworths, 2001).

[9] EC Commission, *Notice on the application of competition rules to access agreements in the telecommunications sector – Framework, Relevant Markets and Principles*, OJ C265, 22 August 1998 (henceforth *Access Notice*). The *Access Notice* does not define a price squeeze but set out two imputation tests as discussed in Section V below.

time selling off surplus unprocessed product on the market, sets the price at which it sells the unprocessed product at such a level that those who purchase it do not have a sufficient profit margin on the processing to remain competitive on the market for the processed product."[10]

This definition is, however, incomplete because it does not refer to three critical elements of a price squeeze as defined above, and discussed in more detail in Section III. First, the Court does not mention that the downstream firm must be equally of more efficient than the vertically integrated downstream firm's division. Second, there is no reference to the duration of price squeeze as a critical element. Third, the Court only makes reference to the input price, ignoring that the vertically integrated firm could also lower its downstream price.

The leading EC Commission decision is *Napier Brown – British Sugar.*[11] British Sugar was found dominant in the upstream market for the supply of raw sugar in the UK. Derived sugar sold in the UK, which can only be produced from raw sugar, was defined as the relevant downstream market as other products (saccharine, aspartame, etc.) were not found to be sufficiently close substitutes and sugar imports were found not competitive because of transport costs. British Sugar was vertically integrated competing in the downstream market for derived sugar with others, including Napier Brown, which purchased raw sugar from British Sugar. The EC Commission found that the difference between British Sugar's prices for derived sugar and the price it charged Napier Brown for raw sugar was insufficient for the latter to cover its own costs of transformation, consisting mainly of repackaging costs. The EC Commission concluded that British Sugar's pricing strategy was a price squeeze aimed at forcing Napier Brown to exit the downstream market, and an abuse of its dominant position under Article 82.

2.2. Types of price squeezes

There are three main types of price squeezes (see Box 1). A vertically integrated firm with upstream market power could potentially manipulate downstream margins by increasing its upstream price, lowering its downstream price, or both.

---

[10] Case T-5/97 – *Industrie des Poudres Spheriques v. Commission of the European Communities,* 30 November 2000, 178.

[11] Case 88/518/EEC – *Napier Brown – British Sugar* (1988).

Two types of price squeezes can be distinguished depending on whether the price of the upstream input is discriminatory or non-discriminatory.

A *discriminatory price squeeze* occurs where a vertically integrated undertaking charges its downstream rivals a higher upstream price than it charges to its own downstream operation (Equation (1), Box 1). Such a *discriminatory price squeeze* raises several issues in law and economics. First, such overt price discrimination will almost certainly constitute an abuse of dominant position under EC competition law (Article 82) irrespective of whether it constitutes a price squeeze. Economists on the other hand have long argued that price discrimination should only be deemed harmful when it has exclusionary effects.[12] Second, as stated above, the fact that the input price for rivals is higher than its cost of production is not sufficient evidence to conclude that a price squeeze has occurred.[13]

A *non-discriminatory price squeeze* occurs when the vertically integrated firm raises the price of the upstream input across the board i.e. both to rivals and its downstream operation (Equation (2), Box 1). Thus, the costs of downstream competitors are raised, while the vertically integrated firm's effective/real margin on its integrated activities remains unchanged, as it would simply cross-subsidise its downstream operation from its upstream division.[14] For the integrated firm the difference between the two forms of price discrimination is not substantial provided that the redistribution of up and downstream profits within the firm due to the price squeeze is relatively costless. This may often not be the case since upstream and downstream operations will have different management accounts, and operate at arms length from one another. In this case a non-discriminatory price squeeze may be hard to implement because it would affect the managerial reward schemes of downstream managers and sales staff, and pose tax issues especially where the integrated firm operates across more than one Member State.

---

[12]   Where price discrimination expands output it increases economic welfare; H. R. VARIAN, "Price Discrimination and Social Welfare" 75 *American Economic Review* 870 (1985).

[13]   Note that this implicitly assumes that the vertically integrated provider of upstream input faces no constraint in raising its input price. However, where there are also other input providers there might be constraints to its ability to do so. Furthermore, as argued in Section V, the upstream price charged by the vertically integrated firm is not necessarily the lowest price available to downstream firms. In this case it is the lowest available price that should be used to test whether a price squeeze occurred.

[14]   By raising P^{ui}, the vertically integrated firm sells the input to downstream rivals above costs ($P^{ui} > C^{ui}$), squeezing their margins, and has no impact on its downstream margins. This can be seen by noting that its upstream margin is $P^{ui} - C^{ui}$ while its downstream margin is $P^{d} - C^{d} - P^{ui}$, hence the overall margin is the sum of the two ($P^{d} - C^{d} - C^{ui}$), which is independent of P^{ui}. The effect on overall profits is, however, more complex and examined in Section III.

A third type is a *predatory price squeeze* (Equation (3), Box 1). This occurs when the dominant upstream undertaking lowers its downstream price below the joint costs of upstream production and downstream transformation, and an adequate margin (see Section VI below). This is similar to the usual definition of predatory behaviour,[15] and it is largely confined to industries where the upstream price is regulated but the downstream one is not. Thus testing for a *predatory price squeeze* also requires an assessment whether the vertically integrated firm can be expected to recoup short-term losses when competitors have been forced out of business.

Box 1

Types of Price Squeezes

The definition of the various types of price squeeze can be formalised using the following notation:

P^d	=	downstream price of the vertically integrated firm;
P^{ui}	=	price of the essential upstream input. This further distinguishes between:
P^{ui}_{int}	=	price charged for the input to the vertically integrated undertaking downstream operation; and
P^{ui}_{3rd}	=	price for the input charged to other downstream firms;
C^{ui}	=	unit costs of producing the upstream input; and
C^d	=	efficient unit costs of downstream transformation.

To simplify assume one vertically integrated undertaking with a monopoly in the supply an essential upstream input to its own downstream operation and downstream rivals. The latter are only active downstream, and to remain in the market need the upstream input. Therefore, the input is assumed to be essential and it is used in fixed proportions with other inputs to produce the downstream product. If M is the minimum long run downstream margin or profit that allows downstream rivals to earn a reasonable return, then a *non-discriminatory price squeeze* exists if:

---

[15] The definition of predatory price squeeze in Box 1 (3) differs slightly from that of predation defined as pricing below a measure of short run cost ($P^d \leq C^d + C^{ui}$ using the definition in Box 1) e.g. average variable costs under the Areeda-Turner Test (P. Areeda & D. F. Turner, "Predatory Pricing and Related Practices" 88 *Harvard Law Review* 697 (1975)).

$$P^d - P^{ui} - C^d \leq M \qquad (1)$$

$$\text{where} \quad P^{ui} = P^{ui}_{\text{int}} = P_{3d} \ .$$

A *discriminatory price squeeze* occurs when:

$$P^d - P^{ui}_{3rd} - C^d \leq M \qquad (2)$$

$$\text{where} \quad P^{ui}_{\text{int}} < P^{ui}_{3rd} \ .^{[16]}$$

In both (1) and (2) the vertically integrated firm could act on , or both to squeeze downstream margins. A special case is that of a *predatory price squeeze* where the vertically integrated firm could only price squeeze by lowering , but not as it is cost regulated. It occurs when:

$$P^d - (C^{ui} + C^d) \leq M \qquad (3)$$

$$\text{where} \quad P^{ui} = P^{ui}_{3rd} = P^{ui}_{\text{int}} = C^{ui}$$

At times it may be difficult and often arbitrary to distinguish a price squeeze from other exclusionary abuses, such as tying. The recent *Microsoft*[17] litigation in the US provides a good example of this. The case involved *inter alia* the allegation that in bundling its Web browser (Internet Explorer) free with the Windows operating system, Microsoft engaged in a vertical abuse designed to foreclose entry to those supplying only Web browsers (downstream market). Legally and analytically this allegation can be treated as tying (pure bundling) of Windows operating system with Internet Explorer, or as Microsoft leveraging its market power in the operating system market to squeeze rivals' profits in the downstream Web browser market. For both approaches the economic and competitive issues are similar – the strategy effectively reduces its downstream rivals profits to an unsustainable level by, in essence, lowering the retail price of Web browsers to zero. As such it could be treated as either a price squeeze or tying. Indeed, Microsoft's defence was based on an imputation test.[18] Microsoft argued that one had to assess not the individual price of Web browsers but the bundled price of the two complements and the impact of

---

[16]   Often P^{ui}_{int} is not a price as such and unobservable being implicit in the internal transaction of the vertically integrated operation. In these cases it might not be possible to distinguish between a P^{ui}_{int} and a P^{ui}_{3rd} .

[17]   *U.S. v Microsoft Corp* Civil Action No. 98-1232, Complaint 18 May 1998.

[18]   Testimony of R. I. Schmalensee, *U.S. v Microsoft Corp.*, CA No 98-1233 (TPJ) 163 (Jan. 11, 1999).

demand-side complementarities to assess whether there was an abuse. This issue is discussed further below.

3. ECONOMICS OF PRICE SQUEEZES

The application of competition law to vertical relationships has been controversial in law and economics. This is principally because the alleged market power abuse arises from products or services which are complements and not substitutes, and the "Chicago School" analysis that the vertical leveraging of market power is not a rational strategy for an upstream monopolist. It is, therefore, necessary to examine the economic theory of vertical leveraging and of price squeezes in particular.

In assessing a price squeeze it is critical to bear in mind that it concerns the leveraging of upstream market power downstream. Therefore the margin on which any competitive assessment must take place is the impact on efficient entry and exit on the downstream market i.e. competition on the downstream market. Thus the relevant economics concerns the conditions of entry and exit downstream, and an assessment of the impact of input prices on downstream entry and exit.

3.1. Chicago School

The Chicago School has long maintained that the vertically leveraging of market power is not an economically rational strategy.[19] This is because there is "only one monopoly profit" in the vertical production distribution chain, which can be extracted by charging a monopoly price for the input. An upstream monopolist cannot generate higher profits by leveraging its market power downstream, because if the downstream market is competitive (as implicitly assumed), there are no additional profits that can be extracted, except at the "cost" of sacrificing upstream profits. There is one monopoly profit, and it will be extracted upstream.

The Chicago theory also points to the irrationality of using input prices to exclude efficient downstream rivals. As stated above, a monopolist will exploit its market power in the upstream market and not seek to foreclose the downstream market. This is even true when the downstream rivals are more efficient than its own downstream division. In this situation it would not "pay" for the upstream monopolist to raise the input price to levels that would be

---

[19]   See R. H. Bork, *The Antitrust Paradox: A Policy at War with Itself,* (Free Press, 1995).

exclusionary and drive them out of business. Rather, the profit maximising strategy is for upstream monopolist to raise its input price to rivals above the (own) profit maximising level to extract the profits from their superior efficiency. The resulting squeeze on the rivals' margins would thus fall short of foreclosing the market to efficient downstream rivals. Downstream firms whose margins are "squeezed" due their own inefficiency are therefore not foreclosed from the market and no infringement of Article 82 has occurred.

3.2. Post Chicago School

A recent economic literature points to cases where vertical leveraging and price squeezes are profitable strategies. This work accepts the Chicago School conclusions but argues that they are built on special assumptions that the downstream market is perfectly competitive with costless entry (and exit); and strict complementarity of upstream and downstream inputs.[20] If these assumptions are relaxed, then the vertical leveraging of market power may be profitable.[21]

Price squeezes can be profitable for the upstream firm where the downstream market is not perfectly competitive.[22] The decision to raise the price of its upstream input will have two effects on its combined (upstream and downstream) profits.

First, an increase in the input price is likely to increase its downstream profits. This is because the higher input price raises its downstream rivals' costs, reduces their output, and increases the downstream price.[23] The vertically

---

[20] The term strict complementarity means that inputs are used in fixed proportions in the production process and hence the proportion of inputs used to produce a unit of output cannot be varied in response to changes in their relative prices. If inputs were not strict complements, an upstream input provider would have reduced market power as downstream competitors could react to any leveraging by buying less of his upstream input and more of the other now cheaper input(s).

[21] See M. Whinston, "Tying, Foreclosure and Exclusion" 80 *American Economic Review* 837 (1990).

[22] Where the degree of downstream (and upstream) market power is high, vertical integration increases economic welfare. In fact, when the upstream market is a monopoly and the downstream market is not perfectly competitive, in the absence of vertical integration, the upstream firm will price its input at the monopoly price and this will be used as a cost for downstream firms to set their price. This could lead to "double marginalisation" resulting in downstream prices being set above the monopoly price. However, the presence of a vertically integrated firm means that downstream prices are not above the monopoly price.

[23] This is evident if one assumes that downstream firms compete à la Cournot to supply a homogeneous product. In this case, an exogenous increase in costs raises the industry price and reduces its output. Furthermore, an asymmetric increase in cost affecting only some firms, such as the one arising from a price squeeze, causes them to reduce their output to the benefit of those that have not experienced a cost increase. The industry price will also increase.

integrated firm, therefore, increases its share of the downstream market, and its margins on each sale by its vertically integrated division are higher. The latter occurs because its downstream costs have not changed while the downstream price has increased. However, because the increase in downstream price decreases total output, it is unclear whether the vertically integrated firm's downstream output increases.

Second, the impact on its upstream profits from the sale of the input to competitors is ambiguous, as total input sales to rivals decline with the increased input price. However, King and Maddock[24] show that if the downstream market is not perfectly competitive (with firms competing *à la Cournot*), and the downstream product is homogeneous, then the vertically integrated firm, which has a monopoly of the upstream input, always has an incentive to increase the upstream input price, as its profit increase with it. Such result holds irrespectively of whether the strategy is discriminatory or not.[25]

There are limitations to the post-Chicago analysis such as that by King and Maddock. First, firms are assumed to compete downstream in supplying a homogeneous product. However, the more differentiated the downstream products, the weaker is the incentive to price squeeze. This is because in a market where product differentiation is significant, the gains from leveraging market power are relatively lower because a smaller proportion of downstream firms' lost market share is captured by the downstream division of the vertically integrated firm. Second, the conclusion that the vertically integrated operator always has an incentive to price squeeze regardless of the level of the input price has been criticised. As the input price increases there is less of an incentive to discriminate, because there is less to be gained from it. In fact, insofar as a price squeeze is an optimal strategy for the vertically integrated operator, there is a trade off between the level of the input price (for example under a *non-discriminatory price squeeze*) and the incentive to engage in discriminatory strategies like a *discriminatory* or a *predatory price squeeze*.[26] This is because the higher the upstream input price, the lower the incentive for a vertically integrated firm to exclude downstream rivals as the gains are lower.

---

[24] S. KING & R. MADDOCK, "Imputation Rules and the Regulation of Anticompetitive Behaviour in Telecommunications", mimeo (1999).

[25] Economides finds that this also applies to non-price discrimination where the vertically integrated firm is able to degrade the quality of the input to its downstream competitors. Such incentive, however, does not apply when the degradation also affects its own downstream subsidiary. N. Economides, "The Incentive for Non-price discrimination by an Input Monopolist", 16 *International Journal of Industrial Organization* 271 (1998).

[26] G. BIGLAISER & P. DEGRABA, "Downstream Integration by a Bottleneck Input Suppliers Whose Regulated Costs are Above Costs", 32 *RAND Journal of Economics* 137 (2001).

Most of the upstream market power can be exploited by engaging in non-discriminatory pricing.

The three forms of price squeezes are substitutable ways of excluding downstream rivals,[27] however their attractiveness to the leveraging firm differs considerably. Price squeezes that increase input prices are less costly to the leveraging firm than those that lower the firm's downstream output price. This is because while the impact of an increase in the upstream price on overall profit, although ambiguous, can be positive. In contrast, a reduction in the downstream price will in most circumstances reduce overall profits and be a more costly way of price squeezing.[28] Moreover, the costs of the latter increases the greater the vertically integrated firm's share of downstream sales.

To sum up, the economic literature appears to agree that a price squeeze is unlikely where the downstream market is competitive, but might be a profitable strategy when it is not competitive.

3.3. Conditions for a price squeeze

From the above discussion it is evident that a number of structural and other (economic) conditions must exist for a price squeeze to be successful. Conditions 1 to 4 below assess whether a vertically integrated firm has an incentive to price squeeze and are related to the circumstances under which a price squeeze is an abuse of dominant position. Conditions 5 and 6 define when a price squeeze has occurred.

– **Condition (1): (Super) dominance on upstream market.** The vertically integrated undertaking must have considerable market power on the upstream input market. This naturally translates into the concept of dominance under EU competition law, and it is a necessary condition to conclude that a price squeeze is anticompetitive. However, it is unclear

---

[27]   Brunekreeft *op. cit.* shows that this trade-off existed in the German electricity sector where electricity transmission and distribution networks are integrated into generation and retail distribution. In Germany access charges to electricity transmission and distribution inputs are not subject to *ex ante* price controls but are negotiated between parties. Therefore, access charges are only controlled *ex post* via competition law. The latter, however, is well equipped to prevent discrimination, but not to control excessive pricing. The freedom to set (non-discriminatory) access charges has led the vertically integrated German electricity operators to focus on exploiting their market power via high input charges, rather than through discrimination.

[28]   This is true provided the downstream price is above the monopoly price. The downstream price could be above the competitive price (or vertically integrated) price dues to double marginalisation. However, this is unlikely in cases where there are suspected price squeezes because of the presence of a large vertically integrated firm competing with non-integrated downstream rivals.

what degree of market power is needed. The European Court of Justice in *United Brands* provides the standard definition of dominance under Article 82 as:

> "… *a position of economic strength enjoyed by the undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately consumers.*"[29]

Usually this is taken to indicate a market share of between 40% to 50%, although firms with lower market shares have also been found dominant. On the other hand, economic models of vertical market power leveraging assume monopoly, and the *Access Notice,* which deals with abuses of dominance in the telecommunications sector applies to "essential facilities", although it does contemplate situations where two or more undertakings jointly control a facility. This suggests that a price squeeze requires that the dominant undertaking have a market share considerably in excess of 40% to 50%. In the leading EC Commission decision, *Napier Brown – British Sugar,* the EC Commission concluded that British Sugar enjoyed a *de facto* monopoly on the market for the provision of raw sugar. Therefore, dominance for a price squeeze is more akin to super dominance (*"position of dominance approaching a monopoly"[30]), which* requires a market share of 80% or more.[31]

–   **Condition (2): Downstream market not effectively competitive**. As discussed above a necessary condition for an effective price squeeze is that the downstream market is not effectively competitive, so that it generates supra-competitive profits. However, this does not imply that the upstream "monopolist" needs also to be dominant on the downstream market. In *Napier Brown – British Sugar,* British Sugar was also found dominant in the downstream market for derived sugar. However, since a price squeeze is a strategy to leverage upstream market power downstream, downstream dominance is not required.

–   **Condition (3): Vertical Integration**. The firm allegedly administering the price squeeze must be vertically integrated, or have control over the essential upstream input and be active on the downstream market as well. If this were not the case, the upstream monopolist could at best charge the

---

[29]   Case 27/76, *United Brands v Commission,* [1978] ECR 207, [1978] 1 CMLR 429.

[30]   Opinion of AG Fennelly in Case C-395/96 *Compagnie Maritime Belge SA v Commission* [2000] 4 CMLR 1076.

[31]   Whish, *op. cit.* 161-163.

monopoly price for its input, supplemented by vertical restrictions to avoid downstream externalities, but beyond this would not be able to appropriate of any downstream profits.

– **Condition (4): Upstream Input must be essential**. The "essentially" condition must exist at several different levels simultaneously:

- **Condition (4.1): Essential to downstream competitors.** This has two related facets. First, there must not be inputs that are close substitutes for the essential input supplied by the vertically integrated firm. Second, the input must be "essential" in the downstream production process in the technical sense of being a strict complement to other inputs or used in fixed proportions. Note that only if the upstream input is used in fixed proportions or a strict complement can leveraging occur. Any lesser degree of complementarity would imply that downstream rivals could, to some extent, substitute the upstream input with other inputs in the production process. This would reduce the vertically integrated firm's market power. Strict complementarity often exists in sectors, such as raw materials[32] and utilities, where price squeezes have been alleged. In *British Sugar – Napier Brown* raw sugar was an "essential" input to produce derived sugar. There was no substitute for it, and downstream competitors could not alter the proportion of raw sugar used to provide derive sugar for example by using more packaging! Similarly, in network industries such as telecommunications and electricity, there are no substitutes for upstream inputs such as network access and transmission. In the telecommunications sector, for example, a service provider using the incumbent's network must buy one minute of the upstream input, i.e. interconnection, with the downstream inputs, such as billing and customer care, in order to compete downstream.

- **Condition (4.2): Essential to downstream competition**. Condition (4.1), however, is not sufficient, as the input must also be essential for downstream competition. For example, a particular input may be essential for a firm to produce a downstream product, but is not essential for competition in that market because there are close downstream substitute products that do not use the input. That is, where the relevant

---

[32]　EC Commission, *National Carbonising*, OJ [1976] L 35/6, the National Carbonising Co. purchased all its coal from the National Coal Board (NCB), and competed downstream with the NCB's in the supply of industrial and domestic hard coke to UK consumers. Coal has to be technically transformed in order to be sold as domestic or industrial hard coke. As long as the retail market was defined as consisting of hard coke only, technical considerations in the transformation process determined the amount of coal required to produce one unit of hard coke.

product market is wider than the downstream product requiring the input in question, it is unlikely that a price squeeze can be effective.

– **Condition (5): Unprofitable downstream margins**. The alleged price squeeze must have the likely effect of foreclosing the downstream market to equally or more efficient competitors by making them unprofitable. This condition distinguishes a price squeeze from other exclusionary abuses such as excessive pricing, since it is possible for an input price to be above the competitive level but not deter more efficient rivals from entering. In *Napier Brown – British Sugar* the EC Commission found that downstream net margins were negative based on British Sugar's own repackaging costs (implicitly assuming that British Sugar's costs were those of an efficient operator).[33]

– **Condition (6): Sufficient duration**. A price squeeze must be of sufficiently long duration to have an exclusionary effect. Temporary or short-term changes in the relative upstream and downstream prices do not have the effect (and possibly intent) to exclude and are not price squeezes.[34] In *Napier Brown – British Sugar,* the EC Commission concluded that if British Sugar had maintained its pricing policy in the long-term, rivals would have been forced to exit the downstream market.[35] Another example is that of Alcoa. The US Supreme Court concluded that Alcoa had monopolised the market for primary aluminium and had engaged in a price squeeze for seven years from 1925 to 1932 by selling some aluminium sheet at prices that were too close to the price of primary aluminium ingot to allow independent producers to achieve adequate margins on their sales of aluminium sheet.[36]

It is interesting to note that in the few price squeeze allegations, which have been considered by the EC Commission and other competition or regulatory authorities, the conditions do not appear particularly conducive to undertake a price squeeze. As shown in Section IV, most decisions have involved either raw materials or access to network industries where the upstream monopolist,

---

[33]   Note that if British Sugar were inefficient, with higher repackaging costs than its downstream rivals, including Napier Brown, then a price squeeze might have not taken place at all. In other words, there is no obligation for a vertically integrated firm with upstream market power to be efficient in the downstream activity! The EU *Access Notice*, para 188, refers to a downstream firm that is "*reasonably efficient*".

[34]   However, repeated changes in relative prices resulting in excessively low or negative margins could be considered part of an exclusionary strategy if they coincided with periods in which competitors signalled their intentions to enter downstream.

[35]   *Napier Brown –British Sugar*, para 66.

[36]   *United States v. Aluminium Company of America*, 148 F.2d 416 (2d Cir. 1945).

unless constrained by regulation, has no incentive to leverage its market power. This is because in such industries the downstream markets are usually competitive with low barriers to entry and exit. However, in all these industries downstream competitors are heavily dependant on the upstream input and, therefore, greatly affected by changes in its price. In such cases, where downstream markets are competitive and the vertically integrated firm has a high degree of upstream market power, downstream margins will be slim and the risk of detecting a price squeeze, where there is none, is correspondingly higher. Further, where the downstream operations of the vertically integrated firm become more efficient, its downstream margins would decline to a level where previously efficient competitors would now become unable to compete. This, however, is an efficient outcome and not a price squeeze. Because of this higher probability of such (Type 1) errors, it is essential that market definition, analysis and the imputation test are correctly applied.

4. COMPETITION LAW ANALYSIS

The analysis of an alleged price squeeze under competition law involves three sequential steps – market definition, competitive analysis, and an "imputation test". Market definition and competitive analysis are essential in verifying the first four conditions discussed above in Section III, for a price squeeze. However, because of the complex interactions between the vertical markets, the boundary between market definition and market power analysis will often be arbitrarily set and not clear-cut. The imputation test (Conditions (5) and (6)) determines whether downstream margins are unprofitable and is discussed later in Section V.

4.1. Market definition

The assessment of a price squeeze must begin with a definition of the relevant market or market(s). This is a necessary step in all competition investigations, and even more crucial for allegations of a price squeeze where it is key to determining both whether upstream market power exists, and, in particular, whether the upstream input is essential to downstream competitors and competition.

Because market power arises in the upstream input market there will be a tendency to begin by defining a relevant upstream input market. The raw material input or network will be seen as the relevant upstream market where the input supplier is dominant. The price squeeze will then be treated as a way of leveraging this upstream dominance into the "related" downstream market.

Indeed, the EC Commission has recently adopted this approach and character-ised the problem as one in which the upstream input market is seen as the "abuse market", and the downstream market as "effect market" (downstream).[37] This is incorrect.

The correct starting point is an analysis of the downstream market to determine whether the input is "essential" for competition in the relevant downstream market. This has been made clear in Court decisions, such as *Bronner*[38] and *Commercial Solvents,*[39] and in EC Directives[40] and the *Access Notice.* For example, the Advocate General's (AG's) Opinion in *Oscar Bronner* dealing with refusal to supply access to a newspaper distribution network stated that it was not upstream competition which is at issue (newspaper distribution networks) but it was that in the downstream service market (newspapers) that was critical. If there are sufficiently close substitutes downstream, then it is not an abuse to refuse to supply access to the facility. This perspective was reinforced by the AG's unusually clear statement that the goal of competition law is not to protect competitors but competition, and that competition is not an end in itself, but the means to enhancing consumer's welfare:

> *"… in assessing this issue it is important not to lose sight of the fact that the primary purpose of Article 86 [now 82] is to prevent distortion of competition – and in particular to safeguard the interests of consumers – rather than to protect the position of particular competitors. It may therefore, for example, be unsatisfactory, in a case in which a competitor demands access to a raw material in order to be able to compete with the dominant undertaking on a downstream market in a final product, to focus solely on the latter's market power on the upstream market and conclude that its conduct in reserving to itself the downstream market is automatically an abuse. Such conduct will not have an adverse impact on consumers unless the dominant undertaking's final product is sufficiently insulated from competition to give it market power. It may be noted that in Commercial Solvents Advocate General Warner, in coming to the same result as the Court, also considered the position on the downstream market: 'I do not think that the question whether the market for the raw materials for the production of a particular compound is a relevant market can, logically, be divorced from the question whether the market for that compound is a relevant one. The consumer, after all, is interested only in the end product, and it*

---

[37] EC Commission, *Statement of Objections*, para 106, Case No. COMP/C-1/37.704 – *KPN Mobile Termination Rates.*

[38] Case D-7/97, *Oscar Bronner GmbH & Co. KG v. Mediaprint Zeitungs-und Zietschriftenverlag GmbH & Co. KG and Others*; and Opinion of Advocate General Jacobs delivered on 28 May 1998, European Court Reports 1998 page I-7791.

[39] Cases 6/73 and 7/73 – *Commercial Solvents v Commission* [1974] ECR 223, [1974] 1 CMLR 309.

[40] *Directive on access to, and interconnection of, electronic communications networks and associated facilities,* 2002/19/EC, of 7 March 2002 (*Interconnection Directive*).

is detriment to the consumer, whether direct or indirect, with which Article 86 is concerned.[41]

This can be further illustrated using the facts in *Napier Brown-British Sugar*. The EC Commission defined the downstream market as refined sugar supplied to UK retail and industrial consumers only. In a so defined market, access to raw sugar is essential to compete downstream. However, had the EC Commission found that "*specialty sugar, liquid sugars and syrups*" and "*saccharin, cyclamates or aspartame*" were close substitutes to refined granulated sugar for retail and industrial consumers, respectively, and defined a wider market, raw sugar would not have been an "essential" input to compete downstream, and the basis for the alleged price squeeze would have not been present. More precisely, even if the EC Commission had found, as it did, that British Sugar's upstream and downstream prices were such to leave insufficient downstream margins this could not constitute a price squeeze because raw sugar is not essential to compete in the downstream market. This brings us to a specific feature of a price squeeze abuse. Only where the downstream product for which abuse is alleged is itself a relevant product market can it be claimed that a dominant provider of an essential upstream input can impose an effective price squeeze. Not surprisingly, in the few cases where it was concluded that a price squeeze had taken place, this was found.[42]

There is another dimension to the market definition exercise. The above analysis relied on the assumption that upstream and downstream were distinct and separate markets. However, it will sometimes be argued and found that up and downstream markets constitute one relevant product market. This was the claim in Microsoft, and also a major consideration in so-called aftermarket cases where the supplier of a primary product supplies complementary services and products in competition with independent or third party providers of the latter. Such demand-side complementarities will be important in determining whether the conditions for a price squeeze exist. If the evidence indicates that, for example, consumers take into account "whole life" costs in making initial

---

[41]   *Bronner*, paras 58-59. The EU *Interconnection Directive* states: "… *considers that denial of access or unreasonable terms and conditions having a similar effect would hinder the emergence of a sustainable competitive market at the retail level, or would not be in the end user's interests*" – *Article 12(1)*. This is reiterated in the Commission's draft Recommendation on pre-defined markets under the proposed Framework Directive: "*The starting point for the definition and identification of markets is a characterisation of retail markets over a given time horizon, taking into account the demand side and supply-side substitutability. Having characterised and defined retail markets, which are markets involving the supply and demand of end users, it is then appropriate to identify relevant wholesale markets.*" EC Commission *Recommendation on Relevant Markets*, C(2003)497, 11 February 2003, Recital 7.

[42]   *British Sugar – Napier Brown* and *National Carbonising Company* (NCB was a monopolist of coal in the UK. Coal was an essential input in the downstream market defined as hard coke).

purchase decisions, then competition authorities are likely to hold that the primary (upstream) and aftermarkets are one relevant product market, and hence it is not possible to mount a vertical foreclosure case.[43]

This type of vertical market issue arose in the EC Commission (first) Statement of Objection in KPN termination rates.[44] The EC Commission alleged that call termination and corporate services were two separate relevant product markets, and therefore because corporate retail packages to closed user groups supplied by KPN were priced below the call-by-call termination rate to other operators, KPN had engaged in a discriminatory price squeeze. However, KPN argued that call termination services supplied to closed users groups was not a separate market from call origination supplied to these groups because the same entity paid both in and outbound calls.[45] Therefore, corporate services of the type supplied by KPN were in a separate relevant product market from call-by-call termination services; a relevant product market, which included both the upstream service termination and the downstream call origination services.

4.2. Market power

The correct definition of the downstream market will provide critical information for assessing upstream market power. The ability of a vertically integrated firm to price squeeze requires two conditions: that (1) the upstream input is "essential" to competition downstream; and (2) the vertically integrated firm has market power in the provision of the "essential" upstream input.

Suppose a price squeeze allegation involving a vertically integrated firm that supplies input a used, together with input b, to produce A. If the downstream market consisted of A alone, the vertically integrated firm could price squeeze only if it had market power in the supply of a. If the vertically integrated firm were a monopolist of a, a were the only input that could be used to produce A and a strict complement to other inputs used in the production of A, such as b, then the vertically integrated firm could price squeeze. However, this is a special case. If downstream competitors could also use c a substitute of a to

---

[43]   C. G. VELJANOVSKI, "Market Definition in the Computer Sector" 5 *Computers & Law* 31 (2002); C. G. VELJANOVSKI, "Competition Law Issues in the Computer Industry – An economic perspective", *Queensland University of Technology Law & Justice Journal*, 2003 *forthcoming*.

[44]   Case No. COMP/C-1/37.704 – *KPN mobile termination rates* (undecided at the time of writing*)*. EC Commission, *Statement of Objections against Koninklijke KPN NV* (2002).

[45]   Case Associates, *Competitive Assessment of GRIP & GRIPNET*, report submitted to EC Commission in behalf of Koninklijke KPN NV (25June 2002).

produce *A,* even if the vertically integrated firm was the sole producer of *a,* it could not operate a price squeeze. Similarly, if *a* and *b* were not strict complements, and therefore downstream competitors could alter the relative proportion of these two inputs in the production of *A,* a price squeeze would be significantly more difficult to implement, depending on the degree of input substitutability, as downstream firms could substitute *a* with *b.* This analysis refers to whether *a* is essential for downstream producers of *A.*

Then, consider whether access to *a* is essential for downstream competition. This is clearly the case if *A* is a market and the vertically integrated firm is a monopolist of *a,* which has no substitutes. However, consider the case where *A* is in the same market as *D* whose production does not require *a,* but *d.* While the vertically integrated firm could price squeeze the margins of downstream producers of *A,* this will have no impact on competition in the downstream market and access to *a* would not be essential for competing with producers of *A.* In fact, even if the vertically integrated operator became the sole supplier of *A,* the price of *A* will be disciplined by competition from suppliers of *D.* Furthermore, if threatened with a price squeeze, downstream suppliers of *A* could switch to the production of *D* in the absence of exit and entry barriers. This threat should also provide a disincentive for the vertically integrated operator to undertake squeezing strategies in the first place.

Industrie des Poudres Spheriques and *BT Surf,* where claims of alleged price squeezes were rejected, illustrate these points.

Industrie des Poudres Spheriques stresses the importance of correctly assessing whether the upstream input is "essential" for downstream competitors. Industrie des Poudres Spheriques (IPS) appealed against the EC Commission's decision not to proceed on its allegations that Pechiney Electrometallurgique (PEM) abused its dominant position in the provision of primary calcium metal. The latter was produced in France by PEM (the only EU producer), China, Russia, Canada and the US. Different qualities of primary calcium metal were available with different degrees of purity. Primary calcium is used to produce broken calcium metal using different processes. IPS was the only producer relying on a process called atomisation requiring very pure calcium metal, while PEM and the other producers used mechanical pulverisation processes. PEM was active in the upstream market for primary calcium metal and also downstream in the production of broken calcium metal where it competed with a number of producers including IPS. IPS had attempted to obtain very pure primary calcium metal from PEM but in the end rejected the product offered because it concluded that its price was too expensive. PEM justified its price on the ground of the additional costs that it would incur to meet IPS'

specification. IPS brought a complaint to the EC Commission claiming, among others,[46] that "*PEM had sought to prevent or delay supplies of primary calcium metal to IPS in order to eliminate it from the broken calcium metal market*".[47] The EC Commission rejected IPS's complaint that then appealed to the Court of First Instance. IPS challenged (among other matters) the EC Commission's claim that IPS was not obliged to seek supplies from PEM when there were alternative sources. The Court concluded that IPS had access to alternative sources of supply despite the antidumping duties imposed on Russian and Chinese imports.[48] Therefore, primary calcium supplied by PEM was not an "essential" input for IPS to compete downstream. Furthermore, not only did IPS have access to alternative sources of very pure primary calcium metal, but also pure primary calcium was not required to produce broken calcium metal. The Court concluded that there were different types of upstream inputs (depending on their degree of purity) that could be subject to different technical or transformation processes. According to the Court, the complainant, in fact, was not obliged to use a particularly pure type of primary calcium metal and its (inefficient) transformation technology.

BT Surf, illustrates the importance of correctly assessing whether the upstream input is essential for competition in the downstream market.[49] Oftel, the UK telecom regulator with competition law powers, found that a dominant network operator cannot commit a price squeeze where the product offered by its downstream division faces competition from other products. Oftel found that BT had not infringed Chapter II Prohibition (effectively Article 82) under the UK *Competition Act 1998*. It was alleged, *inter alia*, that BT's dominance in the upstream market for wholesale call origination on fixed telecommunications networks in the UK enabled it to engage in a margin squeeze downstream in the way it priced the Surf element in the "BT Surf Together" and "BT Talk & Surf Together" packages. Surf was part of an unmetered tariff for off-peak Internet access.[50] Oftel concluded that although BT was dominant in the

---

[46] ISP claimed that PEM had successfully used antidumping procedures in order to strengthen its dominance in the market for calcium metal by cutting off IPS's sources of primary calcium metal in China and Russia.

[47] *Industrie des Poudres Spheriques,* para 21.

[48] *Industrie des Poudres Spheriques,* paras 50-59.

[49] Oftel, *Investigation by the Director General of Telecommunications into the BT Surf Together and BT Talk & Surf Together Pricing Packages under the Competition Act 1998,*4 May 2001 (hereinafter *BT Surf Decision*).

[50] "BT is a vertically integrated supplier in Internet access, i.e. it provides wholesale call origination, wholesale call termination, retail Internet access calls (e.g. Surf) and Internet service provision (via such wholly owned ISPs as BT Internet and BT Connect). A second possible type of anti-competitive behaviour assessed in the investigation relates to BT's dominant position in the market for wholesale call origination on fixed telecommunications networks in the United Kingdom. This provides BT with the potential to restrict or distort competition in retail internet

upstream market for wholesale call origination, it could not engage in a margin squeeze because BT's off peak Internet packages faced competition from other retail Internet products, such as unmetered always-on Internet packages (or as they are called in the decision "24/7" packages). To quote Oftel:

> *"… even if BT's SurfTime products were to become the primary or sole, sustainable off-peak unmetered package, competition with 24/7 unmetered packages would remain. Therefore, the Director considers it unlikely that the Packages, as currently priced, will have a material anti-competitive effect in the relevant Internet access markets."*[51] *"The Director notes that a large number of customers have joined or remained on 24/7 packages after the launch of the Surf packages by BT. Accordingly, it is improbable that providers of 24/7 will be driven out of the market, or even substantially weakened as competitors to BT's SurfTime products at the current set of prices for Surf. This suggests that an attempt by BT in future to raise the price of Surf is unlikely to damage consumers, who could choose to switch to the available 24/7 packages. Therefore, it appears to the Director that there is no distortion in the overall level of competition in retail Internet access.*[52]

In a slightly different case, *Tiscali-Albacom/Telcom Italia*[53], the Italian Competition Authority (AGCM) found that Telecom Italia, the largest Italian telecommunication operator had abused its dominant position by undertaking a strategy akin to a price squeeze. The AGCM's analysis, however, was based on a very narrow downstream market for dial-up free Internet access. Suffice to say that a wider market definition inclusive of ISPs charging for their services would have led to the same conclusions as those reached by Oftel. Telecom Italia was found dominant in the supply of termination services (upstream market) to Internet Service Providers (ISPs) providing final consumers with dial-up free Internet access. ISPs can offer free Internet access because they receive a share of the termination rate paid to the telecom operator where the call terminates. A free Internet access subscriber when dials up to the Internet it pays a local call rate. Part of this local call rate is paid to the terminating operator, which then uses these revenues to attract ISPs. Therefore, terminating operators, including Telecom Italia, compete in attracting ISPs by offering a share of termination revenues ISPs generate. Telecom Italia is vertically integrated because it offers both termination

---

access markets and wholesale call termination of internet calls through the control of the margin available to competitors between the prices for its retail unmetered tariffs and the charges for wholesale call origination." BT Surf Decision, para 12.

[51]   *BT Surf Decision,* para 65.
[52]   *BT Surf Decision,* para. 63.
[53]   AGCM, *Tiscali-Albacom/Telecom Italia,* No. 8482 (A280), 13 July 2000.

services and is active as an ISP. It also controls other telecommunications operators' termination rates through commercial negotiations. The AGCM found that Telecom Italia's remuneration to independent ISPs was "too high" in relation to the termination charges it negotiated with other terminating operators and resulted in a margin squeeze.

5.   IMPUTATION TESTS

A price squeeze must result in unprofitable downstream margins for an efficient firm for a protracted period. To identify whether this is the case, a so-called "imputation test" is used to measure downstream margins of either the dominant undertaking or the (efficient) downstream rivals.

A margin squeeze exists if the net margin (NM), expressed as a percentage rather than an absolute margin, faced by a downstream operator is insufficient for an efficient operator to make a profit in the downstream activity. More formally, using the notation in Box 1, a margin squeeze exists if, for a sufficiently long period of time:

$$NM = \frac{P^d - (P^{ui} + C^d)}{(P^{ui} + C^d)} \leq r \qquad (4)$$

where:

$r =$ long run risk-adjusted rate of return for the downstream activity.

To perform this test information on input prices, downstream prices, efficient downstream costs, and the appropriate margin for a downstream competitor is needed. In practice the calculations can raise complex issues. As noted below, in most circumstances the results from an imputation test need to be carefully assessed in the light of the constraints posed by the available information and data, and the features of the products and markets examined. Here several guidelines are set out to implement the test in practice.[54]

---

[54]   Some have suggested that the price squeeze test should be applied separately to unit margins (price compared to marginal cost), and to total revenues and costs for different ranges of output. To reject a price squeeze allegation both would have to be satisfied. S. P. King & R. Maddock, "Imputation Rules and a Vertical Price Squeeze", 30 *Australian Business Law Review* 43 (2001).

5.1. EC Access Notice tests

The EU *Access Notice* is the only statement of an imputation test by the EC. Although this relates to the telecommunications sector, it has general applicability.

The EU *Access Notice* states that a margin squeeze exists if either:

– **Test 1**: "*The dominant company's own downstream operations could not trade profitably on the basis of the upstream price charged to its competitors by the upstream operating arm of the dominant company*".[55] The downstream division of the vertically integrated firm could not make sufficient returns if it were to acquire the upstream input at P_{3rd}^{ui}; or

– **Test 2**: "*The margin between the price charged to competitors on the downstream market (including the dominant company's own downstream operations, if any) for access and the price which the network operator charges in the downstream market is insufficient to allow a reasonably efficient service provider in the downstream market to obtain a normal profit (unless the dominant company can show that its downstream operation is exceptionally efficient)*".[56] A "*reasonably efficient*" downstream competitor could not make a "*normal*" return if it were to acquire the upstream input at P_{3rd}^{ui} while competing with the vertical integrated firm pricing its products at P^d.

Test 1 attempts to assess a price squeeze indirectly by looking at whether the vertically integrated firm is cross-subsidising its downstream operations from upstream revenues, while Test 2 focuses on the margin of a "*reasonably efficient*" downstream provider. Tests 1 and 2 are similar – both use the same prices: the vertically integrated firm's downstream price (P^d), and the upstream price faced by downstream rivals (P_{3rd}^{ui}) – but differ in three respects:

1. Test 1 uses the downstream costs of the vertically integrated firm while Test 2 uses the costs of an efficient downstream operator. The two might differ, as discussed below, and generally the lower of the two should be used to ensure efficient entry. This is because Test 1 might wrongly identify a price squeeze if the downstream costs of the vertically integrated firm simply

---

[55]   *Access Notice*, para 117. The UK OFT and Oftel have also recently put forward a similar test; *Competition Act 1998 – The Application in the Telecommunications Sector*, (OFT 417) para 7.26. Oftel also enforces the so-called "Talkland Formula" on the two largest mobile operators (Vodafone and O$_2$), which requires that their tied service providers earn a sufficient return. This, together with a non-discrimination rule between tied and independent service providers, protects the latter against price squeezes.

[56]   *Access Notice*, para 118.

reflect its downstream inefficiency. The risk of this type of error is reduced by Test 2's use of a "*reasonable efficient*" downstream firm.

2. The appropriate rate of return, r might also differ. For example, the downstream division of the vertically integrated firm might have a lower cost of capital because integration reduces some types of business/financial risks. Therefore, the appropriate required rate of return depends on which downstream costs are used. If the downstream costs used are those of the vertically integrated firm one should use the rate of return for the downstream division of the vertically integrated firm.

3. Either Test 1 or 2, given the above clarifications, can be used when the downstream products supplied by the vertical integrated firm and its downstream rivals are homogeneous. When the products are differentiated (though sufficiently close to be in the same product relevant market) this is no longer the case. Suppose the downstream firms use the input to provide a product of a higher quality and price (and higher costs efficiently incurred) than the vertically integrated firm. In this case, the downstream costs of the vertically integrated firm and those of its rivals are not comparable (reflected in the higher price of the downstream firms). Therefore, Test 1 will need to use the downstream costs of the vertically integrated firm; while Test 2 can only be implemented by using downstream price and costs of the downstream firm. However, Test 2 could incorrectly identify a price squeeze in some circumstances when all it had identified is the downstream firm's inefficiency in producing a higher quality product or lack of demand for a higher quality product. Therefore, one should not conclude that the vertically integrated firm has price squeezed if Test 1 is satisfied while Test 2 is not. For example, in *Industrie des Poudres Spheriques* the Court concluded that:

> "*The reason for which IPS's customers are not prepared to bear the additional price to which IPS's higher processing costs give rise is either because its product is equivalent to that of its competitors but is too expensive for the market and therefore its production is not sufficiently efficient in order to survive on the market, or its product is better than that of its competitors and efficiently manufactured but is not sufficiently appreciated by its customers in order to justify its offer on the market. In that regard, the applicant does not contest the Commission's statement (page 2 of the decision) that the physical qualities of its product have enabled it, at least until anti-dumping duties were imposed in October 1994,*

to charge prices which could be as much as 25 % above the prices of competing products."[57]

5.2. Correct prices

Two prices are used in the imputation test – the downstream price (P^d); and the essential input price (P^{ui}). As the *EU Access Notice* and *Napier Brown – British Sugar* state, the correct downstream price is that for the product supplied by the vertically integrated firm. The downstream competitor could charge a lower price than that of the vertically integrated firm, for example, to induce consumers to switch from the latter.[58] This price is, however, irrelevant in assessing the vertically integrated firm's pricing practices. The upstream firm has control of its own price not that of its rivals, and hence only the former should be used.

The upstream input could be offered by the vertically integrated firm or other firms. Even though the upstream undertaking is dominant it is possible that downstream firms will nonetheless have a choice of upstream input providers. When this is the case, P^{ui} is not necessarily the price of the input supplied by vertically integrated firm, but the lowest among those offered and available to downstream operators. This is because the input supplied by the vertically integrated firm would not be essential. The price of the input supplied by the vertically integrated firm might be higher than that of its upstream competitors, if the former has upstream market power.

Furthermore, the price offered by the vertically integrated firm to downstream competitors, P^{ui}_{3rd}, could reflect additional costs incurred by the vertically integrated firm to meet the specific requirements of downstream firms. When this price is used, either in Test 1 or 2, it could identify a "price squeeze" based on the higher costs incurred to meet these specific requirements reflected in a higher P^{ui}_{3rd}. When this is the case, the upstream price P^{ui}_{3rd} cannot be used unless these additional costs are deducted. Alternatively, if available one could use the price charged to other downstream competitors that do not have specific requirements that raise the cost of provision. Not doing so would violate the efficiency objective of the test.

---

[57]   *Industrie des Poudres Spheriques*, para 185.

[58]   Entrants in the telecommunications and energy sectors have usually priced their services below that of vertically integrated incumbent operators, and continued to do so. This may be part of a deliberate pricing strategy to gain market share, and also to adjust for (perceived) lower quality services, the absence of a reputation, and to overcome consumer switching costs and inertia.

In *Industrie des Poudres Spheriques* the Court rejected IPS' claim that PEM had undertaken a price squeeze. PEM incurred additional costs in order to process primary calcium metal that met IPS' special requirements. The Court concluded that there was nothing preventing PEM to pass through these additional costs through to its upstream input price. Furthermore, it was IPS' inefficient production process that put it at a disadvantage, and not PEM's pricing policy. As IPS was not an efficient firm, it could not claim that its margins had been squeezed by PEM.[59] As a general rule, if $P_{3rd}^{ui} > P_{int}^{ui}$ because of the additional costs to provide the input to downstream competitors, the efficiency objective of the imputation test requires that P_{int}^{ui} is used instead. Self-provision might involve lower costs than provision to downstream competitors. Therefore, what might appear a small margin for the downstream competitor will be due to the incremental costs of providing the upstream input to meet third parties' specifications. If cost differences are not taken into account inefficient entry will occur.[60]

So far, it has been assumed that P^l and P^{ui} are linear prices. This will often not be the case. The prices faced by final consumers (P^l) and downstream rivals (P_{3rd}^{ui}) may include quantity discounts for large purchases and/or be structured as two-part tariffs with fixed and usage components. For example, telecommunication tariffs consist of fixed charges and a variety of tariff rates based on usage and time of day. There may also be more than one source of revenues for a product. Failure to adequately incorporate all sources of revenues will lead to an incorrect finding of a price squeeze.[61] In these circumstances, it is not appropriate, and sometimes also not feasible, to undertake the imputation test for each price element. The correct approach is to calculate P^l and P^{ui} using appropriate price indices.[62]

A potential problem with an imputation test like (4) is that it focuses on a product or market without taking into account the possible existence of

---

[59] *Industrie des Poudres Spheriques*, paras 169-189.

[60] See J. A. Hausman and T. J. Tardiff, "Efficient Local Exchange Competition", 40 *Antitrust Bulletin* 529, 543-544 (1995).

[61] For example, in *ADSL margin squeeze* Oftel investigated and later dismissed a complaint that BT wholesale subscription price for ADSL access (£41.13) was higher than its price for the retail subscription (£39.99). Although Oftel did not examine this price structure due to subsequent changes in both retail and wholesale subscription prices, BT claimed that it could offer a retail subscription at a price below its wholesale price because it expected additional revenues from e-commerce and advertising.

[62] The EC Commission in its June 2001 discussion paper proposed this approach to the ONP Committee to deal with price squeezes in the provision of local loop access. Reported in Squire Sanders, *Legal Study on Part II of the Local Loop Unbundling Sectoral Inquiry*, February 2002, pp. 44 and 45, available at http://europa.eu.int/comm/competition/antitrust/others/sector_inquiries/local_loop/local_loop_unbundling_inquiry.pdf.

complementarities with other products. While supply-side complementarities can be incorporated in the calculation of C^d, as shown below by making use of the concept of avoidable costs, demand side complementarities pose greater difficulties. Suppose the vertically integrated firm sells a downstream product that is a complement to other products. An example is that of complementary products such as a photocopying machine and afters sale maintenance and spare parts. Suppose there is strong competition in the market for the supply of photocopying machines, but once the product has been acquired maintenance and spare parts can only be obtained from the original seller of the photocopying machine. If consumers are short-sighted and make their choice on the basis of the price of the photocopying machine alone, largely disregarding the price of after sales services, it is likely that the price of the former will be low while that of the latter high.[63] This means that in pricing the first product, the vertically integrated firm will take into account not only the impact on its own demand but also on the other complements it supplies. In so doing, it prices the product for which a price squeeze is alleged at a lower price P^d than that of downstream competitors that do not supply the complements could. In other words, when there are demand side complementarities (4) might detect a price squeeze when there is none. The ability of the vertically integrated firm to internalise the pricing externality between complements is welfare enhancing and improves efficiency and should accordingly be protected. The use of price (indices) for the bundle of services is therefore appropriate in these cases.

5.3. Downstream costs

The imputation test is concerned with ensuring efficient downstream entry. The imputation test (4) uses the downstream costs (C^d) only; costs of producing the upstream input (C^{ui}), and their relationship with its price P^{ui} are irrelevant. As a general rule, the downstream costs used should be the lowest of either downstream firms or the downstream division of the vertically integrated firm. Furthermore, the term "*reasonably efficient operator*" used in the *EU Access Notice* could be interpreted as referring to actual costs incurred by existing firms or the costs of a hypothetical efficient downstream firm based on forward looking Long Run Incremental Cost (LRIC) estimates.

---

[63] The markets for complementary goods and services such as maintenance, upgrades, and replacement parts needed after consumers have purchased a durable good are referred to as "aftermarkets" (see generally Veljanovski footnote 43 above). If consumers take into account full life costs of a photocopying machine (the purchase costs plus post purchase maintenance and other costs), a lower price of a photocopying machine would not affect consumers purchase decisions.

The appropriate measure of costs is that of avoidable or incremental costs. Avoidable costs refer to those costs that the vertically integrated firm could avoid if it decided to close its downstream operation (but continue provide the upstream input to third parties). Incremental costs, on the other hand, refer to the costs that a downstream operator would have to incur if it were to efficiently operate or enter downstream. The lower of the two be used in the imputation test in order to promote efficient entry.

Avoidable or incremental costs are therefore the appropriate measure, and preferable to average costs usually adopted by the EC Commission.[64] The concept of avoidable costs is also more flexible, allowing for example to take into account the time duration of a price squeeze. For example should a price squeeze be undertaken for relatively short period of time, there would be few costs that could be avoided. For longer periods, a larger set of costs could be avoided.[65]

The imputation test's focus on efficiency means that in calculating efficient downstream costs, economies of scope and scale should be factored in. The downstream costs of a vertically integrated firm will often differ from those of its downstream competitors. A vertically integrated firm could offer a wider range of downstream products than any downstream competitor. If there are common fixed costs in producing this range of downstream products, the firm with the largest range might have lower downstream costs due to economies of scope. Economies of scope could also stem from vertical integration if strict complementarity between upstream inputs and downstream transformation implies that the vertically integrated firm has lower costs. Furthermore, if fixed costs are incurred in downstream transformation the firm with the largest downstream market share will be the most efficient.[66] The choice of the appropriate measure of downstream costs is crucial in if a Type I error is to be avoided which would lead to a loss of efficiency because of the negative impact on the ability of the vertically integrated firm to exploit economies of scope and scale. In *Industrie des Poudres Spheriques* the European Court of First Instance's rejection of IPS's claim illustrates the central role of efficiently incurred downstream costs plays in assessing price squeezes.[67]

---

[64] This is the case where predation is defined as prices below the average variable costs. See for example Case C-62/86 *AKZO v. European Commission* [1991] E.C.R. I-3359; [1993] 5 C.M.L.R. 215, ECJ.

[65] See W. J. BAUMOL, "Predation and the Logic of the Variable Cost Test", 39 *Journal of Law and Economics* 49 (1996).

[66] P. A. GROUT, "Recent Developments in the Definition of Abusive Pricing in European Competition Policy" CMPO Working Paper Series No. 00/23, (March 2001), Section II.3.

[67] *Industrie des Poudres Spheriques*, paras 169-189.

5.4. Margins and rate of returns

The imputation test set out above (4) compares a downstream firms NM's to an appropriate rate of return. In practice, finding an appropriate r is may be difficult. Often downstream operators are not publicly listed or, if they are, they are part of large conglomerates, making it difficult, if not impossible, to disentangle the risk-adjusted return of each activity. This difficulty is compounded by the fact that alleged price squeeze often relates to a specific product or line of business for which no direct comparison is available. Where r is not available or there is no directly comparable business to the one being investigated, there are some simple rules to identify a price squeeze.

For example, strong evidence that a price squeeze has taken place exists if $NM \leq 0$ for a sufficiently long period of time. Sometimes correctly estimating C^d is a difficult, if not impossible, task and, therefore, NM cannot be calculated. In these circumstances computing a (absolute) gross margin (GM) could be sufficient (5). If the GM is sufficiently high, a price squeeze could be ruled out.[68] On the other hand, a price squeeze has occurred (with a higher likelihood than in the case of NM) if, for a sufficiently long period of time:

$$GM = \frac{P^d - P^{ui}_{3rd}}{P^{ui}_{3rd}} \leq 0 \qquad (5)$$

An analysis of the profitability of either all downstream competitors and/or of the vertically integrated firm could also provide further valuable information. When there are more than one downstream firms and only one of them alleges that a price squeeze has occurred, a comparison of their NMs or GMs or more simply overall rates of returns can assist. For example, if the firm alleging a price squeeze has an insufficient margin while other downstream competitors thrive, the likely reason is the firm's inefficiency rather than a price squeeze.[69] If the vertically integrated firm's overall profitability (upstream and downstream) is low or negative over the same period when a price squeeze has been alleged, this is strong evidence that a price squeeze has not occurred, unless considerable inefficiencies can be established. Similarly, the economic cycle of the product market investigated should also be taken into account

---

[68] The OFT, for example, refers only to GMs and not NMs; OFT, *Competition Act 1998 – The application in the telecommunications sector*, (OFT 417), para 7.26.

[69] The Dutch Antitrust Authority (Nma) adopted this approach in *Talkline v KPN* when it rejected Talkline's complaint against KPN on the grounds that because other service providers could successfully compete in the market, the wholesale terms offered to Talkline were not anticompetitive.

in order for an imputation test not to detect a market downturn and interpret it as anticompetitive behaviour.

6. REGULATORY ISSUES

The discussion so far has focused on competition law principles for controlling price squeezes. This is a case-by-case approach based on *ex post* assessment. Increasingly regulatory laws contain prohibitions on price squeezes and imputation tests. These are *ex ante* controls, which apply across the board to regulated network operators. It is, therefore, important to briefly draw out the implications of and similarities between competition and regulatory laws.

6.1. Price squeezes and ex ante regulation

As competition has been introduced to the telecommunications and energy sectors there has been increased reliance on *ex ante* regulation to deal with market power and related access abuses. In some jurisdictions, dominant telecommunications operators are under an obligation to satisfy an *ex ante* imputation test in setting all retail tariffs, e.g. the Netherlands[70] and Canada.[71] Although *ex ante* imputation tests raise issues similar to *ex post* ones there is one difference – the *ex ante* imputation test is applied to predefined services (e.g. national calls at peak time), while under competition law the test must be applied to the relevant product market. The two often differ as is evident from the discussion in Section IV.

The application of competition law to sectors, where *ex ante* regulation is also present, raises the issue of whether firms under obligation to provide cost-based access to their networks, often on a non-discriminatory basis, are able to price squeeze. Their ability to do so is severely limited in most cases, assuming that e*x ante* regulatory constraints are effectively enforced. This means that imposing *ex ante* imputation rules is redundant unless the upstream market is subject to very light regulation.

---

[70] In the Netherlands the price squeeze test compares the prices of the retail services offered by the regulated operator with the wholesale prices for inputs charged to an interconnecting operator; OPTA & NMa, *Price Squeeze Guidelines*, 28 February 2001. Price squeezing is also referred to in EC Commission, *Unbundled Access to the Local Loop*, Regulation No. 2887/2000, 11 (5 December 2000).

[71] The Canadian Regulatory Telecommunications Commission (CRTC) requires a telephone operator to submit an imputation test when seeking approval of new regulated tariffs. This requires the operator to demonstrate the profitability of each retail service using its essential inputs using the same prices as it charges its rivals.

Table 1 provides a taxonomy of cases based on the types of price squeeze examined in Section II, and on the type of upstream input price regulation. The latter distinguish between (1) price regulation and non-discrimination; (2) non-discrimination only; and (3) no regulatory constraint. The taxonomy assumes that downstream tariffs are not regulated as is often the case or, if they are, they are subject to a price ceiling in order to avoid excessive pricing. When the upstream input price is regulated at cost, and a non-discriminatory obligation is in place, the vertically integrated firm can only undertake a *predatory price squeeze.*[72] However, while this strategy is feasible, it is not credible, if downstream competitors can easily re-enter when the downstream or retail price is raised later. In this case, imposing an *ex ante* imputation test for each service or tariff element is unnecessary and costly.[73] Only in presence of lighter or no regulatory obligations a price squeeze strategy becomes feasible. In these relatively rare circumstances, meaning that the market is considered sufficiently competitive not to warrant pervasive *ex ante* controls, the application of *ex post* competition law should suffice to control this type of abuse of dominance.

Table 1: *Ex ante* Regulatory Obligations & Ability to Price Squeeze

Regulation Type of Squeeze	Non-discrimination & regulated price (1)	Non-discrimination	No regulation
Discriminatory	Prevented	Prevented	Feasible
Non-discriminatory	Prevented	Feasible	Feasible
Predatory	Feasible but unlikely (2)	Feasible	Feasible

(1) *This applies independently of whether the input price is regulated at cost or at retail minus (ECPR).*

(2) Retail minus by definition prevents that the downstream price is set below the upstream one. A predatory price squeeze is feasible only under cost based regulation. It is however, unlikely because downstream firms could quickly re-enter if "squeezed out" of the market and therefore the vertically integrated firm could not exploit market power after their exit.

---

[72] If the upstream price were regulated at retail minus (or ECPR) even a *predatory price squeeze* would not be possible.

[73] This is because it reduces the firm's flexibility to efficiently set prices based on differences in their elasticity of demand. It also reduces the downstream firm's incentive to differentiate its prices from those of the vertically integrated firm. See generally J. J. Laffont & J. Tirole, *Competition in Telecommunications*, (MIT Press, 2000).

6.2. ECPR and imputation test

It should also be noted that there are strong similarities between the imputation test and the access pricing rule known as the Efficient Component Pricing Rule (ECPR) or "retail-minus". Both aim to ensure effective competition and efficient downstream entry.[74] The ECPR also prevents price squeezes, which an imputation test attempts to prevent. For example, Oftel has recently imposed retail minus to prevent BT from engaging in price squeezes on the market for asymmetric broadband origination and ATM conveyance.[75] The ECPR sets the access charge (the upstream price) by subtracting from the access provider's retail (i.e. downstream) price the avoidable cost of those services and network elements supplied by the access seeker and a suitable margin for the downstream activity.[76] Under retail-minus/ECPR the access charge is calculated as $P_{3rd}^{ui} = P^d - C^d - M$ where $P_{3rd}^{ui} \geq C^{ui}$. Only service (downstream) operators who are more efficient than the retail division of the vertically integrated network operator have an incentive to enter.[77] The ECPR sets the maximum upstream input price: a P_{3rd}^{iu} higher than $P^d - C^d - M$ would imply a price squeeze.

The similarity between an *ex post* imputation test and an *ex ante* access charge based on ECPR has two important consequences. First, it confirms that the notion of efficient downstream competitor is equivalent to that of avoidable costs in testing if a price squeeze has occurred. Second, it restricts the

---

[74] Considerations of allocative or productive efficiency in the provision of the upstream input are absent.

[75] Oftel, *Direction to resolve a dispute between BT, Energis and Thus concerning xDSL interconnection at the ATM switch*, 21 June 2002.

[76] W. J. BAUMOL & J. G. SIDAK, "The Pricing of Inputs Sold to Competitors", 11 *Yale Journal of Regulation* 171 (1994) Alternatively, the access charge could be calculated as equal to the direct cost of providing access plus its opportunity cost.

[77] As an access-pricing rule, ECPR has been criticised for failing to adjust for the incumbent network operator's market power. Under ECPR avoidable costs are subtracted from the network operator's retail prices resulting in an access prices that is "excessive" if the operator is charging monopoly prices. This flaw was central to the long legal dispute over interconnection rates between the dominant fixed network operator Telecom New Zealand (Telecom) and entrant Clear Communications; see generally M. Mueller, "On the Frontier of Deregulation: New Zealand Telecommunications and the Problem of Interconnecting Competing Networks", in D. Gabel & D. F. Weiman, eds., *Opening Networks to Competition: The Regulation and Pricing of Access*, 107 (Kluwer Academic, 1998). Despite this, ECPR has several advantages: it minimises distortions on the network's retail tariff structure and inefficient arbitrage, preserves the operators incentives to invest in infrastructure, minimises the regulatory burdens on operators and regulators, and the network operator has no incentive to foreclose entry. As a result it has often been applied by regulators as an access pricing methodology where it is believed that retail prices are competitively set e.g. for national roaming and indirect access in the mobile sector; *Often Statement on National Roaming – Revised Version*, October 1999; and *Customer Choice: Oftel's Review of Indirect Access for Mobile Networks*, February 1999.

applicability of straightforward price squeeze test to cases where the products offered by the vertically integrated firm and its downstream competitor not only compete in the same market, but are very close substitutes.

7.   CONCLUSIONS

Competition and regulatory authorities across Europe face growing demands to deal with alleged price squeezes. Since most of these allegations have occurred in sectors where downstream margins are usually low, there is a high likelihood that they will be persuaded that there has been a squeeze when none has occurred. In order to avoid the risk that low or negative margins per se will be treated as evidence of a price squeeze, practical guidelines have been set out. First, it has been stressed that the downstream market is key to assessing whether the conditions exist for a price squeeze – the upstream input must be "essential" for downstream competitors and for competition in the downstream market; the downstream market must not be effectively competitive (otherwise the vertical integrated firm could not extract additional profits and hence have no incentive to leverage its market power downstream); the upstream firm must be "super dominant" under EC law with a market share in excess of 80%; and the alleged squeeze must have persisted for a sufficiently long period to make entry of efficient downstream firms unprofitable. Further, even when these conditions are satisfied, it is empirical matter whether low margins are evidence of a price squeeze. The discussion above sets out the main elements of an appropriate imputation test that distinguishes low margins due to inefficiency, from those caused by the exclusionary practices of a vertically integrated input supplier.