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Testing for Cross-Subsidisation

A Report for Royal Mail

CRITICAL THINKING AT THE CRITICAL TIME™

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Glossary

Term	Definition
ATC	Average Total Cost
AVC	Average Variable Cost
D-LRAIC	Distributed Long Run Average Incremental Cost
D-LRIC	Distributed Long Run Incremental Cost
DSAC	Distributed Stand Alone Cost
EC	European Commission
EEO	Equally Efficient Operator
FAC	Fully Allocated Cost
FDC	Fully Distributed Cost
FK	Forburger-Kontakt
FTI Consulting	FTI Consulting LLP
IC	Incremental Cost
LRAIC	Long Run Average Incremental Cost
LRIC	Long Run Incremental Cost
PD	Post Danmark
PPC	Partial Private Circuit
RRRM	Review of the Regulation of Royal Mail
SAC	Stand Alone Cost
SMP	Significant Market Power
SRIC	Short Run Incremental Cost
SWC	Stone & Webster Consultants
UPS	United Parcel Service
USO	Universal Service Obligation
USP	Universal Service Provider

1. Introduction

1.1 This report has been prepared by FTI Consulting LLP ("FTI Consulting") for Royal Mail in connection with Ofcom identifying a potential issue of cross-subsidisation between Royal Mail's letters and parcels businesses.

Background

1.2 In Ofcom's consultation on the Review of the Regulation of Royal Mail ("RRRM") in May 2016[1] Ofcom considered that there may be a risk of Royal Mail "*unfairly leveraging its position in the letter sector into parcels*".[2]

1.3 Implicitly this appears to suggest that Ofcom is concerned about the possibility that Royal Mail is cross-subsidising between letters and parcels, thereby harming competition in the parcels sector. Ofcom goes on to state that *"to address this risk we propose to review our regulatory accounting guidelines and build a costing model to help develop our own view of how Royal Mail allocates costs"*.[3]

1.4 Ofcom explains that Royal Mail has configured its network such that it can utilise its foot-delivery network to deliver small/lightweight parcels alongside letters. This means that Royal Mail's delivery network is exposed to the competitive pressures that it faces in the national parcels sector. Ofcom considers that there is a risk that Royal Mail may:[4]

> *"use revenues from letters to provide <u>below cost</u> parcel services"*
>
> *or*
>
> *"<u>allocate costs</u> associated with parcel deliveries to letter deliveries thus enabling it to set higher prices for letters and lower prices for parcels."*

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1 Ofcom, Review of the Regulation of Royal Mail, May 2016 ("RRRM").

2 RRRM, paragraph 5.3, page 57.

3 RRRM, paragraph 1.23, page 8.

4 RRRM, paragraph 5.34, page 65.

1.5 Ofcom therefore links the risk of Royal Mail cross-subsidising its parcels business through its letters business with the potential challenges of being able to understand the costs related to letters and parcels. These challenges are related to Royal Mail using a combined network for the delivery of both letters and parcels, leading to a significant proportion of delivery costs being common between letters and parcels.

1.6 We understand that Royal Mail has communicated to Ofcom that a combined letters and parcels network is the most efficient operational solution for Royal Mail to meet its Universal Service Provider ("USP") obligations. Further, cross-subsidisation has a role to play in the financial sustainability of the Universal Service Obligation ("USO") – for example cross-subsidisation between urban and rural areas. These two points need to be considered in the context of claims of cross-subsidisation.

Our instructions

1.7 As an input to Royal Mail's response to the RRRM, we have been asked to advise on the appropriate tests to use for testing for cross-subsidisation.

1.8 This report considers the economic principles that should be considered when assessing whether there are cross-subsidies between a firm's different businesses or products, what are the appropriate tests for establishing whether Royal Mail has been cross-subsidising between letters and parcels and which measures of costs are the most appropriate to be used as part of these tests, with reference to relevant academic papers, case law and regulatory precedents.

Restrictions

1.9 This report has been prepared solely for the benefit of Royal Mail for use in responding to the RRRM. We have agreed that Royal Mail may provide this report to Ofcom and that the report may be published by Ofcom in the context of the RRRM.

1.10 FTI Consulting accepts no liability or duty of care to any person other than Royal Mail for the content of the report and disclaims all responsibility for the consequences of any person other than Royal Mail acting or refraining to act in reliance on the report or for any decisions made or not made which are based upon the report.

Limitations to the scope of our work

1.11 This report contains information obtained or derived from a variety of sources. FTI Consulting has not sought to establish the reliability of those sources or verified the information provided. No representation or warranty of any kind (whether express or implied) is given by FTI Consulting to any person (except to Royal Mail under the relevant terms of our engagement) as to the accuracy or completeness of this report.

1.12 This report is based on information available to FTI Consulting at the time of writing. It does not take into account any new information which becomes known to us after this date. We accept no responsibility for updating the report or informing any recipient of the report of any such new information.

Structure of this report

1.13 This report is structured as follows:

- Section 2 provides a summary of economic theory on the definition and measurement of cross-subsidies within a firm;
- Section 3 discusses how the economic theory and the tests proposed for assessing claims of subsidisation can be applied to Royal Mail; and
- Section 4 summarises the conclusion of our analysis.

2. An economic framework to measure cross-subsidies

2.1 The issue of cross-subsidisation and how it may be measured is well referenced in economic literature, with specific references to its application to industries with natural monopolies and utilities. Faulhaber (1975)[5] and Heald (1996)[6] are widely recognised as influential in this field and commonly referenced in case studies and literature.

2.2 Heald, in the context of utility regulation[7], links cross-subsidies across different outputs within an organisation to the existence of one or both of the following factors:

- Common costs which relate to more than one of the organisation's outputs, which leave significant uncertainty on how these common costs can be allocated to the different outputs which share these common costs; and/or
- The existence of a monopoly, due to either economic factors or to political factors, which offers the organisation the ability to flex the prices for different outputs to achieve an improved outcome across the different markets.

2.3 The complexity of identifying cross-subsidies also derives from the different forms that cross-subsidies can take. They can involve one or a combination of different internal revenue transfers.[8] For example they may involve transfers between:

- Regulated and unregulated outputs;
- Vertically integrated outputs;
- Horizontally integrated outputs; and
- Different customers for a single output, including transfers between different categories of customers, or between different geographies, as in the case of geographically uniform tariffs.

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5 Faulhaber (1995), Cross-Subsidization: Pricing in Public Enterprises, The American Economic Review.

6 Heald (1996), Contrasting approaches to the 'problem' of cross-subsidy.

7 Heald (1996), Contrasting approaches to the 'problem' of cross-subsidy.

8 Heald (1996), Contrasting approaches to the 'problem' of cross-subsidy, page 64.

2.4 It should be noted that the existence of cross-subsidies may be desirable to pursue specific policy objectives. For example, a Government or regulator might impose uniform geographical tariffs which will lead to a cross-subsidy from customers in low-cost areas, e.g. urban locations, to customers in higher-cost areas, e.g. rural areas. Other cross-subsidies might arise from requirements of the USO. In such cases, cross-subsidies arising from specific policy objectives might be seen as welfare enhancing and promoting social inclusion.

2.5 Heald also refers to the challenges in defining and measuring the existence of cross-subsidies. He specifically notes that these are due to the difficulty of constructing unequivocal and unconstructed benchmarks for the purpose of determining whether there are cross-subsidies. Two approaches can be identified to define price benchmarks:[9]

- An assessment with reference to cost based benchmarks; and
- An assessment with reference to benchmarks based on optimal pricing.

2.6 The application of both benchmarks is complex, and there are interdependencies between the two benchmarks:

- Cost benchmarks can be affected by the level of prevailing prices, through the impact of prices on demand, given that unit costs will depend on volumes, for example where there are fixed costs and economies of scale or scope;
- Similarly, the optimal pricing decision is often linked to the level of marginal costs, and therefore optimal price benchmarks are likely to be affected by the product cost function.

2.7 The majority of tests for cross-subsidies are defined with reference to cost-based benchmarks, but additional factors beyond cost may be considered as part of the assessment.

[9] Heald (1996), Contrasting approaches to the 'problem' of cross-subsidy, pages 54 and 55.

2.8 Heald refers to three relevant cost measures which are considered in the context of assessing claims of cross-subsidies.[10] These are:

- Fully distributed cost (“FDC”) also referred to as Fully Allocated Cost (“FAC”): this cost measure is based on the adoption of systematic procedures through which all costs, including common costs, are allocated to the company outputs.
- Stand Alone Cost (“SAC”): this cost measure is based on determining the hypothetical cost of producing each output in isolation from all other outputs.
- Incremental Cost (“IC”): this cost measure consists of measuring the increase in cost associated with producing an output in addition to the existing production of the firm. The additional output can be defined as a specific product or a group of products. The measure of incremental cost depends on which existing products and group of products are considered in the calculation.

2.9 The definition of IC also depends on the time horizon which is selected for the analysis:

- Short Run IC (“SRIC”) is generally calculated by assuming fixed capacity, and it is used to measure the economic cost of using existing capacity. It is normally relevant in cases when a firm’s operations are constrained to a specific time period; and
- Long Run IC (“LRIC”) considers the incremental cost of capacity expansion, therefore assuming that the firm has the ability to vary capacity in the relevant time period. LRIC is more commonly used in situations where a firm’s operations are not restricted to a specific time period, and it is more commonly used in cross-subsidisation cases.

[10] Heald (1996), Contrasting approaches to the ‘problem’ of cross-subsidy, pages 56 and 57.

2.10 It is also worth introducing two additional costing measures that are often used in the context of competition law, which are closely related to the cost measures defined by Heald. These are:

- Average Variable Cost ("AVC"): AVC is calculated by dividing the variable cost of production by the output of production, and it is often considered to approximate marginal cost and IC, as it is deemed to be a more practical and workable measure as compared to these cost measures. The AVC measure, like the IC measure, will depend on the time frame considered for the calculation.
- Average Total Cost ("ATC"): ATC is calculated by dividing the total cost of production by the output of production, and it is considered to be an equivalent measure to FAC.

2.11 Economic theory provides commentary on the merit of using the measures described above in the context of assessing claims of cross-subsidisation, favouring the use of IC and SAC over FAC.

2.12 Faulhaber defines the concept of subsidy-free prices when prices charged by a monopolist to each consumer lie between the IC and the efficient SAC of the relevant products. This result is demonstrated under the conditions that: a) the monopolist is constrained to breaking even and b) prices charged to each consumer (or group of consumers) are below the SAC that would be incurred by efficient producers.[11]

2.13 Larouche (2000) summarises the "Faulhaber rule" in that *"as long as a dominant firm prices its services somewhere between incremental costs (seen in an adequate time scale) and stand-alone costs, overall welfare should not be adversely affected, on account either of excessive pricing, predatory pricing or cross-subsidization".*[12, 13]

2.14 Under a subsidy-free price approach, it can be said that all users of a network industry benefit from access to a common network. They do not pay more than they would for their own dedicated network, the price of which would be set at SAC, and do not make anybody else worse off in doing so, for example by pricing below IC. This was also found to be a sustainable equilibrium for a contestable multi-product firm (*Baumol, Panzar and Willig, 1982*)[14] under certain cost assumptions.[15, 16]

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11 NERA (April 2001), Regulatory Approaches to Cost Allocation – A Report for ORR, page 3.

12 Assuming price discrimination is not allowed.

13 Larouche (2000), Competition Law and Regulation in European Telecommunications, page 255.

14 Baumol, Panzar and Willig (1982), Contestable markets and the theory of industry structure.

15 The cost function at the monopoly output must feature (at least weak) subadditivity, productive efficiency, least ray average costs, non-decreasing returns to scale and zero excess profit (after rent).

2.15 Criticism of the use of FAC in the context of cross-subsidies has featured heavily in academic literature. The 1979 paper 'An Analysis of FDC pricing in Regulated Industries' by the California Institute of Technology outlined criticisms of FAC that have arisen during regulatory proceedings. The paper examines the economic consequences of allocating common costs using various methods to determine FAC prices for regulated firms. The paper states that regulatory proceedings involving FAC pricing have resulted in a number of criticisms, for example:[17]

- FAC have no direct relationship with marginal costs so there is no basis in economic efficiency for FAC pricing;
- All methodologies for prorating the common or joint costs are in part arbitrary and therefore dangerous to use in prescribing rates;
- As a result of the somewhat arbitrary determination of FAC, there is no economic basis for concluding that a service is being subsidised by other services if its revenues are less than its FAC; and
- The reasoning behind FAC pricing is circular. Historic revenues are often used in the cost allocation process. Future prices may then be set by reference to these cost measures. Therefore, FAC may depend on a prior tariff structure and revenues, which are then used to determine future prices.

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16 NERA (April 2001), Regulatory Approaches to Cost Allocation – A Report for ORR, page 4.

17 California Institute of Technology, An Analysis of Fully Distributed Cost Pricing In Regulated Industries, June 1979, page 5. For detailed academic references see the footnotes of the academic paper available at http://repository.library.northwestern.edu/fedora/get/inu:inu-mntb-0005494957-bk/PDF.

2.16 Further criticism is provided by the *Brown and Sibley (1986)* paper. They object to the FAC approach on the basis that it is arbitrary, stating that *"economists have shown that FDC cost standards have no meaning as tests for cross subsidy."*[18] A particularly useful summary of economists' views on FAC is provided in this paper:

> *"Economists' criticisms of FDC have been scathing. They particularly single out the fact that different FDC allocation methods are essentially arbitrary, yet can lead to widely different results. […] there is no effort in FDC pricing to increase economic efficiency; the important cost concept is not marginal cost, but an "average cost" with no clear rationale. Also, price elasticities of demand have no place in setting FDC rates, except perhaps in forecasting revenue, so FDC prices will generally be much different from Ramsey prices. Finally, economists have argued that FDC methods are utterly meaningless in one of their main uses, testing for cross subsidy. Cross subsidy, logically, should exist only when the deletion of a service benefits users of other services."*[19]

2.17 The divergence of FAC prices from Ramsey prices is of particular relevance, as it demonstrates that FAC prices are not welfare optimising as they do not take into consideration the characteristics of demand. Similar criticisms around the role of demand came from Sharkey (1982)[20], who undertook game theory experiments finding that in determining common cost allocations, demand matters.[21] Sharkey explains that in establishing whether a set of prices is subsidy-free, both cost and demand conditions should be taken into consideration.

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18 University of Colorado, Interconnect/Access Pricing: A summary and Critique.

19 Brown and Sibley (1986), The Theory of Public Utility Pricing, page 49 (obtained from: NERA (April 2001), Regulatory Approaches to Cost Allocation – A Report for ORR, page 6).

20 Sharkey (1982), The theory of natural monopoly.

21 Heald (1996), Contrasting approaches to the 'problem' of cross-subsidy, page 55.

2.18 Larouche (2000) also contrasts the FAC approach with the IC/SAC approach arguing that by using the Faulhaber approach, i.e. using IC and SAC as the main indicators of competition concerns, one avoids *"intruding too deep into controversial issues of costing and accounting"*[22] and that the alternative is FAC, described as a "more interventionist approach". Using the FAC approach *"competition authorities become entangled in cost allocation as a general issue, since they would measure the cost allocation decisions of the firm against their own standards for full cost distribution. From that perspective, any misallocation of common costs can give rise to cross-subsidization and to competition law concerns."*[23]

Defining a test for cross-subsidies

2.19 Many academic papers have considered what the appropriate test for cross-subsidy is. Heald (1996) also outlines a test for cross-subsidisation.[24] Specifically, an output is the source of cross-subsidy if the price is greater than the SAC and is the recipient of cross-subsidy if the price of the output is less than the IC. Further no cross-subsidy exists when the price of the output is greater than or equal to the IC and less than or equal to the SAC. Further, Cave and Mills (1992)[25] provided an important insight in that floors (IC) and ceilings (SAC) can be set to 'legitimate' prices.[26]

2.20 The test defined by Heald (1996) can be expressed through the following equation. An output *j* is neither the source of, nor the recipient of, cross-subsidy when:

$$IC_j \leq Price_j \leq SAC_j$$

2.21 This equation requires generalisation in terms of revenues so that the test is performed not just for a single output but for all combinations of outputs *j*.

2.22 This is consistent with what some of the critics of the SAC test approach have pointed out, with Faulhaber (2002) recognising that to apply the SAC test, it must be applied to each service individually and to all possible groups/combinations of services, but this 'key insight' is often missed in his earlier work.[27]

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22 Larouche (2000), Competition Law and Regulation in European Telecommunications, page 255.

23 Larouche (2000), Competition Law and Regulation in European Telecommunications, page 255.

24 Heald (1996), Contrasting approaches to the 'problem' of cross-subsidy, page 59.

25 Cave and Mills (1992), Cost allocation in regulated industries.

26 Heald (1997), Public Policy Towards Cross Subsidy, page 596.

27 Decker (2015), Modern Economic Regulation: An Introduction to Theory and Practice, page 335.

2.23 Heald does not specify whether SRIC or LRIC should be used. This will depend on the specific context in which the test is being undertaken. When testing for cross-subsidisation in network industries, where the cost of capacity expansion is relevant for pricing decisions, LRIC is generally considered to be the appropriate measure of cost, as discussed in paragraph 2.9 above.

Application of competition law tests to cross-subsidisation

2.24 A complementary approach to defining the relevant test for cross-subsidisation is to look at case law, in the context of abuse of dominance. If the regulatory authority's concern is about the potential exclusion of competition, due to pricing below cost, then cross-subsidisation in this context could be considered as a specific case of predatory pricing.

2.25 Predatory pricing tests are defined to test that the prices set by a dominant firm are not distorting competition by foreclosing other efficient operators in the market, by setting prices below cost. The relevant cost for the tests is the dominant firm's own cost. There is no obligation to ensure that prices are above the cost of competitors facing higher costs, as this would encourage inefficient entry.

2.26 Prices below AVC, which is commonly used as a proxy for marginal or incremental cost, are presumed to be unlawful predation as such pricing strategy *"has no economic rationale other than the elimination of competitors, since every unit sold is a net financial loss".*[28] Various academic references to the use of AVC can also be found. Areeda and Turner (1975)[29] published a highly influential predatory pricing paper in the Harvard Law Review. In this paper Areeda and Turner demonstrated that *"marginal-cost pricing is the economically sound division between acceptable, competitive behaviour and "below cost" production"*[30] noting the difficulty in ascertaining a marginal cost figure, hence relying on observed AVC as an indicator of marginal cost leading to the *"suggested test for short run predation is pricing below reasonably anticipated average variable cost."*[31]

2.27 In two keynote cases, AKZO and Tetra Pak II, the European Courts sanctioned two different approaches for determining whether a firm has engaged in predatory pricing. These approaches have been referred to as the 'Akzo tests':[32, 33]

- Prices below AVC must always be considered abusive; and
- Prices below ATC but above AVC are only to be considered abusive if an intention to eliminate competition can be shown.

2.28 Philip Lowe, then Director General of the DG competition at the European Commission ("EC"), goes on to discuss IC stating that "*it is widely admitted in the literature that for industries characterised by high fixed costs and low variable costs, even a price covering the variable costs could be predatory if it does not cover the IC of the product in question for a significant period of time*".[34]

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28 Howrey, Pricing Issues under EC Competition Law with a special focus on the Postal Sector, slide 13.

29 Areeda and Turner (1975), Predatory Pricing and Related Practices under Section 2 of the Sherman Act.

30 Areeda and Turner (1975), Predatory Pricing and Related Practices under Section 2 of the Sherman Act, page 716.

31 Areeda and Turner (1975), Predatory Pricing and Related Practices under Section 2 of the Sherman Act, page 719.

32 Global Competition Review, The European Antitrust Review, 2013 page 21.

33 EC, EU Competition Practice on Predatory Pricing – Introductory address to the Seminar "Pros and Cons of Low Prices", page 2-3.

34 EC, EU Competition Practice on Predatory Pricing, page 4.

2.29 Further as a result of the AKZO case, Whish (2015) states that *"If the AVC and ATC standards in AKZO v Commission are inappropriate to determine whether prices are predatory in industries such as these [industries with high fixed costs but low variable costs], an alternative rule is needed. In the Commission's Notice on the Application of the Competition Rules to Access Agreements it suggests that the AKZO standards are not appropriate in a network industry such as telecommunications and that a standard based on LRIC might be preferable. Indeed, even a price above LRIC could be considered predatory, if it does not recover some of the common costs that are incurred where a firm supplies a range of different products: for this reason a 'combinatorial' approach may be taken towards the assessment of cost, whereby a firm's LRIC is combined with its 'stand alone cost', that is to say the cost that it would incur if it had no other activities at all".*[35]

2.30 A relevant example of the application of the cross-subsidisation test to the postal sector is the decision following the 1994 complaint by United Parcel Service ("UPS") accusing Deutsche Post AG ("DPAG") of selling its parcels delivery services below cost. In this case the EC set out a standard for measuring those "cross-subsidies" between a "monopoly" service and competitive activities that result in predatory prices in the latter. The standard adopted for the test was based on LRIC.

2.31 Additional details on the key relevant cases referring to cross-subsidies and predatory pricing are presented in Appendix 1.

2.32 LRIC is commonly used within regulated network industries, such as postal services as a measure of incremental cost. This is consistent with the decisional practices of the European and UK competition authorities, and is seen as providing the correct signal for entry in a network industry. For example, in its March 2012 Statement, Ofcom states:

> *"In relation to setting prices, we considered that LRIC costs provided the correct signals for entry in the market and that Royal Mail should set its prices to maintain a minimum LRIC margin between its access prices and the equivalent retail prices".*[36]

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35 Whish (2015), Competition Law Eighth Edition, page 787.

36 Ofcom, Securing the Universal Postal Service, March 2012 Statement, paragraph 10.89.

2.33 We note that regulators may, in certain circumstances, define specific policy objectives and impose additional constraints above those that what would normally be suggested by economic theory and by competition law. For example, they may want to keep the level of prices in the market above the incumbent's incremental cost if they want to encourage entry in the market. We note that, in such circumstances, the regulator will need to demonstrate that there are concerns related to the level of competition in the market, and that imposing such additional constraint is a proportional measure that will have a positive impact in the market.

2.34 We also note that regulators may also define policies which encourage cross-subsidies. For example, when setting uniform geographic pricing, it is likely that cross-subsidies may exist between the lower cost and higher cost areas.

Approach used by other regulators

2.35 In the context of assessing potential cross-subsidies for Australia Post, the Australian Competition and Consumer Commission ("ACCC")[37] refers to two tests defined in the economic literature to determine if a cross-subsidy is present:

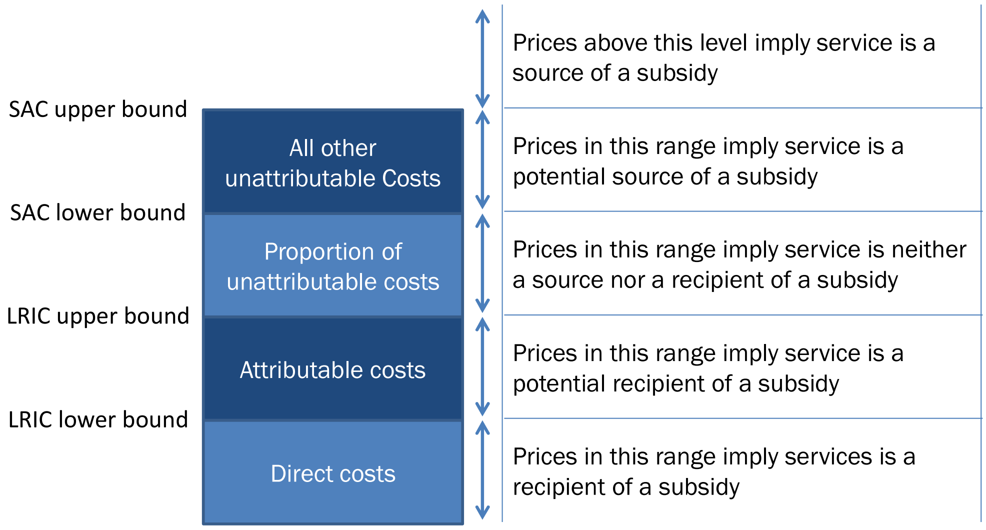
- SAC test: a service (or combination of services) is a source of subsidy if the revenue generated by that service (or combination of services) is greater than the SAC of the services.
- IC Test: a service (or combination of services) is the recipient of a subsidy if the revenue generated by that service (or combination of services) is not sufficient to cover the incremental cost of providing the services.

37 https://www.accc.gov.au/system/files/Tests%20for%20assessing%20cross-subsidy_0_0.pdf.

2.36 In applying these two tests the ACCC defined a test which relies on Australia's Post direct, attributable and non-attributable costs as proxies for the economic costs defined above, and does not require specific calculations for LRIC and SAC. The test is applied by defining the following boundaries to the level of prices:

- If the price is below direct (or incremental) cost, then the service is a recipient of cross-subsidies;
- If the price is between direct costs and a cost which includes both direct and attributable (common) costs, then cross-subsidies may exist, and other factors may need to be considered;
- If the price is above direct and attributable costs and below direct and attributable plus a proportion of non-attributable costs, then the service is neither a recipient nor a source of subsidies;
- If the price is between direct and attributable plus a proportion of non-attributable costs, but below SAC, calculated by including all attributable costs, the service may be the source of cross-subsidies, and other factors may need to be considered; and
- Last, if the price is above SAC, then the service is a source of subsidies.

Figure 1: ACCC Test



Source: FTI

2.37 In applying the test, the ACCC implicitly assumes that:

- LRIC includes all direct costs and a proportion of attributable costs. The proportion of the attributable cost depends on the level at which the LRIC is calculated, i.e. on the group of products selected for the calculation and on the identification of the costs that relate specifically to the group.
- SAC includes all direct and attributable costs, but only a proportion of non-attributable costs. The proportion of non-attributable costs included will depend on the group of products used, and on which of the non-attributable costs are used for their production.

This approach is consistent with the definition of the test by Heald, for which in order to be able to confirm that there are no subsidies, a combinatorial test is required, in the test will need to be run for all product and/or product groups.

Scottish Water

2.38 In Scotland, cross-subsidies in the water sector were reviewed in 2005 by the Water Industry Commissioner for Scotland ("WICS"). The Scottish Water case is particularly interesting given that Scottish Water provides a number of discrete services to different consumers and multiple services to most[38], giving rise to joint and common costs. In a report written by Stone & Webster Consultants ("SWC"), together with Scottish Water and the WICS, that evaluated possible approaches to cost allocation and the measurement of cross-subsidy, SWC states *that "It cannot be claimed that the cost-based prices implied by the FDC approach are in any sense unique since they will clearly depend on the choice of allocation rule. Moreover, critics of FDC highlight that for this reason the approach can be arbitrary and bear no relation to efficient pricing rules (Brown and Sibley, 1986)."*[39]

2.39 The SWC report states that subsidy-free pricing, based on costs between IC and SAC, corresponds to the conceptually correct methodology, but it then proposes to use a methodology using FAC on the ground that it is a methodology that is feasible to implement.

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38 http://www.gov.scot/Resource/Doc/36496/0014269.pdf, page 4.

39 http://www.gov.scot/Resource/Doc/36496/0014269.pdf, page 5.

2.40 It is important to note that the consideration of cross-subsidies in the Scottish Water case was related to setting cost-based regulated charges to the different water businesses. The objective was to ensure that there was equivalence between the charges paid by the different customer groups within a market with no competition. Hence, the use of FAC was acceptable in this specific case due to the objective set by the regulator. This differs from assessing whether cross-subsidies may exist in a market which is not price-regulated, and in the presence of competition, where the concept of cross-subsidy is linked to the ability of the operator to distort competition. As we have seen above, in such cases, the appropriate cross-subsidisation tests would be based on IC and not SAC.

3. Applying the economic test for cross-subsidisation to Royal Mail

3.1 The concern expressed by Ofcom in its 2016 RRRM is that through its decision to utilise a combined network to deliver both letters and parcels, there is the risk that Royal Mail could be "*unfairly leveraging its position in the letter sector into parcels*"[40] and have an incentive to use revenues from its letters business to provide below cost parcels services. Ofcom has stated that Royal Mail has the potential to cross-subsidise its parcels business through its letters business, in a way that might disadvantage other parcels operators.[41]

3.2 From our review of economic literature, case law and regulatory precedent in Section 2 above, it is clear that the appropriate economic test for assessing the existence of potential cross-subsidies is based on IC and SAC and not on FAC measures.

3.3 Should Ofcom's concern be specifically around the potential harm to competition in parcels from pricing below cost then the relevant economic test would involve assessing that Royal Mail's prices are above IC, consistent with the test for predatory pricing as set out in competition law cases.

Royal Mail's LRAIC model

3.4 Royal Mail also runs a Long Run Average Incremental Cost ("LRAIC") model.[42] The outputs of this model include LRAIC and Distributed LRAIC ("D-LRAIC") for all products sold by Royal Mail. We understand that Royal Mail has shared the full model and supporting documentation with Ofcom.

3.5 Royal Mail's LRAIC methodology is broadly consistent with that used by BT to calculate its LRIC costs. Both Royal Mail and BT's LRAIC models are based on the top-down FAC costs submitted to the regulator, and use a defined hierarchy of increments and Cost Volume Relationships to calculate LRAIC.

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40 RRRM, paragraph 5.3, page 57.

41 Ofcom, "Universal postal service returns to financial health", press release, 25 May 2016 (http://media.ofcom.org.uk/news/2016/royal-mail-review/).

42 LRAIC and LRIC are often used interchangeably, as in the majority of the cases LRAIC and LRAIC costs are calculated by calculating the average cost of having removed the volumes related to an increment by dividing the reduction in cost for the increment by the increment volumes.

3.6 The value of Royal Mail's LRAIC is related to Royal Mail's designation as the USP, as a material proportion of fixed costs in Royal Mail's network are due to the USO. To meet the USO requirement, Royal Mail requires a minimum network of mail centres, delivery offices, postmen and postwomen to guarantee a six day collection and delivery service for letters (and five days for parcels).[43] Costs of providing further volumes and additional non-USO products are incremental to these fixed costs.

3.7 In this respect, Royal Mail's LRAIC model is similar to BT's LRIC model. In BT's model, the scorched node approach is employed. This requires that *BT "maintains its existing geographical coverage in terms of customer access and connectivity between customers, and provides the infrastructure to do this from existing network nodes."*[44] The minimum network cost is defined by the configuration of the costs required to deliver one unit of the relevant increment, with other costs being incremental to this.

Using LRAIC in the cross-subsidisation test

3.8 Paragraphs 2.9 and 2.30 demonstrate that LRIC is an appropriate measure of IC to be used when looking at the issue of cross-subsidisation. The output of Royal Mail's LRAIC model can therefore be used to prove that Royal Mail prices are subsidy-free. Royal Mail's unit LRAIC can therefore be defined as the lower boundary for the price test defined in paragraph 2.20 above. Products and groups of products which are priced above this level do not receive cross-subsidies. We understand that Royal Mail does not currently model SAC, and additional work would be required in order to derive the upper boundary of the test for subsidy-free prices as defined below:

$$LRAIC_j \le Price_j \le SAC_j$$

3.9 The test will need to be passed for all individual products and/or product grouping. The estimates of LRAIC and SAC depend on the level of common costs which exist across each combination of products, and it is therefore necessary to demonstrate that the test is passed for each combination of relevant products considered. Given the large number of products offered by Royal Mail it would be impractical to run the test for each combination of products.

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43 Postal Services Act 2011, article 31, Requirement 1.

44 BT, "Accounting Methodology Document Long Run Incremental Cost Model: Relationships & Parameters, 31 July 2015, paragraph 3.16, page 8.

3.10 A range of alternatives has been used to respond to this challenge. A practical first order test was developed and applied by Ofcom in the context of applying the cost orientation remedy to prices. As part of the determination to resolve a dispute relating to BT's charges for Partial Private Circuits ("PPCs"), Ofcom decided to assess overcharging using Distributed SAC ("D-SAC") as opposed to SAC.[45] An equivalent approach involves using D-LRAIC rather than LRAIC to set price floors for the different products. Ofcom adopted a different approach in the alleged margin squeeze dispute raised by Gamma against BT, where LRIC rather than D-LRIC[46] was used as the appropriate cost standard.[47] Ofcom notes that costing standards which include elements of common cost recovery (such as FAC or LRIC+) would set a higher standard for a vertically integrated firm to pass compared to a LRIC approach[48], while also noting that it would be necessary to consider whether common costs are recovered from the aggregate revenue received from all the products or services relevant to them.[49]

3.11 The choice of whether LRIC, D-LRIC, or an alternative measure of IC is appropriate to be used for the test should be based on the regulatory objectives and the competitive landscape of the market under consideration.

Application of this test on the parcels sector

3.12 A test based on LRAIC appears to be an appropriate economic test for claims of potential cross-subsidisation between letters and parcels at Royal Mail. It is consistent with the predatory pricing test used in competition law cases, as discussed in Section 2 above, as a price above LRAIC is unlikely to distort competition, providing that there has not been any exclusionary intention in setting prices.

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45 Determination to resolve disputes between each of Cable & Wireless, THUS, Global Crossing, Verizon, Virgin Media and COLT and BT regarding BT's charges for partial private circuits, Ofcom, October 2009, paragraph 5.33.

46 Distributed LRIC

47 Complaint from THUS plc and Gamma Telecom Limited against BT about alleged margin squeeze in Wholesale Calls pricing, Final Decision, Ofcom, paragraph 6.29.

48 Complaint from THUS plc and Gamma Telecom Limited against BT about alleged margin squeeze in Wholesale Calls pricing, Final Decision, Ofcom, paragraph 6.32.

49 Complaint from THUS plc and Gamma Telecom Limited against BT about alleged margin squeeze in Wholesale Calls pricing, Final Decision, Ofcom, paragraph 6.33.

3.13 Yet, Ofcom may want to set a higher standard than LRAIC, if it could justify that this would be required to achieve a specific policy objective, such as the promotion of competition. For example, when setting the ex-ante margin squeeze test for Virtual Unbundled Local Access ("VULA"), Ofcom used LRIC+ rather than LRIC as this allows for the recovery of common costs and is consistent with the approach previously adopted in charge controls. This, however, was in the context of a price control, based on the finding that BT had significant market power ("SMP") in the wholesale local access market.[50] Therefore, to impose a standard higher than LRAIC in relation to the parcels sector, Ofcom would need to demonstrate that the market is not competitive and that setting prices higher than LRAIC would be a proportional remedy to achieve its policy objective.

Use of Ofcom's own cost model in the test

3.14 In the May 2016 RRRM Consultation, Ofcom suggests that "*to address this risk [of Royal Mail unfairly diverting revenues from letters to parcels] we propose to…build a costing model to help develop our own view of how Royal Mail allocates costs*".[51] This statement suggests Ofcom intends to build a bottom-up model of Royal Mail's letters and parcels business. However, it is not clear how Ofcom then intends to use such a model, and whether it would simply validate the output of Royal Mail's cost allocation exercise, or whether it may consider using the model as a basis to define the level of costs to be used in a test for cross-subsidisation.

3.15 In any case, it appears that the development and agreement of such a model is likely to require substantial time and resources, for both development and calibration, and that it may take several iterations between Ofcom and Royal Mail before it can demonstrate that the model accurately reflects the costs faced by Royal Mail. This casts some doubts on whether such an approach would be proportionate to resolve Ofcom's concerns of Royal Mail's potential behaviour in the parcels sector, which appears to be competitive.

Consistency of this test with past Ofcom decisions

3.16 An approach based on LRAIC is consistent with Ofcom's previous decisions related to the costing obligations to which BT is subjected, which have also been at the centre of disputes between BT and its competitors.

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50 FAMR 2014: Approach to VULA Margin, Ofcom, paragraph 5.57-5.60.

51 RRRM, paragraph 1.23.

Cost Orientation requirement

3.17 In markets where BT is deemed to have SMP, Ofcom often required prices to be "cost orientated". For example, prices in the market for PPCs[52] and for Ethernet circuits[53] were required to be cost orientated. Ofcom required that BT:[54]

> *"set charges on the basis of forward looking long run incremental cost approach, allowing an appropriate mark up for the recovery of common costs."*

3.18 Based on the output of BT's LRIC model, the cost orientation principle sets for each product, as a first order test, a price floor based on the product D-LRIC and a price cap based on the D-SAC. This is consistent with the price test which we have suggested Ofcom should use to test for the existence of potential cross-subsidies for Royal Mail.

3.19 The divergence from the cost orientation obligation was first invoked by BT's competitors, in a dispute between BT and a number of communication providers ("CPs") related to the price of PPCs. Ofcom determined the appropriate first order test for charges being cost-orientated was that each and every charge was above D-LRIC and below D-SAC.[55] The use of DSAC as a first order test was appealed by BT to the Competition Appeal Tribunal ("CAT"), which confirmed the use of D-SAC as a first order test.[56] Furthermore, Ofcom used the D-SAC test in its later determination of whether BT had overcharged various CPs for Ethernet services.[57]

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52 Ofcom, Review of the retail leased lines, symmetric broadband origination and wholesale trunk segments markets, Final Statement and Notification, 2004 "2004 leased lines market review", paragraph S.19.

53 2004 leased lines market review, paragraph S.22.

54 2008 Business Connectivity Market Review, paragraph 8.92.

55 Determination to resolve disputes between each of Cable & Wireless, THUS, Global Crossing, Verizon, Virgin Media and COLT and BT regarding BT's charges for partial private circuits, October 2009 (The PPC Final Determinations), paragraph 1.21(i).

56 Dispute between BT and Ofcom supported by Cable & Wireless, Virgin Media, Global Crossing Telecommunications, Verizon, and Colt Technology Services, CAT Judgment, March 2011.

57 Disputes between each of Sky, TalkTalk, Virgin Media, Cable & Wireless and Verizon and BT regarding BT's charges for Ethernet services, Final Determination, December 2012 (The Ethernet Final Determination).

Ofcom's previous comments about FAC

3.20 Ofcom has also commented on the limitations for using FAC to determine the appropriate price for regulated products. Ofcom considers that it is not appropriate to use FAC to set the price of any individual service. Ofcom notes that:[58]

> *"[this] approach to cost recovery is not uniquely defined and is to a large extent arbitrary."*

3.21 Ofcom has also recognised that FAC methods are somewhat arbitrary. For example, with respect to BT's FAC costs Ofcom notes that:[59]

> *"BT's approach to calculating FAC is therefore only one approach. Other methods may also be reasonable and could produce different views of BT's rate of return on individual services."*

3.22 If cross-subsidisation were assessed relative to FAC, then any price above FAC would be considered a source of a cross-subsidy and any price below FAC would be considered a recipient of a cross-subsidy. There are two issues with this approach:

- As noted above, there are multiple sets of cost allocation that lead to different sets of FACs. One set of FACs may imply cross-subsidisation, another set might not. This demonstrates the arbitrary nature of FAC; and
- Effectively Ofcom would be imposing a requirement that each price is equal to FAC (because one price could only be above/below FAC if at least one other price was also above/below its FAC). This means that testing cross-subsidisation in relation to FAC would be equivalent to imposing cost based price regulation.

58 Ofcom, Guidance for the Adjudicator: The Arqiva Undertakings, January 2009, paragraph A1.2.

59 Ofcom, Cost Orientation Review, June 2013, paragraph 3.38.

4. Conclusion

4.1 The definition and measurement of cross-subsidies is generally recognised as a complex issue within economic literature, as there are many elements that should be considered to assess such a claim. These include the direction of the transfer, the impact of supply on determining prices, the proportion of costs that are common across products and how these common costs should be treated.

4.2 There is however consensus that an appropriate test for cross-subsidies should be based on ensuring that prices are between IC and SAC, and that FAC (or FDC) is not an appropriate cost measure to be used in this context. Multiple economists point out that FAC pricing does not lead to economic efficiency, as it does not take into consideration the characteristics of demand, and that the derivation of FAC is based on arbitrary methods.

4.3 Should the specific concern be about the potential harm to competition from pricing below cost, then the relevant economic test would involve assessing that prices are above IC. This would be consistent with the testing of predatory pricing conduct in competition law cases.

4.4 The calculation of IC depends on the time horizon considered for the calculation of the cost. It is generally the case that LRIC is considered an appropriate measure, as it includes the incremental cost of capacity.

4.5 There are references in competition law to LRIC being used as an appropriate measure for price-cost tests, in the context of cross-subsidisation, for example in the 1994 Deutsche Post case. Ofcom has also referred to LRIC based measures being an appropriate cost reference for price setting, in the context of defining the ex-ante margin squeeze test in the context of VULA, PPCs and in the context of the Gamma dispute against BT.

4.6 We note that in specific circumstances regulatory and competition authorities have imposed higher standards than IC and SAC, but these were justified by specific policy objectives or specific circumstances. For example, minimum prices based on cost measures higher than LRIC may be imposed to favour the entry of competitors in the market. Similarly, when evidence of the intention to eliminate competition can be shown, prices above LRIC but below AVC may be deemed anti-competitive. We are not aware of any evidence to suggest that conditions justifying higher standards should apply when assessing potential cross-subsidies between Royal Mail's letters and parcels sectors. We understand that there is significant competition in the UK parcels sector, and that the sector has also seen strong innovation and market entry in recent years.

4.7 Royal Mail has developed a LRAIC model which we understand has been built based on a methodology which is broadly consistent with that used by BT to produce its LRIC submissions to Ofcom.

Appendix 1 Details of relevant antitrust precedents

A1.1 This appendix provides additional details on the key antitrust cases related to predatory pricing, which confirm that competition authorities tend to identify AVC, as a proxy for incremental cost, rather than FAC, as the appropriate measure of cost to be used in price-cost tests. The cases considered are AKZO, Tetra Pak, Wanadoo and Post Danmark.

Akzo

A1.2 In 1991 AKZO was found guilty of predatory price-cutting. This landmark case set the precedent for other predatory pricing disputes. In this case AKZO had contacted a new entrant from the UK (ECS), warning them to withdraw from the market or AKZO would reduce its prices. The Commission did not follow the Areeda and Turner test that assumes prices above AVC are lawful and considered the strategy of the dominant firm to be relevant i.e. whether or not the dominant firm had adopted a strategy of eliminating competition. As previously outlined the decision, later upheld by the European Court of Justice ("ECJ") on appeal by the Commission essentially stated that:[60]

- Prices below AVC must always be considered abusive; and
- Prices below ATC but above AVC are only to be considered abusive if an intention to eliminate competition can be shown.

A1.3 The ECJ concluded that sales prices below AVC had no other economic purpose than that of driving out competitors. The reason for this is that selling below AVC results in losses that are higher than when not selling at all; furthermore, selling below AVC means an additional loss for each unit sold. If prices are above AVC but below ATC, a dominant firm may still be intending to drive out competitors who are as efficient as it is, but are not capable of withstanding such competition due to fewer financial resources.[61]

60 AKZO v Commission, Case C-62/86, paragraphs 71 and 72.

61 Ibid, paragraph 72.

Tetra Pak

A1.4 In 1992 Tetra Pak was found guilty of predatory pricing in relation to its non-aseptic cartons and was found to be subsidising losses from its profits in the market for aseptic cartons. The cartons had been sold at a loss in seven Member States but most crucially cartons had been sold below AVC in Italy, hence meeting the first 'AKZO test' but the Commission also *"gathered sufficiently clear and unequivocal data to be able to conclude that, in that country at least, sales at a loss were the result of a deliberate policy aimed at eliminating competition"*[62].

Deutsche Post

A1.5 In 1994 UPS lodged a complaint that Deutsche Post AG ("DPAG") was selling its parcels delivery services below cost, alleging that DPAG was using revenues from its profitable letters monopoly business to cross-subsidise its other activities. The subsequent investigation revealed that, for a period of five years, DPAG did not cover the costs incremental to providing the parcels delivery service. On this basis the Commission concluded that DPAG had abused its dominant position by granting fidelity rebates and engaging in predatory pricing.[63]

A1.6 This marked the first time in the postal sector where the Commission's decision set out a standard for measuring those "cross-subsidies" between a "monopoly" service and competitive activities that result in predatory prices in the latter. The standard was based on LRIC.

A1.7 In this decision, the Commission makes an important distinction between costs for network "capacity" and "usage". Costs incurred for providing network capacity relate to DPAG's USO that it has sufficient capacity in order to meet peak demand. These costs are appropriately treated as common fixed costs. On the other hand, the Commission considered that the costs for actual usage of the network for offering a particular product are long-term variable or "incremental" costs (i.e. LRIC).[64]

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62 Official Journal of the European Communities, L 72, Volume 35 (1992), paragraph 147.

63 The European Commission (2001), Antitrust proceedings in postal sector result in Deutsche Post separating competitive parcel services from letter monopoly.

64 The European Commission (2001), Antitrust proceedings in postal sector result in Deutsche Post separating competitive parcel services from letter monopoly, page 4.

A1.8 The implication of this decision is that any competitive service has to cover at least the additional or incremental cost incurred in branching out into the competitive sector i.e. price should be greater than LRIC. The Commission considered that any cost coverage below this level was predatory pricing which fell foul of Article 82[65] of the EC Treaty. [66]

Wanadoo

A1.9 On 16 July 2003, the Commission issued its decision concluding that France Télécom had abused its dominant position on the French market for the supply of high-speed internet access and issued a fine. The decision was based on evidence that there was a plan to restrict competition in the strategic market for high-speed internet access at the expense of competitors.

A1.10 The Commission found that, from the end of 1999 to October 2002, Wanadoo, a subsidiary of France Télécom, marketed its ADSL services at prices which were below their average costs. It emerged from the European Commission's investigations that the prices charged were well below variable costs until August 2001 and that in the subsequent period they were approximately equivalent to variable costs, but significantly below total costs.

A1.11 Appeals of the decision to the European Court of First Instance ("CFI") and the ECJ were unsuccessful.

Post Danmark

A1.12 Post Danmark ("PD") and Forburger-Kontakt ("FK") were postal operators in Denmark with PD operating as the USP. In 2003 PD agreed contracts with three major supermarkets that were formerly major customers of FK, including the Coop. To achieve this PD offered a price to the Coop that was 'materially lower' than FK's price. The price offered allowed PD to cover its AVC but not ATC and FK submitted a complaint to the Danish Competition Council. The basis for the complaint was that PD had:

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65 Now replaced by Article 102 TFEU.

66 The European Commission (2001), Antitrust proceedings in postal sector resulted in Deutsche Post separating competitive parcel services from letter monopoly.

> *"abused its dominant position by practising a targeted policy of reductions designed to ensure its customers' loyalty by, firstly, not putting its customers on an equal footing in terms of rates and rebates, and secondly, by charging FK's former customers rates different from those it charged its own pre-existing customers without valid cost justifications".*[67]

A1.13 The Danish court applied the second AKZO test and found that PD had not engaged in predatory pricing. On appeal, the Danish court referred the case to the ECJ, which reviewed the Danish Competition Authority's calculations for average incremental costs. The ECJ noted that the estimate reflected *"the great bulk of the costs attributable"*, and therefore were high enough not to constitute abuse. Furthermore the ECJ observed that FK had remained in the market following the alleged abusive and had also managed to win back the business of the customer concerned.

67 Global Competition Review, The European Antitrust Review, 2013 page 23.