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PUBLIC POLICY TOWARDS CROSS SUBSIDY

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ABSTRACT: *Although elusive of measurement, cross subsidies are widely believed to have existed on a significant scale in network industries, particularly when these developed under public ownership. After providing careful definitions of when cross subsidy occurs, this article distinguishes eight distinct cases, drawing examples primarily from network sectors. Debates about the desirability of cross subsidy in the context of public enterprise are then reviewed; issues such as the geographical averaging of tariffs and the extent to which non-commercial obligations should be reimbursed by government on the recoup principle are addressed. The policy package of denationalization, liberalization and new forms of regulation have far-reaching implications for cross subsidy policy. For example, liberalization reduces the ability of incumbent enterprises to cross subsidize uneconomic links in a network, particularly if entrants are not subjected to comparable social obligations. Moreover, denationalized enterprises will more vigorously pursue financial profitability, discontinuing cross subsidy related to the traditional*

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* *Résumé en fin d'article; Zusammenfassung am Ende des Artikels; resúmen al fin del artículo.*

equity and political goals, but exploiting cross subsidy as an entry-repelling tool. Both at the member state and European Union levels, there is evidence of confused thinking about the desirability and continued feasibility of cross subsidy; for example, not recognizing the inconsistency involved in imposing non-economic obligations on incumbents while removing barriers to competitive entry. These developments not only erode the viability of the missions of public enterprises in their traditional sectors but also raise issues for public policy if and when technological developments make possible new forms of price discrimination in social sectors.

1 Introduction

Cross subsidies are hard to define, in part because they are hard to measure. Claims that particular cases exhibit cross subsidy can usually be traced to one or both of two sources:

(i) the existence of costs common to more than one output, so that there is enormous scope for argument as to how such common costs should be allocated to outputs; or

(ii) the existence of monopoly power, which may be due entirely to economic factors (cost and demand configurations) or entirely to political factors (the granting of legally enforceable exclusive rights to supply), or to some combination of these. Under these circumstances, cross subsidy may extend far beyond the treatment of common costs, to embrace the entire relationship between costs and prices.

Claims that particular cases exhibit cross subsidy should not necessarily be accepted at face value. Such claims will customarily be intended to elicit public policy responses, whether to make market forces more effective (by taking action to stop anti-competitive behaviour) or to overrule market forces (by substituting administrative or judicial judgements for market processes). In real-life situations, distinguishing between attempts to pursue these two different objectives is not always straightforward.

Two different outlooks on cross subsidy can be identified. First, cross subsidies have often been viewed as a natural characteristic of network industries, certainly nothing to apologize for as a defect of public enterprise or of regulated private enterprise. They were seen to play a major role in nation building, integrating young nations into a

coherent whole – particularly Australia, Canada[1] and the United States,[2] which each stretch across a continental land mass. This goal of nation building, making citizens in diverse and scattered locations feel a sense of belonging, reinforced the merit-good dimensions (universal service at affordable – perhaps uniform – prices) widely perceived to attach to some network industries. Viewed from this perspective, a possible reason for rejecting future use of such cross subsidies is that circumstances have now changed (e.g., networks are now mature and competition should be encouraged, particularly as superior policy instruments are now available).

Second, cross subsidies have been viewed by other writers as unequivocally negative phenomena, one of the manifestations of rent-seeking behaviour by public officials which is held to be an inevitable consequence of government intervention, whether via regulation or public ownership. Stigler's (1971) 'economic theory of regulation' has been one of the most influential capture theories of regulation. Rather than seeking to pursue the public interest, politicians and regulators are viewed as leading participants in the market for regulation. In order to secure re-election or re-appointment, they transfer wealth to their supporting groups, in exchange for votes and campaign contributions. Cross subsidization is therefore not an accidental consequence of regulation or public ownership, but the desire to effect cross subsidization is a powerful motive stimulating regulation or nationalization. Another Chicago academic, Richard Posner, developed the related theme that regulation performed functions normally discharged through the government budget (Posner 1971, 1975). Parallel conclusions have been drawn by the public choice school, which has constructed a multitude of formal models in which the rent-seeking behaviour of politicians and public officials diminishes economic efficiency (Cullis and Jones 1992).

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1 '[T]echnological change has made it possible to liberalize or deregulate many aspects of the telecommunications industry. However, the . . . [Canadian Radio Telecommunications Commission] has not gone as far as technological change would permit in order to achieve its social policy objectives, which focus on cross-subsidization to facilitate "affordable, universal service"' (Stanbury 1989, p. 57).

2 Sherman (1979, pp. 95–7) described the role which the US postal service played in nation building. Its statutory monopoly was enforced by the Postal Act 1845, which suppressed private express delivery services. Competitor products (railway, telegraph and telephone) then eroded its markets, leading to financial difficulties stemming from the fact that the cross subsidies which had grown up in a less competitive era became insupportable.

2 Problems of measurement

Cross subsidy raises difficult issues of identification, measurement and public policy response. Ambiguity stems from the virtual impossibility of constructing unequivocal and uncontested benchmarks for purposes of determining whether there is cross subsidy in particular cases. It is possible to challenge the view that whether there is cross subsidy can be judged on the basis of cost allocations; indeed, it was one of Hotelling's (1925) seminal insights that demand-side considerations influence, *inter alia*, depreciation allocations and therefore 'costs'. The application of game theory leads to exactly the same conclusion about common cost allocations. Accordingly, a choice has to be made as to whether (and, if so, how) demand-side considerations should be allowed to influence cost allocation and, therefore, the benchmark from which cross subsidy is measured. The implications of this choice are far-reaching:

(i) *If not so*, the entire weight must hang on elaborate cost allocation exercises which may not only have weak conceptual underpinnings but which may also entail substantial procedural interventions in markets by public regulators and run the risk that the level of cooperation among market participants necessary to make such arrangements work might spill over into anti-competitive behaviour. Moreover, the use made of the resulting accounting numbers may offend economic sense, notably in prohibiting pricing structures (e.g., peak-load pricing) which can be shown to be Pareto improvements.

(ii) *If so*, cross subsidies have to be measured from benchmarks defined in terms of optimal pricing structures, meaning that the equally intractable pricing problem has to be 'solved' before the issue of cross subsidy can be addressed.

Therefore, a vital question is whether the issue of cross subsidization is being approached from a cost-based benchmark or from a benchmark which is hybrid (in the sense that it depends upon both cost functions and demand conditions).

Considerations of fairness are sometimes evoked in the context of cost allocation exercises, with appeal being made to perceived 'ability to pay'. The danger of such an approach is that it confuses the issue, mixing up the question of whether there are cross subsidies with the question of whether a certain pattern of cross subsidies is desirable or acceptable. Introducing fairness at the cost allocation stage seriously erodes the transparency of the process, precisely when transparency

has become more important because of the changed competitive environment.

Measurement issues concerning cross subsidy are fully discussed in Heald (1996); what follows here is only a summary of conclusions derived there. There are three general approaches to the problem of cost allocation: fully distributed cost (FDC), stand alone cost (SAC) and incremental cost (IC). FDC, alternatively known as fully allocated cost, involves the adoption of systematic procedures through which all costs, including common costs, are allocated to particular outputs. Because FDC subsumes different procedures producing widely different results, any illusion of uniqueness has to be quashed (Ahmed and Scapens 1991). What enables FDC to be described as a single method is solely that all costs must be allocated to outputs, whatever the proportion of common costs and the elusiveness of cost drivers. SAC redefines the problem, away from allocating the accounting costs which have been incurred, to one of determining the hypothetical cost of producing each output in isolation from the other outputs and relating these to the prices charged for each output. An output j is *not* the *source* of cross subsidy if $p_j \leqslant (SAC)_j$. IC is defined as the increase in cost associated with producing a 'second' output in addition to a 'first' output. From this perspective, a second output which at least covers its incremental costs is not the recipient of a cross subsidy from the first output: an output j is *not* the *recipient* of cross subsidy if $p_j \geqslant (IC)_j$. A second output which less than covers its incremental cost is the recipient of such a cross subsidy. It may matter crucially which output is defined as 'first' and which as 'second' because the first must carry all the common costs.

An output j is the *source* of cross subsidy if $p_j > (SAC)_j$, and is the *recipient* of cross subsidy if $p_j < (IC)_j$. An output j is *neither* the *source* of, *nor* the *recipient* of, cross subsidy when:

$$(IC)_j \leqslant p_j \leqslant (SAC)_j$$

There is no cross subsidy when the price of an output j is greater than or equal to its IC *and* less than or equal to its SAC. This equation must be generalized in terms of revenues so that the test is performed not just for individual outputs but also for all combinations of outputs. For all subsets S of the set of all outputs

$$(IC)(y_S) \leqslant \Sigma_{j\varepsilon S}\ p_j y_j \leqslant (SAC)(y_S)$$

where $y_S = (y_j)_{j\in S}$.

It is therefore possible that a particular output which 'passes' the cross subsidy test when that is performed for that output alone forms part of a combination of outputs which 'fails' the test when it is performed for the combination. Naturally, this requirement to test combinations greatly complicates operationalization. Irrespective of the level of aggregation at which it is conducted, this test produces three possible verdicts: source (tested with reference to SAC); recipient (tested with reference to IC); and neither source nor recipient (tested with reference to both). A complicating factor is that, because of the cost synergies which give rise to economies of scope, origins and destinations of cross subsidy do not necessarily sum to zero (Curien 1991). Although measurement is likely to be difficult, an important insight is that floors (IC) and ceilings (SAC) can be set to 'legitimate' prices (Cave and Mills 1992, p. 28).

There is a substantial complication when attempting to operationalize such a test, arising from measurement issues concerning IC. On a gross incremental cost basis, one output may clearly be financially supported from the profits of another activity. Nevertheless, the seemingly obvious conclusion that this is a case of cross subsidy may have to be qualified or retracted if there are interactions on the demand side which mean that below-cost supply of Y_2 leads directly to a more than compensating increase in the profitability of Y_1. Such measures may therefore be exclusively cost-based (gross IC) or adjusted for the demand-side repercussions of supply-side configurations (net IC). This modification from gross to net massively complicates the process of evaluating arguments about whether cross subsidy occurs, because it introduces a requirement for information about cross price elasticities of demand which is typically not available. The issue becomes particularly fraught when there are concerns about the abuse of monopoly power, the present or future exercise of which may well be the source of the divergence between gross and net IC.

Viewed from the perspective of optimal pricing, the relevant question is whether the tariff for a particular link in a network is set higher/lower than that required by first-best or second-best tariffs (Marchand et al. 1984; Heald 1996). Bös (1986) is one of many economists who have downgraded the significance of cross subsidy measures derived from cost data:

> Let us conclude by pointing out that the problem of cross-subsidization is of no importance from the point of view of welfare economics. If optimal pricing includes any kind of cross-

> subsidization (of the Faulhaber type or of an extended type), then that cross-subsidization should be accepted. (p. 194)

Just before reaching this conclusion, he had commented that:

> . . . in a profitable enterprise some goods may be subsidized although the prices are cost covering and they could 'go it alone'. In the long run this problem will, of course, only exist if entry to this market is forbidden. (pp. 193–4)

Approaching cross subsidy from the optimal pricing literature clearly demonstrates the narrowness of a focus solely upon cost allocation. However, far from simple answers emerging, there is a new set of complexities, leading to doubts about operationalization.

When attempting to make judgements about cross subsidy, it is necessary to assess whether the business as a whole would be better off without particular segments (Brown and Sibley 1986, p. 49). This question can be satisfactorily answered only by means of DCF appraisals which look beyond annual accounting data and which explicitly acknowledge the time dimension of cash flows. When allocating costs between products and thus to groups of consumers, it is vital that it is clear what exactly is being allocated to what. Typically, what are allocated are *accounting costs* to existing products and groups of consumers. The measurement of accounting costs is strongly affected by accounting rules and conventions about the valuation of assets and the measurement of depreciation, a particularly difficult and important area in those capital-intensive sectors which are characterized by long-lived assets and rapid technological progress. Where businesses are changing, and the mix of products and consumer groups are themselves changing, the allocation process ought to focus upon the *discounted cash flows* associated with particular products and groups of consumers, present and future. Otherwise, because of life-cycle effects (reflected in peaks and troughs of investment expenditure associated with particular products and consumer groups), cost allocation exercises which focus upon accounting costs may give seriously distorted answers. Curien (1991, pp. 95–6) emphasized this point about the limitations of annual snapshots.

3 Eight cases of cross subsidy

It is helpful to develop the argument in terms of illustrative examples. Many of those used in this article are drawn from public utility sectors, partly because this reflects the interests of the author but also because cross subsidy, often pervasive in such sectors, has

been highlighted by policy reforms such as corporatization, liberalization and denationalization.[3] Some examples are suggested from other sectors, indicating that authors with other areas of specialist knowledge could develop examples from, *inter alia*, media groups, petrol stations, bus networks, retail stores, health care and insurance. Without attempting to be exhaustive, this section demonstrates the policy salience of cross subsidy. If an economy is conceived in terms of two regulated sectors and the rest of the economy, eight cases of cross subsidy can be grouped in the following way:

Within a regulated sector. Three cases represent cross subsidy within the bounds of a regulated sector:

(i) Cross subsidy may occur between outputs which are bundled together in a vertically integrated industry structure: for example, electricity generation, electricity transmission and electricity distribution. While some of these activities may exhibit natural monopoly characteristics which make competition economically undesirable, the vertically integrated structure may itself be the main obstacle to the development of competition in certain activities within that vertical chain.

(ii) Cross subsidy may occur when uniform tariffs apply across geographically differentiated supply zones. Often, such tariff equalization relates to urban areas and their rural hinterland, or to a mainland and its adjacent islands.

(iii) Cross subsidy may occur between consumers of a single output when different categories of consumers are treated differently in economically unjustified ways.[4]

Between regulated sectors. The single case under this heading involves two regulated sectors:

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3 However, concerns about cross subsidies in public utility sectors are far from new: 'In 1932 Bonbright and Means faulted the holding-company systems because they were conducive to social waste and inefficiency, financial manipulation (for example, the issuance of watered stock), secrecy and the manipulation of operating properties (for example, rate-base inflation and artificial write-ups), and excessive service-company fees that would be shifted forward to consumers. Combination companies were faulted because they contained potential for cross-subsidization, while diversification by utilities into nonutility activities was held to be potentially damaging to the ratepayer because of the "menace to the credit of the public utilities"' (Trebing 1983, p. 8).

4 For what might be held to constitute an economic justification, see the discussion below.

(iv) Cross subsidy may occur between economically distinct outputs which are bundled together in a horizontally integrated structure: for example, the distribution in the Netherlands of electricity, gas and cable television is typically undertaken by the same companies. In France, distribution is a jointly managed activity of Electricité de France and Gaz de France. Such arrangements may deliver economies of scope (e.g., on billing systems) but they will diminish the intensity of inter-fuel competition. In the United Kingdom, the emergence of horizontally integrated energy utilities is eroding the legislated separation characteristic of the nationalized period.

Between regulated and unregulated sectors. Four types of cross subsidy can be identified within this grouping, raising concerns that cross subsidy may occur when an enterprise straddles regulated and unregulated sectors, whether within the same national economy or across national boundaries:

(v) Cross subsidy may occur when the producers of a monopolized output bias their choice of suppliers in competitive markets towards their own associated companies, thus earning abnormal profits which can be fed through as costs into the regulated market. Concern about anti-competitive procurement practices have frequently been voiced by OFWAT (1993), the UK's sectoral regulatory body for the water and sewerage industry. Earlier, the telecommunications regulatory body (OFTEL) had expressed concern about preferential treatment and cross subsidy from the British Telecom (BT) network to BT's apparatus supply operation (Vickers and Yarrow 1988). Significantly, Directive 90/531/EEC (Council of the European Communities 1990) extended public procurement rules to privately owned utilities.

(vi) Cross subsidy may flow out of a regulated sector into an adjacent (potentially) competitive activity, such as when a public utility subsidizes appliance retailing. This case incorporates not only the standard concern that monopolists may behave predatorily in adjacent markets but also a new concern that, given the globalization of sectors hitherto organized almost exclusively on a national or sub-national basis, there may be scope for cross subsidy from sectors in one country which are regulated to the same sectors in other countries where markets are more competitive. A wider question is whether the risks attached to geographical and product diversification fall upon shareholders or the consumers of the regulated business.

(vii) Cross subsidy may flow out of a competitive sector into a regulated sector, as when a regulated utility is subsidized by civil engineering activities within the same group. Provided that the economy outside the regulated sector is competitive, it will not be possible in the long term to cross subsidize 'into' the regulated sector. This case is uncommon and most examples pertain to the media, where motivations may relate to political influence rather than profitability.

(viii) Cross subsidy may occur when the enterprise is compelled by government or regulator to commit resources to activities unrelated to its own business; by structuring transactions in this way, they can be excluded from general government expenditure (which is a key national accounts aggregate subjected to scrutiny by financial markets and international organizations such as the Organization for Economic Cooperation and Development). A particularly striking example is the way in which France Telecom has been compelled by French governments to subsidize high-technology and space activities; these have been uninformatively described in the accounts as '*filière électronique*' but certainly included subscriptions of new capital to Thomson SA. Certain costs of government policy were therefore not budgetized. Where costs involve substantial amounts in relation to the business, the incumbent enterprise will have a powerful argument against market liberalization until budgetization has been effected.

Cases (i) and (iv) involve issues concerning the structure of the regulated sector. What is really at stake is the optimality of bundling, both in terms of production by the same firms and in terms of the packaging together of different outputs. Cases (ii) and (iii) raise fundamental issues about the basis of pricing policy. In practice, some of these pricing issues may interact: for example, a given set of cross subsidies will have both consumer-group and spatial dimensions. Cross subsidies to aluminium smelters or horticulturalists will have strongly concentrated spatial effects. Where the pattern of cross subsidization is intentional, the relationship between these two dimensions may differ from case to case: a region may benefit 'accidentally' because it has a concentration of a cross-subsidized group of consumers, or this group of consumers may be subsidized with the aim of benefiting the region. Though there may be ambiguity in some cases, this is a useful distinction to make, as the context for the withdrawal of cross subsidy would be different.

4 Cross subsidy in the context of public enterprise

Whatever the difficulties of precise measurement, cross subsidies have undeniably been a feature of network monopolies, especially when these have developed under public ownership. Equally undeniably, they have been used as a substitute for budget subsidy. An efficiency argument can be mobilized for certain kinds of cross subsidy. In interactive network industries, such as telecommunications, it can be argued that there are positive externalities arising from extending the network. Existing subscribers gain from new connections as new possibilities for calling enhance the value which they place upon the telecommunications service. A second-best efficiency argument is that, in certain institutional contexts (e.g., in developing countries and in historical periods before the development of modern tax/transfer systems), a measure of cross subsidization within network industries has to be accepted because the administrative capability to deliver income support does not exist. The corollary, of course, is that such cross subsidies should be phased out when this capability is established. In practice, most of the arguments used publicly in support of cross subsidy relate to equity concerns. When there are cross subsidies, the cost of redistributive measures, perhaps deemed desirable because of income or needs disparities, are imposed on other consumers of that particular product, rather than on the bulk of taxpayers. However, doubts can reasonably be cast upon the validity of an equity principle which would impose the cost of subsidizing the consumption by poor households of a merit good on to other users of that merit good, rather than upon the wider population on the basis of some measure of ability to pay. Strong opposition to cross subsidies comes from those who fear that they hide the scale, perhaps even the direction, of discretionary allocations of resources, and thus evade public accountability.[5] Those who control resource allocation can

5 'One of the prime aims of nationalisation was to facilitate cross-subsidies from more profitable services. However, cross-subsidisation largely hides the extent of the subsidy and opens the door to political pressures. Also, it inevitably entails restrictions on competition so as to protect the source of funds: cross-subsidisation and unrestricted competition are mutually incompatible. For these reasons, economists have long recommended that explicit public subsidies should be provided in preference to cross-subsidies' (Beesley and Littlechild 1983, p. 8).

favour particular groups of consumers and producers and particular geographical areas, while provoking minimal comment or criticism.

There is much to commend in the recoup principle (Wettenhall 1966) which holds that non-commercial objectives should be compensated for by budgetary subsidy. However, the issues may not be so clear cut in a second-best world.

First, the marginal cost of public funds has been defined as equal to the sum of the direct tax burden plus the marginal welfare cost incurred in raising that revenue. Topham (1984, p. 403) concluded:

> The shadow price of public spending is an important input for policy evaluation, and the possibility that public programmes may have to be upwards of 20 per cent more beneficial than private programmes to secure a welfare improvement underlines the continuing need for firm and reliable evaluations.

Accordingly, comparisons between subsidy and cross subsidy tools for achieving social objectives must take into account the fact that the shadow cost of subsidy will be substantially greater than the budgetary cost.[6]

Second, budget subsidies would necessarily be subject to both the government's internal public expenditure planning cycle and annual parliamentary appropriations, thus making the recipient enterprise vulnerable to political decision making on the state budget and giving the government a powerful lever which might be used to secure conformity with unrelated government policies. Such a system would give the government a highly specific motive for taking interest in cost allocation procedures within the enterprise (with a view to minimizing the budget subsidy), something which sits uncomfortably with sectoral regulation (where the stimulation of competition is claimed to have high priority). When enterprises have just exited from general government, through corporatization and/or denationalization, and the immediate priority is to create a managerial culture congenial to a competitive environment, it may be a thoroughly bad signal to link the enterprise's finances to the annual budget process in this way.

Cumulatively, there is considerable force to the argument that the substantial difficulties involved in the application of the recoup principle are only worth incurring when the scale of the desired subsidy is large. There may seem to be a compelling case for the

6 For a given tax structure, globalization and increased competition will increase the marginal cost of public funds.

recoup principle to apply to telephone calls to emergency services, rather than the cost being imposed upon the network operator. While Littlechild (1983) in his report on telecommunications regulation argued the case for implementing the recoup principle with regard to emergency services and remote areas, Heald (1989) demonstrated that the issues were rendered more complex by the factors above. In the context of BT, operating in a densely populated country with a rural fringe accounting for relatively few people, the Conservative government's rejection of recoup may have reflected the fact that the modest amounts of subsidy were not worth the complications. While the government would have been concerned to avoid the public expenditure cost of these measures, it should be noted that BT also declared itself against recoup.

In practice, public enterprises which are incumbents in network industries are typically enjoined both to cover (variously defined) accounting costs *and* to avoid undue discrimination. Injunctions to avoid undue discrimination are uncertain in their impact without clear specification of what constitutes both 'discrimination' (e.g., offering the 'same' services at different prices) and 'undue' (when such discrimination is not 'justifiable'). The obvious question is whether the charging of different tariffs for the 'same' output where costs of production differ falls into the category of 'undue discrimination' or whether it constitutes 'due discrimination'. From an economic perspective, there are two circumstances under which tariffs would differ for a homogeneous output: first, because underlying costs differ, and, second, because demand elasticities differ. Accordingly, there are two public policy questions. Should differences in cost of provision feed through into higher tariffs? Should the utility be able to discriminate between consumers on the basis of demand characteristics, themselves derived from the alternatives possessed by consumers? Historically, within the context of statutorily protected monopolies, tariff equalization based on cost averaging across geographical areas has often been viewed as perfectly legitimate. Moreover, the motive behind 'no undue discrimination' clauses has sometimes been to prevent those kinds of price discrimination frequently viewed as exploitative by general commentators but which are legitimated by Ramsey-style optimal pricing rules. Social objectives such as 'universal service at affordable cost' have been characterized as consistent with some interpretations of no undue discrimination, whereas on other interpretations there is clearly a direct clash. In many countries, such provisions have strongly influenced the business ethos of monopoly utilities, without having highly specific content. Legal constraints on

the pricing behaviour of public enterprises have usually been rather uncertain in their impact (Prosser 1986).

Geographical averaging of tariffs is important both as a source of, and destination for, cross subsidy. Such averaging raises two problems. First, the incumbent firm needs to make 'excess' profits in zones which are cheap to supply in order to offset the financial losses or unsatisfactory profitability in expensive-to-supply zones. For this to be possible requires that there are sufficiently high barriers to entry into the cheap-to-supply zones to prevent this excess profitability from being competed away. In practice, this means either statutory restrictions on competition or economic barriers (probably in the form of high sunk costs or excess capacity). It should be noted that these consequences are not directly the result of geographically uniform prices, rather of the decision to finance these by cross subsidy from cheap-to-supply areas rather than from taxation or from industry-wide levies on consumption. Second, the provision of the output at geographically uniform prices to expensive-to-supply zones may cause difficulties, beyond those associated with the means of financing them. The extension of the electricity or telecommunications network into sparsely populated areas has been an important objective of social and sectoral policy in many countries. Nevertheless, such a policy may involve large efficiency losses in the following ways:

(i) Such heavily subsidized network extensions may prevent the emergence of alternative, more appropriate means of supply or even of substitute products. Rural electrification via the main network might thus render unprofitable otherwise profitable schemes of local auto-generation. In the case of rural telecommunications, cellular technology may be more appropriate than fixed-station telecommunications.

(ii) Heavily cross-subsidized network extensions may impose such a financial and managerial strain upon the enterprise as to render it unable to maintain its assets in good condition and thus to achieve efficient operation. This has been identified by the World Bank as a major problem in many developing countries.

Naturally, much will depend upon the specific characteristics of particular countries and sectors. In a country which is almost uniformly densely populated, with a rural fringe where few people live, geographically uniform pricing may have a *de minimis* effect on tariffs. In contrast, in a country in which densely populated urban areas are themselves located in a large geographical space mostly characterized by lightly populated rural areas but where a significant

proportion of the total population live, the situation will be entirely different. In the former, geographical averaging of tariffs will not have a large effect upon the tariffs of the cheap-to-supply zones and the alternative option of direct budget subsidies will not be expensive. In the latter, the impact of cross subsidies on tariffs might be high, and the alternative of budget subsidies would be expensive. Belgium, the Netherlands and the United Kingdom fall into the first category, but France into the second.

Finally, as a word of caution, it should be noted that much discussion of pricing policy necessarily abstracts from reality, and it is crucial to recognize how this affects the issue of cross subsidy. Tariff design has a considerable judgemental content. Even in the complete absence of regulatory constraints upon differentiating price by geographical area or by other cost-relevant characteristics, there would be important matters of practicality to be addressed. Tariff design must take account of:

(i) the capabilities and costs of metering technology;

(ii) the requirement that tariffs must be intelligible to consumers if they are to influence consumer behaviour and command public consent; and

(iii) the existing situation which constitutes the point of departure – even where sophisticated technology now exists, there are important questions as to the optimal rate of installation, in the light of both existing costs and expected future technological and cost developments. These considerations are clearly relevant to decisions about domestic water metering in the United Kingdom, where it has historically not existed.

Where competitive entry is prohibited, it is possible to calculate optimal pricing rules, chosen on efficiency grounds, which build in these complications. These practical matters mean that, even when equity considerations are put aside, tariffs must be a compromise between efficiency and the practicalities of implementation. In other words, some cost averaging internal to tariffs is inevitable. Really what is at stake is not whether there is averaging, rather the definition of the domain over which such averaging takes place. When competitive entry is permitted, such 'practicality imposed' cost averaging may make the incumbent vulnerable to cream-skimming entry, whereby the entrant attacks only those market segments which are being averaged against.

5 How liberalization and privatization affect cross subsidy

Market liberalization will inescapably erode the capacity of network operators to sustain certain links from the profits generated by other links. Clearly, this situation will be more pronounced when the technology of the industry permits entry into selected highly profitable links, especially if rapid technological change means that this kind of entrant can enter with superior technology. The incumbent's vulnerability in this case is due to the impracticality of instantaneous replacement of the entire network. Such a task would be beyond the managerial and financial capacity of the incumbent, who would probably face a steeply upward-sloping supply curve for capital goods.

In the context of three developments (market liberalization, divorce of regulation from operation and denationalization), not necessarily pursued with equal vigour in all sectors and all European Union member states, there arises the important question as to the locus of decision making on cross subsidy policy. In the past, publicly owned network monopolies often developed a business ethos in which cross subsidy for social objectives was viewed as virtuous rather than reprehensible, while statutory protection from competition made unnecessary the use of cross subsidy as an entry-repelling strategy. The changes identified above render the social objective a less plausible rationale for cross subsidy, while making entry-repelling cross subsidy a mechanism through which the incumbent might minimize the practical effects of market liberalization. Potential entrants will be aware that the incumbent, faced with non-simultaneous entry in different sub-markets, might view the use of cross subsidy against entrants as an investment designed to protect market share and long-term profitability. UK examples include Stagecoach running free buses against the scheduled services of smaller competitors, and Associated Newspapers temporarily reviving an old title in order to drive out a new entrant from the lucrative London evening newspaper market. Furthermore, there may be differences between cross subsidization 'voluntarily' undertaken by public enterprises, especially by those with a public service ethos extolling cross subsidy, and cross subsidization mandated by regulators for regulated private enterprises. The latter will have a stronger incentive to exaggerate the cost of the cross subsidy, even in the absence of recoup, because of the 'value' which may attach to such a cross subsidy obligation in the context of bargaining about further market liberalization.

When governments directly regulated publicly owned network monopolies, they faced the choice between budget subsidy and cross subsidy for the achievement of social and political goals. Where regulation, as well as being divorced from ownership, has been distanced from ministerial control, sectoral regulators will not necessarily have this choice of budget subsidy and cross subsidy, quite simply because their remit affords no access to budgetary resources. In consequence, those sectoral regulators who have developed their own well-defined policy agenda may resort to mandated cross subsidy in order to pursue certain social objectives. An interesting case is the 'encouragement' by the UK's Director-General of Telecommunications that BT should supply below cost specific services for the deaf (OFTEL 1992).

A statutory obligation to supply those consumers who request supply may be imposed upon the incumbent enterprise, whether through the statutes which establish and regulate the public enterprise or by means of the licence under which a privatized enterprise operates. Clearly, the imposition of such an obligation has profound implications, the precise form of which depends upon:

(i) whether the terms and conditions of a statutory obligation or licence condition to supply permit connection, standing and variable charges to be established on a cost-reflecting basis, or whether they limit absolutely or partially such differentiation; and

(ii) whether, in markets which have been liberalized, the same statutory obligation to supply is imposed upon new entrants to the market as upon the incumbent.

On a level playing field, such obligations would apply to all producers. However, it is a notable feature of liberalization reforms of network industries that this neutrality is often breached.[7] Where there

7 Reviewing the UK privatization programme, Whitehead (1988, p. 235) observed: 'Regulations have been incorporated into licences to ensure universal pricing and services, security of those services and some assistance to disadvantaged consumers, with all the ensuing costs being paid for by cross-subsidy from other profitable services. This has implications for competition, since new entrants are not, on the whole, faced with the same constraints, and so would be at an advantage if it were not for the fact that entry is so difficult for other reasons. This approach is feasible in the short term as long as the social requirements are fairly limited, but it would be quite inappropriate in a longer run where equal entry were the norm. In addition, as social objectives are not to be separately accounted for and evaluated, any more than in the public sector, the imposition of such constraints will distort other decisions and result in managerial slack.'

is a strong desire to stimulate competition in a sector, the playing field is often tilted against the incumbent. It is claimed that incumbency confers so many advantages that such pro-competitive intervention is justified; for example, BT was not allowed by OFTEL to reap the economies of scope associated with joint billing of fixed network and mobile phones. In the absence of budget subsidy to compensate the incumbent for the revenue loss due to this imposed condition, it can only either accept lower rates of overall profitability or seek to achieve its overall profit targets by means of higher profitability elsewhere.

There are important differences between a mature network (covering the entire geographical territory and reaching a very high proportion of potential subscribers) and a network still in its infancy. The former may indeed have been planned and constructed behind the protection of a network monopoly, involving extensive use of cross subsidies on an accounting basis, even if not on a DCF basis. The latter may constitute a case of an unsustainable natural monopoly, whereas system maturity and market size have made competition desirable in the former. The problem for the incumbent of the immature network is that enterprises whose own networks are mature will aggressively enter its markets, thus making it extremely difficult to plan or finance network expansion. Because network maturities differ substantially across the European Union, there is naturally a tension between harmonization of policies and such differentiation of circumstances.

Aside from market liberalization, the most important regulatory innovation of the 1980s was the inroads which price-cap regulation made against the traditional practice of rate-of-return regulation. Privately owned utilities, as in the United States and Canada, were typically subject to profit regulation, whereby rates of profitability were explicitly 'ceilinged' and effectively 'floored'. Publicly owned utilities were also subject to profit regulation, sometimes directly through financial target rates of return, and sometimes indirectly through (variously defined) break-even requirements. The standard argument in favour of the superiority of price-cap regulation is that it does not attenuate the incentives for cost reduction to the same extent as rate-of-return regulation. Once the price cap has been fixed for a time period, the incumbent can keep the benefits of above-target cost reduction until the next price-cap review amends the formula for the following time period. Whereas rate-of-return regulation in combination with FDC methods of cost allocation could be performed at disaggregated levels, the emphasis in price-cap regulation is to define a broad basket of outputs, and then to grant pricing freedom

within that basket. Such pricing freedom can be used in different ways: permitting more flexibility in the search for either optimal tariff structures or for the predatory use of cross subsidy to maintain market position (Vogelsang 1988). In a situation where there is much less *ex ante* regulation of particular prices by regulators, there has emerged a need for *ex post* price monitoring.

Network industries are typically large in relation to other economic organizations, and thus have substantial effects upon the economies in which they are located. These organizations affect, and are affected by, three principal sets of markets. They are suppliers of final output to consumers and of intermediate outputs to other sectors. Their size makes them important employers of labour. If they are in the public sector, their thirst for external finance affects bond markets; in some countries this is direct, though in others it is mediated through government. If denationalized, they instantaneously become some of the largest quoted companies in their economies. Naturally, there are repercussions among these sets of markets. The liberalization of output markets will affect labour markets, weakening the power of unions which previously did not anticipate that 'excessive' pay settlements and output disruption would lead to a permanent loss of market share and employment. There will also be effects on capital markets, where institutional shareholders which hold the market index adjust their portfolios to include these large newcomers. Moreover, denationalization via flotation will create incentives for managers to maximize profits, so as to minimize the risks of takeover, thus implying more aggressive behaviour. It is clearly of practical importance whether this is directed into cost reduction or into predatory pricing and other forms of anti-competitive behaviour. Jones et al. (1991) predicted that denationalization would have two effects:

(i) managers will pay greater attention to financial profitability, thus leading to cost reductions, and hence gains in economic efficiency provided that negative externalities do not offset these gains in X-efficiency; and

(ii) there will be greater abuse of monopoly power through pricing unless this is prevented through regulation, not least because managers hesitant to abuse monopoly power will be forced to do so by the threat of being replaced via the capital market by those with no such inhibitions.

Although there are likely to be some exceptions, the predicted biases of public sector tariffs in monopolized sectors in democratic

polities would be to favour those who vote (residential consumers) as against those who do not vote (business consumers). The exceptions are likely to relate to bulk business users whose importance in employing those who do vote may provide them with a countervailing source of power. While cross subsidy motivated by social considerations is likely to be given short shrift after denationalization with liberalization, there may be considerable potential for using cross subsidy as a barrier to entry in particular markets. For example, when new competitors pay access charges to the dominant telecommunications firm for use of the network, the latter may market discounted calls knowing that the former will continue to have to pay standard access charges. Liberalization without denationalization will require tariff rebalancing to confront the threat of entry but without substituting capital market disciplines for administrative control mechanisms.

Market liberalization can have multiple effects. Targeted entry into an incumbent's markets is likely to compete away the sources of cross subsidy, by forcing price reductions in those markets. The erstwhile recipient must then confront some combination of cost reductions, price increases, output reductions or budget subsidy. The possibility should be entertained that a non-negligible part of the present pattern of cross subsidy is due to accident rather than design. Even if tariffs are 'perfectly balanced' (leaving the exact meaning of this imprecise, other than to say that there is no cross subsidy) in Year 1, the position may have fundamentally changed by, say, Year 5, if there has been a marked change in technology (such as the dramatically diminished importance of the distance factor in telecommunications). While technology and demand conditions may be changing rapidly, prices may be very sticky, probably because of legal and political constraints upon the scale of year-on-year tariff changes. Moreover, claims by enterprises that tariff rebalancing is required may be viewed with a jaundiced eye, especially if it involves price reductions in competitive markets but increases in monopolistic markets. Accordingly, cross subsidies today may be a reflection of the fact that, in earlier years, changes in the structure of tariffs failed to keep pace with changes in technology, costs and markets.

The recipients and sources of cross subsidy may not necessarily correctly perceive their own position: recipients have a habit of believing that they are sources! Moreover, if the pattern of cross subsidy has been long established, the process of adjustment, especially if rapid, may impose substantial unforeseen costs upon those who have invested in plant and appliances on the basis of

existing tariff structures. From an economic perspective, there is the question of the optimal rate of cross subsidy withdrawal. More pressing, however, may be the discontent of those for whom the withdrawal of cross subsidy means high tariff increases; this mood will be intensified if the earlier pattern of cross subsidy had not been publicly understood and the figures which are now being used to justify tariff rebalancing are both shrouded in secrecy and owe much to non-transparent cost allocation procedures.

Examples of inconsistent policies show that the warnings of Baumol et al. (1982, p. 476), delivered fairly early in the process of deregulation, have not been fully heeded. A market which would otherwise be a sustainable natural monopoly may be rendered unsustainable by misguided statutory and regulatory constraints:

> . . . a variety of artificial sources of unsustainability . . . result from special disadvantages imposed by public policy on incumbents over entrants, either intentionally or unintentionally. Examples include regulatory rules on depreciation policy, which force prices for some periods to fall below the pertinent marginal costs; deliberate imposition of cross subsidies designed to benefit groups considered particularly meritorious (e.g., 'lifeline rates' for the elderly or geographic rate averaging that benefits isolated communities which are particularly expensive to serve); environmental regulations, if they are more severe for incumbents; and rules against price discrimination, which prevent adoption of sustainable Ramsey prices. Any of these measures . . . can lead to unsustainability.

The case of postal services provides an excellent illustration of the issues. The UK Conservative government, in office until May 1997, had embarked upon a policy which embraced partial dismemberment (sale of Girobank and possibly of parcels); further narrowing of the letter monopoly (currently set at £1); and denationalization of the Royal Mail (for which it was unable to secure a parliamentary majority). At the same time, it specified a set of 'non-negotiables': 'uniform and affordable' tariffs, house delivery to every address in the United Kingdom and a nationwide network of post offices (Department of Trade and Industry 1992). There is clearly a contradiction between the wish to strip the Royal Mail of its letter monopoly while insisting upon cross subsidy (uneconomic 'addresses' and geographically uniform prices), thus depriving it of the ability to meet competition in highly profitable urban markets. Exactly the same confusion occurs at the European level. Simultaneous insistence upon unrestricted competition and on universal

obligations to supply will lead to policy incoherence, and to the discrediting of the institutions of policy formulation. Perhaps the most evocative case is a uniform letter tariff which covers local distribution in London and Rome, but also letter post between Stornoway and Ajaccio. Policy faces simultaneously in two directions: the injection of competition into letter post systems runs counter to using the letter post as a practical symbol of European political and social integration.

An important facet of policy towards cross subsidy is that it can be extremely difficult to set the perimeter on the effects to be taken into account when evaluating proposals to withdraw or substantially alter the pattern of cross subsidy. Consider the context of an urban transport network.[8] The pattern of public transport investment and of tariffs, most probably substantially underpinned by cross subsidy, profoundly affects the evolution of urban form. A sudden withdrawal of such cross subsidies would affect the market for houses, imposing capital losses upon house owners in areas which have substantially benefited from this cross subsidization and conferring capital gains on house owners in those areas which have hitherto financed the cross subsidy. It is an empirical matter how large these effects might be, and it may be difficult to establish sound econometric estimates because many other factors affect the housing market. Nevertheless, Bover et al. (1989) have demonstrated links between house-price inflation and wage inflation which substantially contributed to the UK's problems of macro-economic imbalance in the early 1990s. Given that the value of net benefits will have been capitalized in house prices, the withdrawal of cross subsidies will have economic effects and may provoke political resistance. As in many such cases, there arises the question as to the optimal pace of withdrawal of cross subsidies – the standard safety-netting problem.

8 A separate issue is that market liberalization may not only lead to the withdrawal of certain links (those which do not cover their incremental costs), but also to temporal restrictions of service (withdrawing from off-peak services). This is most likely to happen if liberalization induces a change of technology, where the incremental costs of off-peak operation are higher under the new technology than they were under the older technology. The issue of off-peak service may raise wider policy concerns: notably, in relation to the mobility of less affluent groups and to public safety from crime. There may develop a complex bargaining game about the relevant cost measures between public authorities (wishing to buy off-peak services) and profit-maximizing transport undertakings (which may have a dominant market position and will have superior information on costs).

Market liberalization has brought in its train an important new pricing issue, one which is intimately connected with the regulatory framework and with competition policy. In network industries, duplication of certain links in the network is often not justified on economic grounds, quite apart from the social costs which such duplication might generate. For example, overhead electricity lines damage visual amenity, and the construction of underground links in network systems is often disruptive to third parties, as when street works aggravate traffic congestion. The potential for competition rests in multiple use of facilities – known variously as common carriage or third-party access – rather than through such duplication. Through the mechanism of regulated access, the entrant does not have to construct a complete network. In telecommunications, for example, an entrant is most likely to construct a rival trunk network but then utilize the local distribution network of the incumbent. Accordingly, both incumbent and entrant will be able to offer 'full service' to the consumer. In the absence of regulatory constraints, the incumbent would naturally deny access to its potential competitor, thus preventing competition in cases where the construction of a full alternative system is not viable. When the regulator insists upon access, there arises the question of how much the entrant must pay for access to the incumbent's distribution network. Given the evident clash of interests, the regulator may have either to enunciate the principles upon which such access is available, or to approve (perhaps even to determine) a tariff structure for access. The complexity of the issue is obvious. IC might be very low (provided that there is spare capacity in the incumbent's network), whereas SAC might be extremely high (the very reason why the question of access arises). From the regulator's perspective, there are two conflicting considerations. First, a charge not too far above IC might stimulate the rapid emergence of competition; the granting of highly favourable terms to the entrant will leave the incumbent carrying most of the common costs. Second, in a situation where the incumbent remains responsible for capacity replacement, expansion and enhancement, there is an obvious danger that terms and conditions for access which are overgenerous to entrants may discourage investment expenditure by the incumbent.

6 Conclusion

The creation of the European single market has reinforced the broader tendency, itself stimulated by technological change and globalization, for regulatory tasks to migrate to higher tiers of

government. Yet there is unmistakable evidence of a substantial lack of coherence about what such regulation seeks to achieve. This article ends by raising for debate seven issues, most of which flow directly from the preceding analysis but some of which are more speculative.

First, cross subsidy needs to be regulated at a European level because its continuing presence will distort the internal market. A particular concern has been that cross subsidization from monopoly to competitive markets would undermine the growth of competition in the latter. As cross subsidy may render incumbent natural monopolies artificially unsustainable, its continued presence may inhibit progress on market liberalization. Moreover, the tightening of transparency requirements on state aid in order to safeguard against subsidy renders more likely the utilization of less transparent policy instruments such as cross subsidy in order to secure the same policy goals by different means. Public regulation and cross subsidy can be protectionist in their consequences, whether by design or by accident. In the context of multilateral trade liberalization, the United States is frequently concerned by what it perceives to be the protectionist instincts of both the European Commission and of member states' domestic policies towards public utility sectors (Waterschoot 1991). Awareness of the potential for cross subsidy may be almost as powerful – and more difficult to regulate against – as its actual use.

Second, there may be two different sets of influences upon the public policy stances of European Union member states towards market liberalization, a process which poses an undoubted threat to traditional patterns of cross subsidy:

(i) the ideological dimension, measured in terms of relative commitments to free market solutions and to state intervention in support of certain public policy goals; and

(ii) the national interest dimension, measured in terms of:

  (a) whether geographical, topological and demographic features result in wide variations in the costs of supply;

  (b) the perceived vulnerability of the national operator to market entry in its output markets or to takeover via capital markets; relative country size may be an important factor, as will be that member state's geographical location within the European Union; and

(c) the timing of market liberalization and denationalization in an economy, which may substantially affect a member state's perceptions of national self-interest. Where, as in the UK, these processes started very early, it may be felt that enterprises, headquartered and primarily operating there, enjoy the important advantage of having made an early transition in a less threatening environment and of knowing better the rules of the new game. In turn, the governments of certain other member states may wish to design their policies in ways intended to negate these UK advantages.

Recognizing these differences will be helpful in understanding both policy stances and transition problems in different member states.

Third, there are evident but rarely acknowledged contradictions within policy as enunciated by the Commission. Its sectoral initiatives are motivated by a desire to promote market liberalization and the development of competition. Yet there have been numerous Commission initiatives which might collectively be described as a policy for the development of a unified European infrastructure. Many of these pronouncements stress the objective of binding the European Union more closely together, an objective with social and political as well as economic dimensions. There seems no reason to believe that the European Union, as configured at any particular date, represents the optimal geographical area for such networks. Therefore, the probability that cross subsidy will occur seems to be high. Moreover, network expansion is a stage at which unsustainability might occur (Baumol et al. 1982, p. 406). Even in sectors which are contestable in the single-period case, there may be problems in the multi-period case. For example, those who finance new capacity may adopt contractual forms (such as take-or-pay) which are anti-competitive in design and in effect. Indeed, it is questionable as to whether appeals for 'level playing fields' and market-driven outcomes should be taken at their face value. Many European programmes, notably the grants of the European Regional Development Fund, are designed to modify the geographical outcomes of market processes. In some cases, they are clearly designed to 'tilt' the playing field.[9]

9 For example, Highlands and Islands Enterprise, the development agency for the Scottish Highlands and Islands, paid a subsidy of £4.9 million towards BT's investment programme of £16.25 million for the provision of full ISDN-standard telecommunications, well ahead of need (2020 is suggested as the

Fourth, the competition policy issues are complex, even before they are clouded by advocacy. Crucial questions concern whether and when vertical and horizontal integration should be allowed in utilities, and the circumstances when separate accounting should be imposed. A UK parliamentary report on petrol retailing (Trade and Industry Committee 1996) provided disturbing evidence about how oil com-panies build anti-competitive features into wholesale tariffs. Ironically, the greater policy salience of cross subsidy means that updates of the most sophisticated empirical work, such as that of de la Brunetière and Curien (1984) and Curien (1991) on France Telecom, are not in the public domain. Even when there is agreement about what the relevant concepts are, there is a lack of secure and independent measurement systems. There are difficult problems of policy design and monitoring, especially when it can no longer be assumed that the entrant is smaller and weaker than the incumbent,[10] and when it is necessary to distinguish *ex ante* expectations from *ex post* results.

Fifth, issues about abuse of monopoly power and about equity seem likely to attract much more attention. There is already evidence of this in the UK in the context of market liberalization in domestic gas supply, where concerns about the disadvantaged position of low-income consumers have been explored in Hancock and Price (1995), Price (1997), and Price and Hancock (1997). Quite apart from the fact that

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likely date without subsidy). The justification for this capital grant was the regenerative benefits of telecommunications, with the attraction of telecommunications-intensive activities from areas with higher overhead costs being the dominant idea. This budget subsidy thus has implications for other rural areas (no other European rural area has comparable infrastructure) and for urban areas (which may suffer outward transfer of activities and employment). Subsidization of infrastructure may become an important tool in the competition between regions and towns for inward investment and job retention. Another dimension of the problem relates to the piggybacking on infrastructure investment undertaken for other purposes. A classic example is the boom in telecommunications-intensive employment in Omaha, as a consequence of the exceptional quality of telecommunications infrastructure established there for US military purposes.

10 In Saskatchewan, deregulation mandated by the Canadian federal government is exposing the provincially owned utilities, Sasktel and Sask Power, to entry from much bigger players (Crown Investments Corporation of Saskatchewan 1996).

such consumers may for various reasons be more expensive to service, market liberalization brings about aggressive forms of price discrimination which have not in the recent past existed in such sectors. Certain suppliers may lose a (substantial) proportion of their business consumers to competitors, whether through parallel networks or common carrier facilities. In the former case, all the costs of the sub-system, which may now exhibit serious overcapacity because of the defections, will be charged to residential consumers. In the case of common carrier facilities, much will depend upon the price levied for carriage. There is an important asymmetry to be noted: potential suppliers will be largely indifferent as to which particular sub-systems they enter, whereas each sub-system will be aware of the dramatic effects of losing business consumers' contributions to common costs. There are likely to be accusations that, in order to maintain business custom, sub-systems will tend to favour business consumers (who have effective alternatives). The corollary is the loading of common costs on to residential consumers (who have few effective alternatives). Provided that the business consumers are paying at least IC, residential consumers, however antagonized they feel by having to pay for (most of) the common costs, have an economic case only if they are paying more than SAC (in which case they can exit).

Sixth, it is evident that certain features of this new regulatory and competitive environment directly or indirectly challenge a significant part of the traditional missions of public enterprises. Whatever view is taken about whether past forms of cross subsidy were desirable, their viability is now severely eroded. Inevitably, this raises issues beyond the remit of this article, concerning the missions of public enterprises within a more integrated European Union (Monnier 1995).

Seventh, technological advances may have significant implications for tariff structures, especially when markets have been liberalized. An obvious example is new forms of metering. More far reaching in their potential effect are techniques such as postal coding (as a basis for differentiating household or car insurance rates) and genetic testing (as a basis for determining private health or pension rates). What is occurring here is that technological advances have refined the process of risk assessment, turning into cross subsidy what would not have been so delineated in the past. Some of the issues now emerging in utility sectors will attract even more attention if and when market liberalization brings such forms of price discrimination into 'social' sectors.

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Politique publique en matière de subsidiation croisée

Bien que le phénomène soit difficilement mesurable, on admet généralement que les subsidiations croisées ont existé à grande échelle dans les industries de réseau en particulier celles sous propriété publique. Après quelques définitions précises quant à l'existence de subsidiations croisées, l'auteur distingue 8 cas différents, prioritairement illustrés par des exemples tirés des industries de réseau. Il examine ensuite la question de la désirabilité de la subsidiation croisée dans le cadre d'une entreprise publique, en considérant des aspects tels que la péréquation

géographique des tarifs et la mesure dans laquelle les obligations non commerciales devraient être remboursées par le gouvernement sur base des pertes. L'ensemble des politiques de dénationalisation, libéralisation et des nouvelles formes de régulation ont des implications importantes sur la politique de subsidiation croisée. Par exemple, la libéralisation réduit la capacité des entreprises en place de financer par subsidiation croisée les lignes non rentables au sein d'un réseau, surtout lorsque les "entrants" ne sont pas soumis à des obligations publiques comparables. En outre, les entreprises dénationalisées rechercheront plus activement un profit financier, abandonnant les subsidiations croisées justifiées par des objectifs traditionnels de politique et de redistribution. Elles l'exploiteront au contraire comme un instrument pour empêcher les entrées. Tant au plan de l'Union européenne qu'au plan national, les idées ne sont pas claires en ce qui concerne l'intérêt et la faisabilité future de la subsidiation croisée. Ainsi on ne reconnait pas l'incohérence existant entre le fait d'imposer des obligations non commerciales aux entreprises en place et la suppression des barrières à l'entrée pour les concurrents. Ces évolutions menacent non seulement la viabilité des missions des entreprises publiques dans leurs secteurs traditionnels mais elles soulèvent également des questions de politique économique lorsque les progrès technologiques permettent de nouvelles formes de discrimination des prix dans les secteurs sociaux.

Staatliche Politik gegenüber Quersubventionierung

Obwohl einer Messung schwer zugänglich, wird weiterhin geglaubt, daß Quersubventionierungen in einem signifikanten Ausmaß in netzgebundenen Wirtschaftszweigen existiert haben, insbesondere, wenn diese sich in öffentlicher Trägerschaft entwickelt haben. Nachdem genau definiert wird, wann Quersubventionierung vorliegt, unterscheidet der Beitrag acht verschiedene Fälle, wobei Beispiele vor allem aus netzgebundenen Sektoren herangezogen werden. Es wird dann ein überblick gegeben über die Debatten hinsichtlich der Erwünschtheit von Quersubventionierung im Kontext öffentlicher Unternehmen, wobei Themen angesprochen werden wie die einheitliche Tarifierung im Raum und das Ausmaß, in dem von der Regierung nicht-kommerzielle Verpflichtungen kostenbedingt ausgeglichen werden sollten. Das Politik-Paket der Denationalisierung, Liberalisierung und neuer Formen der Regulierung hat weitreichende Auswirkungen auf die Politik der Quersubventionierung. Beispielsweise reduziert die Liberalisierung die Fähigkeit bestehender Unternehmen, unwirtschaftliche Bereiche in einem Netz querzusubventionieren, insbesondere wenn Neueinsteiger

vergleichbaren sozialen Verpflichtungen nicht unterworfen werden. Außerdem werden denationalisierte Unternehmen energischer finanzielle Rentabilität anstreben und Quersubventionierung hinsichtlich der traditionellen politischen und Gleichheitsziele abbrechen, aber Quersubventionierung als ein markteintritt-abwehrendes Instrument anwenden. Auf der Ebene der Mitgliedstaaten wie der der Europäischen Union gibt es Beweise für wirre Vorstellungen über die Erwünschtheit und fortgesetzte Durchführbarkeit von Quersubventionierung; beispielsweise wird die Inkonsistenz nicht erkannt, die in der Auferlegung nicht-ökonomischer Verpflichtungen an die bestehenden Unternehmen bei gleichzeitiger Aufhebung der Barrieren für den Markteintritt von Wettbewerbern liegt. Diese Entwicklungen beeinträchtigen nicht nur die überlebensfähigkeit der öffentlichen Aufträge öffentlicher Unternehmen in ihren traditionellen Sektoren, sondern werfen auch Fragen für die staatliche Politik auf, falls und wenn technologische Entwicklungen neue Formen der Preisdiskriminierung in sozialen Sektoren möglich machen.

Política pública en materia de subsidiación cruzada

Aunque el fenómeno sea dificilmente medible, generalmente se admite que las subsidiaciones cruzadas han existido a gran escala en las industrias agrupadas en red, particularmente las que están bajo propiedad pública. Después de algunas definiciones precisas en relación a la existencia de subsidiaciones cruzadas, el autor distingue 8 casos diferentes, ilustrados preferentemente de ejemplos extraídos de industrias agrupadas en red. A continuación examina la cuestión de la conveniencia de la subsidiación cruzada en el marco de una empresa pública, considerando aspectos tales como la diferenciación geográfica de las tarifas y la medida en la cual las obligaciones no comerciales deberían ser reembolsadas por el gobiemo sobre la base de las pérdidas. El conjunto de las políticas de desnacionalización, liberalización y nuevas formas de regulación tienen implicaciones importantes sobre la política de subsidiaciones cruzadas. Por ejemplo, la liberalización reduce la capacidad de las empresas existentes para financiar por subsidiación cruzada las líneas no rentables en el seno de una red, sobre todo cuando las "entrantes" no están sometidas a obligaciones públicas comparables. Además, las empresas desnacionalizadas buscarán más activamente un beneficio financiero, abandonando las subsidiaciones cruzadas justificadas por objetivos políticos y de redistribución tradicionales. Por el contrario, las aprovecharán como un instrumento para impedir las entradas. Tanto en el plano de la Unión Europea como en el nacional, no están claras las

ideas en lo que concierne al interés y factibilidad futura de la subsidiación cruzada. Así, no se reconoce la incoherencia existente entre el hecho de imponer obligaciones no comerciales a las empresas existentes y la supresión de las barreras de entrada para las competidoras. Estas evoluciones amenazan no solamente la viabilidad de los programas de las empresas públicas en sus sectores tradicionales, sino que plantean igualmente problemas de política económica cuando los progresos tecnológicos permiten nuevas formas de discriminación de precios en los sectores sociales.