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# Economic reform in Europe: integrating and liberalizing the market for services<sup>☆</sup>

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## Abstract

The European Union faces challenges in reforming the Gas and Electricity Directives to implement the single market in electricity and gas. The paper argues that there is unfinished business in the areas of *regulation*, *restructuring*, encouraging proper *risk management* through contracting, and designing markets and regulation to ensure effective and sustainable *competition* in the services supplied over the networks. Regulators often lack critical information and appropriate power to act. Restructuring is problematic, requiring forceful competition authorities with a clear agenda to achieve desirable structural reforms. A key issue is striking the right balance between complete liberalisation and ensuring adequate capacity and investment. Finally, proactive competition policies will be necessary to resist the powerful forces for vertical and horizontal integration visible in the Union.

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## 1. Introduction

The Single European Act of 1986 mandated the European Commission to propose policies to bring about a single market in financial services, gas, electricity, transport and telecommunications. The Commission has been remarkably successful in issuing Directives with that intent, and is now focused more on ensuring that the Directives are implemented, and where necessary strengthened to achieve their purpose.

Different countries have embraced this reform programme with differing degrees of enthusiasm, with Bri-

tain, the Nordic countries, and Spain in the vanguard but others more cautious. In the past state-owned utilities were restricted to operate within their national frontiers. Part of the pressure for extending and accelerating market liberalisation comes from newly privatised companies that are seeking to diversify out of their national markets. Some Continental countries, notably France, have not restricted their still state-owned utilities from foreign ventures, and have undoubtedly benefited from a largely protected home market and access to cheaper, de facto state-guaranteed finance. The imbalance this creates for competition is a source of considerable tension within the EU, and a strong reason for further liberalisation and harmonisation, so that companies in the same industry face similar competitive conditions across the Union.

The underlying case for liberalising network industries is that it allows competition to put pressure on sleepy monopolies, and restricts cross-subsidies that frequently take the form of a tax on competitive medium-sized industry to subsidise domestic consumers (and sometimes politically powerful large business). In some sectors, notably telecoms, where technical progress is

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rapid, competition is the best way of identifying winners and enabling them to replace losers. In other sectors with high capital investment needs (water, rail) private finance is seen in many countries as most likely to deliver the investment in a timely and cost-effective manner without entangling the public sector in difficult macro-economic financing decisions. In road transport, however, public infrastructural investment is still required, and its delivery is proving difficult, while the variety of methods chosen by governments to tax and finance roads creates further tensions for the single transport market.

Policy towards many network utilities involves more than purely economic and efficiency considerations. Energy is a matter of national security, service obligations, affordability, and environmental impact. Telecoms is increasingly part of a converged communications industry, where control over distribution of content raises issues of political accountability, privacy and security. The proper regulation of financial services against fraud, to encourage proper corporate governance while encouraging efficient investment and protecting minority shareholders, is critical to efficient investment and hence national performance. As a footloose service industry there are potential great gains to individual countries in strengthening their financial centres, but this may be largely at the expense of other countries. Countries that fear they may lose may resist reforms, impeding the gains from better regulation and restructuring.

Perhaps as a result, the current challenge is to find ways of increasing the effectiveness of competition in delivering efficiency without compromising other goals that are thought to be nationally important. Regulating networks to improve the *efficiency* of competitive outcomes is not necessarily the same as maximising the degree of liberalisation. Nor is merger policy that was designed for normal industries necessarily well suited to address mergers in network industries, and here the tension between member states and the Commission is likely to become potentially acute.

## 2. Reforming network utilities

In a short paper it is impossible to do justice to all the steps that are needed to improve the workings of the single market in services. Instead, we concentrate on four key issues: *regulation*, *restructuring*, and the related issues of *risk management* and ensuring effective sustainable *competition* in the context of the special characteristics of network utilities. Some of the lessons may also apply to aspects of financial markets (where cash points and settlement systems have some similarities with utility networks). These principles are then illustrated for the two key energy sectors of gas and electricity, the subjects of proposed new Directives.

One of the main distinguishing characteristics of network utilities is that the network is potentially an “essential facility”. A facility is essential if competitors require access to the facility if they are to be able to offer their service to final consumers, and if it would be impossible or prohibitively expensive to duplicate the facility. Networks (or in some cases parts of the network, such as the “last mile” or local loop in telecommunications, or call termination in mobile telephony) usually fall into this category, as the network is normally a natural monopoly whose duplication would be excessively expensive and hence inefficient. In most developed jurisdictions, competition laws require that those who own or control essential facilities may be obliged to grant access to competitors where denial of access would have serious effects on competition. This obligation to grant access only arises where downstream competition is possible and only in cases where access to the facility is essential to enable that competition to take place.

Essential facilities occur outside the conventional public network utilities, and are then subject to competition law, in the EU under Article 82 EC Treaty, which prohibits the abuse of a dominant position.<sup>1</sup> If a party owns, or controls access to, an essential facility and denies that access to service providers who can only deliver services to downstream consumers if granted access to that facility, then that party would be in breach of Article 82 and would be abusing its dominant position (unless refusal could be objectively justified, for example because of inadequate capacity).

In the past network utilities were typically granted monopoly franchises and hence downstream competition was not possible, and the essential facilities doctrine did not apply. In exchange for the grant of a monopoly franchise, the utility was either regulated or, more usually, under state ownership with a mandate to operate in the public interest and not just to extract the monopoly rents that control over the essential facility potentially grants. These franchise monopolies were typically vertically integrated (so that the natural monopoly was bundled up with service provision). They were regional or national in scope, and traded with each other where necessary under bilateral agreements. The growing evidence of the beneficial effects of liberalisation, first in telecoms, and subsequently in electricity and gas, suggested to the Commission that “market forces produce a better allocation of resources and greater effectiveness in the supply of services”,<sup>2</sup> and that therefore the principles of the single market—“the free movement of goods, persons,

<sup>1</sup> The term was first used by the Commission in *Sealink/B&I—Holyhead* [1992] 5 CMLR 255, though US precedents go back to *United States v Terminal RR Association* 224 US 383 (1912). See, for example, Whish (2001, 614–24) for discussion and case law.

<sup>2</sup> EC communication *Services of general interest in Europe*, OJ C 281, 26 September 1996, p. 3.

services and capital”<sup>3</sup>—should be extended to these public utilities. Competition is supply makes key network elements into essential facilities, to which the principles of Article 82 should logically apply.

In practice, the European Commission has articulated more specific requirements for individual network utilities in Directives to make clear what would or would not be an abuse of dominant position. Thus the Commission has spelt out how this would apply to the telecommunications sector (in O.J. No. C233/2, 6 September 1991): it would be unlawful for a telecommunications company to refuse to provide reserved services (those in which it still has a monopoly) when it would make it impossible or difficult for competitors to provide non-reserved services.

### 2.1. Regulation

Network industries require suitably staffed, independent but accountable national regulatory authorities (NRAs) with adequate powers of *ex ante* regulation. Competition law under Articles 81 and 82 may provide a useful framework, but actions to address market abuse under these articles are bureaucratic, slow and limited in the range of remedies available. *Ex ante* regulatory powers are particularly important in the early learning period of utility restructuring, where the details of market design and the rights and obligations of market participants need to be adjusted in the light of experience both within the country and from elsewhere.

The three main regulatory problems are that in some countries there is no NRA (e.g., there is no NRA for gas or electricity in Germany); in other countries the NRA is not sufficiently independent of the state, which is particularly problematic where the state retains a majority ownership in the utility being regulated (e.g. France); and finally, the legislative powers of the regulator are inadequate to the purpose. Even where the regulator has adequate powers to control the natural monopoly components, he may lack essential powers (of the kind normally set out in licence conditions) to deal with the potentially competitive service markets, and this is addressed under that heading below.

There are a number of less structural but still significant regulatory issues to resolve. To be effective, regulation should be credible and predictable. Regulatory credibility suffered a serious setback in Britain when the Government forced Railtrack into administration—a move perceived by many to involve overruling the regulator’s duty to ensure that the regulated utility, Railtrack, was able to finance its licensed operations. It remains unclear whether the motive for liquidation was to replace failing management, or a decision that the structure was

inappropriate and should be replaced by non-legislative means. Whether the reduction in regulatory credibility extends beyond railways is unclear—other utilities require no government subsidy and the regulatory task is to restrain prices from excessive levels. The problem in the railway industry is that even profit maximising prices fail to cover costs, given the strong competition from road transport (despite the high taxes on that sector). The government is therefore continuously in the position of paymaster. Independent regulation may not be a plausible option in such circumstances. If so, it is important to learn the lessons and devise suitable ownership and governance structures for railways if that aspect of the single transport market is to be encouraged.

One of the main sources of regulatory uncertainty is the status of future environmental policy and requirements, particularly in the energy industries where important investment decisions must be made on expectations of future fuel prices. Governments have largely failed to agree on an appropriate climate change policy. They appear undecided whether this should be implemented by the most logical solution of carbon taxes on all fuels, or through more discriminatory and relatively illogical and hence unstable interventions such as the climate change levy in Britain, emissions trading, green tickets, favourable subsidies to renewables (but not to large hydro). It does not help that trading regimes for electricity may penalise unpredictable energy sources such as wind—a victim of the New Electricity Trading Arrangements in Britain. Combined heat and power systems (CHP) enjoys a variety of relatively unstable tax advantages in various countries, making investment decisions particularly fraught.

Regulators are poorly placed to give clear signals when the tax and legislative uncertainties are as great as they are, and rapid progress towards an intelligent and efficient environmental policy would do much to reduce risks in energy investment. Unfortunately, given the great variety of existing energy resources (nuclear in France, gas in the Netherlands, hydro in Scandinavia, coal in Germany and Britain) only an optimist would anticipate such a policy emerging smoothly. With the Common Agricultural Policy as an awful lesson, the challenge to the European Union is to demonstrate that it can achieve a rational set of policies towards the environment and hence reduce some of the uncertainty that prevents efficient investment decision making across the single market.

### 2.2. Restructuring and ownership separation

The process of ensuring effective and efficient competition in network utilities in the presence of essential facilities is not straightforward. The logical solution to ensure open, transparent and non-discriminatory access to the essential facility or network is to unbundle the

<sup>3</sup> Article 7A of the EC Treaty.

industry and insist on ownership separation — that is, the party that owns or controls the essential facility should have no ownership stake in or ability to control the potentially competitive services. In electricity, this would prevent transmission or distribution network operators from having ownership stakes in generation and supply (that is retailing to final consumers), while telecoms companies would have to choose between operating the local loop and providing telephone services over the local loop. The main issue in restructuring utilities is to balance the synergies of vertical integration against the benefits of more equal competition, freed from the bias of incumbent ownership of the essential facility.

### 2.2.1. Synergies of vertical integration

The apparently logical solution of ownership unbundling runs into problems if there are significant synergies or economies of scope in operating the network and providing services over it. Thus in the public switched telephone network, the operator must set up a circuit from the caller to the called party by routing the call through switches and maintaining the integrity of that circuit for the duration of the call. Owning and using these switches provide natural synergies. Similarly, the system operator of an electricity system must ensure that supply and demand are kept continuously in balance millisecond by millisecond, and therefore needs very tight control over generation. The gas transmission operator must maintain the correct pressure in all pipelines from well-head to burner tip as a loss of pressure could cause an ingress of air and lead to explosions. In the past, the required close coordination between production (of electricity or gas) and operation of the transmission network has been facilitated by vertically integrating the activities under common ownership. If they are separated, that coordination will now have to be achieved by contracts and market signals, with an inevitable increase in transaction costs. In some cases, the extra transaction costs would be so high that it would be more efficient to retain common ownership. In other cases, the transaction costs are more modest, while the improvements in efficiency from allowing competition and market discovery to reallocate resources and drive down costs considerably outweighs the extra transaction costs.

If the owner of the essential facility also provides services over the essential facility that are in competition with those offered by potential entrants, then it will have powerful incentives to discourage entry or discriminate against successful entrants. Abuse of the dominant position provided by an essential facility is illegal, but it may be extremely difficult for competition authorities or regulators to distinguish between access charges that are cost-justified (or can be objectively justified) and those that are (unreasonably) discriminatory. Equally it may be hard to distinguish between access terms that can be

technically justified and those that have been devised purely for commercial advantage. Many of the complaints about delays in liberalisation and impediments to open, transparent and non-discriminatory access fall into this category (see, for a good set of examples, the Sixth Report on the Implementation of the Telecommunications Regulatory Package, COM (2000) 818 of 7 December 2000).<sup>4</sup>

Whether and under what circumstances ownership unbundling is cost-effective is an empirical question, the answer to which may change as a result of technical progress. Commission Directives attempt to summarise the present state of knowledge in the belief that the experience from some cases or countries can be applied elsewhere in the EU (even if not necessarily to countries at lower levels of development). Many of the tensions experienced during the liberalisation process arise because of disagreements about the applicability of lessons from earlier reforms, or even what lessons can be drawn from particular experiences.

The electricity supply industry provides a good example. In a mature and densely meshed network, with adequate transmission capacity and few transmission constraints, and adequate generation capacity with a generous reserve margin, there is a strong case for ownership unbundling of transmission and generation, following the model adopted by the restructuring of the Central Electricity Generating Board of England and Wales in 1990. Provided there is adequate competition, discussed below, generators can then bid to deliver electricity to final consumers using the grid under regulated third party access (where access and transmission charges are regulated and published in advance). The system operator secures the various ancillary services needed to maintain the quality of supply (frequency, voltage, instantaneous balance, spinning reserves and reserves available over varying time periods). The previous system in which investment in transmission and generation was simultaneously determined by the integrated monopoly can in theory be replaced by decentralised mechanisms. Well-designed charges for access and transmission combined with a competitive wholesale market could then guide new investment in a timely manner to the least-cost location.

In smaller systems where individual investments are large relative to total capacity, and/or where the least-cost plant has high fixed costs and long lead times (quintessentially, nuclear power stations or large coal-fired power stations), the benefits of tight coordination between investment decisions in transmission and generation can be significant. Centralised planning may allow

<sup>4</sup> See

<http://europa.eu.int/ISPO/infosoc/telecompolicy/implrep6/com2000-814en.pdf>

the system to be operated with lower reserves and hence lower cost, but with less flexibility than would be desirable in a liberalised market. The efficiency gains of competition need to exceed the extra costs for unbundling to be cost-effective. These costs include setting up and running the new markets as well as the providing additional spare capacity to ensure liquid and competitive markets. Thus the argument that ownership unbundling is necessarily desirable for electricity is not absolute, but contingent upon prevailing circumstances. In the EU, the benefits of improving interconnection between countries and the present levels of transmission adequacy and generation reserve strongly suggest that the competitive benefits of ownership unbundling greatly outweigh the loss of synergies in tight ownership control over transmission and generation. That view is resisted in France, where *Electricité de France* argues that its preponderance of inflexible nuclear power stations requires far tighter coordination between transmission and generation than in other EU electricity markets. These issues are discussed below in the context of proposed reforms to the Electricity Directive, and suggest that striking the right balance between the benefits of introducing competition against the increased costs of vertical separation cannot be taken as axiomatic but will depend on the evidence.

Circuit-switched telephony (both fixed line and mobile) exhibits strong synergies between network operation and service provision. The information needed to bill customers is collected at the same time that the circuit is set up between switches, and has in the past argued for the local area network provider to also offer local telephony services. In the US, the Modified Final Judgement separated AT&T's long-distance lines from the local Bell Operating Companies in the United States in 1984, thus allowing competition for long-distance traffic. Other operators could offer phone service, but had to make access payments for origination and termination to the local Bell company, allowing partial unbundling of service and network.

Technical progress that made long-distance telephony contestable has continued, and the increasing range of methods of handling calls to final customers (by cable, wireless, and possibly even power lines) is increasingly making the local telephone service contestable, allowing the possibility of facilities-based competition between different service providers. Once this is economic, the network ceases to be an essential facility. If competition from alternative providers is sufficiently intense, it may reduce the need for network regulation.

New bottlenecks may, however, replace the old essential facility of the local loop. Once a customer has chosen between alternative facilities for delivering calls, then that facility provider controls the bottleneck of call termination and origination with that customer. Whether this creates the potential for abusing a dominant position

or not depends very much on the contestability of that facility, which may in turn depend upon who pays for its use. Mobile network operators (MNOs) are arguing with the Commission and many national regulatory agencies about whether call termination to mobile phones is an essential facility that needs to be regulated, or whether the high churn rate and intense competition between MNOs ensures that the total price for using mobiles is kept at competitive levels. This might involve a different balance between origination and termination charges than might be imposed by a perfectly informed welfare-maximising regulator, and the possible (small) welfare losses can be balanced against the reduced cost of regulation.

Vertical integration is likely to lead to an attempt to load as many costs onto the bottleneck element as possible, allowing the incumbent's competitive service to be cross-subsidised, thus deterring entry and restricting competition. Where facilities-based competition is possible, inefficient cross-subsidies will be constrained, and the benefits of the resulting competition may outweigh the apparent extra costs of duplicating facilities, to which must be added the possible considerable costs of regulating access charges and conditions. These costs can be high, particularly as they can delay or deter innovation, and may argue against enforced sharing of network elements. Where facilities-based competition is not sensible, ownership unbundling may be justified, and here the extra transactions costs need to be balanced against the extra costs of regulating access and dealing with the strong incentives to discriminate. Again, these costs can be high, and need to be added to the other benefits from non-discriminatory competition when deciding on the desirability of ownership unbundling.

#### 2.2.2. *Efficient restructuring choices*

There are two problems to address in choosing the desirable degree of ownership unbundling. First, what is the most suitable structure of vertical relations between the essential facility or natural monopoly elements of the industry and the potentially competitive services that require access to the essential facility. Second, what is the best way to achieve this, given the current ownership structure. For the energy industries of electricity and gas, there is considerable evidence and widespread agreement that upstream production should be under separate ownership from transmission and distribution. There remains some ambiguity about the appropriate relationship between the transmission owner and the system operator, who may need extensive control over some production units to provide balancing and ancillary services. Whether these should be secured from separate owners under contract and through spot markets, or by direct control of some owned assets (such as pumped storage units) may depend on the system architecture and fuels available. There is less agreement about the desir-

able degree of separation between distribution and downstream supply (retailing to final customers), and that is discussed in detail for the case of the electricity industry below, but applies equally for gas.

In the case of telecommunications the structural questions are rather different, and relate to the best route to liberalisation. Complete vertical separation appears unattractive, and the question is whether to aim at facilities-based competition or to enforce various forms of unbundling, particularly of the local loop. Mobile telephony started with facilities-based competition, though with access to existing facilities for some entrants. The issue here is the extent to which facilities may be shared to reduce the cost of 3-G roll-out.<sup>5</sup>

There is even less agreement and insufficient evidence to determine the best structure for railways. The Directive requires functional unbundling between track infrastructure and services offered over the track (by train operating companies, or TOCs). Clearly, a single market requires a degree of inter-operability so that TOCs can access tracks in other countries. It is less clear whether the British solution of complete vertical separation between track and TOCs is efficient or sustainable. The collapse of Railtrack and the difficulty of financing the West Coast upgrade to allow the TOC Virgin to operate high speed tilting trains led to contractual risk sharing for that investment, suggesting that synergies between track and TOC are important, particularly for new investment. The future structure of British railways is unclear, but may evolve towards regional vertically integrated track and train companies. Arguably the more important integration to secure is between track and track maintenance companies, which was severed with unfortunate consequences in Britain. Finally, the water industry remains vertically integrated for the most part on the water supply side, though in Britain some companies combine sewerage operations, while others delegate that to the regional water and sewerage company. Attempts to introduce competition upstream have had limited success, constrained by the economics where the main cost lies in transport and distribution and not in production (except for new supplies in some areas). The high cost of metering and ensuring quality standards further limits the prospects for competition where facilities must be shared.

<sup>5</sup> Regulating telecoms is further complicated by the rapid convergence between different media, particularly internet, where unregulated competition from internet constrains regulatory options for the PSTN, while stimulating internet access (e.g. through broadband offered over the local loop) may yield socially desirable spillovers that raise important pricing issues. There is not room to discuss these wider issues here.

### 2.2.3. *The problem of transition to the new structure*

The best time to make structural changes is at (or before) privatisation, but that lesson has been largely ignored. Britain sold telecoms and gas as vertically integrated monopolies, and only unbundled electricity and rail after many years of regulatory experience. The Directives forced a rapid pace of reform on member states, giving them little time to resolve the debate between those arguing for national champions, those resisting any structural change, and those concerned to deliver competitive micro-economic foundations for their service sector. In some countries the problem of transition was complicated by municipal or state-level ownership and prior private ownership. Few countries have enthusiastically embraced the need to compensate for stranded assets that might be involved in extensive divestiture, particularly as the gainers from liberalisation are more likely to be the commercial and industrial sector than the voting public. The alternative is to impose sufficient regulatory pressure and require legal separation in the hope that this will encourage the companies to voluntarily accept full ownership separation as a way of escaping increasingly onerous regulation. That is likely to take time, judging from UK and US experience. The issue is further discussed in the section on gas restructuring below.

### 2.3. *Unbundling, risk and contracts*

Unbundling vertically integrated companies creates new transactions between the upstream and downstream parties that were previously internalised and offsetting. In some cases, notably the electricity market, the market clearing spot price for these transactions will be extremely volatile and creates significant risk. When capacity is tight, electricity spot prices can easily exceed 1000 euros/MWh, but with adequate capacity off-peak prices may fall to the variable cost of the least cost generation plant (15–20 euro/MWh), well below the price needed to cover fixed costs. Customers face the risk of volatile and occasionally extremely high prices, while generators face the risk of sustained periods of low average prices failing to recover their investment costs.

The natural instrument to hedge these risks is a contract between the generator and the final customer (often with intermediate contracts involving suppliers). Where the utility is vertically integrated and regulated, regulation (or state ownership) normally guarantees stable and predictable final consumer prices, possibly periodically adjusted to changes in fuel costs (which for domestic customers may amount to only one-quarter of the total price). In effect consumers are covered by implicit long-term or undated contracts, which are well-suited to finance the very durable infrastructural investment in transmission and generation. In the case of gas, investments in pipelines were, and to a considerable extent

still are, financed on the back of 20-year contracts for transport, and similarly gas wells were developed on the back of long-term contracts, often linked to the transport contracts.

Unbundling typically greatly shortens the duration of contracts, often to as little six months to two years. This period is sufficient to deal with daily volatility of the kind found in electricity spot markets, but does not deal with the longer term volatility associated with variations in the capacity-demand margin. Private investors will be wary of speculatively financing infrastructure, particularly in transmission, without some assurance that it will be allowed to earn an acceptable return. Where wholesale and retail markets are competitive and liquid, investors can assess the commercial risks involved in investing to increase supply ahead of projected increases in demand. Where transmission is regulated under credible cost-reflective tariffs the same may also be true. However, regulators are under a variety of pressures to meet environmental objectives, protect vulnerable consumers, ensure security of supply in the face of international energy disruptions, as well as having a duty to deliver as low prices as possible to final consumers. Investors in some countries which have yet to develop a tradition of independent and economically rational regulation may be reluctant to forego the security of commercially enforceable long-term contracts, particularly for gas.

The problem is that long-term contracts can pre-empt capacity in transmission and effectively foreclose the market, reducing competition. There is therefore a tension between a desire for liberalised markets supporting a variety of contracts of varying lengths, and the present situation which, particularly in the gas market, is relatively inflexible and resistant to competitive pressure. Again, achieving the right balance between the benefits of risk reduction that long-term contracts provide and the opportunities for market foreclosure that pre-emptive capacity contracting may offer lies at the heart of many disputes over opening up markets.

#### *2.4. Sustaining effective competition over networks*

The California electricity crisis, described below, reminds us that short-run demand elasticities for electricity are very low, transmission constraints fragment markets, and within these fragmented markets individual producers may have considerable if temporary market power and spot prices in these markets can reach very high levels. Sustained periods of shortages caused by under investment or adverse hydrological conditions may mean that market clearing prices can remain at high levels for lengthy periods and can produce politically unsustainable final prices to voting consumers.

This problem is peculiar to energy markets, as other network utilities do not have the same spot wholesale

markets whose prices feed directly through to final consumer prices. Ensuring adequate competition to prevent the exploitation of transient market power is difficult enough, but in many national markets the number of major energy producers is sufficiently small that normal problems of market power can be expected, particularly as demand grows and capacity is retired replacing the present glut of capacity with future tighter markets.

Past Directives appear to take the view that normal competition law is adequate for the unregulated or potentially competitive parts of the market, such as wholesale electricity production and gas production. The Directives therefore concentrate on structural reforms and access regulation. If liberalisation is to deliver the promised efficiency gains, though, considerably more attention must be paid to ensuring that the potentially competitive markets are effectively competitive, and this will have consequential implications for how they and the networks are regulated.

### **3. Reforming the Electricity and Gas Directives**

The four issues of reforming regulation, restructuring, managing risk and ensuring effective competition are conveniently illustrated by the case of the gas and electricity industries, both the subject of proposed reforms of the energy Directives. The original Electricity Directive 96/92/EC was much influenced by the success of restructuring the Electricity Supply Industry in Great Britain, which demonstrated the superiority of unbundling (the model followed in England and Wales) compared to the Scottish model of privatising vertically-integrated regional companies (Newbery, 2000). The Electricity Directive 96/92/EC and Gas Directive 98/30/EC were adopted in 1996 and 1998, and had to be implemented by February 1999 and August 2000 respectively.

In late 1998, a group of us undertook a study of the rationale, progress and possible problems with implementing the Electricity Directive. The resulting book, *A European Market for Electricity?* (Bergman et al., 1999) drew attention to a number of unsatisfactory aspects of the reforms. Very similar conclusions were subsequently drawn by the European Council, which called on the Commission to accelerate the work to complete the internal market in electricity and gas at Lisbon in March 2000. Gas liberalisation had been considerably more contentious because of perceived issues of security of supply, and had taken eight years to introduce a relatively less demanding directive compared to electricity, but the European Parliament was anxious to completely liberalise both energy markets.<sup>6</sup>

<sup>6</sup> Resolution "Liberalisation of Energy Markets" A5-0180/2000, 6 July 2000.



In response the Commission proposed amending the two Directives at the European Council in Stockholm in March 2001.<sup>7</sup> The main changes proposed were to require *regulated* Third Party Access (TPA) for both gas and electricity (denying the former option of negotiated TPA), to strengthen the requirements for unbundling to legal (but not necessarily ownership) separation of generation and transmission, to remove the option of the Single Buyer Model, and to allow all gas and electricity customers freedom to choose their supplier by 1 January 2005, thus ending the domestic customer franchise monopoly. In addition the Directive would require all countries to establish independent regulators to approve transport tariffs *ex ante*, and to monitor and report to the Commission on the state of electricity and gas markets, particularly the supply/demand balance.

France, who missed the deadline for enacting the earlier Directives, and has done the minimal restructuring and market opening, opposed the proposals, arguing that it was too soon to deem energy liberalisation a success. Germany, with its preference for negotiated TPA and vertical integration, also opposed the proposals, particularly the requirement for an independent regulator. Pressure for reform from consumers and those countries that have liberalised continues, but for the present the Commission is reliant on competition law to bargain for further improvements in exchange for approval for further EU electricity mergers.

### 3.1. Opening the gas market

The gas market is central to Europe's energy needs and security concerns. Effective liberalisation could transform the industry, dramatically lower prices and reduce EU import bills. At present the price of gas is linked to the price of oil, rather than being determined by supply and demand on a competitive market. The link to the oil price is a relic of the period when the price of gas was based on its value to the consumer rather than to the cost of production (including scarcity rents). It dates from the period when pipeline and wells were financed on long-term take-or-pay contracts with an objectively enforceable price clause. Internationally traded oil was the logical index that satisfied the value-based pricing rule and could be contractually enforced.

The potentially dramatic effects of unbundling and competition can be seen from Britain before the interconnector to the Continent was opened up. During that period, the price of gas fell dramatically and it was only the opening of the interconnector and the ability to export to the oil-based pricing regime in Europe that

caused prices to double. Gas-on-gas competition is facilitated by a densely meshed high pressure pipe-line system and a sufficient number of competing producers. When they sell into a market in which combined cycle gas turbines are the least-cost option for investment and have to compete against coal generation for dispatch, the stage is set for sustainably low gas prices. If the major suppliers to the EU (Russia, Algeria, Norway, Libya) have to compete with each other and against coal in the electricity market, with liquid spot forward and futures market, then they may be forced to accept a loss of linkage to the oil price. As international trade in LNG moves from long-term contracts to a more liquid spot market, that tendency will be reinforced.

The reality is still a long way from this vision. The EU commissioned a report into the opening of the gas market (DRI.WEFA, 2001)<sup>8</sup> which shows the considerable obstacles that remain in liberalising the gas market. The main barrier to competition is restricted access to the grid, difficulties in obtaining gas, and vertical integration. The report notes that there has been to date no significant downward pressure on transportation and distribution costs and no fundamental move from oil-linked pricing towards LRMC-based pricing. Perhaps this is not surprising as the only country with ownership unbundling is the UK, and only seven countries (Finland, Ireland, Italy, Luxembourg, Spain, Sweden and UK) have regulated third party access. Germany lacks a regulator while the score card of operators' experience of accessing the grid as of March 2001 is poor in all countries except the UK, and particularly poor in Belgium and Germany, with the Netherlands scoring the lowest mark on the balancing regime.

Gas exhibits all of the problems that control over the essential facilities of transmission, balancing and storage provides to an incumbent determined to protect the market against competition. Britain demonstrated the difficulties of ownership restructuring in a privatised market, and unfortunately many gas companies on the Continent are partly or wholly privately owned. Britain privatised British Gas as a vertically integrated monopoly in 1984, and spent the next 15 years applying regulatory pressure and references to the Monopolies and Mergers Commission to enforce a regime in which ownership unbundling was considered the least unattractive option by the owner. That was in the context in which Britain was self-sufficient in gas and not reliant upon imports from politically unstable regions to the east. The argument that long-term contracting supported by massively capitalised, vertically integrated national champions is the only way to ensure security of supply is difficult to refute in the absence of convincing alternative models.

<sup>7</sup> COM (2000) 125 final, 13 March 2001; available together with the Press Release and Working Paper at <http://europa.eu.int/comm/energy/en/internal-market/int-market.html>

<sup>8</sup> From [http://europa.eu.int.com/energy/en/gas\\_single\\_market/finalcor:vol1.pdf](http://europa.eu.int.com/energy/en/gas_single_market/finalcor:vol1.pdf)



As with electricity, discussed below, there are sound reasons for continuing with some long-term contracts, and that strongly suggests retaining the domestic franchise for gas. The ideal is to separate transmission and distribution from production and supply (including the management of long-term contracts with the distribution companies) to remove the incentives for exploiting and abusing essential facilities.

One effective way in which dominant incumbents can extract market power is through unreasonable pricing for ancillary services such as balancing and storage, and excessive charges for transmission and distribution. These charges can have very adverse effects on the efficient operation of the electricity market, where access to short-term gas for supplying electricity into a short-term spot or balancing market may be critical at preventing electricity price spikes. Under some systems of gas balancing charges, notably those in the Netherlands, the price for such gas can be so high as to either pass spikes through to the electricity market or cause suppliers to withhold their generation, amplifying the problems in the electricity spot market. It will take knowledgeable and well informed regulators armed with considerable regulatory powers to align the prices for various gas services towards costs and improve the liquidity of gas spot and contract markets.

### 3.2. *Reforming electricity markets*

All the Commission documents on the web site go to some lengths to argue that the proposed measures for the European energy market “will avoid the type of problems currently faced by California, which have resulted from an inadequate legal framework and inadequate production capacity” (EC Press Release). Clearly, the California electricity crisis has awakened fears that liberalised electricity markets may be politically unsustainable, at least, without careful design and regulation. The very high prices observed in California (and in the North- and Mid-West of the United States) have demonstrated very clearly that the scarcity price of electricity can reach extremely high levels when supply is tight. Defenders of the former electricity industry structure have argued that vertically integrated franchise monopolies with regulated final prices are the only politically sustainable structure, that is necessary to secure adequate capacity to avoid shortages and/or high prices (see, for example, the pseudonymous Price C. Watts, 2001). The cost of flawed liberalisation has now been demonstrated (by the high prices and the impact of economic activity in the event of power outages) to be unacceptably high, and calls into question the whole electricity liberalisation agenda.

The evidence from Europe and the United States suggest that there are a number of conditions for successfully liberalising gas and electricity markets. The first is

that for the wholesale market to be competitive, potential suppliers must have access to the transmission system in order to reach customers. This is best achieved by ownership separation of transmission from generation. Newbery (2000), drawing on work with and by Pollitt (Newbery and Pollitt, 1997; Domah and Pollitt, 2001), contrasts the success of this strategy in England and Wales (a permanent annual reduction of costs of 6% compared to the no-reform counterfactual) with the failure of privatisation in Scotland, which left the two incumbent vertically integrated utilities unchanged. In a federal (or multi-country) market such as the EU, this requires that suppliers, traders and consumers can gain access to trading partners in and through other countries. This lesson has been endorsed by the Commission.

The second condition is that there is adequate and secure supply. For electricity, there are three conditions that need to be satisfied for supply security: the network infrastructure must be adequate and reliable;<sup>9</sup> there is adequate generation capacity;<sup>10</sup> and there is security of supply of the primary fuels (gas, oil, coal, etc.). In the case of gas, supply security means that pipeline integrity and pressure must be maintained (normally through a combination of line-pack, swing, short, medium and longer duration storage,<sup>11</sup> and interruptible contracts); that adequate supplies are available, often underwritten by long-term contracts; and that the risks of interruption to these sources of supply has been addressed (particularly those involving imports from, or transit through, politically unstable regimes). Again, this is recognised by the Commission.

The final condition is that there is appropriate regulation of the markets of these liberalised utilities. This condition is less obvious, and has been largely ignored by the Commission and many EU countries, but without it, there are serious risks that the benefits of liberalisation may be lost, and the political costs of flawed outcomes may undermine support for reform.

#### 3.2.1. *Regulating wholesale markets*

The mantra “competition where feasible, regulation where not” suggests that regulation should be confined to the natural monopoly elements, typically the networks. That would be mistaken, for the potentially competitive elements still need regulatory oversight to ensure

<sup>9</sup> In practice, this means that the grid is built to an  $n-1$  standard, allowing any single circuit to fail without causing system breakdown.

<sup>10</sup> The reserve margin required will depend upon the reliability of the generation units, the variability of demand, and the response speed of the generation units, and should be available for at least the specified (and very high) fraction of the time so that the risk of capacity shortfall is less than a specified level.

<sup>11</sup> Line-pack, or variations in pipeline pressure, deal with daily variations in demand, swing is the ability of production to vary with demand, and storage is characterised by volume and deliverability, usually in inverse relationship.

that markets are not manipulated nor market power abused. The default assumption is that wholesale gas and electricity markets are no different from other markets, and should therefore be subject to the same competition law as other markets, notably Articles 81 and 82 of the Treaty, which have been transposed into national legislation (e.g. as the Competition Act 1998 in the UK). There are a number of obvious problems with this approach. First, because it is *ex post* and penalty-based, it is necessarily legalistic and inevitably slow compared to *ex ante* regulation. Second, the EU test of abuse of dominant position normally requires the dominant firm to have 40% or more of the relevant market. Defining a market that is so dominated can be problematic. Third, the presumption is that normally markets will be effectively competitive, so that the information needed to establish market abuse is not collected routinely, but only when an alleged abuse is investigated.

The British energy regulator, Ofgem, with over a decade of experience of dealing with the initially concentrated wholesale gas and electricity markets, is acutely aware of the limitations of normal competition legislation. In 2000, Ofgem persuaded the majority of large electricity generating companies to accept the Market Abuse Licence Condition (MALC), which specified certain forms of behaviour as *prima facie* abusive, meriting investigation and possible penalty. Two generators, AES (with 7% of total capacity, mostly under long-term sales contracts) and British Energy (with overwhelmingly base-load inflexible nuclear power) did not consider the change in licence conditions necessary and appealed to the Competition Commission. The condition related to behaviour in the Electricity Pool, due to be replaced by the New Electricity Trading Arrangements (NETA) in early 2001. Partly as a result, the Commission were not persuaded that it would be against the public interest for AES and British Energy to continue without the licence modification (Competition Commission, 2000). Ofgem decided to withdraw the condition.

Several important points emerge from this episode. First, generators in Britain require a licence to operate, and that licence contains conditions governing acceptable market behaviour. Grid codes contain additional, often technical, conditions to ensure that the System Operator has the requisite powers to balance electricity supply and demand and maintain system integrity and quality, but these are not sufficient to address many forms of market manipulation. Licence conditions can only be modified by agreement. If this is not possible, they are referred to the Competition Commission, who are required to determine whether the modification is required to prevent outcomes that are against the public interest.<sup>12</sup>

<sup>12</sup> The public interest test is normally interpreted as a social cost benefit test with a larger weight on consumer welfare than profits.

Second, the case for the MALC rested on distinctive features that favour the exercise of market power in apparently unconcentrated market structures (with Herfindahl–Hirshman indices below 1800). Specifically, electricity cannot be stored,<sup>13</sup> supply must be instantaneously matched to demand, transmission constraints require active systems balancing, and demand is highly inelastic in the short run over which daily price variations occur. The most obvious evidence of these distinctive characteristics is the considerable volatility over short time periods. The English pool price has moved from 17 euros/MWh to 1700 euros/MWh over a single 24-hour period, and even more extreme price spikes have been seen in the US. If even modest-sized generators can profitably raise prices by only offering marginal capacity at very high prices for short periods, or in particular places, then such transient behaviour by non-dominant producers is unlikely to fall foul of normal competition law.<sup>14</sup>

Finally, licence conditions are important as they specify the information that must be made available to the regulator to monitor conduct. This includes details of all generating set behaviour (availability, output, bids, contract cover, for each discrete time period, typically an hour or less), as well as powers to investigate plant outages and retirement, both of which may be strategically manipulated to increase scarcity and prices. Without such information and the authority to act quickly and effectively on their evidence, price manipulation is to be expected in tight markets. Electricity prices in the California wholesale market during the off-peak winter season January–April 2001 were 10 times that in the same period in 1999, and the estimates of the additional profits that generators earned above the competitive level for the year 2000 amounted to over \$8 billion (Wolak and Nordhaus, 2001). If there are no penalties or costs for this kind of behaviour, and such large rewards, private quoted generators would be in breach of their duty to shareholders if they did not exercise their periodically considerable market power whenever possible.

At least some EU countries have liberalised their elec-

There are proposals to replace it with a competition test, which could be interpreted as placing sole weight on long-run average consumer welfare (which may well require adequate profit incentives and rewards to ensure investment).

<sup>13</sup> Except as water in dams in hydro systems (including pumped storage, of which there is 2000 MW in Britain), but the ability to withhold water in low demand periods for release at high demand periods is very limited except in a small number of countries. Even when a significant fraction of capacity is hydro (as in California) it is typically capacity-constrained at the peak.

<sup>14</sup> Arguably, the markets can be narrowly defined (even down to a 15 minute period is a constrained transmission zone) to rule out some abuses, but even this will not deal with the case of general market tightness, where a change in supply relative to total demand of 5% can dramatically alter the market power of an individual generator and hence the equilibrium price.

tricity industries under the requirements of the Electricity Directive but failed to write the required information-gathering and enforcement powers into their electricity legislation. It is most unlikely that such information will be voluntarily provided. A full-scale competition inquiry with the necessary powers to request information may take months, and fail to find evidence that would stand up to in court. If in addition generators are not required to hold a licence, regulators cannot follow the route open in Britain and modify the licence to prevent future abuse and require that necessary information be routinely supplied.

The United States, with its more legalistic approach, is much clearer about the duties of regulators when liberalising. Under the Federal Power Act 1935, the Federal Energy Regulatory Commission, FERC, has a statutory obligation to ensure that wholesale prices are “just and reasonable”. If an electric utility wishes to sell at market-determined wholesale prices, this will be only allowed providing “the seller (and each of its affiliates) does not have, or has adequately mitigated, market power in generation and transmission and cannot erect other barriers to entry.”<sup>15</sup> Even then, the authority to sell at market-determined prices can be withdrawn and replaced by regulated prices if there is “any change in status that would reflect a departure from the characteristics the Commission has relied upon in approving market-based pricing.”<sup>16</sup>

FERC therefore assumes that market pricing is “just and reasonable” so long as it is competitive. The reason for its concern to ensure that prices remain competitive is that any FERC-approved form of pricing greatly restricts the competition authorities from intervening. At the same time, existing antitrust laws are relatively powerless to enforce competitive outcomes in the energy industry as “the antitrust laws do not outlaw the mere possession of monopoly power that is the result of skill, accident, or a previous regulatory regime. ... Antitrust remedies are thus not well-suited to address problems of market power in the electric power industry that result from existing high levels of concentration in generation.” (DOE, 2000).

This suggests a further contrast on the two sides of the Atlantic, reflecting the prior histories of the electricity industry on the two continents. Deregulation in the United States was in principle a cautious relaxation of regulatory control over prices, with considerable awareness of the potential problems of market power. Electricity restructuring in Europe has tended to overlook issues of market power, and instead has concentrated on introducing wholesale and often retail markets in the

expectation that they will be naturally competitive. The dictum of confining regulation to the natural monopolies has often been taken too literally, paying too little attention to the unnatural, or at least undesirable, monopolies in generation.

### 3.2.2. *Market power and market fragmentation*

The EU has adequate, arguably surplus, generation capacity, modest demand growth, access almost everywhere to gas that enables new entry by rapid-build modest scale combined cycle gas turbines (the least-cost choice except perhaps for hydro in favoured areas). These are ideal enabling conditions for a competitive generation market. Theory (Green and Newbery, 1992) and evidence (Newbery, 2000) alike suggest that with a sufficient number of competing generators and adequate spare capacity, prices will be close to the competitive level. Even if generation is concentrated, provided entry is contestable (and entrants can contract with suppliers or customers), then wholesale prices should be restrained to the long-run marginal cost of generation (Newbery, 1998), even if they may be somewhat too high with spare capacity.

Yet although there has been some convergence of retail prices for large customers (CEC, 2001), there are few wholesale spot markets, and those that exist are not fully arbitrated. In some cases the price differences are visible in the high auction prices for interconnection between countries, notably between Germany and the Netherlands and between France and England. Even allowing for the cost of securing interconnection, there remain systematic profitable arbitrage opportunities. In other cases the interconnector auction prices are low, as between exporting Belgium and The Netherlands, although Belgian costs are well below Dutch spot prices. The absence of a wholesale market in Belgium or France, the dominance of the incumbent company in each of these countries, and the fact that the Belgian electricity company, Electrabel, also owns the largest generating company in The Netherlands, may explain the low interconnect auction price. The lack of wholesale markets and the presence of transmission constraints both hinder arbitrage and amplify market power in the resulting isolated markets.

Germany provides another interesting case, because the spot prices have been very low in 2000–2001 (compared to the long-run marginal cost). Brunekreeft (2002) argues that the best strategy for vertically integrated generating/transmission companies wishing to deter entry is to charge avoidable cost for generation and recoup fixed costs through transmission tariffs. That strategy is possible as transmission tariffs are negotiated, and there is no sector regulator to ensure non-discriminatory access. Not surprisingly, Germany is resisting the proposed changes to the Electricity Directive. Given spare capacity, low prices are a feasible equilibrium

<sup>15</sup> Heartland Energy Services, Inc, 68 FERC and 61,223, at 62,060 (1994), cited by Bogorad and Penn (2001).

<sup>16</sup> Heartland 68 FERC at 62,066, cited as above.

strategy, and have the attraction of reducing the cost of buying other generating companies, allowing increasing concentration. Once the industry reaches the limits of acceptable (to the competition authorities) concentration, market power can be restored by reducing spare capacity—and plant retirements started in mid-2001.

If regulators lack the necessary competition powers, the EU electricity market risks two unattractive alternatives. At present the lack of power exchanges forces most electricity to be bought on contract—which reduces short-run market power and hedges price-spikes (Newbery, 1995). Without a new Directive, distribution companies retaining a domestic franchise and subject to yardstick regulation of their power contracts could provide countervailing power against generating companies. The distribution companies could contract with entrants (or even build their own capacity) to cap unreasonable price increases. However, opaque markets, lack of information and the regulatory power to enforce competitive pricing, combined with horizontal and vertical integration may lead to the old German-style equilibrium (as described in Müller and Stahl, 1996)—safe but rather expensive.

With the new Directive, the end of the franchise by 2005 is likely to encourage generators to integrate forward into supply, and risks removing the counterparties to longer-term contracts that would facilitate entry. If entry is impeded, and markets remain national and thus concentrated (because of interconnector constraints), then it will be profitable for companies to reduce the spare capacity margin, with possibly Californian consequences (worse if the regulators lack the legislative power to intervene).<sup>17</sup>

### 3.2.3. Avoiding Californian-style crises

The best short-run method of supporting electricity liberalisation is to rapidly increase transmission capacity (offered at efficient prices). This would increase the number of generators competing against each other, dilute market power, and reduce the need for regulatory market intervention. That is difficult as it requires agreement between different regulatory regimes in each country, and because the desirable ‘excess’ transmission (relative to an efficient centrally managed system) is a multi-country public good. Even if successful, in the longer run the problem is that if demand grows and generators find it profitable to tighten capacity, high prices would be transmitted Europe-wide. To avoid that requires adequate generation capacity. Ensuring adequate capacity and contestable entry without the nor-

mal pattern of long-period commodity price swings needs good long-term contracts, possibly combined with capacity payments. Neither of these is easy in a fully liberalised market, compared to the former vertically integrated franchise model, or even the disfavoured Single Buyer model. A competently regulated domestic franchise may be preferable to a fully liberalised supply market, judging from the cost-benefit analysis of Green and McDaniel (1998), and that ignored the additional contracting benefits noted here.

There are additional problems in ensuring that the benefits of capacity adequacy are captured by those providing them (the multi-country spill-over problem again). Wolak (2001) recommends firm forward contracts for California (heavily dependent on out-of-state imports). As a general point, regulators should aim for capacity adequacy and maximise plant availability by ensuring maximal contract cover, and should confine any price caps to the contract market. This may require further reforms to trading arrangements, and will certainly require that regulators have adequate competition powers.

## 4. Conclusions

This paper has argued that there is unfinished business in the areas of *regulation*, *restructuring*, encouraging proper *risk management* through contracting, and designing markets and regulation to ensure effective unsustainable *competition* in the services supplied over the networks. Regulators are increasingly meeting and sharing experiences, and should form a valuable constituency for further reforms of the system of regulation, so that part is well in hand. Although many are at the steep part of the learning curve, the accumulating experience of other countries ought to help in this process. Restructuring in contrast is far more problematic, as it requires forceful competition authorities with a clear agenda to achieve desirable structural reforms, rather than behavioral remedies or tacit agreements on acceptable pricing. As more utilities come under private ownership, so further restructuring will be increasingly constrained by the deals that can be struck in exchange for mergers (some of which may not be desirable) or in response to the pressures applied to regulate access to essential facilities.

The main issue that may be neglected is striking the right balance between complete liberalisation and ensuring adequate capacity and investment. Long-term contracts are an invaluable counterpart to speculative investment in durable assets, and a retail franchise is the natural counter-party to such long-term contracts. Larger customers can either sign interruptible contracts, long-term contracts, or take their risks in the short-term market, but domestic consumers have expectations of price

<sup>17</sup> The European Council met in Barcelona on 15–16 March 2002 and weakened this requirement of “freedom of choice of supplier for all European non-household consumers as of 2004 for electricity and for gas. This will amount to at least 60% of the market” (European Commission, 2002).

stability, security of supply and quality of service that may be poorly served by a completely liberalised market. As this is one of the key proposals in the reformed Energy Directives, there is some urgency in assessing the balance between the benefits of competition compared with the risks of future capacity scarcity. There is some evidence from the Barcelona Council Meeting that the Commission is having second thoughts about the desirability of complete liberalisation (see footnote 17 above).

Finally, proactive competition policies will be necessary to resist the powerful forces for vertical and horizontal integration visible in the Union. As newly privatised utilities are freed from their domestic market, and as some state utilities can reach deep into the state pockets to finance overseas acquisitions, so the process of acquisition and merger has gained momentum. National regulators find it difficult enough to deal with markets whose boundaries are not coincident with the national border. These problems are exacerbated where the same companies appear on both sides of that border. Greater scepticism with the concept of national champions is needed, particularly in the electricity supply industry, where economies of scale are modest beyond a certain level. Similar scepticism should be shown in the gas industry, where complex cross-holdings already compromise competitive ownership and control. Where competition is insufficient, regulators should take seriously the desirability of over-investing in transmission and inter-connection capacity, to maximise the extent of the market and the number of competitors that each company faces.

Competition between telecoms companies will doubtless continue intensively, and further shake-outs may well happen, but at least several countries have recognised the advantage of competitive auctions to allocate scarce spectrum. Financial services have not been properly discussed in this paper, but there are clear economies of scale in settlement and clearing. Consolidation, following the model in the United States, with suitable governance and vertical separation, looks desirable to reduce financial transaction costs. It is less clear that there are advantages in reducing the number of stock exchanges, but the current model of vertical integration between exchange and clearing and settlement tends to enforce this pressure. Clearly, national rivalries in locating financial institutions which may then attract inward investment and which generate substantial invisible income, complicates the process of a reaching agreement on how best to restructure the financial sector. Indeed, where reforms redistribute gains and losses between member countries, as may also happen in energy, pro-

gress may be slower than desirable, and makes competition policy to reduce the power of nationally based companies even more important.

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