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COMPETITION AND REGULATORY REFORM IN PUBLIC UTILITY INDUSTRIES: ISSUES AND PROSPECTS

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1. INTRODUCTION

Throughout the world the electricity, gas and telecommunications industries[1] have undergone dramatic changes over the past twenty years. These changes have involved a major re-appraisal of the role of government regulation in such industries with greater emphasis being placed on promoting competition. Historically in Ireland the public utility industries were public sector monopolies. This position is now set to change due to a combination of technological developments, pressure from the European Commission which is pressing member states to liberalise such industries, and a growing realisation that greater competition in these industries may be beneficial to the economy at large.

At the outset we would like to point out that the paper is not concerned with the issue of privatisation. There is a tendency to associate liberalisation and regulatory reform with privatisation. It is important, however, to recognise that privatisation is a separate issue. In fact privatisation may, as in the UK case, actually limit the introduction of competition. As Kay and Thompson (1986) observed:

> 'But without the consent, or acquiescence, of these same managers privatisation of any sort is a difficult and protracted business. As a result, measures of liberalisation, or deconcentration, associated with privatisation - those which offer most in terms of potential gains in efficiency - are also those on which major concessions have been made to win management support for the political process of privatisation.'

* The authors are respectively a member of and legal advisor to the Competition Authority. We wish to express our thanks to Patrick Lyons, Joe Durkan, John Fitzgerald and an anonymous referee for their helpful comments on earlier drafts of the paper. We accept full responsibility for any remaining errors and ommissions. The views expressed are those of the authors and do not purport to represent those of the Authority.

In contrast Massey (1995) notes that deregulation in New Zealand was designed to promote competition and that the authorities there only embarked on a privatisation programme following liberalisation. Similarly the approach taken in the present paper is to focus on the question of increasing competition. The question of privatisation is one which should be considered separately subject to the constraint that the development of competition should not be limited to facilitate privatisation.

The balance of the paper is set out as follows. The following section describes the essential characteristics of the public utility industries in Ireland. This is followed by a consideration of the possibilities for competition in the energy and telecommunications sectors. We then examine the extent to which EU rules define the options available to the Irish authorities. The implications for regulatory reform are then considered and a number of alternative models are examined. The following section considers whether a more pro-active approach to competition in public utilities is desirable. Some conclusions are offered in the final section of the paper.

2. THE ENERGY AND TELECOMMUNICATIONS SECTORS IN IRELAND

(i) Background.

BGE, the ESB and Telecom Eireann are State Companies respectively engaged in the provision of gas, electricity and telecommunications services throughout the State. Summary statistics for all three are set out in Table 1. All three firms are vertically integrated monopolies. This is because the government response to the natural monopoly aspect of the transmission network was to extend the monopoly into the downstream supply markets, thereby establishing vertically integrated monopoly public utility operators. This pattern was common in many European countries. In contrast in the United States private ownership of such industries was the norm with the potential for abuse of market power due to the natural monopoly elements of the industries being dealt with by means of regulatory controls.

Table 1 Summary Statistics for Irish Public Utilities (1994)

	BGE	ESB	Telecom
Turnover £m	217	977	979
Profit (Loss) £m	45	(19)	80
Employment	788	10966	12332

Source: Annual Reports (The figures for Telecom relate to the year ending 31.3.1995.)

All three companies, like most other State companies, are subject to certain constraints which would not apply to private sector companies. Their operations are regulated by specific Acts of the Oireachtas. These require *inter alia* that proposals for price increases must be approved by the Government.[2] Section 21 of the

Electricity Supply Act, 1927 requires the ESB to operate on a break even basis. All three companies are obliged to achieve a host of non-commercial objectives. As Bristow (1985, p.178) observed 'not infrequently a proposal aimed at improving the financial health of an enterprise is rejected or delayed by a minister'. In January 1995, for example, the Minister for Transport Energy and Communications told the Dail that an ESB application for a price increase had been with the Department for seven years (Dail Reports, 21 February 1995, Col. 870).

The public utility industries, while differing in a number of respects, share certain common features. Each of them combines naturally monopolistic activities with potentially competitive features. Natural monopolies arise where economies of scale are such that the production level corresponding to the lowest unit cost of the firm is sufficient to meet total market demand when price equals that unit cost (Weyman-Jones, 1994). Public utilities have traditionally been viewed as classic examples of natural monopolies. In practice only certain parts of them constitute a genuine natural monopoly, while other activities are at least potentially competitive. In the case of electricity the transmission line network which makes up the national grid and the local distribution network are natural monopolies since it would be highly inefficient for competing firms to duplicate such facilities. Similarly the gas pipeline network also constitutes a natural monopoly. Historically in the case of telecommunications, the local network was regarded as a natural monopoly, although the position here is less clear cut, a point considered below.

While the transmission and distribution systems involve a high level of sunk costs and, in the case of gas and electricity constitute natural monopolies, the marginal cost of providing services over the network, however, is often quite low. Indeed in some instances it may be virtually zero. For this reason two-part tariffs which split charges into a fixed charge for access to the service, combined with a variable charge based on consumption are commonly employed in utility industries. Fixed, i.e. rental, charges are significant for telephone services but are relatively low in the case of gas and electricity. Such tariffs enable price for consumption to be set at the level of marginal cost in order to increase allocative efficiency with the fixed charge being set at the level necessary to recoup the fixed costs. Fixed charges may, however, cause consumers who are prepared to pay relatively little to consume the product to drop out of the market This is an inefficient outcome since it means that some consumers willing to pay at least the marginal cost of the service opt out.

A second feature of utilities is that demand fluctuates systematically during the course of each day, week and year. For example, business demand for gas, electricity and telephone services is concentrated during working hours, while domestic users consume more outside of working hours. Similarly demand for gas and electricity is greater in winter than in summer. The bulk of the cost involved with catering for peak demand is the fixed cost of installing sufficient capacity to cope with such demand. Higher prices for peak use, 'peak-load pricing', are a common feature of utilities as they discourage more costly peak time usage, while helping to meet the

higher cost of providing such services (For a more detailed analysis of peak load pricing see, Berg and Tschirhart, 1988).

Demand may also fluctuate randomly in a way that is unpredictable. For example, demand for electricity and gas will be higher on a particularly cold winter's night than on the average winter's night. This poses problems because capacity is fixed and electricity and telecommunications output is largely non-storable.[3] Armstrong et al (1994) point out that this problem could be dealt with, in theory at least, by offering 'real time' tariffs where the price of the service at any time responds continuously in an attempt to balance demand and available capacity. Such a pricing system would require that consumers be constantly aware of the price possibly by means of having prices displayed on telephone or electricity meters. Clearly this would involve very substantial investment costs. If the firm is required to offer stable and predictable prices a trade-off is required between installing enough capacity to meet the average peak which will be insufficient to deal with unusual peaks, and installing enough capacity to meet all conceivable levels of demand, thereby incurring much higher construction costs. In the case of electricity the problem could be alleviated by imports which is now an option following the restoration of the inter-connector to Northern Ireland.

In the case of gas and electricity the trade-off between installing sufficient capacity to meet any conceivable level of demand and the cost of failures arising from inadequate capacity can be resolved through differential pricing. Thus industrial users can be offered a choice between a high price with supply guaranteed and a lower price with some risk that if demand exceeds capacity their supply will be cut off. The higher firm supply price means that consumers who value the service most will choose this option. Those users who are only prepared to pay the lower interruptible price, because they place a lower value on having a guaranteed supply, will be the first to be cut off if supplies are inadequate to meet demand. Such a system of firm and interruptible tariffs is operated by British Gas, for example.

(ii) Electricity

The production and supply of electricity to final consumers is a highly complex, integrated process which can be broken down into four stages, as follows:

1. Generation;
2. Transmission;
3. Distribution;
4. Supply to individual customers.

The first and last of these activities is potentially competitive. In contrast the transmission and distribution systems are natural monopolies. By transmission we mean the high voltage nation-wide network of lines which carry power from the generating stations. Distribution involves taking power from the high voltage

transmission network, reducing voltage by means of transformers to levels suitable for industrial and domestic usage and then supplying power to individual homes and business premises by means of the lower voltage local line network. Both transmission and distribution involve high sunk costs. Total ESB investment in the distribution system since 1988, for example, amounted to £516m (see Table 2). Currently the ESB is the only entity which may sell electricity within the State and it owns virtually all of the generating plant along with the transmission and distribution network.

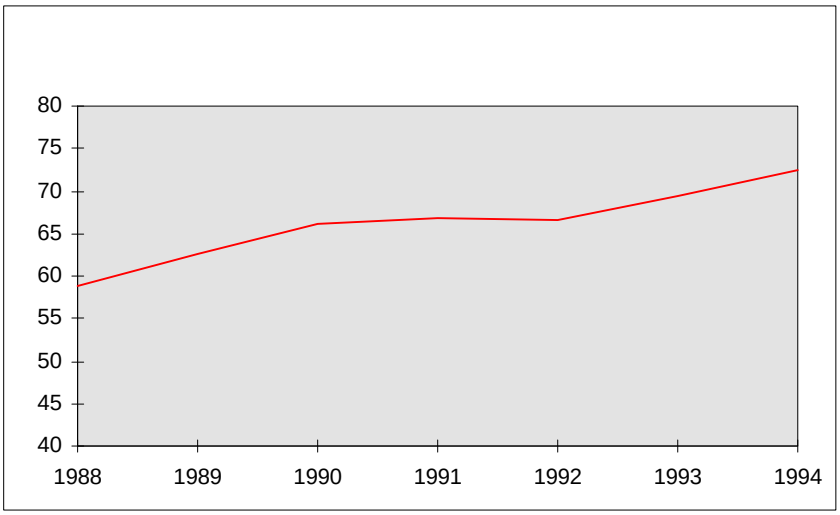
Table 2 ESB Annual Capital Expenditure (£m)

Year	Generation	Transmission	Distribution	General
1988	18	10	50	12
1989	12	5	54	14
1990	12	2	62	16
1991	24	2	70	20
1992	34	4	84	18
1993	35	8	106	21
1994	41	6	90	17

Source: ESB Annual Reports.

Electricity is costly to transport and a proportion is lost in the course of transmission. Transmission losses increase with the level of use of the system and with distance. The situation is further complicated because supply is subject to unpredictable outages. Balance between supply and demand must be maintained constantly throughout the system otherwise non-localised power outages or blackouts will occur. The need to maintain constant balance between supply and demand requires very close co-ordination between generation and transmission and is a major reason why these two activities have traditionally been vertically integrated. Installed generating capacity has to exceed demand and indeed Figure 1 illustrates that present ESB generating capacity is well above the level of peak demand. Plant has to be up and ready to supply to cope with any sudden surge in demand or plant failure. This is referred to as ‘spinning reserve’. In addition to the requirement that some stations be run in order to meet spinning reserve requirements, start-up costs mean that it may be better to keep stations running even when they are not producing rather than shutting them down and starting them up again.

Figure 1 Peak Electricity Demand as % of Installed Generating Capacity

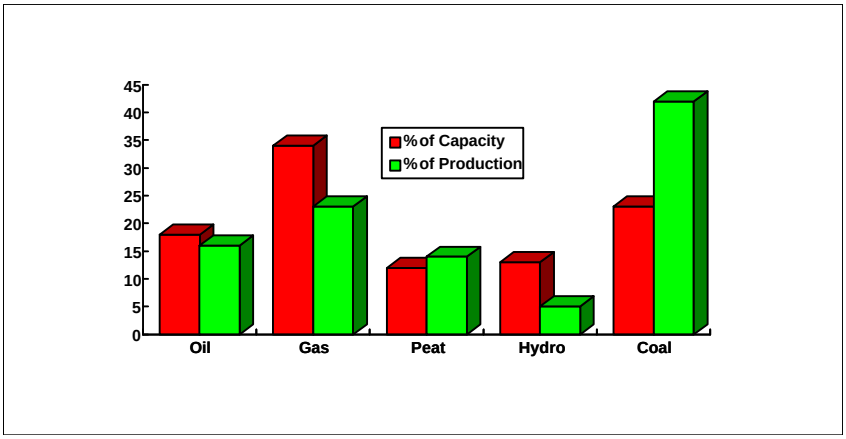


Electricity systems generally use a mixture of different plant types with a diversity of fuels. Figure 2 gives details of ESB installed generating capacity and electricity production by fuel type. Coal accounted for 42 per cent of electricity generated in 1992 compared with just 1 per cent in 1983/84. Hydro accounted for only 5 per cent of total generation with the remaining 53 per cent spread between gas, oil and peat. Very small generating units have traditionally been regarded as inefficient with estimates that capacity of around 400 MW was the minimum efficient scale for fossil fuel generating plants (Armstrong et al., 1994). Technological changes, however, mean that small scale generating plant may be efficient and could become more common in the future.

Table 3 gives details of trends in electricity generation, sales and revenue over time. Total electricity sales in 1994 amounted to 14025 million units - an increase of 4.4 per cent on the previous year. Since 1985/86 total electricity sales have increased by 43 per cent while ESB customer numbers have grown by 15 per cent. Over the same period staff numbers have fallen by 8 per cent, while the average price per unit of electricity sold has fallen by 19 per cent in nominal terms or 36 per cent in real terms. The fall is partly because of the Government's failure to sanction any price increase in spite of applications by the ESB.

Figure 3 illustrates the pattern of electricity consumption. The domestic and industrial sectors each accounted for around 38 per cent of total electricity consumption in 1994 with the commercial sector accounting for the balance.

Figure 2 ESB Generating Capacity and Output by fuel type, 1992



Source: ESB Annual Report, 1992. Note: 81% of gas plants can also burn oil.

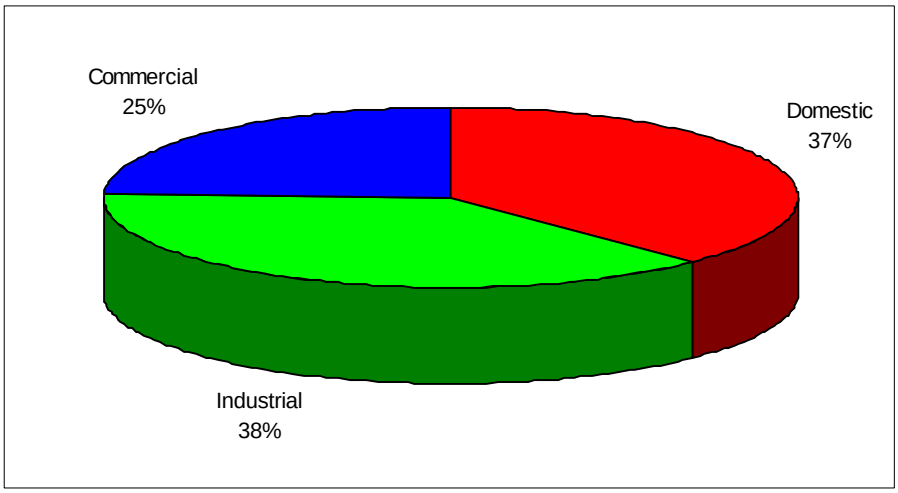
Table 3 Electricity production and sales various years

Year	Units Sold millions	Average Price per Unit Sold (p)	Customers ('000)	Staff ('000)
1985/86	9788	7.736	1195	12114
1986(a)	7295	7.548	1207	11763
1987	10506	7.010	1222	11383
1988	10616	6.666	1235	10903
1989	11169	6.542	1257	10724
1990	11768	6.425	1279	10490
1991	12370	6.348	1302	10096
1992	13104	6.307	1327	10340
1993	13439	6.269	1348	10028
1994	14025	6.238	1376	9784
% change 1985/86-94	+43.3	-19.4	+15.1	-19.2

Source: CSO; Statistical Abstract 1993, Table 14.7 and ESB Annual Reports.

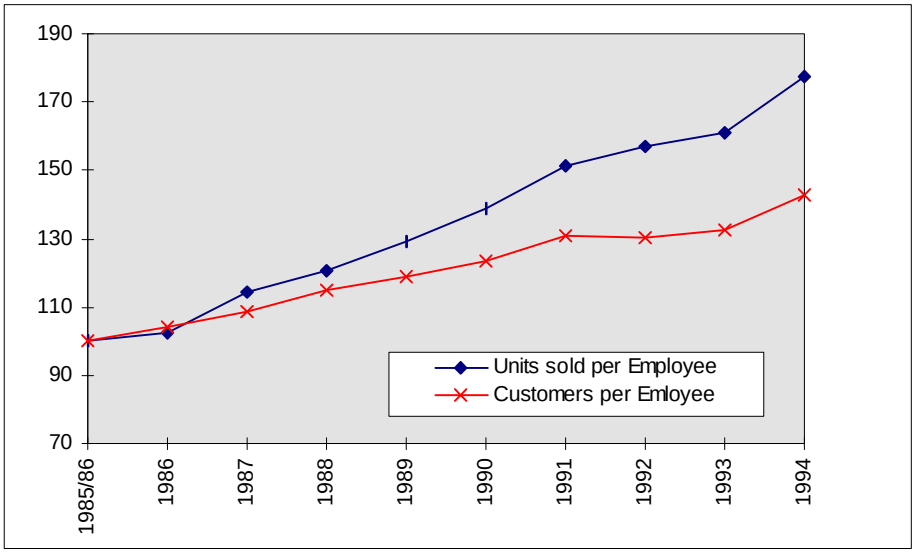
Figure 4 illustrates that productivity measured both in terms of units sold or customers per employee has increased considerably. Nevertheless in spite of such improvements and the fall in electricity prices the indications are that further rationalisation is required in order for the ESB to cope with the prospect of competition. Initially the Costs and Competitiveness Review reportedly aimed to cut costs by £120m. The outturn now looks like resulting in a somewhat lower level of savings

Figure 3 Distribution of Electricity Sales in 1994



Source: ESB Annual Report, 1994

Figure 4 ESB Productivity (1985/86=100)

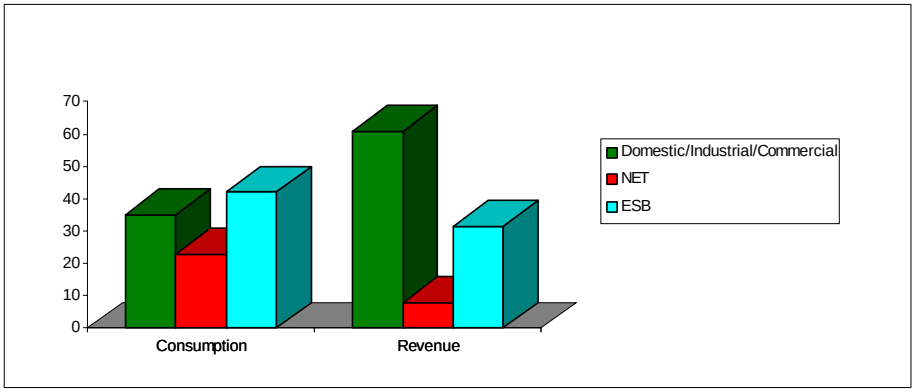


Source: CSO and ESB Annual Reports.

(iii) Gas

The natural gas industry is similar in many respects to electricity. Natural gas production involves the extraction and pumping ashore of natural gas from the Kinsale Head and Ballycotton gas fields which is then transmitted and distributed by a network of pipelines for supply to individual consumers. Production and supply are potentially competitive and indeed the extraction and piping ashore of gas is carried out by private sector exploration companies. All natural gas extracted offshore must, however, be sold to BGE for resale. BGE also controls the national gas grid (transmission network) and during the 1980s it acquired control of all of the old town gas companies giving it control of the local distribution networks for natural gas. The main gas pipeline is largely confined to the South and East of the country and it is estimated that around one third of households are within the pipeline network (BGE. 1994). 78 per cent of the reserves in the Kinsale Head and Ballycotton fields had been depleted by the end of 1994 and the fields will be exhausted by the turn of the century (ibid.). The completion of an interconnector linking the Irish gas pipeline to the UK means that natural gas can be imported from other European countries, thus ensuring continuity of supply in the absence of any further offshore discoveries. Equally importantly the interconnector means that, theoretically at least, larger customers could purchase from overseas suppliers, creating scope for competition from imports. The pattern of gas consumption and sales is shown in Figure 5 below.

Figure 5 Percentage Distribution of Natural Gas Consumption and Revenue, 1994



Source: BGE Annual Report, 1994

More than 40 per cent of natural gas in 1994 was supplied to the ESB for electricity generation. A further 23 per cent was provided to NET - a state owned company engaged in fertiliser production in a joint venture with a subsidiary of ICI. The remaining 35 per cent of gas consumption was due to the household, industrial and commercial sectors with households accounting for only 11 per cent of the total. Gas

is supplied to the ESB and NET at prices which are well below market rates. Revenues from sales to NET represented just £17m out of total sales revenue of £217m, or less than eight per cent of BGE revenue. Households along with industrial and commercial users contributed almost two thirds of BGE revenues. Competition from other fuels means that domestic and commercial users are probably not paying above market prices. Rather what is happening is gas is being sold at below market prices to the ESB and NET involving a reduction in profits of BGE which are being used to subsidise the activities of other State owned companies.

(iv) Telecommunications

The telecommunications sector is currently experiencing massive technological changes. Telecommunications services now extend far beyond basic voice telephony as the distinctions between telecommunications, broadcasting and computer services are becoming increasingly blurred. In considering the sector it may be useful to distinguish between the actual telephone network and the services provided over the network, while recognising that the distinction between these concepts is not always clear cut. The telecommunications network connects users by means of a combination of exchanges and transmission links. Subscribers are connected to local exchanges by means of a 'local loop'. These are in turn linked to trunk or long-distance exchanges and ultimately to international networks. In practice local exchanges may be connected to more than one main exchange, thus providing several possible routes for any long distance call.

The capacity of telecom networks has been greatly expanded by the introduction of fibre optic cables in place of the traditional copper wires. For example, a single fibre, thinner than a human hair, can carry 30,000 simultaneous telephone conversations (Economist, 30 September 1995). While installation costs for fibre optic and traditional cables are similar, the maintenance costs of the former are far lower. The introduction of fibre optic cables has also dramatically reduced the long-run marginal cost of long distance calls. The increased capacity of fibre optic cables combined with the growing complexity of exchanges which now use electronic switching equipment has also greatly extended the possible range of services which can be provided over the network. Digital transmission has replaced traditional analogue signals leading to a growing convergence between telecommunications and computing technology. By 1993 digital exchanges accounted for 66 per cent of Telecom Eireann's capacity while 70 per cent of the transmission network consisted of fibre optic cables (Hall, 1993).

At local level cable television companies have emerged as significant competitors to public telecommunications operators (PTOs) in countries such as the US and UK. Traditionally cable systems, unlike telephone networks, sent information over their network in one direction only. The coaxial cable normally used for cable networks provides much more bandwidth than the copper wires traditionally used in telephone networks. In other countries cable companies have been installing fibre optic cables.

Providing telephone services over their networks means that cable companies can generate an additional revenue stream from their networks. Ireland already has a well established cable network covering all of the major urban areas, although each cable operator has a statutory monopoly in its allotted territory. Currently Telecom Eireann is the majority shareholder in Cablelink, which provides cable services in Dublin, Galway and Waterford. Cablelink is estimated to enjoy profit margins of 23 per cent and to earn a profit of £17 per subscriber. In spite of this, however, it sought and apparently obtained approval to increase its standard price by £10 per subscriber in late 1995.

Table 4 outlines some indicators of performance in respect of Telecom Eireann. Turnover has increased from £704m in 1990 to £979m in 1995 - an increase of 39 per cent. Over the same period the number of exchange lines increased by 28 per cent while employment fell by almost 12 per cent. Telephone traffic measured in terms of local and STD metered units increased by 31 per cent. Telephone charges in Ireland for many services are expensive by international standards due to Telecom's high cost base. A recent survey of seven EU member countries found that Ireland had the highest telephone charges for business of the countries surveyed (Irish Times, 22 May 1995). As Figure 6 illustrates, however, labour productivity in Telecom Eireann, in terms of main lines per employee in 1990, was the lowest in the OECD. Between 1990 and March 1995 the number of lines per Telecom employee increased by 34 per cent from 73 to 98. This would still only put Telecom ahead of the 1990 figure for Australia, New Zealand and Turkey. In contrast the number of lines per employee in Telecom New Zealand has increased from 86 to 214 between 1990 and 1994 (The Treasury and Ministry of Commerce,

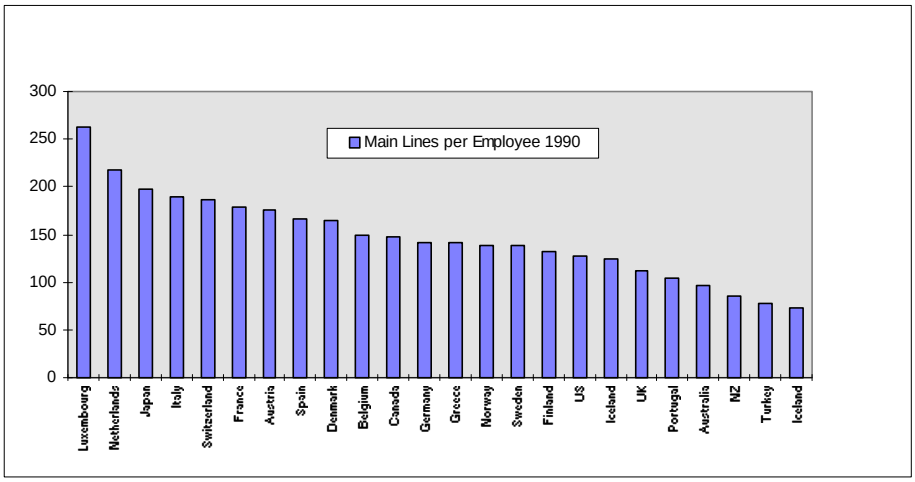
Table 4 Some Indicators of Performance for Telecom Eireann

	1990	1991	1992	1993	1994	1995	% change 1990-95
Turnover £m	704	782	788	814	871	979	+39.1
Profit	79	94	91	94	80	74	-6.3
Exchange Lines ('000)	967	1029	1048	1154	1170	1240	+28.2
Local & STD Metered Units million (estimates)	3747	4010	4330	4406	4582	4921	+31.3
Employment	14367	13964	13425	13033	13069	12662	-11.9

Source: Telecom Eireann Annual Reports and CSO Statistical Abstract, 1993, Table 12.32.

1995). It is clear that productivity in Telecom still needs to increase substantially just to reach the level of the next lowest telecom operator in the EU. Thus, as in the case of electricity, there is scope for considerable efficiency gains in telecommunications.

Figure 6 Main Lines per Employee, 1990



Source: OECD, (1993).

Figure 7 outlines the distribution of Telecom Eireann revenue in 1995. Not surprisingly the largest component is due to telephone traffic which accounted for 62 per cent of total revenue from telecommunications traffic. Rental income accounted for a further 21 per cent of total revenue. As already noted two part tariffs in the form of fixed rental charges combined with charges for usage represent an efficient mechanism for dealing with the fact that the telecom network involves high levels of sunk costs with low marginal costs of production.

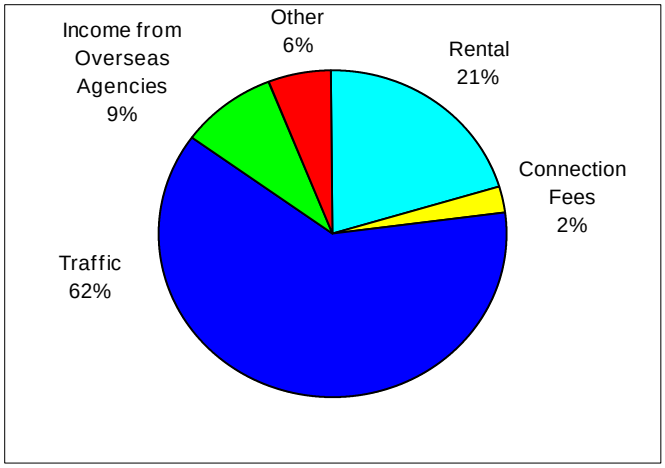
3. INCREASING COMPETITION

(i) The Case for Greater Competition.

In most industries competition between individual producers results in the production of the highest possible level of output at the lowest possible cost. In contrast monopolies have generally been identified as being inefficient, resulting in higher prices and lower levels of output compared with competitive markets. Monopolies impose significant unnecessary costs on society. Higher monopoly prices reduce consumer surplus and result in deadweight losses to society. Monopolists face less incentives to operate efficiently leading to what has been described as X-inefficiency. Monopolists also have an incentive to engage in 'rent-

seeking' behaviour in an attempt to maintain their monopoly position. Such behaviour is wasteful from the perspective of the economy at large.

Figure 7 Distribution of Telecom Eireann Revenue, 1995



Source: Telecom Eireann Annual Report, 1995

In addition, because of their monopoly status and their key position in the economy as providers of essential services to business and consumers, there will generally be a demand for regulation in some form or other to prevent monopoly utilities from abusing their dominant position. The resources employed in such regulatory regimes represent a further cost to society of monopoly in such industries. Lack of competition allows monopolists to continue producing poor quality/high cost services while still keeping their customers. In the case of natural monopolies economies of scale mean that a monopoly will be more efficient than several competing firms. In the case of a small open economy such as Ireland, inefficiencies attributable to monopolies adversely affect the cost structure facing the traded goods sector, thus undermining its ability to compete with foreign competitors. This has serious adverse consequences for employment in the traded sector and in the economy as a whole.

Experience of liberalisation of energy and telecommunications markets elsewhere shows that competition has resulted in increased efficiency, lower prices and improved quality and range of services to consumers. OFTEL (1994) reported that telephone charges in the UK had fallen by 35 per cent in real terms since 1984. This was in spite of the fact that initially competition was limited by the government decision to allow only one new entrant to the industry, thereby establishing a duopoly. In the US the break-up of the AT&T telephone monopoly following a lengthy antitrust case resulted in residential long distance telephone charges falling by 50 per cent in real terms since 1984 without unduly compromising universal

services (Bingaman, 1995). Increased competition in US telecommunications hastened the deployment of fibre optic technology and spurred an increase in technological innovation (US Department of Justice, 1994). In New Zealand liberalisation has resulted in falls in both household and business charges.[4] It was also accompanied by a major investment programme which has meant that 98 per cent of lines are now connected to digital switches. Competition in telecommunications was also found to have yielded substantial benefits to users and PTOs in Australia and Japan (OECD, 1992). In the case of electricity in the UK large customers' bills have fallen by 10 per cent on average in real terms while prices to smaller customers are down by 4.5 per cent (Green, 1995). Henney (1994) also found that liberalisation of the electricity industry in the UK, while suffering from certain shortcomings, nevertheless represented an improvement on the previous regime where generation was confined to a monopoly producer (For a more detailed review of the benefits from introducing competition in public utility industries see OECD, 1992).

(ii) The Scope for Increased Competition.

Electricity generation and retailing are not natural monopolies and indeed the ESB does not have monopoly rights in respect of generation. Competition could therefore be introduced in electricity by permitting suppliers other than the ESB to sell directly to consumers. Minister Lowry has announced that from 1 January 1998 electricity producers will be able to sell to very large users. It appears, however, that only a small number of firms will be able to purchase electricity in their own right as a result and the ESB has reportedly lobbied to have this small number reduced even further.

The Minister also announced proposals for the establishment of an independent power procurer. Originally this was to be an independent subsidiary of the ESB. It would be responsible for purchasing electricity from all suppliers and reselling it to users. It would appear that EU Commission proposals in respect of electricity would greatly limit the scope for such a scheme (see below). The alternative is to establish a wholesale electricity market where suppliers and consumers can purchase and sell electricity. Wholesale electricity pools now operate in some fifty countries. The main features of such a pool are as follows:

- The pool would bring together buyers and sellers and would provide a non-exclusive forum for contract trading. It would establish an independent spot or real time price and would provide for metering, reconciliation and settlement of transactions according to agreed pool rules.
- The introduction of long-term contracts, standardised secondary contracts and a contract trading market.

- The introduction of 'security hedges' which would provide a mechanism for wholesale buyers to contract with generators for firm supply.
- The establishment of a suitable framework for market governance and management.
- The provision of information services.
- Transitional measures to deal with ESB's market power until effective competition in supply is achieved.
- Clarification of the relationships between the pool and the transmission network.

The above proposal is based on proposals for the development of a wholesale electricity market in New Zealand where the option of a single wholesale purchaser was rejected (WEMDG, 1994).

Competition is also possible, theoretically at least, in the case of natural gas supply by allowing overseas suppliers to supply customers in Ireland by using the interconnector link with the UK. Interestingly the ESB has reportedly sought the right to import gas through the interconnector but thus far it has not been able to reach agreement with BGE regarding charges for the use of the inter-connector. Not surprisingly the chairman of BGE is reported as saying that it would prefer to sell the ESB gas that it has imported, rather than let the ESB use the interconnector for a fee. The Department of Transport, Energy and Communications is reportedly in the process of commissioning a study on the question of third party access to the gas pipeline network (Irish Times, 28 October 1995).

The position in telecommunications is somewhat different. Telecom currently enjoys a monopoly position in respect of most core telecommunications services. However, there has been some liberalising of parts of this market, partly as a result of pressure from the EU Commission, and partly because of technological developments. Telecom is exposed to competition in international markets from domestic suppliers using leased lines and from overseas call-back services. Leased lines are also being used to introduce competition on internal long distance calls. A licence has been awarded to a second mobile operator. Competition in local services is also theoretically possible given the high level of penetration of cable systems in all major urban areas.

Given that various parts of the public utility industries are potentially competitive, it would appear that permitting competition in such areas would prove to be economically beneficial. Indeed the Culliton Report on Industrial Policy recommended that the utilities should be opened up to competition (Culliton, 1992). It must be conceded that, given the nature of the industries we are dealing with, competition may suffer from certain shortcomings. The fact that the outcome under competition might fall some way short of the ideal solution does not mean that it is

not a desirable option. The question is whether competition can produce a superior outcome to that achieved under a regulated monopoly.

Unfortunately there are worrying signs that attempts are being made to limit the development of competition. The single power procurer model, for example, has been seen as limiting competition (The Economist, 3 June 1995). It is worth noting that, according to its Chief Executive, this model was proposed by the ESB itself as:

> 'We recognised that if the company was to remain vertically integrated there was going to have to be a power procurer.' (Business and Finance, 6 April 1995).

Telecom substantially increased its leased line charges late in 1995 and reportedly indicated that many of the companies hardest hit by the increase would migrate to more cost effective services. Telecom announced that the charges had been independently audited (Irish Times, 17 November 1995) but this is a long way from a transparent scheme for regulating such charges. This illustrates a more general problem in Ireland, namely the lack of any agency charged with the task of publicly advocating the virtues of competition throughout the economy.

(iii) Possible Difficulties

While liberalisation or deregulation of the public utility industries would make competition possible, at least in theory, it has to be recognised that, of itself, it would not necessarily result in competition emerging. The transmission and distribution networks for electricity and gas constitute natural monopolies and it would be inefficient for any new entrant to construct an alternative transmission and distribution system. It would therefore be necessary to allow private producers access to the transmission and distribution networks. Such a proposal is in line with that made some years ago for electricity by Jakobsen (1984). Incumbent operators, however, have a strong incentive to deny competitors access to their distribution networks or to impose excessively high charges for access to prevent competition. Ergas (1995) observes that:

> "Even if it were in the incumbent owner's interest to allow competing entry because its owner's losses from increased competition in the downstream market would be outweighed by gains from access revenues and enhanced internal efficiency, principal-agent problems may still lead the firm's managers to refuse to deal. Particularly in public enterprises with a long history of public ownership, managers may be output or employment maximisers, more interested in retaining market share than in increasing shareholder value. Being risk-averse, the incumbent's managers may weigh the certain loss of a 'quiet life' far more heavily than the uncertain gains they could secure from operating in a competitive environment.....As a result the

> firm's managers may stall or obstruct access by the entrant even when such access would have been granted by the facility's owners."

Stern (1992) claims that incumbent firms in the gas industry throughout Europe deliberately exaggerated the problems and advanced obscure technological arguments to block proposals that EU member states grant gas suppliers from other states access to their networks. In the UK it took almost four years of negotiations to secure agreement on the question of access charges permitting Mercury to enter the market in competition with British Telecom. Similarly in New Zealand disputes between Telecom New Zealand and Clear Communications relating to access charges for the local loop were only resolved after a long drawn out court battle which was ultimately decided by the Privy Council in London. Interconnection charges in respect of a number of other telecommunications services were agreed without too much difficulty, however.

Technological changes mean that local telephone networks may no longer constitute a natural monopoly. In New Zealand, for example, one new entrant has constructed networks in the major cities. Similarly cable TV networks can be used to provide telephone services and in the UK many cable operators are currently installing local networks. Any new entrant wishing to compete in the market would still need access to the existing Telecom network. This is because potential subscribers to any alternative telephone network will want to be able to make calls to existing network subscribers. Indeed unless they could have such access, there would be no incentive for any consumers to subscribe to any new network so that denial of such access would effectively prevent a competing service from getting off the ground. Consequently even though the local network may not be a true natural monopoly, access to the existing network is still vital for entry to the market

For some time after the lifting of restrictions on entry, new entrants are likely to provide only very limited competition to the incumbent firms. In 1992, for example, purchases of electricity by the ESB from small suppliers amounted to only 34.4 million units which represented just 0.2 per cent of sent out load. Admittedly there are some large industrial concerns in the State which generate their own electricity. Some of these might have some spare capacity and might be capable of selling some power to other consumers. Realistically this is still likely to represent only a very small proportion of total electricity demand. Consequently the removal of restrictions on selling electricity will provide little competition and the ESB is likely to remain the major electricity generator for the foreseeable future. Over time this could change if liberalisation attracted more private investment into electricity generation. Arguably the situation in telecommunications may be different. Telecom is already exposed to competition in the international calls market from other suppliers using leased lines and from call back services located outside of the State. It appears that it will soon face competition on internal long distance services. Nevertheless in the market for local calls competition may remain rather limited for some time, although this could be altered if Telecom was required to dispose of its

share holding in Cablelink. Overseas experience is mixed. Even now, British Telecom still has over 90 per cent of the UK market, but in New Zealand, Clear Communications has managed to capture 20 per cent of the internal long distance and international business (The Treasury and Ministry of Commerce, 1994).

The impact on incumbent behaviour of the threat of new entry should not be entirely discounted. The experience of electricity deregulation in New Zealand where firms have been permitted to generate and/or transmit electricity in competition with the state owned Electricorp since 1988 is worth noting in this regard. Electricorp reduced its unit costs by 23 percent in its first three years of operation, with real costs per unit of electricity falling by 18 percent between 1987/88 and 1988/89. Spicer, et al (1991) identified considerable improvements in Electricorp's financial performance, compared to that of its predecessor, the Electricity Division of the old Ministry of Energy. They also found that output per employee was substantially higher, while the improvement in performance was not achieved at the expense of quality of service. Turner (1989) observed that competition provided a very strong stimulus to improving performance and attributed the cost savings achieved by the company, at least in part, to such pressures. The level of competition to which Electricorp is actually exposed is somewhat limited and it could be argued that the efficiency gains achieved were due to reforms in public sector management procedures rather than a result of increased competition (see Massey, 1995).

Nevertheless Spicer et al (1991) report that Electricorp senior management saw competition from new entrants as a very real threat and this had a significant effect on its pricing strategy, which in turn required significant changes in order to reduce costs. It could be argued that Electricorp's response was designed to deter new entrants and preserve its dominant position. Six years after liberalisation of the New Zealand electricity market it was felt that Electricorp's dominant position had prevented the development of effective competition and this prompted the Government to break up its generating activities and establish a wholesale electricity market There are limits to the effectiveness of potential competition if none actually materialises as utility industries would not appear to satisfy the requirements for contestability.

A third difficulty often raised in the context of proposals to introduce competition into the utility industries is the threat of 'cream skimming'. This arises because the incumbent state firms are required to provide services on terms which make it uneconomic to do so. Rural customers, for example, do not bear the full cost of being linked to the network but are cross-subsidised by other consumers. In such circumstances the removal of restrictions on entry may cause new entrants to concentrate on those segments of the market where the costs of providing services are lowest and where they will be able to undercut the price of the incumbent firm, since they do not have to cross-subsidise operations elsewhere. This raises the question of whether charges for access to the transmission and distribution networks should in some way reflect the costs of the provision of uneconomic services in order

to prevent 'cream skimming'. This latter point needs to be treated with some degree of caution.

(iv) Incumbent Advantages.

The basic advantage of any statutory monopoly is that it has been given the opportunity to establish itself in the absence of competition. The three utilities being considered here have all had the benefit of this statutory protection; and, for their physical networks, have had powers to compulsorily purchase land or easements. They also have miscellaneous statutory powers, privileges and protections of varying importance.

(a) Electricity.

The ESB is established by the Electricity Supply Board Act, 1927 and it has a statutory monopoly of generation, transmission, distribution and sale to the public[5]. Originally, electrical generation had been owned privately, but existing operations were acquired successively by the ESB. The Board has power to make orders affecting and to issue permits to any new "permitted undertakings" to generate, distribute or supply, so that no new entry into generating has been able to occur, or grow, without the consent of the ESB.

The ESB has had the benefit of compulsory purchase powers, and the right to enter on lands in specified circumstances in pursuance of the job of building and maintaining the network[6]. If it were a given that the transmission and distribution network was a true natural monopoly, these privileges would not be enormously relevant to the areas in which competition is possible i.e. generation and retail sale. However, under EU draft legislation independent producers would be free to construct direct lines to their large customers. Thought will have to be given to the extent to which it will be appropriate to replicate these privileges for private operators to permit the construction of such lines. There is an argument to be made that exact replication now of the ESB's privileges would lead to insufficient regard for planning and environmental considerations.

The status of the ESB as a State company is marked by statutory privileges; the power to make delegated legislation in respect, e.g. of trespassing at generating stations, and the transmission and distribution system;[7] the creation of a criminal offence, of discharging corrosive matter into water where it can get into a generating station owned by the ESB.[8] Vis-a-vis its customers, the Board may enter any premises to which electricity is supplied to check meters[9]. Some of these privileges could be reproduced by way of contractual provision by any competing supplier. Even where they cannot, they may not be a benefit of any commercial significance. However, it is suggested, there is an intangible benefit to any company which is identified in the eyes of its customers, by such statutory indicia, as the "real" or State endorsed provider. It is suggested these privileges are or would become anomalous

where new entrants were offering, for example, to supply electricity to households in direct competition with the ESB.

(b) Gas

BGE is set up by the Gas Act, 1976. It is not in terms given a monopoly of the sale of gas to the public. Instead it is provided that all gas landed in the State or got within the jurisdiction of the State by a licensee under an exploration licence shall be offered for sale to the Board on reasonable terms.[10] Not unlike the ESB's situation, the Board is not given statutory protection for all its areas of operation, but has a *de facto* monopoly resulting from the statutory protection it does have. The Board may make use of acquisition orders to lay pipeline over or under land. No other person may lay a pipeline without the consent of the Minister.[11] The Minister for Transport Energy and Communications may with the agreement of the Minister for Finance give the Board general directions on pricing policy but does not have power in relation to a price to be charged in a particular case.[12]

(c) Telecommunications.

Bord Telecom is established as a statutory company by the Postal and Telecommunications Services Act, 1983. Its statutory monopoly includes telex, mobile radio telephony, paging and satellite services. It does not include cable television, which is regulated by the Wireless Telegraphy Acts, 1927 to 1972, or radio and television broadcasting. Telecom's role as a shareholder in Cablelink, the cable network owner, does not carry with it its statutory privileges in respect of its telecommunications functions. The exceptions to Telecom's monopoly are for limited applications which are mainly not of commercial importance[13]; internal telecom systems within private homes, or within one building or between employees of one business, for internal use. Telecom is given some miscellaneous statutory privileges, applicable to all its services; it is immune from tort or contract liability for various failures or delays of the system[14]; it is a criminal offence wilfully to cause Telecom to suffer loss in respect of a rental, fee or charge[15]. As in gas and electricity, these may be anomalous in a competitive market

4. EU LAW

The existing and proposed sector specific legislation affecting the three utilities shows some common threads. The EU will require barriers to new entry to be removed; it will encourage access to networks to take place on a commercially negotiated basis; and it will allow for and may require the funding of a universal service obligation, the minimum content of which will be prescribed, from competitors within the sector. It will require Member States to put in place a body, or bodies, as the regulator of specified questions of licensing and dispute resolution. It does not provide for the control of output pricing.

(i) Electricity

Steps in respect of electricity began in the wider context of an internal market for energy. The Commission issued a draft directive in 1993[16] based on the principle of Third Party Access. The net question which has been most problematic for Member States was whether liberalisation would be by way of permitting Third Party Access to the grid, or by way of appointing a Single Buyer. The Commission reported[17] in 1995 to say that it would be possible for Member States to proceed by way of a Single Buyer regime if and only if the type of Single Buyer put in place by a Member State complied with criteria which the Commission then defined. These are, inter alia, that:

- large customers would be able to negotiate directly with independent producers and importers, including agreeing price;
- the Single Buyer would act as a transparent mechanism for the transport of electricity bought by such direct negotiation;
- the Single Buyer would be obliged to buy all electricity offered;
- distributors, as well as large customers, would be eligible to buy from the Single Buyer.

The Council of Ministers[18] has agreed in principle that it will be possible for Member States to choose whether to proceed by way of Single Buyer or Third Party Access. The apparent compromise has not been effective to move the political discussion forward since the member states have yet to reach agreement as to the minimum content of the legislation. The networks to which access would be granted are the transmission and distribution grids. The third parties to whom it is proposed to give access are specified as being generation and transmission companies inside or outside the territory who wish to supply distribution companies or large industrial customers or their own establishments. This presupposes the absence of national bans on the import of electricity. The Commission has brought Article 169 action against all the Member States in respect of their import and export bans which includes Ireland as a defendant. Third party access where chosen would be given on a negotiated basis, with Member States providing a dispute resolution mechanism. The Commission Working Paper[19] states that the Single Buyer where that is chosen

would have to buy electricity in unlimited quantities from all willing and qualified sellers, inside or outside the State; and where buying for transmission to a specific user must charge them a traffic cost for transmission which is published and transparent.

The 1993 draft directive, apart from Third Party Access to the grid proposes unbundling of the vertically integrated companies and opening up of the construction of generating and transmission capacity. The "unbundling" provisions would require the separation of accounts for production, transmission and distribution activities, and, in the case of vertically integrated companies such as the ESB administrative independence of the grid operator from the other activities. What is proposed in relation to the construction of generating and transmission capacity is either (a) non-discriminatory licensing procedures; or (b) competitive tendering organised by an independent regulatory body; for the construction of generation or production capacity. There is reportedly a Government decision that the ESB will lose its monopoly of generation by 1998.

The liberalisation of construction and operation of generating capacity would require some institution to oversee the commissioning of that capacity. The Commission states that the proper person to have oversight of the issue of commissioning production capacity is a public body independent of the grid operator. At the time of the announcement of Minister Lowry's choice of the Single Buyer system, it was reported that parts of this function will be reserved still to Government. The question whether it is possible for a Minister, who also gives commercial directions to the ESB, to operate directly a non-discriminatory licensing procedure is explored below.

The draft Directive provides for refusal of authorisations on the grounds of non-respect of public service obligations. It is assumed in the draft that Member States are free to expand the present scope of universal service obligations imposed on generating companies, subject only to an obligation to make the content thereof public.

(ii) Gas

The Commission took the view in 1992 and 1993 that liberalisation of the energy market would proceed with electricity first, and then gas. Since then there are indications that the Commission may in fact act by way of Commission directive rather than Council legislation. The legislation before the Council in respect of gas is a draft directive[20] parallel to that currently being considered in respect of electricity, the basic provisions of which are as follows.

Natural gas undertakings shall be operated on commercial principles (This mirrors a similar provision for electricity undertakings, and both provisions are subject to the imposition of a public service obligation.). Licences shall be granted for the building and operation of gas facilities, storage, transmission and distribution on qualitative

and not quantitative grounds. Licence conditions shall be published, objective and non-discriminatory and concern safety and environmental considerations, and the capability of undertakings. Transmission companies, i.e. those owning transmission grid, "shall conclude all agreements necessary" with other transmission companies "to enable a user ...to use the interconnected system". Costs of all transmission and distribution companies must be unbundled. Member States shall take all necessary steps to allow commercial agreements to be negotiated between suppliers, large industrial customers and distribution companies, and to provide a dispute resolution mechanism. Member States shall ensure that producers and customers are able (in the sense of free, it is suggested) to sell and buy gas by means of a direct line.

(iii) Telecommunications

The Telecom area of privilege has been successively eroded by EU legislation. The Terminal Equipment Directive[21] required the removal of statutory privileges in supply of terminal equipment and required licensing to be subject only to specified qualitative criteria. Telecom had previously had the benefit of one of the limited number of licences issued by the Minister under section 111(2). The Services Directive, 1990[22] required that services, other than the public provision of voice telephony be opened to all comers, subject only to specified, qualitative, licensing criteria. This did not apply to mobile radio telephony, paging or satellite services, but it opened the market for the provision of Value Added Services (VAS) of handling and storing voice telephony, such as voice mail systems, and voice and data services for internal use in businesses and closed user groups, e.g. bank or airline reservation dedicated lines. These are still licensed by the Minister under s.111, but there is no quantitative criterion. In practice applicants are required to declare that they will not provide voice telephony, and that they will use the public network. SI 328 of 1994 obliges a National Regulatory Authority (NRA) to publish details of licensing and declaration requirements, and conditions for the attachment of terminal equipment to leased lines.

(iv) Access Pricing

Neither terminal equipment nor VAS provision raise issues of access pricing, or output pricing. The Leased Lines Directive[23] however obliged Telecom to provide to applicants a minimum set of leased lines, for use or resale since 5 June 1993. The directive requires the cost of lines to be "cost oriented". Access to the incumbent's network is also necessary, and the Open Network Provision Directive[24] lays down "guiding principles" and "essential requirements" for ONP conditions of access. These are, principally, that the conditions for interconnection must be objective, transparent and published; they must guarantee equality of access and they must be non-discriminatory. Only reasons based on security of the network, maintenance of the network integrity, protection of data and the interoperability of services should be applied to limit access to networks or services. For leased lines, the Minister for Transport Energy and Communications created the NRA to "decide on.. disputes

between (Telecom Eireann) and users in matters relating to any refusal to provide leased lines, or the interruption of the provisions to provide leased lines." There is not explicit provision for the resolution of interconnection charges as a separate issue.

The Commission proposals for legislation for the opening up of voice telephony and the licensing of new entrants[25], and the specific issue of determination of interconnection charges[26] would require the removal of all barriers to new entrants to voice telephony. They would also specify the principles to be applied by Member States in "interconnection, with regard to...universal service and interoperability" applying the principles of Open Network Provision. It would require Member States to remove any obstacle to the free commercial negotiation of interconnection. It would also place a direct obligation on operators of the public network, and public telecommunications services, to provide interconnection. The cost of interconnection may have an added element, added by the Member State, of a charge for the provision of the universal service obligation, which must be calculated in a transparent way. The draft directive would go further than the ONP directive in providing that charges "promote economic efficiency and sustainable market entry" and that they "normally" include "re-imbursement of one-time costs of interconnection" and usage charges, which may be capacity based charges, and/or traffic related charges. Clearly, the practical issue in calculating charges on any of these bases also requires that it be made possible to find true costs.

(v) Universal Service Obligation

The Services Directive[27] takes as given that the "task" (in the Article 90 sense) assigned to the national PTOs is the provision of the universal network. It is also assumed that the USO should be financed by cross subsidisation from within the sector. The subsequent Commission proposal for a directive on voice telephony[28] takes the present minimum content of a USO as being connection to a network, for basic voice telephony, emergency services, and public call boxes. It also appears that Member States will be free to increase that minimum content, and require competitors to fund it, subject to doing so in a transparent fashion. Council Resolution 94/C/48/01[29] on universal services principles in the telecommunications sector states, inter alia, that "the concept of universal service must evolve to keep pace with advances in technology, market development and changes in user demand". This reflects the general EU approach that the content of the universal service obligation will and should increase.

(vi) The Treaty Rules

The Treaty Rules apply to the three sectors under consideration, excepting only to the extent that sector-specific legislation is in place. In the telecommunications sector, the Commission has stated that bans on entry to voice telephony are justified by reference to the universal service obligations of telecoms operators. Clearly, this

acts as an estoppel on the Commission. Since it is however, in effect, no more than the opinion of the Commission, expressed not in the form of an exemption, but in the non-operative preamble to a Directive it leaves open the position of Member States' incumbent PTOs under Article 86, should any intending entrant to the field of voice telephony, blocked by such statutory monopoly, seek redress in reliance on the ECJ jurisprudence of the doctrine of essential facilities. The deadlines of 1998, and 2003, for the introduction of competition into voice telephony derive from the decision of the Council of Ministers and at the moment exist as a statement by the Commission that they will not take action under Article 90(3) against any Member States until those time limits expire. The choice by the Commission not to act against a Member State would again not necessarily prevent an intending entrant in Ireland bringing an action in the national courts, under Article 86 and/or 90(1). There are of course, in telecommunications as in electricity, important reasons why new entrants will not wish to effect a forced entry.

Articles 85 and 86 are framed as provisions which govern agreements, decisions and concerted practices between undertakings, and the unilateral actions of undertakings. Being addressed to undertakings, they do not, as formulated, deal with the situations in State companies where anti-competitive effects result not from an agreement or unilateral action of the company, but from actions or directions of the State, or a Minister. Article 90 (1) is directed to the behaviour of Member States. States are subject not only to Article 90 and Articles 85 and 86 but also to the competition considerations involved in Articles 30 and 37.

Article 90(1) applies to "public undertakings, and undertakings to which Member states grant special or exclusive rights."[30] The ESB, BGE and Telecom are both public undertakings, and undertakings which have been granted exclusive, and possibly special, rights. It is established that the mere grant or existence of exclusive rights is capable of amounting to a restriction of competition[31] or an abuse of a dominant position[32]. Article 90(2) provides a derogation from the competition rules for undertakings "entrusted with ... services of general economic interest or ... a revenue producing monopoly". These are stated to be subject to Articles 85 and 86, and indeed the other rules of the Treaty relating to competition, insofar as they do not obstruct the performance of the tasks assigned to them. The derogation afforded by Article 90(2) applies to electricity and telecom undertakings, in respect of some, but not necessarily all of their core business and statutory monopoly, which is relevant given that it is a problem peculiar to vertically integrated near-monopolies that a dominant position in one market may allow them to abuse, or maintain, a dominant position in another.

Under Article 90 (3), the Commission may act directly against a Member State for breach of Article 90 (1). It is of course also the case that any person affected by a breach of Article 85 or 86 may bring an action in the Irish courts. The State utilities are only at risk of action in the national courts under Articles 85 and 86 in respect of their own-initiative behaviour. In respect of anything necessitated or required by the

State, or directed by the relevant Minister a litigant would have to rely on Article 90(1). The Francovich case[33] establishes that there must be a remedy, if necessary in damages, in private action against a Member State for the failure by a Member State to implement a directive. It would not be impossible to envisage the Francovich case as the basis for an action for damages in the Irish Courts for breach of Article 90(1), although some lawyers would not agree that it can be extended that far. Proceedings have already been brought on that basis, apparently without opposition on that particular point, in O'Neill v Minister for Agriculture[34]. It is established that national courts may apply the 90(2) derogation.

Article 37 applies the free movement of goods provisions to State monopolies of a commercial character. The obligation on Member States is to adjust progressively such monopolies, to the goal that there be "no discrimination regarding the conditions under which goods are procured and marketed ... between nationals of Member States." Article 37 (1) and 37(2) are of direct effect and can be invoked before the Irish courts. The Article applies to electricity and gas which have been deemed to be "goods" for the purpose of the Article and the Article is the basis for the Commission's Article 169 actions against the Member States, including Ireland, in respect of import bans for gas and electricity.

5. INSTITUTIONAL ASPECTS OF REGULATION

(i) Regulatory Failure

The primary economic rationale in favour of government intervention in any area of economic activity is based on the concept of market failure. More recently there has been a growing recognition in the economics literature of what may best be described as 'government failure' (see, for example, Stiglitz, 1990). There are related problems of regulatory capture both by the regulated bodies and the state bureaucracy. The former arises where regulators tend to identify over time with the regulated industry and end up defending it rather than policing it. Indeed Stigler (1975, p.115) argued that 'as a rule regulation is acquired by the industry and is designed and operated primarily for its benefit.' He noted the absence of economists and politicians on such bodies along with the undue weight of oldish executives and lawyers and concluded that 'the commissioners are of an age, background and prospects such that they are not likely to benefit by a major controversy with the regulated industry.' This implies that the composition of any regulatory agency is important for the prevention of regulatory capture. One means of reducing the risk of regulatory capture would be to provide that regulators would not be permitted to accept a position on the board of a regulated firm for several years after they had ceased to hold the post of regulator as is the case for members of certain US regulatory agencies under the 1978 Ethics in Government Act. Other safeguards against regulatory capture may also be needed. The second problem is that once established, regulatory bodies tend to perpetuate and enlarge their activities.

The essential message to emerge from this body of literature is that private market failure may not, of itself, constitute a sufficient justification for state intervention. Rather it needs to be established that such intervention will actually lead to a better outcome than that produced by the market and, where it is justified on such grounds, the preferred option is that which imposes least cost. This is not a new idea. Pigou (1924) observed that: 'It is not sufficient to contrast the imperfect adjustments of unfettered private enterprise with the best adjustment that economists in their studies can imagine. For we cannot expect that any State authority will attain, or even whole-heartedly seek that ideal. Such authorities are liable alike to ignorance, to sectional pressures and to personal corruption by private interest. A loud-voiced part of their constituents, if organised for votes, may easily outweigh the whole.'

Such theoretical developments have resulted in a re-appraisal of the regulatory framework in many developed economies since the early 1980s. This re-appraisal has resulted in the easing of regulations in many areas of economic activity with market forces being given a freer rein. Although this process has generally been referred to as deregulation, this is not a wholly accurate description of the process. Rather than simply abolishing regulations entirely, the process in most countries has involved a reform of the regulatory framework with a greater emphasis being placed on market forces.

The problem of setting prices would be greatly simplified if the regulator had sufficient information to set prices at their optimal level. The issue of information has come to assume a key role in the economics of regulation over the past ten years. It is now widely recognised in the literature that information asymmetries between the regulator and the regulated firm make effective regulation very difficult. The more information the regulator possesses the more effective regulatory decisions are likely to be. Information is not costless, however, and the regulator will have to choose between the cost of acquiring additional information and the benefit to be obtained from more efficient regulation. The information asymmetry problem can be eased by setting price fixing rules which provide incentives for firms to reveal information about their operations. Of course because regulation is a dynamic rather than a static process firms will know that it is in their interests to provide misleading signals to the regulator in the hope of producing a more beneficial regulatory regime in the future. The announcement of a full scale review of electricity prices in the UK in early 1995 was prompted by a belief that the electricity companies had misled the Regulator. Indeed the problems had been evident for some time. Troughton (1993, p.2), for example, observed that:

> "Experience in the United Kingdom has shown that even with a large regulatory body to oversee the industry, deliberate attempts have been made to manipulate or game the spot market to enhance the profitability of individual players."

A further example of the way in which regulated firms mislead regulators is provided by the fact that the CEGB seriously misled the UK authorities about the true cost of nuclear generation (see, for example, Lawson 1992, on this point).

(ii) The Institutional Options

In Ireland, there is an EU obligation to provide an institution, or institutions, to perform tasks specified in the existing and proposed legislation for the three utilities considered here. The nature of the institution(s) is not prescribed. The tasks would be licensing (of voice and non-voice telephony services and mobile telephony; construction of electricity generating capacity), dispute resolution (interconnection charges to the fixed and mobile telephone network; access to the electricity transmission and distribution grid; access to the gas transmission and distribution pipelines; any other issues arising in relation to the operation of the gas or electricity grids) and some miscellaneous other tasks, such as terminal equipment type approval, and the "encouragement" of the sharing of telephone network facilities. The institution(s) granting licences for services in any of the sectors would have to be competent to establish and administer criteria for maintenance of integrity of the network; security of supply; interoperability; in the case of telecommunications, allocation of frequencies and protection of data and in the case of electricity, inter alia, protection of the environment and land use. The institution(s) performing the dispute resolution functions for access pricing would have to be competent to establish "real" costs for elements of the access provided by the vertically integrated monopoly; and ultimately, if necessary, to set the access price.

There are other tasks which are more policy making than rules making such as determining the extent of a universal service obligation; and tasks which are not imposed by the EU such as output pricing, which might potentially be allocated to the institution(s) dealing with the above.

It is important to state that literal compliance with EU requirements would fall short of providing an institution with overall responsibility for promoting competition in the sector or sectors being regulated. There are immediate criteria for the performance of the above tasks which involve satisfying the needs of different interest groups, as well as operating in the public interest. Thus, for dispute resolution, it should obviously provide decisions which resolve the instant dispute, are timely and are credible to all parties. This last is not a matter of reaching decisions which are liked by all parties, but of ensuring that decisions meet criteria of internal consistency and the decision making process is seen to be procedurally fair. For licensing, one criterion would be that the system be sufficiently certain not to discourage potential entrants. However, the overriding criterion for all tasks should be that the regime chosen is genuinely effective in promoting competition.

The options for any regulatory regime include sectoral regulators; a general regulator with responsibility for the entire economy, i.e. the national competition authority; the

Courts; a Minister; or any combination of two or more. The substantive law used to regulate the utilities may be either self contained, sector specific law; or it may be the law of general application to the entire economy; or it may be a combination of the two, as where it is provided that the sector specific rules do not preclude the application of the general law.

(iii) Sector Specific Regulator

The decision to have a sector specific regulator is one which typically goes hand in hand with the decision to have sector specific rules. If sector specific rules are considered to be needed then, typically, that will form part of a regime in which sector specific expertise is accumulated in one institution which is dedicated to the sector. For setting access prices, output prices, and costing universal service obligations, it is clear that sector specific expertise in such competition issues is required. It is also the case that expertise in applying wider general principles of competition regulation is necessary. The perceived advantages of sector specific regulators are that they are designed to have expertise in the industry being regulated. All regulatory institutions are in danger of lack of information vis a vis the regulated firms, but sector specific regulators can potentially be staffed with expertise in the industry. They can also deal with continuing day to day matters where that level of regulatory availability is required. This is also an argument for combining functions relating to one industry, whether competition regulation or regulation of a different nature such as technical type approval, in one institution, to benefit from economies of scope.

It is recognised that any regulator, or regulatory office which is industry-specific faces a greater danger of regulatory capture, through becoming sympathetic to the industry, than a competition office which operates across the entire economy. This is exacerbated where, as in telecommunications, the specialist expertise required to regulate an industry must perforce to some extent be recruited from the monopolist itself, or from State officials who have prior to the introduction of competition had responsibility for the State company, as is the case in Ireland. It is suggested that the countercheck of a regulatory institution based more widely than the telecoms industry is some guard against the danger of capture. This is not incompatible with focusing expertise necessary for this sector in one office, while simultaneously making that office part of a wider structure. The wider structure can be provided by the existing competition institutions; by a single public utility regulator; or by another institution such as the courts. It is notable that in some countries the role of sector specific regulators has been reduced or even abolished and responsibility transferred to an overall competition agency (see below).

(iv) Broad Spectrum Regulator

A regulatory body which is responsible for all sectors of the economy, such as, in Ireland, the Competition Authority is also typically associated with applying a

general law, rather than detailed sectoral rules. For the purposes of regulating the former monopoly markets of the State utilities, the advantages and disadvantages of a broad spectrum regulator are rather the mirror image of those of the sector specific regulator. A general purpose body set up as such will not without special provision have the sectoral expertise to apply detailed sectoral rules. The corollary of this is that unlike a sector specific regulator it will, in theory, have the benefit of a concentration of economic and legal expertise, and experience. One method proposed in Germany under their new Bill, is to have the sector specific regulator as the repository of industry specific expertise, but have questions of general principle referred to the general competition authority. This type of interaction is also used in Finland, on a basis of informal requests for views, which had worked well but is about to change with more of the responsibility being returned to the general competition authority. One perceived advantage of a general competition authority is that it has a broader economy wide perspective. Similarly such an agency, where there is a collective responsibility for decisions about a sector, is to that extent less likely to be subject to, or be perceived to be subject to regulatory capture.

(v) Ministerial Control

(a) The present Ministerial control

In Ireland State monopolies have been subject to informal control from the Minister who is also the shareholder. This would be simply unacceptable to fulfil the EU requirements for provision of a regulatory institution, both on general principles[35] and as specifically provided for in the proposed directive on voice telephony. This does not preclude Ministerial control, but it does preclude control by the Minister who is the shareholder in the incumbent operator. There is also a specific problem for a Government Department or Departments using officials who are potentially transferable between the functions of regulating competition in a sector such as electricity or telecom, and making commercial policy decisions for the State company or companies in that sector.[36]

The dispute resolution mechanism provided in this State in fulfilment of the requirements of the EU Services Directive, and Leased Lines Directive is the Minister for Transport, Energy and Communication. The regulatory function is carried out within the Department by the Telecommunication and Radio (Regulatory) Division. The net issue on which the Division is potentially required to arbitrate, that of access charges, is one on which there has been no statement of policy by the Minister or the Government, and there has been no public discussion of or input into the principles to be applied. There is an appeal from the decisions of the NRA, both in respect of granting s.111 licences for the Services Directive, and resolving disputes in relation to leased lines, and refusals to provide lines, to the District Court. This provision is inappropriate to the issues involved in access pricing. At the stage in the UK where access charges between British Telecom and Mercury were being decided, the agreement was estimated to be of the order of

£750m in value to the companies. While allowing that the UK is a much larger economy, the fact that the civil jurisdiction of the District Court is £5,000 suggests that it is hardly the appropriate forum for such issues.

(b) Ministerial Regulation in the future

As stated above, the conflict of interest issues do not preclude regulation by a Minister other than the Minister who is a shareholder in the relevant State utility. Having a Ministerial regulator may initially avoid having to draw a line between policy issues and administrative issues. The disadvantage of not drawing that line is that all regulatory decisions and actions remain subject to direct lobbying of the relevant politician by the affected persons. Secondly, there is an added fear where the regulator is a Minister, which is that regulation will be too directly a vehicle for "ideology and political opportunism" (Foster, 1994). Thirdly, Ministerial controls at present display a lack of the transparency which is essential to effective regulation, and a sense of the natural justice required in dispensing a licence of commercial value.

The Department of Transport, Energy and Communications has responsibility under the Wireless Telegraphy Acts, 1926 to 1988 for licensing of the use of any wireless telegraphy, within which definition comes the re-diffusion systems for broadcast television. In Carrigaline Community TV v Minister for Transport, Energy and Communications, Ireland, AG and Cork Communications[37], a community based, non-profit making television UHF (ultra high frequency) re- diffusion system sought injunctions restraining the Minister from prosecuting them for operating without a licence; and a mandatory injunction requiring the Minister to consider their application for a licence. They succeeded on the basis, inter alia, that the Minister in exercising his discretion to licence re-diffusion systems had not made explicit to the would-be licensees the technical argument forming the basis of his preference for another distribution system. The case is a very clear message that in operating any regulatory system a Minister, or any regulator cannot rely on the scarcity of their resources to limit the type of decision they make. It will be necessary for any regulator to be funded to the point, not necessarily of themselves making all the arguments for and against every option under consideration, but of being able to tell every party affected the arguments they need to meet It will not be acceptable in the future for Departmental officials to go to one established operator in the market to, effectively, seek the benefit of their technical expertise, before making a decision which favours that incumbent. Any regulatory regime has to be credible and acceptable to incumbents, and entrants, and customers, which in these sectors is ultimately the public at large. Equally any regulatory agency which is not clearly independent and adequately resourced is likely to lack credibility.

(vi) The Courts

More even than a broad spectrum regulator, the courts are not typically used to apply sector specific rules, but rather the general rules. That can be either as the sole form of regulation, as it is for public utilities in New Zealand, or it can be in parallel with any of the other institutions discussed here. The sector specific tasks prescribed by EU legislation might theoretically be carried out using the Courts as the sole regulator although it could be expected to be too unwieldy in practice. A court cannot be used as a policy maker. It also cannot be used as a day to day resource where that level of availability of the regulator is required. Courts will not in the normal course of events be staffed by experts in the relevant sector and that gap would then have to be bridged by expert evidence. The court's function is to resolve a dispute on facts before it, between the parties before it, which does not necessarily create general rules for the convenience of other competitors in the market

> "It is a regrettable fact that the decision of this appeal will only decide whether, in the past, Telecom has abused its dominant market position. It will not decide whether Clear's past stance in negotiations was reasonable, let alone fix the terms for interconnection."[38]

Posner (1977) on the other hand has argued that the courts are a superior mechanism to regulatory agencies firstly, because courts are not easily subject to regulatory capture; and secondly because the injured parties in any abuse of dominance situation are in a better situation than any regulator to know when their interests are harmed and to prosecute those interests by litigation. Also:

> "We do not believe that the courts will do an especially good job in dealing with this issue - distinguishing predatory behaviour from ordinary competitive actions is not easy ... - but only that the problem will be no more difficult in the telecommunications industry than elsewhere." (Besen & Woodbury 1983).

Two other criticisms of the courts are delay, and rigidity. A competitor (and this might be either the incumbent or the new entrant) can deploy litigation as a delaying tactic by litigating every issue in sequence. Also, once an issue of principle is decided, at a Supreme Court level, it is in place until such time as either the Court reverses itself or is overtaken by legislation. This may result in an issue which arises in the context of one sector, being dealt with in a way which is binding for all regulated utilities. Arguably, this is also true of a general regulatory body, where the view of the body on an issue of general principle may not change until the personnel is changed.

Any decision of a court succeeds in that it resolves the issue as between the parties and, as in the Clear case[39], permits access to begin. In an area where there is not one right answer plainly apparent to such questions as the level of access charges, arguably any machinery chosen to arrive at a determination will be open to the criticism of having failed to find the right answer.

(vii) Sector Specific Rules

The decision to have sector specific rules, like a decision to have sector specific regulator, reflects a view that there are problems peculiar to monopoly utilities which require some form of treatment beyond the normal competition regime. One of the foremost problems is that they are monopolies and, typically heavily vertically integrated. The Competition Act, or Article 85 and 86 of the Rome Treaty provide for agreements, or abuses, which restrict competition, but they do not provide a detailed guide to altering an existing market structure. The function of the sector specific regulators in the UK has been described as being to 'act as a substitute for competition, at least until competition emerged.' (Whish 1993). This is not as such wrong, but there is a danger with this approach, which is that it can become fixed in stone, and become an obstacle to the sector moving towards true open competition. Full competition should, arguably, include being subject to the same competition rules as other sectors. A serious issue to be addressed is whether the creation of different rules for a sector could operate as a block to the emergence of a natural market. A first concern should be that the existence of different rules should not itself cause a distortion of the emerging market. This is recognised in different ways in different countries. The extreme example is the New Zealand decision to make whatever structural changes were thought necessary and then leave the field open to competitors and the general law. A less extreme approach is that adopted by Finland and Australia, where having had a detailed sectoral regulation for telecommunications, they are now, as they had planned, rolling back the sectoral regulation and leaving more functions to the general competition authority. Austel, the Australian telecommunications regulator, is to be abolished in 1997. Where a time limit is placed on the sector specific regime, this operates to some extent to inhibit the danger, inherent in any regulator, of perpetuating their own existence. As Littlechild (1986a) noted:

> "Competition is the most effective protection against monopoly; regulation is merely a stop gap until sufficient competition develops."

In the case of telecommunications, sector specific rules face a further problem because technological change means that the extent of the natural monopoly, which is the area that, from an economics perspective, needs to be regulated, is constantly changing thus threatening to render sector specific rules obsolete. Australia's telecom regulator has indicated that regulatory provisions may have a life span of two years or less. The UK experience of having only sector specific rules has been that OFTEL, for example, has expressed concern at the absence of a general condition forbidding anti-competitive behaviour or abuse of dominant position. It is not possible to draw up licence provisions *ex ante* which anticipate and specify item by item, behaviour which may restrict competition. BT has expressed opposition to OFTEL's proposals for the inclusion of a general prohibition on anti-competitive behaviour in its licence (Financial Times, 25 November 1995). The former Director

General of Fair Trading, Sir Brian Carsberg, who has expressed his preference for a competition law which would take the general prohibition approach of Articles 85 and 86, has also said[40] that he would favour extending such an approach to breaches of regulations for utilities. UK experience shows that, in the absence of a clear prohibition on anti-competitive behaviour, regulation will not prevent abuse of market power.

For Ireland the EU obligations in the utilities sector do require something more than the existing general competition law. It is possible, in theory to take the approach that a mechanism could be provided by recourse to the Courts or other body, to apply the general principle set down in section 5 of the Competition Act and Article 86 of the Treaty and elaborated in the case law. The doctrine of essential facilities already contains the idea of an obligation to give access to a network and cases such as *National Carbonising*[41] go some way to indicating the principles of access pricing. However, specific provisions such as the obligation to "encourage" facility sharing in telecommunications go beyond the general principles of the Competition Act and the Treaty.

(viii) General Rules

Following liberalisation of electricity and telecommunications the New Zealand authorities specifically rejected the idea of establishing specific industry regulators and decided instead that the problem of abusive behaviour should be dealt with under the Commerce Act, 1986. The Treasury argued that:

> "...officials consider, and Ministers have agreed that this sort of problem is best dealt with through general competition policies and rules including provisions within the Commerce Act. We would not agree with the contention that special legislation may be required. The introduction of special legislation would imply an ad-hoc approach to regulation of the Electricity Corporation and the electricity industry that is inconsistent with the general thrust of policies agreed to for SOEs. In particular, corporation or industry specific legislation can, as history has demonstrated, create major distortions in the economy which lead to the inefficient use of resources." (Spicer et al, 1991, p.107).

Due to dissatisfaction with the Privy Council decision in *Clear* it is proposed to establish specific rules in respect of interconnection charges. It is not, however, proposed to establish a sector specific regulator (The Treasury and Ministry of Commerce, 1994).

Poland has also chosen the option of simply removing the statutory privileges of the State utilities, leaving them subject to the application of the general competition legislation. This option was chosen despite, or indeed perhaps because of the disproportionate level of vertically integrated monopolies in the Polish economy.

The Anti-Monopoly Office found the access pricing of the incumbent telecommunications operator to be an abuse of its dominant position.[42] The problems which are identified in using a general law to deal with the specific areas of access pricing, universal service obligation, and output pricing are uncertainty, and delay pending determination by the relevant institution of the application of the general principle to the factual situation.

Section 5 of the Competition Act prohibits an abuse by one or more undertakings of a dominant position within the State or a substantial part of it. Although their statutory privileges are outside its scope, BGE, the ESB and Telecom, like all undertakings are subject to the provisions of the Act in respect of their actions except to the extent that they are specifically exempted from it by future statutory provisions. Attempts to prevent competitors entering the market by denying access to transmission and distribution networks or by applying unfavourable terms for access could, therefore, be challenged in the courts under the Act. Similarly abusive behaviour in the downstream product market could also be challenged. A future regulatory regime could choose to exclude the State companies from the 1991 Act, or could provide for an interaction on the basis that a specific statutory rule ousts the jurisdiction of the general rule.

(ix) Interaction between institutions

In a number of countries (Sweden, Australia, Germany, Finland, Canada and the US) utility sectoral regulators operate alongside the antitrust laws. The potential interaction between a sector specific regulator, and a general body which might be either the Courts or a competition authority is by way of a division of responsibility for issues, rather than industry sectors. A regulator could, for example, deal with specific issues such as setting access charges, while the general body would police anti-competitive behaviour. The interface is effectively the same as that between sector specific rules, and a general competition law. The interaction of the Finnish and German systems is described above. The Canadian interface between sector specific and general rules is what is called the regulated area defence; where behaviour is the subject of detailed sectoral rules, that ousts the jurisdiction of the general rule. By contrast, the US courts have repeatedly and consistently rejected claims that activities approved by regulatory agencies or essential to comply with the regulatory rules were immune to challenge under the antitrust statutes. Both regimes however are successful insofar as that they have a white line distinction between the two types of institution, which itself is necessary to prevent duplication of jurisdiction. As there is a real risk of anti-competitive behaviour by incumbent firms, and it would appear to be extremely difficult to frame sector specific rules *ex ante* to deal with all possible forms of anti-competitive behaviour, it would appear preferable that utilities continue to be subject to the general competition rules. A regime which combines sector specific rules with general competition rules would appear to have the benefit of maximising the strengths and minimising the weaknesses of each type of regime.

6. SOME PRACTICAL DIFFICULTIES

Permitting competition in respect of public utilities will require the government to face up to the essential contradiction involved in the present policy, under which the state utility companies are required to attempt to simultaneously operate on a commercial basis and discharge a number of non-commercial obligations for social reasons. In its 1994 Annual Report, the Chairman of the ESB stated that the development of the ESB 'requires from the Government, as owner, a commercial freedom which has not been forthcoming during the company's history to date.' In a competitive regime BGE, the ESB and Telecom should be required to operate on a strictly commercial footing. If the Government wants a state enterprise to supply goods and services on a non-commercial basis it should enter into a formal agreement with the relevant company and pay for the provision of such services. In the past such subsidies were paid to the ESB under the rural electrification scheme while Section 51 of the Postal and Telecommunications Act, 1983 provides for Telecom to be reimbursed where it is asked by the minister to provide a service which would be loss-making and Telecom considers it unnecessary for its statutory functions. A failure to take such measures in conjunction with the establishment of a regulatory regime would effectively pass the task of resolving the trade-off between conflicting objectives to the regulator. This would be a rather inappropriate function for a regulator, since such trade-offs involve political judgements. It would also make a highly complex task even more difficult.

(i) Some Theoretical Issues

The case for a regulatory regime arises because the incumbent firm (a) may abuse its market power by charging excessively high prices for its output and (b) because it might set prices for network access in a way that is designed to hinder its competitors (It may also be true that new entrants will want to obtain access for as low a price as possible). The regulatory problem can be viewed as a form of principal-agent relationship where the regulator is the principal and the regulated firm is the agent. Principal-agency theory recognises the existence of information asymmetries between the principal and the agent. It also recognises that agents face incentives to act in their own best interests rather than those of the principal. This requires that the principal devise a set of rules which will provide the agent with an incentive to operate in the principal's interests. This, however, is easier said than done.

Orthodox economic theory argues that efficiency is maximised where price equals marginal cost. In public utility industries the marginal cost of providing the actual service is very low, while economies of scale mean that marginal cost is less than average cost. Setting price at the level of marginal cost will result in losses for the regulated firm. The first best solution to the problem would be to set price equal to marginal cost, in order to maximise allocative efficiency, and for the government to compensate the incumbent firm by payment of a direct subsidy. As Stiglitz (1990)

points out, however, such a policy ignores the question of how the revenues to pay such a subsidy are to be raised and assumes, in particular, that there are no distortions associated with raising such revenue. It also requires that the government know the magnitude of the subsidy required to make the firm viable.

The second best solution to such problems is to require the firm to operate at the intersection of its demand curve and its average cost curve. At this point the firm simply breaks even. The picture becomes more complicated when, as in the case of public utilities, we are concerned with multi-product firms. Where there are differences in the elasticity of demand for the different outputs of the firm, price discrimination may result in a more efficient outcome than would otherwise occur because, it results in higher output than would arise under the monopoly price. One mechanism for setting prices based on this approach is Ramsay pricing which indicates that the regulator of a natural monopoly should set prices such that, in any given market segment i

$$((P_i - MC_i)/P_i) = R(1/e_i),\ 0 < R < 1 \quad \ldots\ldots\ldots\ldots\ (1)$$

where e_i is the price elasticity of demand for the market segment i and R is the Ramsay number.

Essentially the Ramsay solution approximates what a profit maximising monopolist would tend to do naturally but constrains the total amount of revenue accruing to the monopolist. Ramsay prices operate on the basis that mark-ups should be lower for those products with high price elasticities of demand and higher for those where demand is relatively inelastic. The rational for this is that the distortions arising from the need to set price above marginal cost will be minimised if the mark-ups lead to approximately the same proportionate reductions in demand for different services, since this will result in a smaller contraction of output and smaller deadweight losses than might otherwise occur. Ramsay prices suffer from a number of deficiencies, however. They require that the regulator possess enormous amounts of information regarding demand elasticities in different markets and firms' costs. Armstrong et al (1994) point out that Ramsay prices are rarely used in practice and were not applied in the case of Electricite de France even when Boiteaux - a pioneer of the concept of Ramsay pricing - was in charge of that company. Vogelsang and Fissinger (1979) have developed a regulatory model which, over time, pushes the regulated firm toward a Ramsay price solution. Ramsay prices also require that different customers be charged different prices for the same product and this may not prove acceptable politically. Baumol and Sidak (1994) point out that it is not clear that Ramsay prices calculated *ex ante* will necessarily maximise economic efficiency particularly in the case of telecommunications.

(ii) Regulating Output Prices

Regulating output prices poses a number of complex problems. For example forcing dominant suppliers to charge very low prices might benefit consumers in the short-term but it may inhibit entry by new suppliers, thus preventing the development of competition to the long-term detriment of consumers. NUS (1995) found that the development of competition in UK telecoms had been stifled by the price-cap regime which operates there. If adequate competition does not develop it may cause prices to rise in the longer-term.

The sunk cost nature of investment in public utilities raises other problems. Once the regulated firm has invested in new capacity, a price that is sufficient to cover variable costs is sufficient to cause it to continue supplying services. The risk that the regulator may set prices *ex post* which are too low to cover the fixed costs of necessary investment may actually deter the firm from undertaking such investment *ex ante*. This raises problems of commitment and the credibility of the regulator. Such problems can be overcome provided the regulated firm believes that the regulator is committed to allowing it to earn a 'fair' rate of return on its investment. Indeed many regulatory regimes require that the regulator allow firms to earn a 'fair' rate of return on capital. While such a guarantee provides an incentive for firms to engage in a high level of investment, it suffers from certain drawbacks because it means that unnecessary or inefficient projects should be rewarded as much as efficient ones. In the US judicial precedents have established that regulators are only required to allow a fair return on capital that is 'used and useful' (Armstrong et al, 1994). In the UK regulators are obliged to ensure that the regulated firm can finance its operations. Nevertheless the scope afforded to regulators under the UK regime permits regulators to alter the rules of the game after firms have borne the 'sunk costs' of investment. This reduces the incentive to invest and raises capital costs. The importance of regulator credibility was highlighted by the decision of the electricity regulator in the UK in early 1995 to implement a full scale pricing review less than a year after agreeing a price-cap with the electricity companies and within days of the Government selling its shares in the two electricity generating companies. To some extent this move has damaged the credibility of the entire regulatory system in the UK.

Several forms of output price regulation have been used in practice and the main variants are now considered. Indeed the ESB could already be said to operate under a form of output price regulation since, as noted, it is obliged by statute to operate on a break even basis. Such provisions have proved wholly ineffective at controlling prices. This is because such a regime provides no incentive at all to control costs. In addition, the ESB has also evaded this constraint by effectively adopting a system of double depreciation in its accounts.

Prior to its nationalisation in 1949 the gas industry in the UK had a long history of regulation. Bailey (1986), for example, describes how, under an arrangement known

as the sliding scale, dividends paid by the gas companies to their shareholders could not exceed 10 per cent of their capital unless their prices fell. If prices rose dividends had to be reduced. An alternative known as co-partnership provided that increases in profits due to a fall in prices were to be split between the workforce and the shareholders, thus providing a direct incentive to efficiency. A recently published study has called for the re-introduction of sliding scale regulation in the UK in place of price cap regulation (Burns et al, 1995). The study found that, although price cap regulation works well in ensuring technical and allocative efficiency, various factors can result in profits being either very high, or very low. Such outcomes can arise where the regulator is either weak or ill informed or overly aggressive, or if the company is subject to unexpected shocks in the interval between regulatory reviews. OFFER (1995) has listed sliding scale controls as an alternative to price caps for regulating the transmission charges for the use of the National Grid.

Sliding scale regulation avoids the need to forecast inflation. Dividend sliding scale regulation operates on the basis that dividends can only increase beyond a certain level provided that prices throughout the year have been below a certain level. More formally such a constraint can be expressed in the form:

$$(\lambda_A - \lambda_S) < ((P_S - P_A) / P_S)\,\alpha \quad \text{..... (2)}$$

where λ_A and λ_S represent actual and expected dividend yield respectively, P_A and P_S are actual and standard price and α is the profit sharing parameter.

If at the end of the year the firm wished to pay a dividend which was above the standard dividend even though its price had not been below the standard price, the regulator would oblige it to make an end of year rebate to its customers, the size of which will be determined by α. The scheme operates on the premise that the firm's objective will be to maximise profits even though some of the benefits of so doing will accrue to customers. As Burns et al (1995) point out, however, the level at which the profit sharing parameter α is set may have implications for the regulated firm's behaviour. Intuitively the effects of a regime which embodies a 90:10 share out in favour of the customer is likely to differ from one which offers a 90:10 share out in favour of shareholders. For a dividend sliding scale regime to be effective the regulator needs to ensure that the regulated firm does not manage to evade regulatory controls by paying dividends to shareholders in other ways. An alternative to the dividend sliding scale regime is a price related profits levy under which it is the firm's profits, rather than dividends, which are conditional on its pricing behaviour. Burns et al (1995) show that such a regime will produce the same results as a dividend sliding scale. Again the regulator in such a regime needs to ensure that the firm does not manipulate its profits by changing its accounting procedures in respect of depreciation and bad debts. A more fundamental problem in the existing Irish context is that the ESB, BGE and Telecom are all state owned so that regulatory regimes which focus on dividends or profits are unlikely to prove very effective.

Rate of return controls have been extensively used in the United States over a long period. Essentially controls in this form set limits on the profits which a regulated firm may earn. Rate of return regulation suffers from certain drawbacks. It provides inadequate incentives for firms to minimise costs and encourages them to employ a higher level of capital than would otherwise be the case and this produces a less favourable return than a competitive market. Once the rate of return is set, the firm can raise prices to offset any increase in costs so there is little incentive to minimise costs. Rate of return regulation encourages excessive or so called 'gold plating' investment, also known as the Averch-Johnson effect, because increasing the capital base increases allowable profits. In the case of a multi-product firm selling some outputs on competitive markets such regulation may lead to pricing below marginal costs in those markets as a means of inflating the rate base. Regulation of this type provides little incentive for firms to worry about X-efficiency. In practice rate of return regulation is based on past performance giving rise to 'regulatory lag'. The existence of regulatory lag means that there is some incentive to reduce costs since the firm will enjoy a short-term benefit from reducing costs at least until the next regulatory review. Rate of return regulation also requires that the regulator possess substantial information about cost and demand. There is also the thorny issue of deciding on an appropriate rate of return. The US system has also been characterised by lengthy legal disputes between the regulators and the regulated firms on the issue of the rate of return to be allowed (Weyman-Jones, 1994).

Due to doubts about the efficacy of rate of return regulation the UK Government commissioned a study of all options for regulating British Telecom before its privatisation in 1983. Littlechild (1983) advocated a form of price capping regulation which he claimed was superior to rate of return regulation in terms of restraining monopoly power, promoting competition, reducing X-inefficiency, and providing incentives for cost reductions. Interestingly, however, he found that on all counts bar protection against monopoly, no regulation was superior to regulation. It was also claimed that price cap regulation would be simpler to operate and less vulnerable to producer capture. As a result price capping was applied to British Telecom and has since been applied to a number of other privatised utilities in the UK. In the US price capping has replaced rate of return regulations in the case of telecommunications.

The price cap applied to British Telecom and a number of other utilities in the UK has generally involved setting the maximum rate of price increase as some amount less than the increase in the general level of consumer prices, the so-called RPI - X formula where X represents a target for efficiency gains by the firm.[43] The retail price index was chosen in preference to any industry specific price index since the latter could be manipulated by the regulated firm. It also provides clear and easily understood signals to consumers. It was argued that this system would give the regulated firm an incentive to achieve productive efficiency and would promote innovation because cost reductions greater than X would be reflected in higher profits for the firm. Such a regime was also claimed to be simpler to operate since

there was no need to measure the asset base or rates of return, cost allocation between competitive and monopolistic parts of the firm was unnecessary, and future movements of costs and demand did not have to be forecast.

Two different forms of price capping have been applied. The first known as the 'tariff basket method' has been used in the case of British Telecom and the water companies. This type of price cap requires that the weighted average of price increases of the products included in the basket should not exceed the RPI - X price cap. This method can be used whether products are commensurable or not. The second method is known as average revenue regulation and has been used in the case of gas and electricity. This mechanism can only be applied where the products supplied by the regulated firm are commensurable, which is the case for gas and electricity where output can be measured on the basis of therms or kilowatt hours. Under this system the regulated firm proposes price changes and predicts the total revenue and output given the new prices. Predicted average revenue is only permitted to grow by RPI - X. Since the firm faces an obvious incentive to act strategically in making its forecasts a clawback factor is included to clawback any gains or losses from forecasting errors. Bradley and Price (1988) demonstrated that average revenue caps would not lead to a convergence to Ramsay prices, as in the Vogelsang Fissinger model, unlike a pure price cap model.

Pure price cap regulation would not permit any degree of cost pass-through. In practice in the UK cost pass through is permitted in respect of a relatively large part of the regulated firms' total costs (Armstrong et al, 1994). Permitting cost pass through is designed to protect the firm against increases in costs which are outside of its control, while allowing consumers to benefit from downward movements in costs before the next review. The regulator has two main alternatives to permitting costs to be passed through, either to set a higher price cap to compensate the firm for the risk of higher profit volatility, or to increase the frequency of regulatory reviews.

Setting price caps in respect of a basket of products simplifies the task of the regulator. It also has certain other advantages. Flexibility will allow the firm to increase profits and, if the price cap ensures that consumers as a whole are not worse off as a result, the net result is increased social welfare. Flexibility also enables the firm to alter relative prices in response to changes in costs and to unwind cross-subsidies which may exist. The pace at which cross subsidies can be reduced may be limited for distributional reasons. Complete freedom to vary prices could also permit anti-competitive behaviour by the firm, since it might attempt to reduce prices in competitive markets and engage in predatory pricing, while financing this behaviour through higher prices in markets where competition is limited.

Decisions are also required in respect of the length of time between price cap reviews. The longer the lag the greater the incentive for productive efficiency since it increases the benefit to the firm arising from any cost reductions. Long lags, however, might adversely affect allocative efficiency. There is obviously some trade-

off between these two objectives. Price caps suffer from an obvious defect in that they provide no incentive for the firm to provide a good quality service. In fact the firm has an incentive to under invest in quality. Consequently price capping also requires that the quality of services be regulated.

In order to determine the appropriate X factor regulators in the UK have taken into account a variety of factors such as the value of existing assets, the cost of capital, expected rates of growth of productivity and demand and the progress of competition. One of the alleged benefits of price caps was that they reduced the regulatory burden since they did not require the measurement of capital or rates of return. As Armstrong et al (1994) point out regulators concerned with allocative efficiency must take such factors into account. Estimating the cost of capital and the value of the regulated firm's asset base is an extremely complex task. Clearly problems arise here due to the existence of information asymmetries. Regulators in the UK have made use of detailed financial models to determine the X factor. The process is an iterative one. The regulator will tend to choose an initial value for X and the resulting cash flows and accounting statements are then estimated from the model. If this yields an unsatisfactory result then the regulator will adjust X until the regulator is happy with the outcome. Such methods therefore involve formulating views about the desired outcome. The whole process is therefore a highly complex one and far more difficult than originally envisaged.

There has been a tendency over time in the UK to increase the range of regulated products. Armstrong et al (ibid.) point out how, in the case of BT, international calls, leased lines and connection charges have entered the basket of regulated services so that about 70 per cent of BT's business (in terms of revenue) is now regulated compared to 50 per cent in 1984. Price caps have had to be supplemented by quality controls. Commenting on the experience of British Gas, Spring (1992) found that 'regulatory intervention has spread from the tariff segment to all aspects of the business and become increasingly intrusive.' The existence of regulatory discretion may reduce the incentive to invest and raise the cost of capital. Price caps have tended to become tighter, while regulators have tended to become more closely involved in trying to actively influence firms' decisions on the level and structure of prices rather than simply checking that licence conditions are being adhered to. It has in effect become more like 'rate of return' regulation over time. Littlechild (1986b) conceded that 'rate of return considerations are necessarily implicit in setting and resetting X'. The UK regime originally avoided much of the lengthy legal disputes characteristic of the US regime. Instead price caps and other licensing obligations were resolved by negotiations between the regulators and regulated firms. This may be changing. Mercury Communications recently won a court action against OFTEL thereby establishing that the regulator's decisions could be challenged in the courts. The Director General of OFTEL has also stated that it was having to deal with an increasing number of legal issues and that it had had to double its legal staff (Financial Times, 10 February 1995).

Price cap regulation has not proved to be as successful as originally predicted. Lynk (1993) found evidence that BT continued to ear above normal profits in spite of price capping. Burns and Weyman-Jones (1994) found that few of the regional electricity distribution companies (RECs) had significantly improved their productivity following privatisation, although price caps supposedly offer firms the incentive to beat the cap and maximise profits. The decision by the electricity regulator to undertake a full scale price review less than a year after establishing new price-caps because the regulated firms financial performance was much better than previously envisaged also raises some very serious questions about the system. The regulator, Professor Littlechild, was the architect of the RPI-X system. If someone as well informed about the difficulties of regulating such firms publicly admits that he got it wrong, one must ask whether successful regulation is possible. A number of studies of utility regulation indicate that the individual regulators have had a crucial influence on its overall efficacy (see for example, Foster, 1993). The fact that success is more dependent on the individual regulator rather than the regime itself again raises serious questions about the regime. More importantly all of the output price regulatory regimes considered here are designed to regulate output prices of privately owned firms. They assume that such firms will act as profit maximisers. Thus price cap regulations operate on the assumption that the firm will endeavour to minimise costs, thereby providing information to the regulator about the scope for efficiency gains which can be used in future price cap reviews. It is not at all clear that such a regime would represent a solution in an Irish context where the regulated firms continue in State ownership. Specifically it would appear that such firms would not have the same incentive to minimise costs and maximise profits subject to the price cap. If one argues that competition will pressure them to cut costs, this begs the question, if competition is adequate to ensure such an outcome, why regulate? The other side of that coin is that regulation is not an adequate substitute for competition.

(iii) Setting Access Charges

When the network operator is part of a vertically integrated firm which is also competing in the provision of services over the network it has obvious incentives to provide access to its competitors on less favourable terms. Such unfavourable terms may relate not only to price but to quality of service and a number of other factors. Ensuring that this does not happen requires that the regulator possesses highly detailed information about the operations of the incumbent firm and is prepared to undertake extensive monitoring of its activities. This is both complex and expensive. If the regulator fails to detect and prevent such behaviour then many of the benefits from competition will be lost.

Once the incumbent firm has met the fixed cost of establishing a transmission network, the marginal cost of providing services is extremely low. Setting access charges at marginal cost means that the network owner will not receive any contribution towards the fixed cost of the network. Since the incumbent will have to recoup such costs from customers of its services access charges based on marginal

cost would also allow rival operators to undercut the network owner's prices resulting in 'cream skimming'. The Minister had indicated that access charges would have to reflect the cost of providing universal services (Dail Debates, 21.2.1995). It is extremely difficult for a regulator to establish the true level of such costs and incumbent firms have an incentive to overstate them.

A considerable amount of work has been undertaken into establishing how access charges for connection to networks should be determined. Willig (1979) considered the question of access charges in respect of telecommunications, while Baumol (1983) also analysed this question in respect of access to the railroad network. The rule proposed in those studies has become known as the efficient component pricing rule (ECPR) and it is discussed further in Baumol and Sidak (1994). In New Zealand the courts accepted that the ECPR was the appropriate way to set prices.

The ECPR recognises that each unit of access supplied to a competitor represents a unit of sales lost by the incumbent and, according to this rule, the access price should be equal to the marginal cost of access plus the profit loss suffered by the incumbent from the loss of that unit of sales. It is a form of marginal cost pricing which includes the opportunity cost to the incumbent of granting access to a competitor. The inclusion of opportunity costs is designed to provide a contribution towards fixed costs and, at the same time, to prevent inefficient entry and 'cream skimming' by ensuring that rivals only take custom from the vertically integrated firm if, and only if, they are more efficient than it in producing the final product. The ECPR ensures efficient production and, provided entry conditions are not otherwise distorted, it will result in efficient entry.

The ECPR, however, suffers from a number of shortcomings which raise considerable doubts about its usefulness for setting access charges. If new entrants cause the overall market to expand, how is the incremental opportunity cost to be measured? OFTEL (1994) argued that in an industry characterised by economies of scale and sunk costs, which is the case for public utilities, it would be difficult for a new entrant to achieve the same or lower costs than the incumbent initially and that, under the ECPR, it would not be able to enter the market. It has also pointed out that in its simplest form the ECPR would mean that competitors could end up contributing to the incumbent's inefficiency as the opportunity cost to the incumbent includes its monopoly profits. Baumol and Sidak (1994) argue that this will only be true where final product prices are not subject to regulatory control. Thus the ECPR can only be used where prices in the downstream market are also regulated. In order for the ECPR to operate as an optimal pricing rule it is necessary that other regulated prices be set optimally too. If regulated output prices involve some degree of cross-subsidisation, then there will still be some incentive for new entrants to 'cream-skim' and only enter the higher revenue markets.

OFTEL concluded that the rule was too restrictive and, while it may yield short-term benefits by discouraging inefficient entry, the ECPR would deter new entrants who

might prove more competitive in the long-run and it was therefore too restrictive if the major objective of policy was to move towards a competitive market. Dews (1995) advanced similar criticisms arguing that, in the longer term, competition would deliver a more efficient industry with lower costs to consumers. She also argued that the rule is flawed since it requires that lower prices from the new entrant can only be sourced from efficiency savings and cost reductions, rather than squeezing retail margins. Following the judgement of the Privy Council in *Telecom v. Clear*, which accepted the ECPR as a mechanism for setting access charges, in spite of the fact that final product prices were not regulated, the authorities undertook a review of the regulatory regime which concluded that the various shortcomings of the rule raised 'concerns about the appropriateness of the BW rule for pricing interconnection in the New Zealand regulatory environment.' (The Treasury of Ministry of Commerce, 1995, p.33).

Various alternative mechanisms for setting access charges have been proposed by economists including:

1. setting prices at short-run or long-run marginal cost;
2. setting prices at long-run average incremental cost;
3. Ramsay Pricing;
4. Two-part charges, e.g. a high 'fixed' charge with a low 'usage' charge;
5. Peak-load pricing;
6. Revenue capping rules.

A number of these options, however, also suffer from some serious deficiencies. As already noted pricing at short-run marginal cost will not provide sufficient revenue to cover total costs. Similarly we observed that Ramsay prices are difficult to estimate and rarely used in practice. Using long-run average incremental costs is a particularly favoured pricing rule in telecommunications (OFTEL, 1995). All access pricing rules involve difficult and detailed economic analysis. Setting prices wrongly is likely to have significant adverse consequences. 'There simply do not exist 'bright line' rules to determine what constitutes an appropriate access price across all industries and situations.' (The Treasury and Ministry of Commerce, 1995, p.54).

7. PROMOTING GREATER COMPETITION

The implications of the previous sections are that regulating public utility industries is a highly complex task. Setting output prices and access charges requires that the regulator possesses detailed information regarding the business concerned. However, the regulator must rely on the regulated firm to provide the necessary information. The existence of information asymmetries greatly complicates the regulator's task. International experience shows that sector specific regulatory regimes are particularly vulnerable to capture. In the US regulation of the electricity industry was found to have no discernible effect on the industry's behaviour (Stigler and Friedland, 1962). Similarly in the case of telecommunications the break-up of AT&T

and the competition which ensued as a result was far more beneficial than regulation. Armstrong et al (1994) describe the decision to initially limit competition in telecommunications in the UK as a missed opportunity. The main lesson therefore is that regulation is no substitute for competition.

(i) Horizontal Issues

The Minister for Transport, Energy and Communications has already indicated that the proposed new peat powered generating plant to be located in the Midlands might not be built by the ESB and has announced a tender for its construction and operation (Sunday Tribune, 5 March 1995). Such an approach should be taken a stage further in order to foster competition. One very effective way to achieve this would be to restrict investment in new generating capacity to firms other than the ESB, at least until the ESB's share of the market had been reduced below a certain level. The target could be set at a level that would expose the ESB to a significant degree of competition. The proposals recently announced by the Minister would allow only a small number of consumers to purchase electricity directly. It is not clear why this option should not be afforded to a wider number of customers. Competition could also be increased by allowing consumers to purchase electricity from suppliers located outside the State by allowing imports from generators in Northern Ireland. Access would have to be granted to the inter-connector on the same basis as for the rest of the transmission system. Such proposals would lead to greater competition in electricity supply in the medium to long-term.

The only way to achieve a greater degree of competition in the short-term would be to actually break up the ESB's generating activities into several competing generation companies. The key issue is whether splitting up the ESB's generating system makes economic sense. In practice a horizontal break-up of the ESB's generating capacity would encounter several difficulties. As Table 6 illustrates generation is dominated by a small number of stations while production costs vary quite considerably.

Moneypoint accounted for more than 40 per cent of total electricity generation in 1992. The next three stations, in terms of units generated, accounted for a further 32 per cent of total generation. Given that peak demand for electricity in 1992 was 2700 MW, then, if it were true that 400 MW was the minimum efficient size for a fossil fuel station, this would imply that 7 stations of that size would be sufficient to meet the nation's electricity requirements. Thus, as Fitzgerald and Johnston (1995) have argued, even a horizontal break-up of the ESB generating network may result in only a limited degree of competition in the market. Technological developments which may make smaller power plants viable may alter the position considerably, although unless competition is permitted the potential of such plants may not be fully realised. The hydro plants, with certain exceptions, are the cheapest, although costs per unit generated at Moneypoint are not much higher than those for the hydro plants. Similarly generation costs for Poolbeg, Aghada and Tarbert are well below those of

many of the peat fired stations and the other smaller thermal plants. The latter plants would not appear to be attractive to would-be buyers. At best it might be possible to split the ESB generation system up into two or three similarly sized units with roughly equivalent cost structures but even this is likely to be extremely difficult.

Table 6 Details of Installed ESB Generating Plant at 31 12 1992

Station	Fuel Type	Capacity MW	Works Cost per Unit Sent Out (pence)
Moneypoint	Coal	916	1.671
Arigna	Coal	15	10.663
Poolbeg	Gas/Oil	510	2.176
Aghada	Gas/Oil	255	2.079
Tarbert	Oil	500	2.641
North Wall	Gas/Oil	104	2.371
	Gas/Oil	104	
	HR	42	
Marina	Gas	270	6.219
	Gas	85	6.219
Shannonbridge	Milled Peat	125	4.384
Lanesboro	Milled Peat	85	3.794
Ferbane A	Milled Peat	60	8.598
Ferbane B	Milled Peat	30	5.901
Rhode A	Milled Peat	40	5.965
Rhode B	Milled Peat	40	4.242
Bellacorick	Milled Peat	40	6.227
Allenwood	Sod Peat	40	14.214
Cahirciveen	Sod Peat	5	12.157
Gweedore	Sod Peat	5	12.157
Ardnacrusha	Hydro	86	1.445
Pollaphuca	Hydro	30	7.086
Golden Falls	Hydro	4	7.086
Leixlip	Hydro	4	7.086
Cliff	Hydro	20	0.871
Cathaleen's Falls	Hydro	45	0.871
Carrigadrohid	Hydro	8	2.604
Inniscarra	Hydro	19	2.604
Clady	Hydro	4	1.575
Turlough Hill	Pumped Storage	292	

Source: ESB Annual Report 1992

Fitzgerald and Johnson (1995) proposed that some ESB power stations could be franchised out. Similar proposals were included among the recommendations for the

establishment of a wholesale electricity market in New Zealand. Specifically it proposed that over a period of five years approximately 40 per cent of Electricorp's plant would be leased to other operators, although they would be retained in State ownership. In addition it recommended that:

- Initially 95 per cent of Electricorp's capacity should be sold under long-term contracts, falling to 80 per cent as the leasing programme is completed, (in order to limit the possibilities of Electricorp manipulating wholesale pool market prices);
- Electricorp would not be allowed to own or build the next power station that sets the next long-run marginal price for electricity;
- A proportion of Electricorp's gas supplies sufficient to fuel a 300-400 MW power station should be sold to a third party;
- For the next ten years Electricorp would be restricted to building no more than 50 per cent of any new capacity.
- Information on the price and quantity of all generator and demand-side offers into the spot market to be made available at each point of connection to the grid (WEMDG, 1994).

On 8 June 1995 the New Zealand Government announced plans for a more detailed reform. These provided that ElectriCorp would be split in two with the creation of a new state company which would own 27 per cent of Electricorp's existing generating capacity. In addition ten smaller plants representing just over nine per cent of capacity would be sold to third parties, while Electricorp would also sell the gas for a new combined cycle generating plant to a third party as proposed by the WEMDG report. The government also announced that the other proposals contained in the report, limiting the amount of new plant to be built by Electricorp for a period of ten years and obliging it to sell most of its power by means of long-term contracts, would be implemented.

The position in telecommunications is quite different. Competition already exists in the market for international calls and appears imminent in the market for inland long distance services. New entrants in this sector may well be tempted to enter into arrangements with companies such as the ESB, Iarnrod Eireann and possibly Bord na Mona which already possess much of the necessary physical infrastructure and/or have the necessary rights of way for such infrastructure. Competition in local services could be provided by cable TV networks which are well established in all the main urban areas. At present, however, Telecom Eireann holds a 65 per cent stake in the main cable operator in Dublin, Cablelink. In order to promote competition in the market for local telephone services Telecom would have to be obliged to divest itself of this share-holding. There appear to be no reasons for Telecom maintaining its share holding in Cablelink and divestiture would not appear to pose any major problems. If the cable system were used to provide telephone services this could also lead to lower cable subscription rates given that economies

of scope would result from supplying both telephone and cable services over the network.

(ii) Vertical Issues

It was argued that the question of determining access charges was made far more difficult where the network operator also competed in downstream markets. One way of dealing with this problem would be to vertically break-up incumbent firms by establishing independent companies for the operation of the transmission and distribution systems. Armstrong et al (1994) have argued that deciding whether or not to separate vertically integrated monopolies was possibly the most important question for structure regulation. Experience in other countries indicates that it is not essential that the transmission and distribution systems be owned by the same organisation. Indeed in many instances liberalisation of utility industries was accompanied by the break-up of vertically integrated incumbent firms. This was the route followed, for example, in the case of electricity in England and Wales but not in the case of gas or telecommunications in the UK. In the latter cases this appears to have been due to the fact that deregulation was undertaken in advance of the privatisation of such firms. Given that speedy privatisation required the co-operation of the existing management, the government appears to have decided against vertical separation in order to retain management support for privatisation. In New Zealand the separation of the national grid into a separate independent firm was seen as essential for the introduction of competition into the electricity market (Electricity Task Force, 1989). Such a split-up had the added advantage that it reduced the need for detailed regulation of access charges (Trans.-Power Establishment Board, 1991). In the US AT&T's vertically integrated monopoly in telecommunications was broken up as a result of a landmark antitrust case. This resulted in the separation of AT&T's business in the competitive long distance market from the local networks. Mulgan and Briscoe (1995) advocated the vertical break-up of the UK telecommunications sector.

There are benefits from vertical separation of the transmission and distribution networks at least in the case of electricity and gas. Vertical separation of networks reduces some of the problems associated with regulating such activities since independent operators of transmission and distribution systems do not have the same incentive as a vertically integrated firm to discriminate against new firms providing services in competition with the incumbent over their networks. Thus the UK Rail Regulator proposed that access charges for rail freight would be determined by negotiations between users and Railtrack, subject to a requirement that charges would not be excessive, distortionary or involve any cross subsidy (ORR, 1994). Armstrong et al (1994) point out that partial separation involving the establishment of separate subsidiaries with separate accounts may or may not be able to ease the problem of regulating access charges of a vertically integrated firm. Local distribution networks also constitute natural monopolies. In the event of vertical separation there is the possibility of establishing several local distribution companies

for different parts of the country. One benefit of the creation of several local distribution firms is that it would allow the possibility of yardstick competition. Yardstick competition represents a useful means for overcoming the problem of information asymmetries between the regulator and regulated firms. This can be done by making the reward to individual firms dependent on their performance relative to that of other similar firms. The establishment of a number of regional distribution companies for gas and electricity would permit yardstick competition between them. Scott and Convery (1990) argue that separating the transmission and distribution systems from production in the case of gas and electricity has the advantage that it is designed to allow and indeed encourage competition.

As against this, if there are significant economies of scope arising from vertical integration, these will be lost in the event of a vertical split. In New Zealand the Electricity Task Force (1989) concluded that the benefits from vertical separation outweighed the costs. Landon (1983), however, observed that the costs of vertical separation in such circumstances could be quite high. Kaserman and Mayo (1991) estimated that arms-length contracts between generators and suppliers adds almost 12 per cent to US electricity prices compared to vertically integrated production.

(iii) Some misconceptions

It is sometimes suggested that competition in utilities would not represent an efficient outcome in an economy as small as Ireland.

> "International experience has shown that electricity systems that are regulated, state managed or controlled, and/or non-competitive do not deliver electricity or security of supply at the lowest possible cost and price to consumers. Such systems are also economically inefficient." (WEMDG, 1994, p.15).

Claims that competition would not be efficient in small countries ignore the fact that many small countries have permitted greater competition in utilities in recent years. The case of New Zealand has already been highlighted, where, as already noted, the authorities have recently announced that ElectriCorp is to be split into two competing entities in order to foster greater competition (Financial Times, 9 June 1995). In Finland the Electricity Market Act which came into force on 1 June 1995 opened up the production and distribution of electricity to competition. Major electricity users are now permitted to buy electricity from any producer or distributor and households will be able to choose between competing suppliers after two years. Following a change of Government in Sweden the deregulation of the electricity market was postponed to allow for a further review of the implications for smaller distributors and consumers. The Energy Commission, which conducted the review, concluded that deregulation should proceed as soon as possible, preferably by 1 January 1996. In Australia the Federal and State Governments recently agreed to implement the proposals contained in the Hilmer Report on National Competition

Policy (Hilmer, 1993). In the case of public monopolies the Report recommended that:

1. Regulatory and commercial functions should be separated;
2. Natural monopoly activities should be separated from contestable ones; and
3. Potentially contestable activities should be separated into several independent competing businesses.

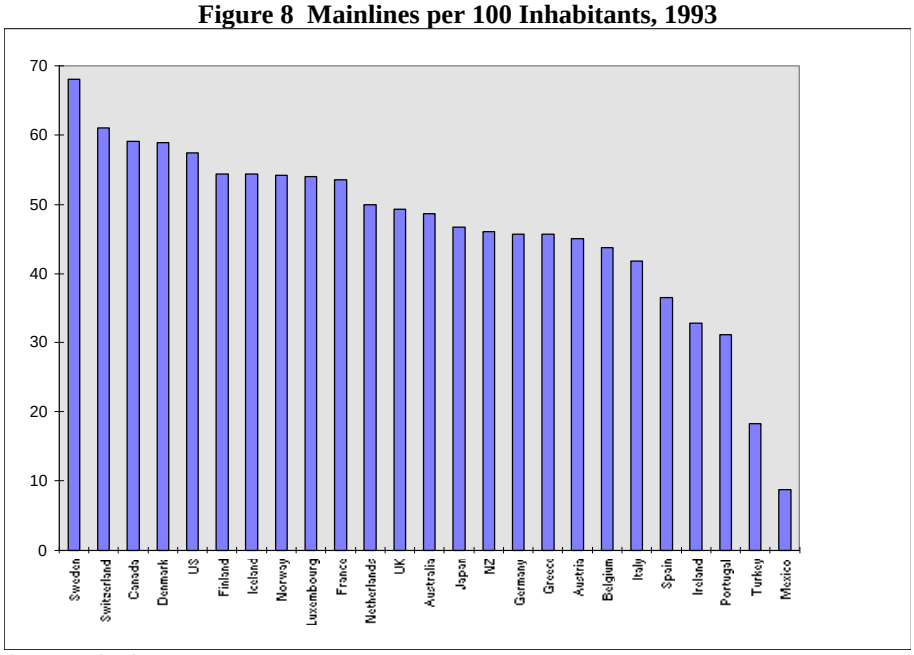
The Federal Government recently reached agreement with the State administrations to implement the Hilmer Report proposals (Financial Times, 12 April 1995).

It is often erroneously claimed that introducing competition in the case of public utilities will lead to a decline in employment. Introducing competition in such industries is likely to impact on employment within the economy in several ways. Pressures on incumbent firms to increase efficiency and reduce costs in response to increased competition is likely to involve some job losses in such firms. This will be partly offset by new competitors entering the market and creating new jobs. In addition, to the extent that competition leads to lower prices, demand for the output of the industry may be expected to increase and this will also have a positive impact on employment in the sector. In New Zealand, for example, although the liberalisation of telecommunications resulted in Telecom New Zealand reducing its workforce from 26,500 in 1986 to 14,900 in April 1990, Douglas (1993) claimed that total employment in the telecommunications industry actually increased by 3000. In the decade up to 1990 direct PTO employment in Ireland fell by virtually the same amount as in New Zealand, although Ireland did not liberalise its telecommunications market over this period (OECD, 1995). In OECD countries with the longest experience of liberalisation jobs in new entrants have offset those lost in incumbent firms (ibid.). Finally by reducing costs to the traded sector, increased competition will result in employment gains in that sector of the economy. Fitzgerald and Johnston (1995) report that simulations using the ESRI medium-term model suggest that the initial impact of a cut in costs in the energy utilities would be to reduce employment by about 3000 in the first year but that the loss of employment in utilities would be offset by increased employment in other sectors in future years.

Another criticism advanced in respect of liberalisation is that it would permit "cream skimming" and undermine universal service provision. It is worth noting in this context that the level of telephone penetration in Ireland, which is perhaps one measure of universal service provision, is low by developed country standards (Figure 8). The commitment to universal service provision is a relatively recent development and up to the end of the 1970s investment in telecommunications services was accorded low priority while demand for telephones was deliberately discouraged. The *Dargan Report* quoted the Deputy Secretary in the Department of Posts and Telegraphs with responsibility for telecommunications as saying that:

"No effort had been made to "sell" telephones; in fact the Department's practice of insisting on payment, by all new subscribers, of rental covering a year at least in advance was designed to contain the enormous latent demand within manageable limits."

Figure 8 Mainlines per 100 Inhabitants, 1993



Source: OECD

Armstrong et al (1994) point out that the danger of cream-skimming can be exaggerated and that restricting competition is not the only way to deal with this problem where it arises. In addition the incumbent operator has an incentive to overstate the cost of such social obligations where it is allowed to recoup them in access charges from other suppliers. OFTEL (1994) reported that the cost of the universal service obligation was lower than previously thought. Similarly, while Telecom Australia estimated the cost of its social obligations at A$850m, an independent study estimated them at A$250m. A recently published OECD study on telecommunications concluded that:

"At the same time there is no evidence to indicate that infrastructure competition has had a negative impact on the provision of telephone services. Despite the fact that a number of PTOs in monopoly markets have argued this case they have not been able to provide persuasive evidence in support of their position. Instead there is growing awareness that competition can be applied to improve and enhance universal service through direct service provision and transparent financial contributions

> from new operators; applying price discipline to incumbent PTOs; stimulating market growth; and introducing new technologies, flexible pricing and innovative services. Moreover it is often overlooked that increased efficiency in incumbent PTOs, stimulated by competition, is a major factor in bringing down the cost of delivering universal service." (OECD, 1995, p.5).

The study found that in the UK the entry of cable TV companies to the telephone market meant that some households which had previously been unable to afford a telephone were able to obtain one. This represents a good example of how competition has enhanced universal service provision. It also noted that competition had stimulated technological innovations which had reduced the costs of universal service provision.

8. SOME CONCLUSIONS

There is considerable scope for increased competition in public utilities to the benefit of consumers and the economy at large. Competition requires the government to face up to the essential contradiction involved in the present policy, whereby state utility companies are required to attempt to simultaneously operate on a commercial basis and discharge a number of non-commercial obligations for social reasons. If the Government wants a state enterprise to supply goods and services on a non-commercial basis it should enter into a formal agreement with the relevant company and pay for the provision of such services.

Liberalisation will leave a number of other important issues to be resolved. Incumbent firms are likely to remain dominant and they will be able to abuse that dominance both in respect of their customers and their rivals who will need to gain access to the incumbent's distribution network in order to compete, raising questions as to what sort of measures need to be put in place to deal with such behaviour. In some respects EU policy has defined the type of measures to be adopted, while in others there is still a considerable range of policy options available. Regulation however is not a substitute for, and will not deliver the benefits which can accrue from competition. In fact, certain forms of regulation may even hinder the development of competition. Commenting at the time of electricity privatisation in the UK, Robinson (1989) argued that:

> "But it seems a pity that life should be made so difficult for the many organisations which seem to want to enter electricity generation and that we should have to wait to realise the benefits which competition could bring."

It would be unfortunate if we were to repeat such a mistake.

Regulating public utilities poses a number of complex problems. As Schick (1993) observed 'the task of supervising national, centralized monopolies appears one that

most economists would wish only on their worst enemies'. The appropriate objective for regulation is to prevent anti-competitive behaviour but otherwise to allow competition, rather than attempt to manage the market. Such an objective can best be achieved by sector specific rules to deal with specific issues such as interconnection charges, operating in tandem with general competition law.

Appendix: An Illustration of the Efficient Component Pricing Rule

For illustrative purposes, let us suppose that the incumbent firm produces an essential input to services in the downstream market at a constant marginal cost of 2p. Now if we assume that the firm also has a downstream subsidiary which converts the input into a final product at an additional constant marginal cost of 3p. If the final product sells at a price of say 10p, the incumbent enjoys profits of 5p per unit sold. A new entrant wishing to enter the downstream market must purchase the essential input from the incumbent firm. How much should it pay the incumbent? According to the ECPR, if every unit sold by the new entrant results in a loss of sales to the incumbent, then the price should be the 2p marginal cost of production, plus 5p in profits foregone, giving a total charge of 7p.

It is assumed that the marginal cost includes normal profit so that the 5p profits which the incumbent enjoys on each unit sold constitutes monopoly profits. Now if final output prices are regulated, the regulator should set prices at a level which would eliminate any monopoly profits, i.e. 5p. In that case the access price is 2p. At those prices only new entrants with marginal costs equal or less than 3p, which is the marginal cost to the incumbent of converting the input into the final product, will be able to profitably enter the market, i.e. less efficient firms will not be able to enter.

Suppose now that the incumbent firm has to discharge certain social functions which impose an additional cost of 1p per unit, which is not borne by new entrants. In that case the access price should be set at 3p, i.e. 2p + 1p. Thus, the ECPR will take account of such social obligations.

Footnotes

1. These industries are collectively referred to as public utilities throughout the paper. Generally the term public utilities includes water supply and sewage services as well as gas, electricity and telecommunications. The present paper is not concerned with water supply and sewage services.

2. In fact there is nothing in the various Electricity Supply Acts which requires that the ESB obtain ministerial approval for a price increase. In practice the ESB has not sought to raise prices without ministerial approval.

3. This is not entirely accurate. Night storage heaters, for example, use off-peak power to produce heat at other times while fax transmissions cannot be stored. Such considerations do not apply in the case of gas which can be stored.

4. Estimates for a basket of services showed that between 1990 and 1994, residential charges fell by more than 4 per cent while business charges fell by 11 per cent. (The Treasury of Ministry of Commerce, 1995).

5. Act, ss. 35, 37, 61.

6. ss. 20, 45, 51 and 53 as amended.

7. s. 33

8. s. 42

9. s. 25

10. s. 37

11. s. 40

12. s. 11

13. s. 87(3)

14. s. 88

15. s. 99

16. COM (93) 643, OJ C123, 4 May 1994.

17. COM (95) 80/5, 15 March 1995.

18. 1 June 1995

19. COM(95)80/5 op. cit

20. COM(93) 643 final, COD 385

21. 88/301/EEC

22. 90/388/EEC, 28 June 1990

23. Council Directive 92/44/EEC, 5 June 1992

24. 90/387/EEC, 28 June 1990.

25. Commission Proposal announced 15 November 1995

26. COM(95)379 final.

27. 90/388/EEC, 28 June 1990

28. As announced on 15 November 1995

29. OJ, 16 February 1994

30. A public undertaking has been defined in Directive 80/723, as one "over which the public authorities may exercise directly or indirectly a dominant influence by virtue of their ownership of it, their financial participation therein or the rules which govern it." This definition is specific to the directive in relation to financial services in which it is contained.

31. Commission telecommunications equipment directive 88/301

32. Höfner and Elser v Macrotron, Case 41/90 23 April 1991 (1991), ECR I 1979

33. Francovich and Bonifaci v Italy, Joined Cases C-6/90 and 9/90 (1991), ECR I-5357

34. Heard October 1994. Judgement has not been delivered at time of going to press.

35. Case C-202/88 (1991), ECR I-1223

36. Samenwerkende NV v Commission, C 36/92 (1994), I ECR (not appropriate for Ministry officials in their capacity as a national competition authority to receive from the Commission documents of commercial relevance to one firm, where

within the same Ministry, commercial decisions were taken in respect of the state company which was one of its competitors).

37. High Court, unreported, Keane J., 10 November 1995

38. op.cit.

39. op.cit.

40. 25 February 1995

41. National Carbonising Co. Ltd. v. Commission, 109/75r (1975).

42. It was found to be cross subsidising its long distance tariff to customers by its charges to competitors for local access.

43. The RPI is the retail price index. The equivalent measure in Ireland is the consumer price index CPI.

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[1]These industries are collectively referred to as public utilities throughout the paper. Generally the term public utilities include water supply and sewage services as well as gas, electricity and telecommunications. The present paper is not concerned with water supply and sewage services.

[2]In fact there is nothing in the various Electricity Supply Acts which requires that the ESB obtain ministerial approval for a price increase. In practice the ESB has not sought to raise prices without ministerial approval.

[3]This is not entirely accurate. Night storage heaters, for example, use off-peak power to produce heat at other times while fax transmissions can be stored. Such considerations do not apply in the case of gas which can be stored.

[4] Estimates for a basket of services showed that between 1990 and 1994, residential charges fell by more than four per cent while business charges fell by 11 per cent. (Treasury - Ministry of Commerce, 1995)

[5] 1927 Act, ss.35,37, 61.

[6] 1927, ss.20, 45,51 and 53 as amended.

[7] 1927, s.33

[8] 1945, s. 42

[9] 1927, s.25

[10] s.37

[11] s.40

[12] s.11

[13] 1983, s. 87(3)

[14] 1983, s. 88

[15] 1983, s.99

[16] COM (93) 643, OJ C123 4.5.94.

[17] COM (95) 80/5 of 15.3.95.

[18] 1st June 1995

[19] COM(95)80/5 op. cit

[20] COM(93) 643 final, COD 385

[21] 88/301/EEC

[22] 90/388/EEC of 28th June 1990

[23] Council Directive 92/44/EEC of 5th June 1992

[24] 90/387/EEC of 28th June 1990.

[25] Commission Proposal announced 15.11.95

[26] COM(95)379 final.

[27] 90/388/EEC of 28th June 1990.

[28] As announced 15.11.95

[29] OJ 16.2.94

[30] A public undertaking has been defined in Directive 80/723, as one “over which the public authorities may exercise directly or indirectly a dominant influence by virtue of their ownership of it, their financial participation therein or the rules which

govern it." This definition is specific to the directive in relation to financial services in which it is contained.

[31] Commission telecommunications equipment directive 88/301

[32] Höfner and Elser .v. Macrotron Case 41/90 23.4.91 (1991) ECR I 1979

[33] Francovich and Bonifaci .v. Italy Joined Cases C-6/90 and 9/90 (1991) ECR I-5357

[34] Heard October 1994. Judgement has not been delivered at time of going to press.

[35] Case C-202/88 (1991)ECR I-1223

[36] Samenwerkende NV .v. Commission C 36/92 (1994) I ECR (not appropriate for Ministry officials in their capacity as a national competition authority to receive from the Commission documents of commercial relevance to one firm, where within the same Ministry, commercial decisions were taken in respect of the state company which was one of its competitors.)

[37] High Court, unreported, Keane J. 10.11.95

[38] op.cit.

[39] op.cit.

[40] 25.2.1995

[41] National Carbonising Co. Ltd. v. Commission, 109/75r (1975)

[42] It was found to be cross subsidising its long distance tariff to customers by its charges to competitors for local access.

[43]The RPI is the retail price index. The equivalent measure in Ireland is the consumer price index CPI.