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Price Caps for Telecommunications

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POLICIES AND EXPERIENCES

INFORMATION COMPUTER COMMUNICATIONS POLICY

INFORMATION COMPUTER COMMUNICATIONS
POLICY

37

PRICE CAPS FOR TELECOMMUNICATIONS

POLICIES AND EXPERIENCES

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

As competition is increasingly introduced into telecommunication markets, regulators have been examining price cap mechanisms as an important tool to control pricing for former monopoly operators. This report examines the experiences in the use of price cap regulation in various OECD countries and reviews the scheme's performance in delivering its promised benefits. It was recommended for derestriction by the Committee for Information, Computer and Communications Policy in October 1994.

This report was prepared by Mr. Patrick Xavier of the Swinburne University of Technology (Melbourne, Australia). It is published on the responsibility of the Secretary-General of the OECD.

SUMMARY

It is now some ten years since price cap regulation was first introduced in the United Kingdom in 1984 to regulate British Telecom. Since then several other countries have introduced versions of the scheme, and many others are currently considering its implementation. But to what extent have the promised benefits of price caps actually materialised when the scheme has been implemented? This study assesses the actual effects of the price cap scheme against its anticipated effects, including the extent to which it has:

-- succeeded in delivering sustained real price reductions;

-- facilitated price flexibility and rebalancing consistent with competitive behaviour and cost structures;

-- served to provide sustained incentives for improved economic performance resulting in enhanced productivity and reduced costs;

-- resulted in "adequate" earnings for the operator;

-- encouraged appropriate investment/capacity expansion;

-- been consistent with improvements in the quality of service;

-- impeded achievement of equity objectives;

-- led to simplified, more transparent and less costly regulation;

-- permitted decentralised "arm's length" regulation; and

-- promoted competition and its resulting benefits to customers.

There is no doubt that price cap regulation has been effective in holding down price increases for services which are not subject to competition. This is demonstrated by the fact that prices for such services are typically close to their maximum price cap permitted levels. However, price cap regulation has

been less relevant to the prices of competitive services since these typically fell far more sharply than required by the price cap.

Price cap regulation has also provided the regulated firm with more price flexibility than cost-plus rate of return regulation. However, as observed in this study, it has been a common practice to limit the regulated firm's pricing flexibility through the use of separate price caps on each of several "sub-baskets" of services. Regulation has sought to impose such constraints on overall pricing flexibility to reduce the ability of the regulated firm to cross-subsidise competitive services through price increases in non-competitive services. Through the use of these sub-caps, the price cap scheme has been able to control the nature, extent and speed of price rebalancing. And this turns out to be the most demonstrable effectiveness of the price cap scheme.

There has been speculation that price cap regulation could lead to a reduced rate of return for the regulated firm and that this in turn would reduce a carrier's ability to undertake the capital expenditure necessary to sustain technological change and innovation. So far price cap regulation has allowed high rates of return to be earned and this appears to have caused considerable concern in some quarters such that rate of return considerations are now a major feature of many price cap schemes. However, a preoccupation with the rate of return would precipitate the danger that price cap regulation becomes in effect simply a surrogate for rate of return regulation, with all the incentives for inefficiency that this would bring.

Another function of price cap regulation has been to address equity concerns about the potential sharp rises in the price of individual services that could result from uninhibited price rebalancing. *Indeed, the conclusion reached by this study is that in practice, price cap schemes may well have been more concerned about -- and at any rate have been more effective in addressing -- equity objectives than efficiency objectives.* That is, in practice the price cap appears to have been effective not so much in achieving efficiency objectives, but with: customers obtaining a "fair" share of productivity gains; the regulated firm earning a reasonable or "fair" rate of return; cushioning the impact of price rebalancing on needy and vulnerable customers through the use of sub-caps; and with "fair" competition. However, some countries with rate of return regulations have been effective in meeting equity objectives.

This regulatory focus on equity is not surprising. After all, many regulatory activities have long been initiated and driven by perceptions of fairness (which are far more understandable to policy-makers and the electorate)

rather than the esoteric (to non-economists at any rate) concept of economic efficiency.

A more cost-effective approach to pursuing equity objectives is the use of transparent, specifically-targeted subsidies. Moreover, where such schemes are in place, this may allay the fears of vulnerable groups and may allow efficiency-orientated policies freer progress.

Has price cap regulation in practice lived up to its promise to be a step toward administrative simplicity and transparency? Certainly, price cap regulation in practice has been far more complex than the simple CPI-X formula might suggest. Indeed, in the United Kingdom, the United States and Australia, attempts to fine tune the price cap scheme have resulted in a *complicated, more intrusive, less transparent* system than was originally intended.

It became increasingly evident that assessing the impact of price cap regulation is complicated by the fact that the indicators being examined are also being affected by other policies/factors, particularly the level of competition. This underlines the need to clearly recognise that price cap regulation should not be regarded as a sufficient, stand-alone policy. Rather it should be designed, implemented and assessed as a complementary part of a package of policies, particularly the promotion of effective competition.

Price control schemes can cause significant distortions particularly if applied for a long period. The function of price cap regulation is more appropriately the narrow and temporary one of moderating sharp changes in prices while the market is in transition. Expecting much more of price cap regulation could distract from the need to think strategically beyond a preoccupation with price control towards a clear focus on the need for effective competition.

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Chapter 1

INTRODUCTION

1.1 Introduction

Price caps are not new. As in the case of other essential (public utility) services, governments in many countries have for long sought -- openly or covertly -- to impose caps on the prices of telecommunication services. Frequently, telecommunication operators had to obtain government approval for price increases. Since social and political reasons generally prevailed in favour of low prices, and since such government involvement (for equity and political reasons) presented a cloak behind which inefficiencies could flourish, the financial outcome for the telecommunication operator was often an inadequate rate of return or worse, a deficit.

Recently, a new form of price regulation -- first introduced in the United Kingdom in 1984 to regulate British Telecom -- has been attracting considerable attention. In essence, this so-called "Price Cap" regulation limits increases in the average price of telecommunication services to no more than the increase in an inflation index minus a specified amount referred to as the "X" factor. This means, for example, that if the inflation index increases by 7 per cent, and the "X" factor is set at 3 per cent, an operator's controlled prices would, on average, be allowed to increase by no more than 4 per cent in that year.

In 1989, this price cap scheme was also applied to AT&T in the United States, and to Telecom Australia. Several other countries have since introduced versions of the scheme, including France, the Netherlands, Germany, Sweden and Denmark and several other countries are currently considering its implementation. Indeed, in some countries (*e.g.* the United Kingdom and Australia), the scheme is now also being applied to regulate price increases in other industries such as water, gas and electricity services. The Appendix provides brief details of the price cap regulation schemes applied in various

countries. These structural aspects of the scheme do not receive extensive attention in this report because such details are readily available elsewhere.

The growth in the number of countries applying the scheme is in itself a testimony to the persuasiveness of the promised benefits of price cap regulation. But to what extent have these promised benefits of price caps actually materialised when the scheme has been implemented? In other words, how well has price cap regulation performed in practice?

This question is attracting strong interest because in the face of rapid changes in technology, privatisation and increasing competition, many countries are looking hard for suitable ways to reform their regulatory systems so that they are more appropriate to such circumstances.

This report examines the experiences relating to the use of price cap regulation in various countries and reviews the scheme's performance in delivering its promised benefits. The predominant focus of the study is on the experience of price cap regulation in the United Kingdom, the United States, and Australia. This is partly because the longer experience with price caps in these countries means that more data about the effects of the scheme is available. But the focus on these countries is appropriate for another reason. The United Kingdom, United States and Australia are further down the track in introducing competition than many other countries now considering the use of price cap regulation. Accordingly, their experiences will be particularly valuable in providing useful insights about the effects of price cap regulation when used within an environment of increasing competition. Moreover, these three countries also provide examples of the use of the price cap scheme in somewhat different institutional circumstances. In the United Kingdom, the scheme was introduced to regulate a newly-privatised British Telecom facing competition by a new entrant, Mercury Communications. In the United States, it is being introduced in an increasing number of States to regulate Local Exchange Carriers (LECs) in already competitive circumstances. In Australia, it was introduced to regulate the former monopoly operator facing competition from a privately-owned new entrant, Optus Communications.

1.2 The approach of this study

This study does not dwell extensively on the theoretical underpinnings of price cap regulation but concentrates largely on investigating the impacts the application of the scheme has had. This is in part because there is already a voluminous literature on the theory of price cap regulation. But it is primarily

because the situation which appears to have developed in regard to the use of price caps is a case in which practice is now well ahead of theory which, as several commentators have pointed out (see, *e.g.* Braeutigam and Panzar, 1993), is still to be resolved in some respects. The desirability of price cap regulation is therefore very much an empirical question whose value is to be judged on the basis of whether it achieves the desired effects.

It must be acknowledged at the outset that the impact of price cap regulation is complicated by the fact that the indicators examined are also being affected by other policies/factors, particularly the level of competition. Moreover, this analysis of some of the effects of price cap regulation is necessarily partial, particularly in the case of the United States and Australia where the scheme has only been in operation since 1989. In other words, there has simply not been adequate time for many of the important effects to be observable and measurable. But decisions are being made about the price cap scheme so that even at this stage a review should be useful. Where the requisite data are not available, action can be taken to generate such data for subsequent reviews of the scheme's effects.

1.3 The structure of the report

The paper is organised as follows. After this introductory chapter, Chapter 2 discusses the appropriateness of rate of return regulation especially in telecommunication markets which are becoming increasingly competitive. Although this subject has received extensive treatment elsewhere, there is a need to register a reminder here as a necessary preamble to discussing the claimed relative advantages of price cap regulation. Such a reminder of the deficiencies of rate of return regulation is necessary also because features of this form of regulation are still present in many countries, and, indeed, are present even in regulatory systems which purport to use price cap regulation. Notably, in the United Kingdom where price cap regulation was first heralded as a system which was to be markedly different from rate of return regulation, there has been a unmistakable drift towards the incorporation of many of its features.

Chapter 3 explains the anticipated effects -- both desirable as well as undesirable -- of the price cap scheme. These anticipated effects of the scheme provide the criteria used to evaluate its performance.

Chapter 4 assesses the actual effects that price cap regulation has had when the scheme has been applied. The performance assessment is conducted through considering these actual impacts of the scheme against the criteria presented by its anticipated impacts. In other words, how did price cap

regulation perform when the actual impacts of the scheme are compared against its anticipated impacts?

Finally, Chapter 5 presents the conclusions of the study.

Chapter 2

REGULATION IN AN ERA OF INCREASINGLY COMPETITIVE TELECOMMUNICATION MARKETS

2.1 Introduction

In recent years there has been an acceleration in the liberalisation of telecommunication markets to allow competition in an increasing number of countries. Although monopoly provision of telecommunication services still exists, there is a clear momentum toward eliminating it. This momentum is being driven by an increasing acceptance that competition is far better suited than regulated monopoly to exploit the rapidly developing and ever more versatile technologies relating to telecommunication. These developments have transformed the product of the telecommunication industry from a simple, essentially standardised basic service -- such as might be provided by a monopoly and rather easily regulated -- into a constantly and unpredictably proliferating and evolving collection of services, provided with a correspondingly diversified and evolving collection of technologies by an ever-expanding, diverse set of providers. As Kahn (1993*a*, p. 7) puts it:

> *"...the wide consensus that competition, wherever feasible, is the best mechanism for serving the interest of consumers -- protecting them from having to pay prices in excess of cost, stimulating constant improvements in efficiency, product quality and diversity -- applies with unusual intensity to a technologically dynamic industry like communications. At the very core of the superiority of the competitive market over any system of regulation is the inescapable phenomenon of unpredictability -- the unpredictability of services, new and old, that will be forthcoming under undiluted profit incentives and under pressures of competition; the unpredictability of what their respective values will prove to be; and the unpredictability of which providers will prove to be the most capable of exploiting those opportunities."*

The dramatic developments and unpredictability are likely to spread. Markets and services are converging as telecommunication technology advances and enlarges the capabilities of telecommunication networks. The expected merger of information and entertainment envisioned in services such as video on demand and interactive video has received wide press coverage. Major alliances and mergers across traditional market boundaries have already occurred or have been proposed, for example, among telecommunication companies and cable TV companies. Such developments should be considered in determining what changes need to be made to regulation.

The increasing acceptance of competition is also due to the recognition that:

-- competition can bring substantial benefits to users, in terms of increased choice, greater innovation and higher quality of services at reduced prices;

-- competition stimulates significant gains in the size of the telecommunication market;

-- universal service has not been impaired by market liberalisation, on the contrary, competition can be applied to complement and enhance universal service;

-- competition encourages improvements in the efficiency of public telecommunication operators and opens up new employment opportunities in and beyond the telecommunication sector.

Accompanying the liberalisation of markets have been significant changes in telecommunication regulation. Regulatory functions have been separated from the operation and provision of telecommunication services resulting in independent regulatory structures and improved transparency in policy frameworks. Indeed, for some countries such as New Zealand, the traditional approach towards regulation has been abandoned. No separate specific regulator of the telecommunication industry has been established. Competition law will be depended upon to police corporate behaviour in the telecommunication as in other industries. By contrast, in the United Kingdom, the United States and Australia, for example, it has been considered necessary to establish a separate telecommunication industry regulator. However, the primary role for these regulators is now to facilitate and promote competition in the industry. But, it is widely accepted that, in the transitional period to effective competition at any rate, some telecommunication services will

continue to be provided in non-competitive markets. Accordingly, there is need to ensure that the customers for such services, which include residential and small business subscribers, are treated fairly and that universal service and other government objectives are not ignored.

The best approach to eliminating the abuse of market power and ensuring efficient and fair pricing is in nearly all cases to increase market competition. As work conducted by the OECD evidences, universal service obligations and equity concerns can be assisted rather than threatened by competition (OECD forthcoming). For instance, competition is accelerating the use of technology which will make it commercially attractive to reach customers once considered unavoidably unprofitable -- such as those who live in remote areas. At any rate, equity concerns can be addressed within a competitive context through cost effective, specifically targeted, transparent schemes which do not deplete economic performance. But there may be occasions where special policies and regulatory provisions will be considered necessary.

These considerations underpin the standpoint of this study:

-- that effective competition exerts the best influences for the enhanced performance of the telecommunication industry and it is in the public interest to encourage its substitution for direct regulation wherever feasible;

-- where market power might otherwise result in captive customers being exploited and/or deny actual or potential rivals the opportunity to compete on the basis of their relative competitiveness, regulation will continue to be needed, at least on a transitional basis; but,

-- such residual regulation must be adapted to the requirement of effective competition; so that to the greatest extent possible, social or non-economic policy objectives should be pursued using instruments other than regulation.

These basic propositions about the role of regulation will have many supporters (see, *e.g.* Kahn, 1993*a*; Schultz and Janisch, 1993) and suggest a set of basic principles against which to judge specific regulatory policies in an era of rapidly increasing competition. But regulatory instruments such as price cap regulation need also to be considered in terms of their cost-effectiveness (including the cost burden that such regulation imposes) in achieving the objectives of regulatory policy in an individual country. The Canadian Radio-

Television and Telecommunications Commission (CRTC) provides an example of regulatory reform objectives (CRTC, 1992) which are fairly typical of an increasing number of regulatory regimes:

> *"...any changes to be made to the current framework in order to enhance the efficiency and effectiveness of regulation must at the same time be conducive to the attainment of the following objectives:*
>
> *(1) universal accessibility to basic telephone service at affordable prices;*
>
> *(2) opportunity for telephone company shareholders to earn a reasonable return on their investment;*
>
> *(3) equitable treatment of subscribers in terms of service and price;*
>
> *(4) assurance that telephone companies do not unfairly take advantage of their monopoly dealings with competitors; and*
>
> *(5) encouragement of the development and widespread availability of new technology and innovative services to respond to the needs of business and residence customers."*

2.2 A strategic approach to regulation

Consideration of regulatory reform needs to adopt a strategic perspective. Certainly regulatory decisions should not be based on the extent of competition that exists today but should also consider anticipated developments. For telecommunications, regulatory reform in most countries can confidently anticipate a rapid extension and intensification of competition. Moreover, the transitional period to competitive markets will be much shorter in the 1990s than it was in the United States and the United Kingdom in the 1980s. This is because of rapid technological change and innovation, a better understanding of regulatory mechanisms, and simply because there is now more confidence about the benefits of competition.

Regulation should be confined to an explicit narrow focus and regularly reviewed to ensure it is still necessary and/or appropriate. Certainly there are dangers that "regulated competition" can become increasingly intrusive. Indeed, Schultz and Janisch (1993) warn that regulation confronted with competition appears to have a systematic tendency either to suppress

competition or to try to orchestrate it and control the results it produces. This could lead to the appearance of competition but not its substance. The current (April 1994) debate in the British press over telecommunication regulation is unanimous about one point: ten years after the system was introduced to regulate a duopoly, there are increasing signs that its relevance in the current situation -- wherein there are now a multiple number of competitors -- requires thorough review. Critics of the current United Kingdom system argue that rather than decreasing in terms of complexity and scope as competition has increased, telecommunication regulation in the United Kingdom appears to have become more complicated and intrusive.

All this does not mean that regulation is necessarily undesirable. It does warn emphatically though of the need to be continually vigilant about unnecessary and obsolete regulation. In the years to come, the importance of telecommunications to society and the economy is likely to increase. It is important to ensure that regulation does not inhibit but facilitate the provision of the full potential of telecommunication services.

2.3 Commercialisation of government-owned monopoly operators: the role of price cap regulation

In many countries, there has been substantial cross-subsidisation of some telecommunication services. The prices of basic local residential service and service in rural areas were kept low at the expense of high prices on other services, particularly long distance and services to businesses in concentrated urban areas. As is now well recognised, such policies typically allowed gross inefficiencies to develop. A frequent consequential result was financial loss or an inadequate rate of return. In many countries, the onset of privatisation and competition has catalysed the need for changing such policies. A common approach to reform has been the drive to "commercialise" the activities of the usually government-owned monopoly telecommunication operators.

In Australia, for example, the regulatory reform measures instituted in the mid-1980s required Telecom Australia to operate as if it was a commercial entity. To infuse it with the efficiency pressures of earning a reasonable level of profits, Telecom was required to *increase* its rate of return to a specified target level. Only in more recent years since this target rate of return (about 12 per cent) has been comfortably exceeded has the concern about Telecom's rate of return switched from its inadequacy to whether an excessive rate of return is being earned.

There is little doubt that setting this rate of return target did exert pressure for more efficient economic and financial performance (Xavier, 1991). The need to lift the rate of return led to operating cost efficiencies and also curtailed uneconomic investments (because such investments would make it harder to achieve the target). The target rate was a transparent, widely understood performance measure which management could use to rally staff support for efficiency improving change.

Price cap regulation was introduced to help ensure that the prescribed rate of return target was achieved by Telecom not simply by increasing its prices but through improvements in efficiency. It was recognised that the rate of return can also be raised through quality and service degradation. So Telecom Australia was also required to provide information on its operations to facilitate monitoring and assessment according to a range of performance indicators.

A perceived major advantage of instituting a formal price cap scheme in Australia is that it served to distance managerial decisions regarding price changes from government approval. In principle, so long as price rises stay within the confines of the price cap limits defined on the basis of a specific predetermined index, government approval would not be required.

2.4 Rate of return regulation

The rate of return regulation practised in some countries such as the United States and Canada, has had a different focus. The concern here is to guard against "excessive" monopoly profits. The aim of rate of return regulation is to limit the operator's rate of profit to a "reasonable" or "fair" level. Once the acceptable rate of return is determined, the regulator approves prices for each service offered by the company such that the combined revenue from all services produces the overall revenue required. In effect, the rate of return regulation system virtually guarantees that the predetermined rate of return is earned on all "prudently" incurred infrastructure and operational costs.

This form of rate of return regulation, traditionally practised in the United States, is basically a "cost-plus" approach. And this is its primary problem. Experience in the United States and Canada indicates that within such a cost-plus arrangement, incentives to contain costs are diminished and, instead, incentives for inefficient behaviour proliferate. Since cost reductions will generally require price reductions rather than be reflected in increased profitability, rate of return regulation weakens incentives to pursue risky but profitable technological innovation and other forms of achieving improvements in economic performance. The fact that even if the firm achieves a

revolutionary innovative breakthrough it will not be permitted a corresponding increase in its profits will no doubt reduce incentives to undertake the substantial risk and expense required for success in the innovation process. In addition, because the rate of return is calculated as a percentage of invested capital, the firm has an incentive to over-invest in capital (so long as the cost of capital is less than the permitted maximum rate of return). Indeed, to maximise profits, the regulated firm has an incentive to manipulate its inputs of capital and labour, without regard to efficiency, and to adopt strategies for investment and pricing based on what it expects the regulatory agency might wish, not necessarily what best serves its customers and society (FCC, 1992, p. 5322).

In short, in practice, rate of return regulation has created distortions in decision-making resulting in over-investment; "cost-padding" including overstaffing and inefficient work practices; inefficient choices about technology, the input mix and in the extent of diversification.

To guard against such abuses, the regulator has to expend considerable resources to try to ascertain that the costs incurred by the regulated firm (upon which it is allowed to earn a "fair" return) are "costs necessarily incurred". This is not an easy task for the regulator because of "information asymmetry". That is, the regulator will have far less information than the regulated firm. Indeed, the regulator will usually be significantly dependent on the information provided by the regulated firm (which can of course be expected to be biased towards promoting the interests of the firm).

The poor incentives for economic performance and the high costs of rate of return regulation were major factors in the British Government's decision to reject this approach as a means of regulating British Telecom (OFTEL, 1992*a*, p. 13) and to use price cap regulation instead.

2.5 Rate of return regulation in an era of increasing competition

In the United States, rapid developments in telecommunication technology and competition have aggravated the difficulties of rate of return regulation and made it increasingly clear that this system is unsuitable especially when applied to telecommunications.

A major reason why rate of return regulation of the type practised in the United States is inappropriate in competitive circumstances is that it constricts the price flexibility required for effective competition. For instance, because of previous cross-subsidisation policies, unless significant price rebalancing is permitted, the incumbent is vulnerable to cream-skimming new

entrants. Indeed, competitive restrictions placed upon incumbent providers can result in potentially higher cost new entrants obtaining business that could be served by the incumbent at a lower cost.

Under rate of return regulation, AT&T's ability to respond rapidly to increasingly aggressive competition from the other inter-exchange carriers was impeded (Huber *et al.*, 1992). For instance, AT&T had to seek approval for price increases in proceedings that could drag on for years. Considerable cost and revenue data were required to demonstrate that the new prices were appropriate. A simple rate rebalancing application could be held up for several months.

The inability to accurately allocate rate base and expenses among services (as required by the rate of return regulation process) is another problem which will be accentuated by increasing competition. This is because, with competition, the incentives for shifting costs away from competitive services and on to the monopoly services -- upon which the guaranteed rate of return would be earned -- are increased. This can facilitate the practice of cross-subsidy since the regulated firm could set very low prices where it faces competition, making up for any shortfall in revenue from the guaranteed returns on its monopoly services. Such tactics could present a major impediment to the emergence and survival of competition and may be difficult to challenge because of the difficulty in allocating joint and common costs. Accounting regulations may help diminish the ability for firms to practice internal cross-subsidisation. However, the problem of internal cross-subsidisation will probably continue to exist even under a price cap regime.

Finally, a system based on an assured rate of return will itself be under threat as competition intensifies. This is because in such circumstances, the regulator can no longer really guarantee that the regulated firm will earn the predetermined acceptable rate of return since earnings in competitive markets will depend on the relative competitiveness of participants.

2.6 Modifying rate of return regulation to improve efficiency incentives

In the United States, a variety of different modifications to traditional rate of return regulation aimed at improving efficiency incentives have been attempted. Because their objective is to increase incentives for efficient behaviour, these modifications have been referred to as "incentive regulation".

As noted earlier, under rate of return regulation a firm that has not yet earned its authorised or target rate of return faces similar incentives to an unregulated firm in regard to cost reduction and demand expansion, since every dollar earned by those actions is kept by the firm. Once the rate of return constraint is binding, however, incentives for efficient behaviour are reduced. The advantage of a sharing plan is that the firm always retains some incentives for efficient behaviour since it is allowed to retain an agreed percentage of earnings (often arranged on the basis of a sliding scale) in excess of the authorised return. The wider the range of earnings (both high and low) the firm is allowed to achieve, and the larger the portion of the permitted over-earnings, the more efficiency incentives the firm is likely to have.

Clearly, the ability to retain a share of profits over the authorised rate means that earnings sharing schemes do provide more incentives to improve efficiency than rate of return regulation and they are still in use in several States in the United States, sometimes in combination with price cap regulation. However, earnings sharing schemes face some degree of the problems besetting rate of return. For instance, it is still necessary to calculate a firm's rate of return and to become engaged in many of the associated accounting and monitoring problems of rate of return regulation. For these reasons, price cap regulation is currently gathering increasing support as the preferred incentive regulation scheme. The following chapters examine the rationale of price cap regulation and review price cap policies and experience in various countries.

Chapter 3

THE ANTICIPATED EFFECTS OF PRICE CAP REGULATION

3.1 Introduction

As discussed in Chapter 2, the deficiencies of traditional forms of regulation in the face of rapid developments in technological change and competition led to a search for alternative methods of regulation. An increasing number of countries are introducing price cap regulation. What is its appeal?

This chapter discusses the anticipated impacts of price cap regulation. These anticipated impacts include the promised benefits of the price cap approach. But there are also some anticipated costs of the price cap scheme. Together, these anticipated impacts -- both desirable and undesirable -- provide the specific criteria which are used to assess the scheme. The use of these criteria is appropriate since the aim of the performance assessment is to assess the extent to which these anticipated impacts of price cap regulation did actually materialise when the price cap scheme was applied.

3.2 The promised benefits of price cap regulation

The original rationale of price cap regulation envisaged the scheme as a simple system which essentially provides a system which ensures that customers share in the gains from cost reduction attained by the firm. Efficiency incentives would be sustained since the regulated firm is allowed to keep profits earned through better-than-expected cost reductions. Within the overall price cap, the firm would be free to rebalance its prices to achieve efficiency and competitive objectives.

The appeal of price cap regulation is best explained through a discussion of its promised benefits.

A document published by the German Federal Minister of Posts and Telecommunications (1993) specifies the typically perceived merits of the scheme:

-- it guarantees that prices fall on average relative to general purchasing power (in line with productivity advances in the telecommunication industry);

-- it enhances the enterprise's flexibility in adjusting its price structure;

-- it provides a strong incentive to lower costs; and

-- the burden of regulation is relatively light, at least in the medium and long term.

These and other promised benefits of the scheme are explained in the following discussion.

3.2.1 Price cap regulation results in simplified, more transparent, less intrusive and costly regulation

The price cap system is based on an apparently simple formula which promises an "arm's length" method of regulating price increases. Once the "X" factor is set, regulatory approval for price increases within the price cap limits is not required so that regulatory intrusion into managerial decision-making is minimised.

It was anticipated that by focusing on just two variables -- the familiar and publicly-reported inflation index and a pre-agreed "X" factor -- the price cap scheme would significantly reduce the need for substantial information (*e.g.* detailed cost data) from the regulated firm each time approval for a price rise is sought. Moreover, there would be less need for the regulator to question and/or be involved in managerial judgments about capital investment, the allocation of costs, etc. At least, this would be the case once the level of the "X" factor had been determined.

This decreased need for information under the price cap approach was seen as a significant advantage in view of the problems of information asymmetry referred to earlier. Since prices are easier to measure and track than profits, it was also expected to reduce the administrative costs of regulation considerably.

3.2.2 *Price cap regulation ensures sustained real price decreases*

The price cap formula ensures that the average price of telecommunication services falls in real terms by at least the amount of the "X" factor. In so doing it ensures that productivity gains are shared with customers in the form of lower real prices (as would tend to occur in competitive markets).

This focus on prices -- rather than costs as in rate of return regulation -- is perceived to be consistent with customer interests, since customers are more interested in and are better able to monitor the price they pay for services rather than what they cost.

3.2.3 *Price cap regulation permits price flexibility including price rebalancing*

Price cap regulation allows the increased pricing flexibility required for competitive behaviour -- at least in regard to downward price movements. A desirable feature of competition is that it can be expected to result in some prices falling closer to their cost levels. On the other hand, some services which were priced below their cost will experience price increases. In general, such "rebalancing" of prices so that they are more reflective of costs is consistent with economic efficiency.

3.2.4 *Price cap regulation provides sustained incentives for improved economic performance*

A primary attraction of the price cap approach is that, by contrast with rate of return regulation, it promises sustained incentives for economic efficiency. This is because in principle it does not place a rigid ceiling on the level of profits which a firm is permitted to earn but allows the regulated firm to enjoy increased profits where it can reduce costs by more than the "expected" cost reduction embedded in the "X" factor. Thus, the more the firm manages to reduce its costs, the higher the profits it can earn. In this way, the scheme is expected to provide *sustained* incentives for improved productivity (by contrast with the rate of return regulation approach, wherein efficiency incentives would rapidly diminish as the maximum allowed profit level is reached). The price cap ensures that higher profits are not earned through raising overall prices but through operating more efficiently.

3.2.5 Price cap regulation provides incentives for technological change and innovation

In short, the ability to earn higher profits provides the potential rewards for the risk taking and considerable expense of technological change and innovation. Millman and Braeutigam (1989) argue, that by comparison with rate of return regulation, price cap regulation could result in better investment and diversification decisions resulting in the capture of greater "economies of scope, risk diversification, and market synergies".

3.2.6 Price cap regulation provides protection against cross-subsidisation and other potential abuses of market power

As noted earlier, where the regulated firm is involved in selling services subject to competition as well as services that are not, there will be incentives to cross-subsidise the price of competitive services financed through over pricing non-competitive services. Thus, price caps on non-competitive services can help to minimise such practices and provide vulnerable customers with protection against potential abuses of market power.

3.2.7 Price cap regulation promotes competition and its resulting benefits to customers

The price cap regime will help in changing the public utility mentality associated with guaranteed returns based on regulatorily approved prices. Such changes in corporate culture are necessary to empower those who want to refocus corporate attention towards meeting customer and market-driven needs.

3.3 Issues of concern regarding the impact of price cap regulation

There are also several concerns about the impact which price cap regulation might have on the regulated firm in regard to the rate of return earned, investment, quality of service, and equity.

3.3.1 Impact on the regulated firm's earnings

Under price cap regulation, earnings are no longer guaranteed and there have been fears that control over prices would have uncertain effects on the rate of return earned.

3.3.2 Impact on investment/capacity expansion

If the regulated firm's earnings are significantly reduced by the price controls imposed on it, this in turn could affect internal -- and external -- funding of investment programmes at a time of rapid technological change and strong demand.

3.3.3 Impact on quality of service

A concern relating to a regulated firm's ability to earn higher profits under the price cap scheme is that a firm can earn higher profits not only through lowering its costs but through the provision of lower quality services.

3.3.4 Impact on equity objectives

Equity concerns are prominent in price cap schemes. For instance, part of the rationale of the price cap formula is that it can provide an equitable sharing of productivity gains. Through the "X" factor, the price cap scheme ensures that not all cost reductions through technological, scale and efficiency gains are simply retained as profits, but that some measure of these gains are passed on to customers, including customers of non-competitive services. The regulated firm would also share in efficiency gains since it is allowed to retain any additional profits it generates as a result of better-than-expected performance in regard to efficiency and technological improvements.

Another equity concern relates to the price rebalancing that will be permitted under the price cap scheme, since some groups will benefit considerably while other groups will incur significant costs. This concern is particularly acute if the losers are low-income or other already-disadvantaged groups. Low income families are likely to make relatively fewer calls per line especially long distance and international calls. They would not therefore stand to gain as much from the price fall aspect of price rebalancing as large users. Other light users too would enjoy less benefits. In the case of low income light users, there is the concern that sharp increases in the exchange line rental could displace subscribers from the network and threaten universal service objectives.

3.3.5 Impact on employment

There is also the concern that the ability to increase profits under the price cap scheme will result in increased labour shedding and unemployment. One of the aims of price cap regulation is to provide incentives for telecommunication carriers to improve productivity and other aspects of

economic performance. But cost-reducing technological and organisational innovations result in reduced carrier workforces, at least initially. However, the expansion of the telecommunication sector could create more jobs as lower prices attract new customers and induce existing customers to make greater use of telecommunication services. Moreover, lower telecommunication prices and innovative services could help create new jobs in the many businesses that increasingly rely upon telecommunications in the production of goods and services.

Chapter 4

THE ACTUAL EFFECTS OF PRICE CAP REGULATION

4.1 Introduction

The previous chapter discussed the anticipated effects of price cap regulation. In this chapter, the actual effects of price cap regulation resulting from its application are examined, while the conclusions of this examination receive further attention in the next chapter. As explained earlier, the criteria used to assess the performance of the scheme have been selected on the basis of its anticipated effects -- both benefits and costs. The assessment criteria drawn from the discussion in Chapter 3 are set out in Table 4.1.

TABLE 4.1. CRITERIA FOR ASSESSING THE PERFORMANCE OF PRICE CAP REGULATION

TO WHAT EXTENT HAS PRICE CAP REGULATION:

1. Succeeded in delivering sustained real price reductions?
2. Facilitated price flexibility and rebalancing consistent with competitive behaviour and cost structures?
3. Served to provide sustained incentives for improved economic performance resulting in enhanced productivity and reduced costs?
4. Resulted in " adequate " earnings for the operator?
5. Encouraged appropriate investment/capacity expansion?
6. Been consistent with improvements in the quality of service?
7. Been consistent with achievement of equity objectives?
8. Led to simplified, more transparent and less costly regulation?
9. Permitted less intrusive "arm's length" regulation?
10. Promoted competition and its resulting benefits to customers?
11. Encouraged introduction of new services and features?

Economists will be familiar with these criteria, since criteria 1, 2 and 6 are concerned with so-called allocative efficiency; criteria 3 and 4 with technical efficiency; and criteria 5, 6, 10 and 11 with dynamic efficiency.

4.2 The actual effects of price cap regulation

4.2.1 Impact on the price level

The average price of telecommunication services in price cap baskets has fallen to satisfy price cap requirements in all the countries where the scheme has been applied. Judged simply in terms of this criterion, the price cap scheme has been demonstrably successful. In particular, there is no doubt that price caps have been effective in limiting price rises for services which are not subject to competition. For such services, the price increase was usually close to the maximum allowed by the price cap provisions -- indicating that the price cap constraints were binding. Indeed, the provision of such protection to vulnerable groups -- for equity reasons -- turns out to be the most clearly distinguishable effect of price cap regulation.

Another distinguishable feature is that the prices of some telecommunication services have fallen dramatically during the price cap regimes in the United Kingdom, the United States and in Australia. Indeed, the price falls have been far greater than the price cap requirements dictated. But the very fact that these sharp price falls, largely in international and long distance services, far exceeded price cap requirements suggest that they did not occur because of the price cap scheme but were driven by other factors, such as technological change, economies of scale and competitive pressures.

Since the impact on the level of prices is a primary anticipated effect of the scheme, a more detailed examination of price effects experienced in individual countries is warranted. First the change in the level of prices in individual price cap countries is examined. Then the experience in these countries is compared with price changes in non price cap countries to see whether more substantial changes are evident in price cap countries.

The United Kingdom

Table 4.2 shows the movement in BT's prices for various services under the price cap system. BT's average prices have fallen by about 26 per cent between 1984 and 1992, and by 12 per cent between 1989 and 1992. The price rebalancing which occurred as a result of the varying price movements of different services is discussed later.

Table 4.2. Index of BT's price changes adjusted for inflation

	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Connection charges	91	91	97	102	94	100	100	104	69	68
Rentals	101	107	107	102	94	94	100	104	108	110
Trunk calls	169	162	140	133	123	112	100	97	96	85
Local calls	120	124	131	125	115	107	100	100	99	88

1. Base year = 1990-91.
2. Based on 1989-90 revenue weights.
3. Inflation adjusted using July RPI of price control year (price control year runs from August to July).
4. For price control year 1993-94, February 1994 RPI used.

Source: OFTEL.

The United States

Figure 1 shows that there were substantial decreases in the real price of AT&T's telecommunication services under the United States price cap regime. As Table 4.3 shows, Basket 1 services (comprising residential and small business services, including interstate and international long distance rates) have generally been kept near the levels permitted by the price cap limits. This indicates that the price cap limits were effective in containing price increases for these services. The price index for residential service declined from 98.8 to 93.6 under pressure from price cap requirements. Notably, after a sharp fall in 1990 (the year following the introduction of the price cap scheme), the price index for AT&T's international service levelled off over the next two years and rose from 94.7 to 95.9 in 1993, despite the presence of competition.

The price index for the commercial services in Basket 2 fell to be comfortably under the price cap limit.

Basket 3 prices were also comfortably less than the price cap limits. Indeed, in November 1991, all services in this basket were removed from the price cap scheme except for the voice grade private line service. The FCC's action to remove competitive services whose prices were falling faster than the price cap requirements is to be commended and emulated. It is worth repeating that, in principle, only non-competitive services should be placed (and retained) within a price cap basket.

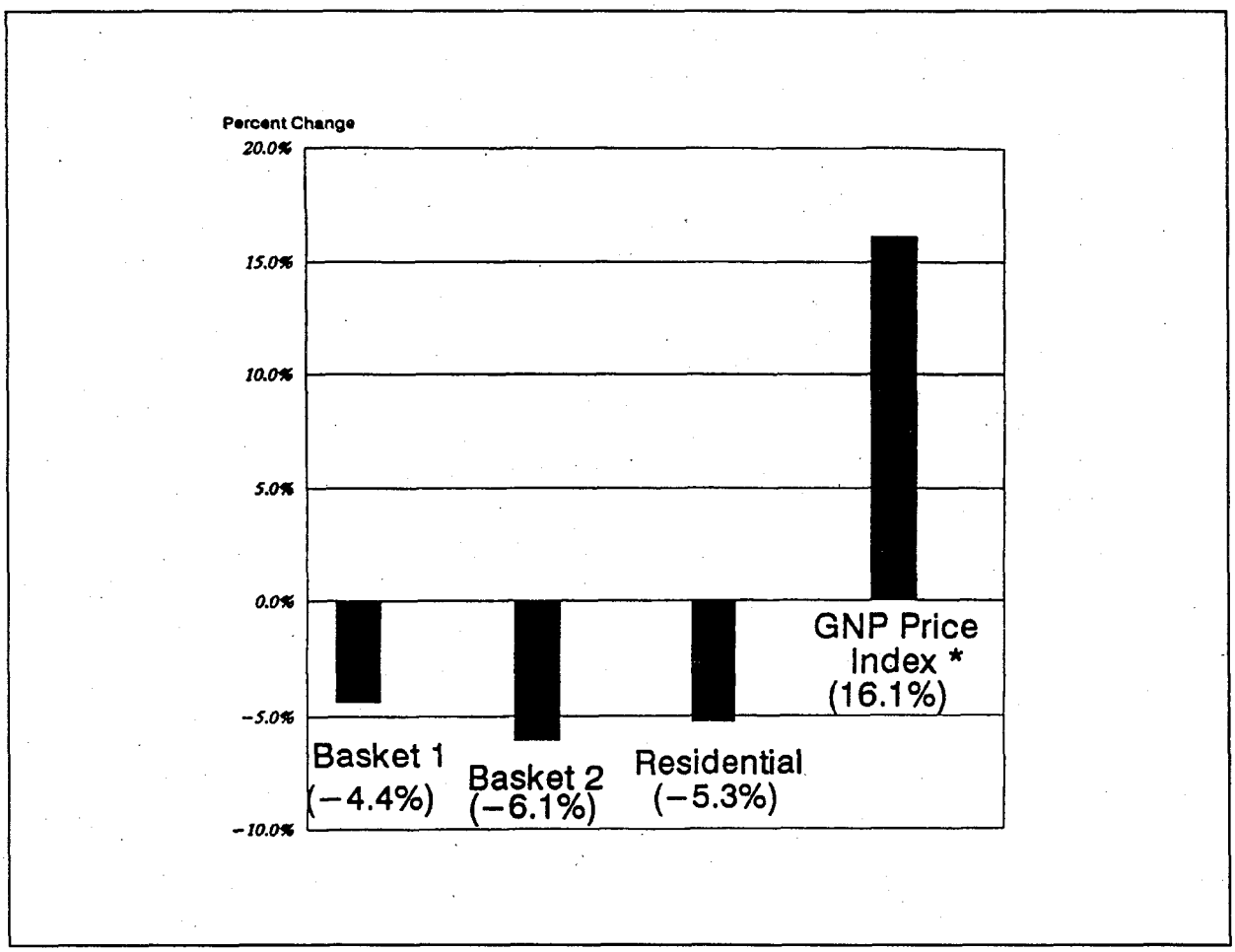
Table 4.3. AT&T's price cap indexes (30 June 1989 - 30 June 1993)					
Index, by Basket and Band [1]	30 June 1989	1 July 1990	1 July 1991	1 July 1992	30 July 1993
BASKET 1 Price cap index	96.6	94.3	94.1	94.4	94.7
Actual price index	98.4	94.3	93.6	94.3	94.1
Residential index	98.8	94.5	94.1	94.5	93.6
Service Band indexes: Day	95.7	91.8	89.2	91.9	90.3
Evening	99.5	91.4	90.9	89.8	86.9
Night/Weekend	99.6	99.9	102.2	102.2	99.7
International	99.2	94.6	94.5	94.7	95.9
Operator and card	98.6	98.7	96.4	99.5	104.7
Reach out America	97.1	88.5	88.4	86.9	83.3
BASKET 2 [2] Price cap index	96.8	94.0	93.8	94.1	94.1
Actual Price Index	97.3	92.8	93.4	92.5	91.4
Service band indexes: AT&T 800	98.4	94.7	95.3	92.1	96.9
Directory 800	–	–	100.0	103.6	106.4
MEGACOM 800	92.3	85.3	85.8	85.2	83.3
Other 800	100.0	90.0	89.0	89.0	89.0
READYLINE 800	96.5	92.3	85.3	93.4	91.0
FORMER BASKET 3 [3] Price cap index	98.3	96.7	97.3	–	–
Actual price index	96.9	93.1	95.9	–	–
Service band indices: AT&T WATS	94.8	94.7	99.0	–	–
MEGACOM	92.8	88.6	90.4	–	–
Other switched	100.2	99.0	97.1	–	–
Other private line	99.2	76.1	78.3	–	–
PRO WATS	96.1	91.1	92.8	–	–
SDN	81.9	76.8	77.8	–	–
Voice grade private line	101.2	98.1	102.8	–	–
RESTRUCTURED BASKET 3 [3] Price cap index	–	–	–	102.8	105.3
Actual price Index	–	–	–	97.9	101.2

1. Indexes on 31 December 1988 equal 100. Indexes on 30 June 1989 are those that immediately preceded price caps, which began 1 July 1989. Indexes in this chart for years 1990, 1991, and 1992 do not include promotional offerings.
2. On 21 May 1993, Basket 2 was restructured to remove all services except Directory 800. Indexes were reset as a result. For purposes of comparability, the Basket 2 indexes in this chart for 30 June 1993 are those immediately preceding the restructure.
3. In November 1991, Basket 3 was restructured to remove all services except private line analog and indexes were reset to 1 August 1991 equals 100.

Source: FCC, Common Carrier Bureau, Tariff Division.

Figure 1. Four year change in AT&T's prices compared to GNP price index

30 June 1989 -- 30 June 1993



1. This figure compares the first quarters of 1989 and 1993 and thus lags the basket figures by 3 months. More recent data for the GNP Price Index are not yet available.

Source: AT&T prices are the Actual Price Indexes and the Residential Index from Figure 1. The GNP Price Index is from the Bureau of Economic Analysis, Department of Commerce, Survey of Current Business.

Most of the empirical research conducted in the United States also draws favourable conclusions about the impact of price cap regulation in keeping prices down. Work done by Mathios and Rogers (1989) conclude that AT&T's prices for the period 1983 to 1987 were 7-8 per cent lower in those States which applied price cap regulation relative to States which continued to use rate of return regulation.

Taylor (1992) concludes that price reductions in recent years have resulted from price cap regulation as well as competition. In a commissioned study (prepared for AGT), Tardiff and Taylor (1993) estimate that toll prices for companies in States with some form of incentive regulation tended to be lower by 4 to 8 per cent, while there is no measurable effect on local prices. Following its price cap performance review of AT&T's price cap, the FCC (1993) also concludes that the price cap plan appears to be functioning effectively in helping to ensure that subscribers enjoyed reasonable rates while granting AT&T substantial increased flexibility in its operations.

Not all assessments of the price impact of price cap regulation in the United States have been favourable. Huber *et al.* (1992) argue that the sharp changes in the price of long distance services have been brought about entirely by the falling costs of local exchange access. They point out that, despite the presence of competition, plummeting carrier costs due to technological change have not been translated into commensurate falls in customer prices and argue that this was due, in some measure, to FCC price bands under the price cap regulation scheme. Indeed, they argue (p. 337) that the FCC's price ceilings and price floors have become the principal instrument for stabilising long-distance prices at "comfortably uncompetitive levels". However, the FCC points out that the price floor provision for AT&T has not been binding since the FCC had in fact approved all of AT&T's requests to set prices below the price floors. At any rate, the FCC advises that it has since moved most business services out of the price cap scheme, thus eliminating price floors for these services.

An emerging issue in the United States is whether and, if so, how the price cap scheme affects behaviour in oligopolistic market structures. Beginning in mid-1993, AT&T has raised Basket 1 prices several times, and these increases were promptly matched by its two major competitors. AT&T's price increases were permitted under the price cap limits largely by offsetting reductions in optional calling plans and promotional rates. The FCC is currently considering moving these competitive offerings out of the price cap scheme.

Local Exchange Carriers in the United States

Price cap requirements for the Local Exchange Carriers (LECs) have also been met. The FCC points out (1994) that during the first three years of the LEC price caps, all of the LECs have kept their rates at or below the applicable price cap limits. For example, for 1993, Ameritech priced services within its inter-exchange basket, special access basket, and traffic sensitive basket were 14.3, 5.3, and 1.5 per cent, respectively, below the relevant price cap indexes. By comparison, for 1993, Nynex priced services within its traffic sensitive and special access baskets at the relevant price cap indexes, and priced services within the inter-exchange basket 0.05 per cent below the applicable price cap index.

Australia

The yearly movement of Telecom Australia's prices on average is shown in Table 4.4. During the first price cap scheme in Australia which applied between 1989 and 1992, prices for domestic services (rentals, local calls and long distance calls) rose by 9 per cent in nominal terms, while the consumer price index increased by 22 per cent. That is domestic prices fell in real terms by 13 per cent (about 4 per cent per year on average), which is 1 per cent more than what the "CPI-4 per cent" price cap required.

During this period, Telecom Australia's prices for international calls fell by 3 per cent in nominal terms, constituting a real price fall of 25 per cent -- about *twice* the decline required by the price cap. This sharp fall in prices indicates that prices were not being driven down by the price cap requirement but by other factors.

International comparisons of price falls in price cap and non price cap countries

Another perspective to investigating the impact of the price cap on price level changes is to compare what happened in countries using the price cap against countries not doing so. Data in Table 4.5 indicate that in Australia, the rise in the average price of services in the OECD residential tariff basket was about the OECD average of 5 per cent.

Table 4.4. Telecom Australia's price index compared to CPI 1989 - 1992					
	1 July 1989	30 June 1990	30 June 1991	30 June 1992	Cumulative change in index
Telecom price index					
Domestic	100	100	103.5	109	+9%
International	100	100	98.2	96.8	-3%
Consumer price index					
Previous year	100	107.3	116	122	+22%
Current year	100	108	114	116	+16%

Source: Austel (1992, p. 77).

In the United Kingdom, the fall in BT's average price between 1990 and 1994 was about 5 per cent. In the United States, prices apparently fell about 7 per cent. These price falls were in contrast to the price rises which occurred in many OECD countries not using price caps. However, they were also noticeably less than those that occurred in some countries not using price caps such as Germany (-9%), Japan (-10%), and Norway (-26%), indicating that price cap regulation is not necessary in itself to ensure that substantial price reductions occur. Nevertheless, it should be also recognised that the significant price reduction in some countries (*e.g.* Germany) during this period were from very high levels and have resulted from incumbent monopoly carriers reducing prices sharply in order to rapidly prepare themselves to face expected competition.

4.2.2 Impact on the structure of prices

Flexibility in restructuring or "rebalancing" prices so that they more closely reflect market conditions and costs is widely seen as an important aspect of effective competition and (allocative) economic efficiency. Moreover, for the incumbent operator, price rebalancing has become an imperative since significant cross-subsidisation practices, entrenched by past policies, have rendered it vulnerable to new entrants especially in high profit markets. Hence, there are concerns that the expanding use of sub-caps for individual services and groups of services in the United Kingdom, the United States and in Australia has impeded

the nature and extent of price rebalancing appropriate to competitive circumstances.

Before examining this issue, it should be explained that "price rebalancing" is a term which is used to refer to the process by which, within an overall constraint on the average movement of prices, some prices rise relative to the average while others fall. In practice price rebalancing can take a number of forms, including:

-- changes in the relative prices of calls over different routes, known as "geographic de-averaging";

-- a change in price to reflect more of the fixed cost (exchange line rental) as opposed to usage costs (call tariffs);

-- changes in the ratio of peak to off-peak prices; and

-- introduction of volume discounts for particular customers or groups of customers.

When a single overall price cap basket is used, sharp falls in the prices of some services (long distance and international) allow substantial increases in the price of other services (local). However, where an individual service (or group of services) also has a separate price cap imposed on it, this impedes the extent of price increase and this in turn can affect the operator's ability to reduce prices for other services (since any revenue fall here cannot be adequately offset by revenue increases through price increases elsewhere). Hence, price caps can constrict the extent of price rebalancing.

The price cap "sub-baskets" are generally constructed to reflect the competitiveness of services and to contain the potential for cross-subsidisation of more competitive by less competitive services which could impede competition. However, it is likely that the extended use of sub-caps has inhibited the extent and speed of rebalancing required for efficient pricing. This trade-off situation between the concerns about potential cross-subsidisation and efficient pricing is not easily resolved. While economic principles would generally support price rebalancing consistent with competitive pressures and cost structures, they do not clearly specify the optimal extent and rate of rebalancing. One suggested approach is that the principle of Ramsey pricing be used to guide rebalancing. But there are problems in applying this principle, since Ramsey prices are difficult to estimate with accuracy (as they require assumptions about marginal costs, price elasticities and externality factors).

Table 4.5. Series index of residential basket total charge

	1990	1991	1992	1993	1994
Australia (Telstra)	100.00	109.12	112.19	111.77	105.24
Austria	100.00	97.79	94.51	91.16	90.53
Belgium	100.00	97.37	103.64	98.04	98.55
Canada (Bell Canada)	100.00	89.69	92.34	94.53	96.04
Denmark	100.00	112.17	112.88	113.99	113.12
Finland (HTC)	100.00	125.09	136.44	140.83	123.48
France	100.00	105.65	106.61	106.44	105.92
Germany	100.00	93.43	92.92	91.17	90.74
Greece	100.00	128.26	116.63	117.13	124.09
Iceland	100.00	78.60	77.30	82.23	127.72
Ireland	100.00	102.37	88.59	95.47	95.78
Italy	100.00	118.64	117.82	112.79	111.81
Japan (NTT)	100.00	93.97	92.64	94.10	89.57
Luxembourg	n.a.	n.a.	n.a.	n.a.	n.a.
Netherlands	100.00	99.64	106.30	103.87	110.59
New Zealand (TCNZ)	100.00	115.79	104.17	89.87	95.74
Norway	100.00	83.02	82.59	83.38	74.00
Portugal (TP/TLP)	100.00	103.34	93.68	99.03	98.64
Spain	100.00	126.84	123.44	128.81	128.51
Sweden (Telia)	100.00	114.86	107.64	105.99	103.87
Switzerland	100.00	105.97	125.31	128.76	132.17
Turkey	100.00	135.33	127.35	113.77	112.74
United Kingdom (BT)	100.00	101.53	104.05	101.71	95.36
United States (Nynex)	100.00	97.38	96.40	93.79	92.71
OECD average	100.00	105.91	105.02	104.29	105.08
Weighted average	100.00	101.55	101.07	99.64	98.03

Note: The number of calls is fixed at the level of 1990 basket level (796.8 calls). The basket is expressed in the form of an index that makes 1990=100. Weighted average is calculated with 1992 telecommunication mainlines. Original data including tax, in US$ based on PPP.

Source: OECD.

Price rebalancing in the United Kingdom

Despite the use of an expanding number of price caps for individual services and separate "sub-baskets" of services, a considerable degree of price rebalancing has occurred in the United Kingdom. Table 4.2 shows the trend in BT's connection charges, exchange line rentals and call charges from 1984 to 1993. As Table 4.2 shows, there has been an increase in rental charges in recent years. On the other hand, the level of trunk call (long distance) prices has fallen appreciably. It is evident from the table that a significant degree of price rebalancing has taken place under the price cap regime in the United Kingdom. However, the price cap scheme *has* restricted rebalancing since BT has disclosed that it would have preferred to have increased rentals by RPI+8 per cent, which is significantly more than it is permitted to do under the RPI+2 per cent limit the price cap applies to increases in rental charges. An interesting development in the United Kingdom is the way that competitive pressures have even led to a fall in local call charges.

Rebalancing in the United States

Kwoka (1992) concludes that AT&T has taken considerable advantage of the pricing flexibility conferred by price cap regulation, "...varying prices among services in accordance with costs and competition in ways that traditional regulation would have permitted only after long and burdensome delays". The data in Table 4.6 indicate that local call charges levied by NYNEX -- which also operated under a price cap restraint -- rose sharply by 77 per cent between 1990 and 1994. By contrast, long distance call charges fell substantially, by about 40 per cent for calls to areas more than 110 kilometres away. However, as Table 4.7 indicates, United States international service prices to Europe (levied by AT&T) actually rose slightly in recent years in contrast to the sharp falls experienced in most other OECD countries. Moreover, although AT&T's prices for calls to countries in the Pacific region fell by about 3 per cent, this was considerably less than the OECD average price fall of 13 per cent.

Australia

The number of sub price cap baskets has also been increased in the Australian price cap scheme from two in the first price cap (1989-93) to three in the second price cap (1993-97). The sub-caps within the current overall Australian price cap of CPI-5.5 per cent are:

Sub-cap	**Services covered**
CPI-2 per cent	connections, rentals and local calls combined
CPI-5.5 per cent	trunk calls
CPI-5.5 per cent	international calls, operator connected calls

Telecom Australia is further restricted in that it cannot increase its prices for connections, rentals, local calls or trunk calls by more than the CPI in any one year. AUSTEL explains (Pattas, 1993, p. 3) that the current Australian price control arrangements are intended to complement competitive pressures to move prices towards costs but in a way that protects all customers -- especially those who depend on services facing little or no competition -- and to help ensure that competition is fair and efficient.

Despite the constraints imposed by the sub-caps, Telecom Australia has rebalanced its prices significantly.

Figure 2 indicates that Telecom increased the charge for local calls in nominal terms but did not increase average (revenue weighted) prices for trunk and international services -- resulting in significant falls in *real* prices for these services.

Figure 3 shows that in percentage terms, prices for domestic trunk have also experienced differential changes. Calls over the shortest distance band (0-25 km) have experienced the largest increases while the size of the price movements declines significantly as the distance bands increase -- resulting in an actual price decline for the two longest bands. These price movements are consistent with a competitive strategy of rebalancing prices to reduce the charges for services with the highest profit margins since they are the most vulnerable to competitive entry.

Rebalancing in price cap compared with non price cap countries

As noted earlier, BT has rebalanced its prices significantly, with usage charges falling while rental charges showed pronounced rises. However, as Table 4.6 indicates, by contrast with the OECD average increase in local call charges of 18 per cent between 1990-94, BT *reduced* its local call charges (by about 18 per cent) as well as its long distance charges (by about 25 per cent). BT's geographic price rebalancing appears to have been more contained than the average for OECD countries as a whole, and by considerably less than some countries which do not use the price cap system, such as Italy, Denmark and Switzerland. As Table 4.7 indicates, BT also reduced the prices of its international services significantly between 1990 and 1994, especially for calls in the highly-competitive North American routes (about 42 per cent).

Geographic rebalancing has been significant in the United States. The increase in local call charges by about 77 per cent between 1990 and 1994 ranked amongst the highest increase for an OECD country, exceeded only by Italy (where the increase was about 132 per cent) and Switzerland (where the increase was about 78 per cent). Moreover, falls in the prices of long distance calls in the United States were about double the OECD average. However, as Table 4.7 indicates, the price of international calls apparently rose between 1990 and 1994. It should be noted, though, that the price index for the United States may overstate actual price rises because it focuses on peak period per call rates. During this period, the United States carriers offered substantial discounts to customers subscribing to optional bulk rate plans, which would not have been taken into account. Moreover, this rise in United States international call prices -- which went against the trend in most other OECD countries -- should be considered against the considerable decreases in the price of United States international calls which occurred during the 1980s.

For the Local Exchange Carriers in the United States, the price cap "sub-baskets" were effective in limiting rebalancing. However, there were some significant price falls largely in special access where high capacity private line prices fell because of technological advances and competition. There have also been recent price falls in regions with high traffic volumes made possible by substantial economies of scale.

Table 4.6. Usage charge rebalancing 1990-94 period
Usage charge in 1994 relative to 1990 expressed in index

1990=100	Local	27 km	110 km	+490 km
Australia (Telstra)	124.42	65.89	103.96	94.34
Austria	93.41	97.93	89.01	89.01
Belgium	102.58	121.54	101.04	101.04
Canada (Bell Canada)	n.a.	n.a.	105.60	105.60
Denmark	143.17	75.52	82.75	82.75
Finland (HTC)	131.75	50.21	48.32	48.32
France	102.66	135.91	86.25	86.25
Germany	97.66	97.66	70.88	70.88
Greece	143.95	93.43	95.91	99.57
Iceland	98.69	98.14	79.15	78.06
Ireland	94.27	27.48	70.45	70.45
Italy	232.52	91.47	91.52	91.52
Japan (NTT)	106.38	84.97	81.03	57.78
Luxembourg	n.a.	n.a.	n.a.	n.a.
Netherlands	0.46	130.80	100.46	100.46
New Zealand (TCNZ)	n.a.	25.76	20.10	98.63
Norway	80.42	39.95	36.46	36.46
Portugal (TP/TLP)	104.21	53.30	103.13	103.13
Spain	109.73	110.00	120.64	104.67
Sweden (Telia)	99.06	24.95	45.47	84.56
Switzerland	178.62	94.37	96.62	96.62
Turkey	104.91	52.45	138.48	115.40
United Kingdom (BT)	82.14	74.67	74.39	74.39
United States (Nynex)	177.17	78.98	56.77	62.08
Simple average	118.55	79.36	82.54	84.87
Weighted by mainlines	137.35	87.21	76.21	74.42

Note: Data is from business and residential tariff basket. The number of calls is fixed at the 1990 level so that both years are comparable. New Zealand is not included for local calls because of uncharged call charges for residential users. Canada is not included for local calls, since it has uncharged local calls, but 100 is used only for calculating OECD averages.

Source: OECD.

Table 4.7. International call charge rebalancing between 1990-1994
peak rate 3 minute call over 4 minute average

Origin\destination	Europe	North America	Pacific	Simple average
Australia (Telstra)	93.88	**81.46**	85.45	86.93
Austria	93.85	**76.17**	97.93	89.32
Belgium	74.75	50.68	**41.03**	55.49
Canada (Teleglobe/Bell)	**79.09**	98.19	89.84	89.04
Denmark	111.72	**79.84**	110.57	100.71
Finland	87.60	**85.80**	92.35	88.59
France	90.22	73.12	**68.93**	77.42
Germany	94.21	**61.67**	92.24	82.71
Greece	57.67	**49.65**	53.78	53.70
Iceland	84.86	**69.81**	88.44	81.04
Ireland	69.89	51.33	**45.17**	55.46
Italy	62.19	56.80	**53.21**	57.40
Japan (KDD)	74.10	**70.80**	71.50	72.13
Luxembourg	106.30	**67.00**	80.03	84.44
Netherlands	92.35	75.35	**60.10**	75.93
New Zealand (TCNZ)	97.63	**93.99**	97.69	96.44
Norway	81.00	56.10	**52.05**	63.05
Portugal	79.95	**67.96**	72.59	73.50
Spain	84.69	**47.24**	77.81	69.91
Sweden (Telia)	87.92	89.09	**79.90**	85.64
Switzerland	79.46	**73.98**	76.03	76.49
Turkey	104.01	**81.46**	**81.46**	88.97
United Kingdom (BT)	78.62	**57.68**	78.13	71.47
United States (AT&T)	101.88	107.96	**96.65**	102.17
OECD average	86.16	**71.80**	76.79	78.25

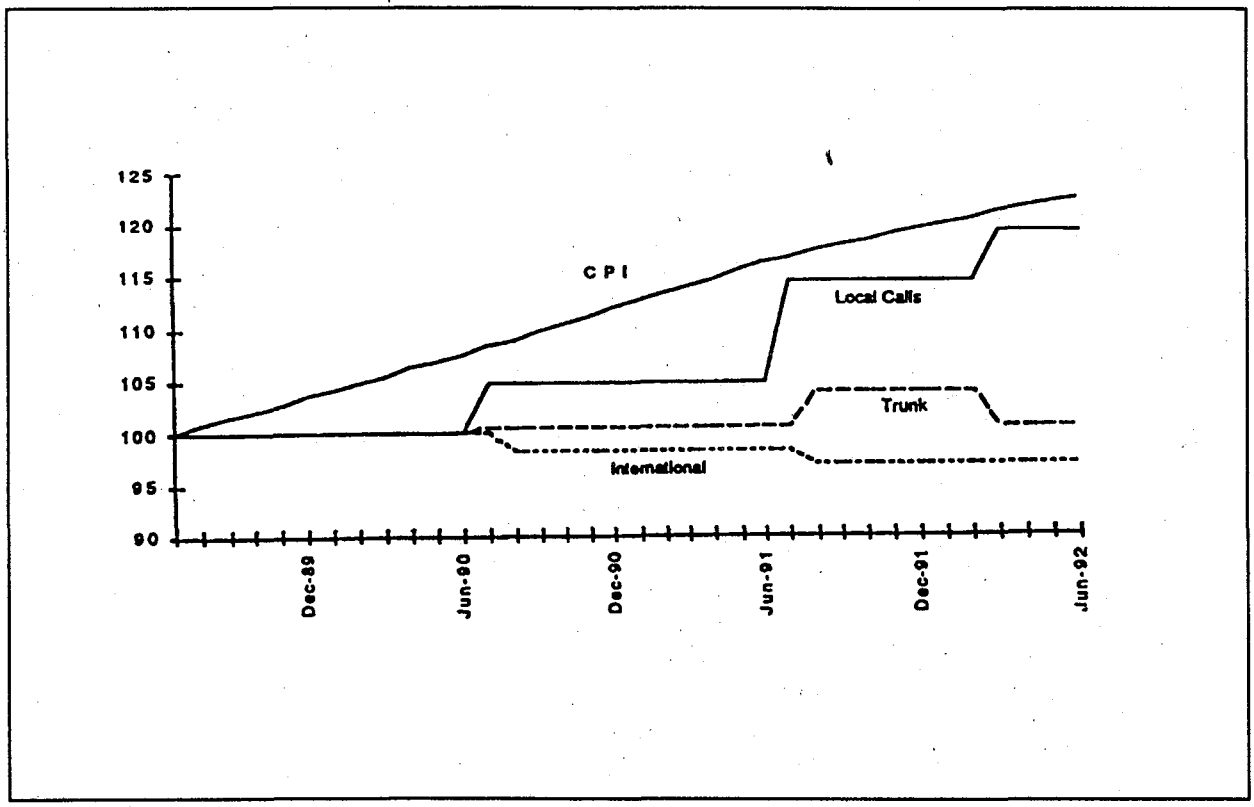
Note: The OECD countries are divided into three areas:
a) North America: United States, Canada.
b) Pacific: Australia, NZ, Japan.
c) Europe: European OECD Member countries.

The call charge in 1994 is expressed as an index so that the charge in 1990 becomes 100. The calculation is in US$ based on PPP.

Figures in bold represent the area that experienced the largest tariff reductions between 1990-94.

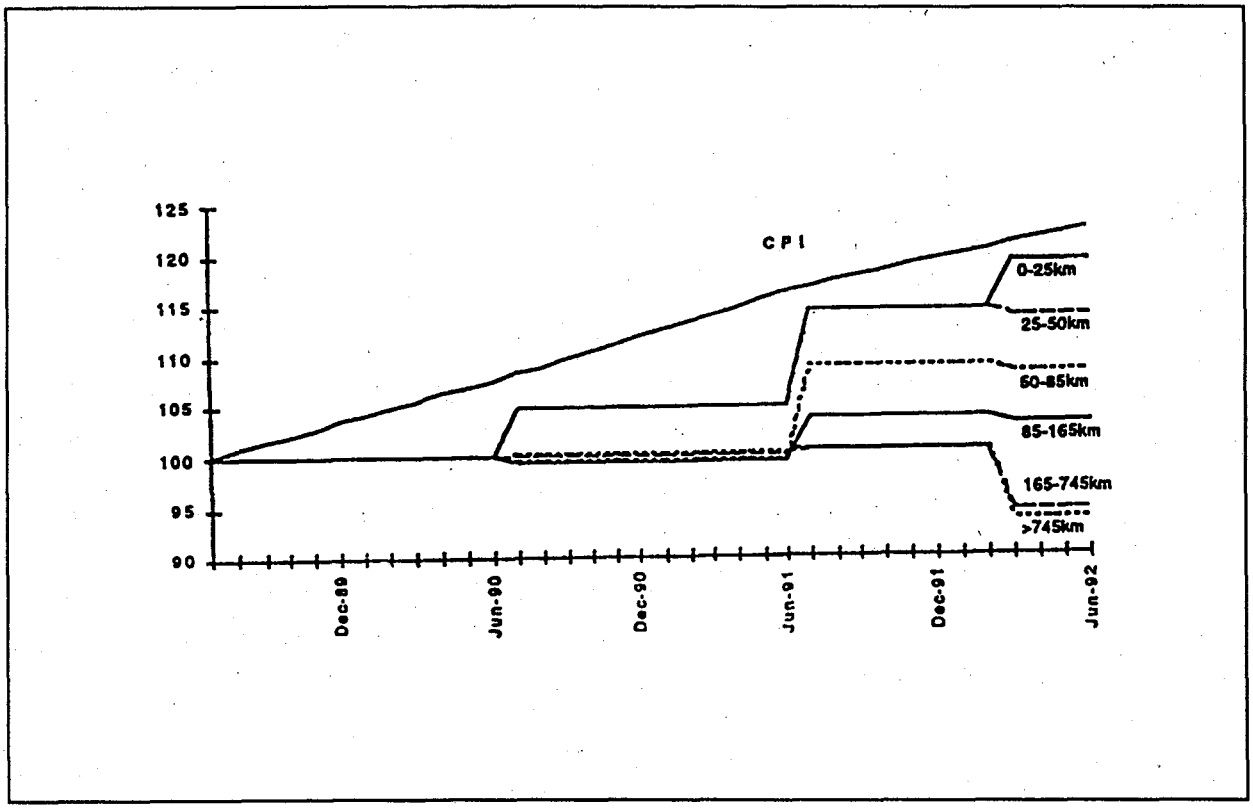
Source: OECD.

Figure 2. CPI and revenue weighted price movements for service baskets



Source: Austel, 1993.

Figure 3. Comparison between rates for trunk calls and CPI



Source: Austel, 1993.

In Australia, as Table 4.6 indicates, while some price rebalancing has occurred with local call charges rising about 22 per cent between 1990 and 1994, long distance charges declined by far less than the OECD average. Indeed, the extent of rebalancing which occurred in Australia appears to have been less than has occurred in many other OECD countries which did not use the price cap scheme.

To conclude this section, examination of the data in Tables 4.5, 4.6 and 4.7 indicate that geographic price rebalancing has occurred in price cap countries, but to a lesser extent than in some non price cap countries. However, caution must be exercised when making comparisons with sharply rebalancing non price cap countries. Much depends on the price level and structure from where a carrier starts. Some carriers were starting from high price levels with structures well away from costs and might be expected to rebalance rapidly with the onset or prospect of competition. For countries preferring a more controlled extent and speed of rebalancing, price cap regulation could be useful.

Rebalancing between usage and fixed costs

How much price rebalancing has occurred in price cap regulation countries in regard to the balance between the usage charge and the fixed charge component? Table 4.8 provides some information about this. The usage charge component has declined markedly in the United Kingdom and United States, much faster than the OECD average. This relative increase in the fixed charge component seems consistent with developments in telecommunication technology which will make service supply costs less usage sensitive. In Australia, however, after declining during 1990 to 1993, the usage charge component rose in 1994. The reason for the rise in the usage/fixed ratio was not in fact a rise in the usage charge but was due to a sharp fall in the fixed charge component because of a decrease in the telephone installation fee from A$ 253 to A$ 173. In addition, the monthly rental charge was reduced for both business and residential subscribers.

Rebalancing between peak and off-peak

An interesting development in the United Kingdom was BT's abandonment of the peak 9 am to 1 pm rate for business customers as of March 1994. This competition-driven measure appears to be inconsistent with economic principles which would advocate that peak period prices reflecting higher supply costs at such times be maintained/introduced in order to encourage improved load management and efficient capacity expansion. However, there may be excess

capacity and economies of scale which may justify this decision on economic as well as commercial terms.

Volume discounts

Volume discounts are another form of price rebalancing and can reflect economies of scale as well as the growing negotiating power of some users to extract significant discounts for services that are specially tailored to their telecommunication usage requirements. These volume discounted services are being increasing used in the United Kingdom, the United States and Australia, and is further evidence of the price rebalancing which is occurring in price cap regulation countries.

Volume discounts serve to reduce the average price of telecommunication services. It is noteworthy that while they are excluded from the United Kingdom price cap basket, by contrast, volume discounts are included in the Australian price cap basket. In effect, the exclusion of volume discounts makes the United Kingdom price cap more demanding than if they were included.

4.2.3 Impact on economic performance

An important anticipated benefit of the price cap system is that it would sustain or at least not diminish incentives for economic performance, especially productivity improvements. In principle, the price cap scheme is more likely to sustain incentives for reducing costs than the rate of return regulation alternative. However, the incorporation of rate of return constraints into the price cap scheme can be expected to blunt these efficiency incentives. What can be confidently expected is that labour productivity figures will show substantial improvements due to the considerable amount of workforce "downsizing" that has occurred. But this labour downsizing has occurred also in non price cap countries due to competition or the preparation for competition. Total Factor Productivity data would have provided more useful information since the contribution of other factors of production (*e.g.* capital) would also be tracked. However, the available data on this more comprehensive measure of productivity did not allow recent improvements in the productivity of price capped operators to be examined.

In considering economic performance under the price cap scheme, there is also the issue of the appropriate "tightness" of the price cap formula. For instance, the Australian Treasury (1993, p. 34) suggests that the initial Australian price cap may have been set conservatively in order to minimise the financial risks to the enterprise. Abraham (1993) also argues emphatically that the initial price cap formula was not tight enough (and suggests that the "X" factor could have

been set as high as 9 per cent rather than the 4 per cent that was set). Thus, the assessment of the price cap scheme in terms of its potential to deliver improvements in productivity is further complicated if the requisite pressure for productivity improvement is not applied. While a tight price cap could no doubt squeeze out further cost reductions, this aim needs to be balanced by the recognition that the predominant factor driving productivity in the telecommunication industry is the improved technology embodied largely in new capital expenditure. An important element of this capital expenditure involves the replacement of obsolete equipment with modern and more efficient new equipment which provides improvements in productivity and service quality. This is expensive, and a tight price cap formula may make it more difficult to generate appropriate internal funding for such programmes.

There is clearly a need for better information on productivity. At this stage, perhaps the most certain significant contribution price cap regulation has made towards improvements in productivity are the benefits conferred by the sharp focus the determination of the "X" factor has attracted to productivity, its measurement and its improvement.

4.2.4 The rate of return

In principle, the price cap system should allow the rate of return to be determined by the ability of the regulated firm to beat the cost reductions required by the "X" factor. However, in practice the expected rate of return has tended to be a *determinant* of the price cap formula. For instance, OFTEL (1992*a*, p. 13) declared:

> *"It is therefore necessary periodically to review the price control, in order to ensure that the firm's rate of return follows a broadly acceptable path over time and a major factor in determining the appropriate level of the control at the time of the review is the projected rate of return on capital employed."*

Evidently, AUSTEL (1993) has much the same view concerning the rate of return, declaring that:

> *"...The process of determining X needs to have regard to a number of factors such as likely productivity trends, investment needs, profit and dividend targets. This makes this X determination process not that dissimilar from establishing an appropriate rate of return."*

Indeed, Melody (1991) suggests that in the United Kingdom, the level of the rate of return earned has become a prime criterion for assessing the effectiveness of the price cap. High profits appear to be regarded as a failure of the price cap to operate effectively. This view about profits should be challenged because it would result in price cap regulation becoming simply a surrogate for rate of return regulation, with all its well-known attendant problems discussed earlier. Such a result would be particularly regrettable if -- as occurred in the United States and as seems to be happening in the United Kingdom -- there is also an emphasis placed upon trying to assess the "correct" rate of return through a "cost of capital" approach. There are warnings (Flemings Research, 1992, p. 14) that this would give rise to endless and largely fruitless disputes of a highly technical and essentially irresolvable kind. Moreover, the esoteric nature of this type of debate would reduce the transparency of the regulatory system.

Indeed, OFTEL (1992*a*, p. 13) itself recognises that:

> *"Where the rate of return on capital is used as a criterion for setting price controls, some of the difficulties brought about by profit control also occur in price cap regulation. One clear example of this difficulty is in determining the admissibility of certain items of investment and cost. The general approach in the United Kingdom has been to invite the regulated firm to submit its proposals for investment and its costs for evaluation by the regulator. The regulator then has to form judgements about whether certain items of cost are legitimate, both in terms of their nature and in terms of their level."*

Interestingly, despite repeated proclamations that regulation is necessary only in the "transitional" period after deregulation and should gradually *decrease* (as competition becomes more effective), OFTEL appears unperturbed by this prospect of increased and *more intrusive* regulatory involvement.

The rate of return achieved under price cap regulation

How have firms fared under price cap regulation in regard to the rate of return?

As shown in Table 4.9, BT did show healthy profits under the price cap scheme during 1988-89 to 1990-91. As the Table shows, BT's return on capital from total group profits was about 20.8 per cent in 1988-89, 18.8 per cent in 1989-90, increasing to about 22.6 per cent in 1990-91. These profit levels caused an outcry from the United Kingdom public and raised criticisms about the ineffectiveness of the price cap system in restraining profits.

As Table 4.10 shows, AT&T's rate of return on its interstate services rose under the price cap from 11 per cent in 1989 to 13.7 per cent in 1990. However, in 1991 there was a decline to 13.4 per cent with a further fall to 12.8 per cent in 1992, due partly to the recession and partly to a significant increase in the rate base from US$11.15 billion to $12.77 billion.

The rate of return for Local Exchange Carriers (LECs) also increased under price cap regulation. The initial price cap rates in January 1991 were targeted at an 11.3 per cent rate of return. In 1992, the most recent year for which complete data are available, the overall interstate rate of return for the price cap LECs had risen to 12.3 per cent, and all price cap LECs earned above 11.3 per cent. For the RBOCs, earnings ranged from a low of 11.4 per cent for Bell Atlantic to a high of 13.3 per cent for Nynex. GTE earned 11.3 per cent, Rochester 12 per cent, and United 12.8 per cent.

In Australia, the rate of return achieved under price cap regulation has declined as Table 4.11 shows. In 1989, the first year of the price cap, the rate of return achieved by Telecom Australia was 14 per cent. In 1990, the rate of return declined to 13.7 per cent, falling further to 13.2 per cent in 1991, 12.4 per cent in 1992, recovering somewhat to 12.7 per cent in 1993 mainly because, as Table 4.11 shows, Telecom Australia's interest costs dipped sharply in that year.

Of course, a firm's estimated rate of return depends on the accounting principles and practices (including asset revaluation practices) used. Thus published rate of return figures should be viewed in the knowledge that some accounting manipulation of rate of return results is possible. Moreover, the published accounting rate of return, estimated on the basis of Historical Cost Accounting principles, could in fact turn out to be significantly different when Current Cost accounting is used. This is an issue with important policy implications for price regulation but outside the scope of this study. Indeed, OFTEL has disclosed that it will acquire the power to require BT to prepare and publish accounts for its regulated business according to accounting principles prescribed by OFTEL. This provision already exists in the regulation of the United Kingdom water industry, and would be a means of obtaining more relevant and accurate information, including current cost accounting information, for price monitoring.

Table 4.8. Index of the usage to fixed telephone charge ratio for OECD countries[1]					
	1990	**1991**	**1992**	**1993**	**1994**
Australia (Telecom)	100.00	93.72	93.47	92.06	100.17
Austria	100.00	111.11	99.30	99.28	98.30
Belgium	100.00	111.63	111.63	111.65	112.64
Canada (Bell)	100.00	124.98	119.97	119.97	117.89
Denmark (Ktas)	100.00	86.44	89.92	89.92	89.92
Finland (Htc)	100.00	71.57	44.01	42.91	45.34
France	100.00	100.57	100.56	100.55	92.66
Germany	100.00	83.81	82.53	82.53	82.53
Greece	100.00	42.35	44.11	31.09	24.51
Iceland	100.00	64.20	87.54	87.36	87.36
Ireland	100.00	106.55	82.60	82.63	76.01
Italy	100.00	94.55	90.19	94.58	94.58
Japan (NTT)	100.00	86.28	90.76	90.76	74.28
Luxembourg	n.a.	n.a.	n.a.	n.a.	n.a.
Netherlands	100.00	102.02	93.68	93.68	94.98
New Zealand (TCN)	100.00	108.31	82.12	70.90	66.59
Norway	100.00	57.57	57.15	57.81	48.81
Portugal (TP/TLP)	100.00	97.13	97.13	99.99	95.83
Spain	100.00	87.41	87.41	87.56	86.98
Sweden (Televerket)	100.00	109.37	86.94	86.94	70.70
Switzerland	100.00	105.11	102.39	97.01	95.36
Turkey	100.00	158.56	125.46	133.83	122.02
United Kingdom	100.00	79.03	73.82	71.12	63.60
United States	100.00	100.00	73.85	70.25	63.87
OECD average	100.00	94.88	87.68	86.71	82.82

1. Excluding tax.

n.a. Not available.
Source: OECD.

4.2.5 Impact on investment

United Kingdom

A report prepared for and published by the United Kingdom Department of Trade and Industry (1994) concluded that the investment programme under price cap regulation had resulted in a top ranking telecommunication infrastructure. Although never the most advanced in any one area, the United Kingdom consistently ranked a good second in regard to telecommunication infrastructure and does not lag significantly in any major respect. However, it is difficult to ascertain the impact of the price cap scheme on this situation.

United States

The United Kingdom report referred to above also concluded that the United States's telecommunication infrastructure ranks highly among OECD countries. The FCC has monitored LEC infrastructure development under price caps, including deployment of technologically-superior hardware and software and concludes that infrastructure development has accelerated during the price cap regulation period. For example, under rate of return regulation, the price capped LECs were replacing electro-mechanical switches with more advanced digital switches at the rate of about 5 per cent of total lines per year (1 per cent of total lines were connected to digital switches in 1980, 40 per cent had been converted by 1989). The conversion rate under price caps has been about 12 per cent per year; by 1992, 75 per cent of LEC price cap carriers' lines were connected to digital switches. The deployment of ISDN (from 6 per cent of total price cap lines in 1989, to 26 per cent in 1992), and SS7 (from 17 per cent of total price cap lines in 1989, to 65 per cent in 1992) are other measures of deployment of new technologies under price cap regulation. Fibre optic transmission facilities have grown from less than 4.5 million equipped channels in 1989 to over 10.4 million in 1992.

Table 4.9. BT's return on capital (1988-89 to 1990-91)			
	1988-89 (%)	1989-90 (%)	1990-91 (%)
Inland public telephone services			
Access			
Business	-11.1	-13.3	-8.0
Residential	-14.6	-14.3	-11.8
Calls			
Local	34.7	40.2	43.4
National	57.6	75.0	74.3
Sub total	17.5	18.4	20.7
International calls	84.1	84.9	81.9
Inland private circuits	19.0	13.6	12.2
Public payphones	-16.2	-7.2	-20.6
Other systems business	27.3	20.2	11.9
Total systems business	21.7	22.2	22.4
Other activities	11.1	13.9	10.8
Total group	**20.8**	**18.8**	**22.6**

Source: Compiled from tables presented in OFTEL (1992*a*), pp. 9-10.

Table 4.10. AT&T's interstate rate of return
US dollars in thousands

Row	Item	1989	1990	1991	1992
1	Total revenues	$25 945 517	$25 204 356	$25 672 542	$26 587 150
2	Total expense & taxes	$24 719 988	$23 666 092	$24 177 121	$24 988 303
3[1]	Net earnings	$ 1 225 529	$ 1 538 264	$ 1 495 420	$ 1 598 846
4	Rate base (average net investment)	$11 145 915	$11 207 433	$11 151 312	$12 520 508
5[2]	Rate of return	11.00%	13.73%	13.41%	12.77%

1. Row 3: Row 1 minus Row 2;
2. Row 5: Row 3 divided by Row 4.

Source: FCC, Common Carrier Bureau, AT&T's interstate rate of return reports.

Table 4.11. Telecom Australia, selected financial statistics					
	1992-93	**1991-92**	**1990-91**	**1989-90**	**1988-89**
Rate of return	12.7%	12.4%	13.2%	13.7%	14.0%
Depreciation/amortisation	2 030.4	2 086.7	1 665.5	1 491.4	1 481.1
Sales	12 133	11 437.21	9 251.5	8 533.4	7 671.6
Dep/Amor over sales	16.7%	18.2%	18.0%	17.5%	19.3%
EBIT	2 914.9	2 885.2	2 815.3	2 453.5	2 126.4
Other revenue	523.0	791.3	279.7	345.5	305.2
Operating income/sales	19.7%	18.3%	27.4%	24.7%	23.7%
Interest expense	920.7	1 202.0	1 189.8	1 163.0	1 153.3
Interest expense/sales	7.6%	10.5%	12.9%	13.6%	15.0%
Dividend	674.0	478.0	250.0	185.5	0.0
Op profit after extraordinary	904.8	299.8	870.6	1288.3	974.1
Dividend/op profit	74.5%	159.4%	28.7%	14.4%	0.0%
Interest cover	3.2	1.5	2.3	2.0	1.8
Average cost of debt	11.1%	13.2%	13.1%	12.7%	12.3%

Source: Telecom Australia, Annual reports.

Table 4.12. Telecom Australia: capital expenditure[1]
1981-93

Year ending 30-Jan	Capex	Total revenue	Capex/Total revenue
1981	1 164.4	2 609.4	44.6%
1982	1 247.6	3 084.4	40.4%
1983	1 573.1	3 635.8	43.3%
1984	1 412.8	4 220.7	33.5%
1985	1 570.1	4 764.9	33.0%
1986	1 980.9	5 471.7	36.2%
1987	2 403.1	6 057.4	39.7%
1988	2 236.1	7 199.5	31.1%
1989	2 580.5	7 976.8	32.4%
1990	2 963.9	8 878.9	33.4%
1991	2 989.0	9 531.2	31.4%
1992	3 015.0	12 228.5	24.7%
1993	2 701.0	12 656.0	21.3%

1. Figures are in millions of Australian dollars.

Source: Telecom Australia.

Australia

In regard to the funding of capital expenditure, what raises some concern is that OECD figures (1993, p. 43) indicate that in Australia, telecommunication capital investment as a percentage of telecommunication revenue has steadily fallen from 42 per cent during 1981-83, to 31 per cent during 1984-86, to 28 per cent during 1987-89, and to 19.6 per cent during 1990. Figures provided by Telecom Australia set out in Table 4.13 confirm this steady decline. Until 1992, Telecom's capital expenditure continued to increase gradually in absolute terms. In 1993, the capital expenditure figure fell even in absolute terms leading to a sharp fall in the proportion of total revenue taken up by capital expenditure from 24.7 per cent in 1992, down to 21.3 per cent in 1993.

It is difficult to assess the extent to which the fall is attributable to price cap regulation because, as Table 4.13 shows, investment as a percentage of telecommunication revenue has fallen in recent years in many OECD countries.

4.2.6 Technological change, innovation and new services

The benefits of lower costs and prices will pale in significance if telecommunication operators do not offer the range of state-of-the-art technologies and services customers require. Indeed, it is becoming increasingly recognised that superior telecommunications can be a competitive edge in domestic and international business.

In the United States, the profit flexibility introduced by price cap regulation appears to have encouraged carriers to search out these niche markets. Many new services have emerged, including services such as caller identification and call forwarding. The most dynamic new service activity has been in data communication, with the deployment and rapid growth of Local Area Networks, frame relay, Asynchronous Transfer Mode (ATM), and other data services. However, it is difficult to verify any causal relationship between price cap regulation and technological innovation.

4.2.7 Quality of service

It is necessary to consider how quality has fared under the price cap scheme for all user groups because a deterioration in quality of service is effectively a hidden price increase. There is little doubt that competition has served to improve quality of service for large business users. Indeed, along with innovation, quality of service has become an important part of a telecommunication firm's competitive strategy. For instance, it is becoming increasingly common for telecommunication carriers to establish formal contracts

on service quality with their leading customers, with specified penalties for failure to deliver.

Ensuring that quality of service for low-revenue, marginally-profitable or unprofitable customers also improves, or at least does not deteriorate, may be quite another matter. To ensure that quality of service for such subscribers is maintained may require formal regulatory monitoring, assessment and publication of performance information.

In the United Kingdom, the indicators of BT's quality of service (see OFTEL, 1992*a*, p. 15) suggest that quality performance has improved significantly since 1985-86. However, critics have suggested that some (less competed for) customers have not shared in the quality improvement.

In the United States, an FCC review (1993) concluded that, in general, service quality did not deteriorate under price cap regulation. The FCC estimates that performance standards such as trunk blockage, installation and repair intervals, and dial tone response times have been met successfully over 95 per cent of the time. The average unscheduled downtime per loop remained less than 4 minutes per year for LECs under the price cap. However, the FCC noted with concern that another indicator of quality, residential service quality complaints per million residential customers, rose in 1991, and remained high through the first quarter of 1993, although it fell in the second quarter of 1993.

In Australia, indicators of Telecom's quality of service (McGregor, 1992) point to an appreciable improvement. It is noteworthy that the current Australian price cap scheme includes a quality of service provision which allows AUSTEL to judge the price of a service to have increased if quality decreases.

4.2.8 Achievement of equity objectives

No doubt, equity (or "fairness") considerations are as, if not more, important to policy-makers and the electorate than economic efficiency. A major equity issue concerning price cap regulation is the extent and speed of price rebalancing since this could result in a substantial increase in the cost of the telephone service to some customers.

Table 4.13. Public telecommunication investment as percentage of revenue[1]				
	1983-85	**1986-88**	**1989-91**	**1992**
Australia	34.68	36.41	27.36	21.34
Austria	45.22	40.34	40.10	40.70
Belgium	36.60	24.99	28.15	22.40
Canada	26.18	27.12	34.37	33.45
Denmark	27.23	27.72	20.81	17.02
Finland	32.94	33.81	32.81	29.51
France	43.26	31.61	27.23	24.55
Germany	40.66	42.01	45.36	51.82
Greece	42.87	20.46	33.39	44.86
Iceland	26.86	18.15	16.51	25.99
Ireland	41.73	24.00	21.02	19.17
Italy	47.42	39.99	55.54	46.51
Japan	32.04	34.19	35.76	37.24
Luxembourg	21.85	34.71	36.00	35.77
Netherlands	21.94	21.78	28.52	27.12
New Zealand	20.35	21.16	28.48	29.14
Norway	31.67	26.93	20.95	23.80
Portugal	25.81	31.82	49.52	43.23
Spain	44.83	45.52	65.44	36.16
Sweden	33.65	30.26	23.85	19.55
Switzerland	31.43	36.26	38.89	32.45
Turkey	62.15	65.18	28.95	20.20
United Kingdom	19.37	20.80	18.84	14.43
United States	17.76	16.19	15.11	15.05
OECD	33.67	31.32	32.21	29.64

1. The first three colums of numbers show a three-year moving average. The fourth column shows actual 1992 values.

Source: OECD.

Table 4.14. Median residential bill for BT customers[1]
£ per quarter

	1988-89	1989-90	1990-91	1991-92	1992-93[2]
Connection charges	1.74	1.38	1.38	1.38	1.35
Exchange line rental	13.95	15.35	17.13	18.46	19.54
Local calls	10.33	10.57	12.04	13.04	14.56
National calls (inc. "m" rate)	7.18	8.35	8.25	9.42	8.23
International calls	1.36	2.01	1.66	1.36	1.74
TOTAL (excl DQ/IDQ)	34.56	37.66	40.46	43.66	45.42
DQ/IDQ charges	-	-	1.09	0.36	0.35
TOTAL	34.56	37.66	41.55	44.02	45.77

1. Movements in the median bill reflect changes in patterns of usage as well as changes in the price of individual services.

2. Improvements in BT's systems mean that the samples employed in the construction of the median bill for 1992-93 were larger and more representative than in earlier years.

Source: OFTEL.

OFTEL has endeavoured to track the incidence of price cap regulation on various groups of customers. For instance, since 1989, the bill of the typical residential customer -- the so-called "median residential bill" -- has been monitored. This monitoring disclosed that, overall, the typical residential bill fell in real terms only by 3 per cent, while BT's average prices have fallen by 12 per cent over the same period (OFTEL, 1992*a*). As Table 4.14 shows, despite the separate price cap on exchange line rentals of RPI+2, rentals increased appreciably between 1988-89 and 1990-91.

Of special concern are those customers who make very few calls, because the rental charge would now constitute a high proportion of their (increasing) total telephone bill. These customers are often those who rely on the telephone as a "lifeline", particularly the elderly and housebound. Most of these low users will, moreover, not share in the benefits of price rebalancing (the reduced price of long distance calls), but will experience the disbenefits (the increase in rental charges).

Encouraged by OFTEL, BT has introduced schemes to ensure that low or "lifeline" users of the telephone who need the telephone for emergency purposes and who receive rather than make calls are insulated from sharp price increases.

Chapter 5

CONCLUDING REMARKS

5.1 Introduction

Assessing the impacts of price cap regulation in countries where it has been applied has proven to be a problematic task. This is partly because some of the requisite data, including recent productivity estimates for price capped carriers, are not available. Moreover, in some countries, such as the United States and Australia where the price scheme has been applied only since 1989, some of the impacts of price cap regulation may not yet be observable. Thus, this review must be treated as an interim and preliminary one. The review also proved problematical because it is difficult if not impossible to separate the impact of price cap regulation on carrier performance from the impact of other policies, especially the nature and extent of competition. Indeed, in the United Kingdom for instance, although price caps have been in use since 1984, sharp falls in prices were most evident after the United Kingdom duopoly situation gave way to more open competition in 1992. This complication concerning the combined effect of policies/influences in fact underlines the need to recognise that price cap regulation should not be regarded as a stand-alone regulatory instrument. Rather it should be designed, implemented and assessed as a complementary tool to other policies, especially that of promoting competition.

5.2 The level and structure of prices

There is no doubt that price cap regulation has been effective in holding down price increases for services which are not subject to competition. This is demonstrated by the fact that prices for such services are typically close to their maximum price cap permitted levels. However, price cap regulation has been less relevant to the prices of competitive services since these typically fell far more sharply than required by the price cap, due to competitive pressures. Price cap regulation has also been consistent with competition-driven volume discounts, optional calling plans and other service innovations.

Price cap regulation has provided the regulated firm with more price flexibility than cost-plus rate of return regulation. This is an important

advantage of the price cap scheme since the difficulties of allocating costs to individual services will be magnified in competitive circumstances because the incentives to cross-subsidise the prices of competitive services from those of non-competitive services would be strong. However, as observed in this study, it has been a common practice to limit the regulated firm's pricing flexibility through the use of separate price caps on each of several "sub-baskets" of services. Regulation has sought to impose such constraints on overall pricing flexibility to reduce the ability of the regulated firm to cross-subsidise competitive services through price increases in non-competitive services. The sub-caps have also been imposed to achieve equity objectives as discussed further below. In particular, upward price movements have been controlled, and this turns out to be the most demonstrable effectiveness of the price cap scheme.

5.3 The rate of return in price cap regulation

There has been speculation that price cap regulation could lead to a reduced rate of return for the regulated firm. But this has not happened. Indeed, the rates of return achieved by price price capped carriers appear to have caused considerable concern in some quarters because they are too high, and this concern needs to be addressed. To begin with, it is arguable that high profits which result from good performance and not from abuses of monopoly power, should be applauded (as is generally the case in the private sector) rather than criticised. At any rate, a preoccupation with the rate of return should be avoided. Certainly, a drift towards a greater emphasis on the control of the rate of return to ensure that only "normal" profits are earned would precipitate the danger that price cap regulation becomes in effect simply a surrogate for rate of return regulation. This would be a significant step in the wrong direction. An important aspect of competitive behaviour is the provision of a product that is so attractive to customers that the producer makes above average returns, for at least the time it takes for competitors to catch up. If no company is ever allowed to make "excess" returns, the incentive for dynamic, innovative behaviour is correspondingly reduced, to the customer's detriment.

This profit incentive is particularly important in the case of telecommunications, where quality of service and especially product innovation is central to the competitiveness of the market. If a company comes to believe that it will be penalised for taking new initiatives if they turn out to be profitable, it will face a perverse incentive structure. This would negate the critical incentive for efficiency within the competitive system. This critical importance of the efficiency incentives presented by the ability to earn supernormal profits is widely recognised. Indeed, it would be ironic if the United Kingdom and Australia

should move toward the United States style of rate of return regulation at the same time that the United States is moving to adopt a variant of the price cap model!

This scenario is well illustrated by the BT price cap scheme, which initially set out to be an uncompromising, sharply different, alternative to rate of return regulation. However, in subsequent revisions of the scheme, the BT plan appears to have moved gradually towards incorporating rate of return considerations. The version of price cap regulation applied to Local Exchange Carriers in the United States incorporates explicit rate of return considerations. As noted earlier, rate of return considerations are also at the centre of the Australian price cap scheme.

The above argument about letting profits find their own level (once the "X" factor has been determined) cuts both ways of course. The same argument would advocate that a regulated firm face the threat of reduced profits or losses if it fails to achieve the reasonably expected cost reduction incorporated in the "X" factor.

5.4 Product and service innovation

There is little doubt that the most effective driver of dynamic efficiency in the telecommunication industry is competition. Product and service innovation and quality have become central to competing effectively in the telecommunication market. But maintaining technological advance and innovation also depends critically on investment levels. Indeed, the really important strategic dimensions of telecommunication performance and development will be in regard to technological change, innovation and quality. The benefits of lower prices will pale in significance if telecommunication operators do not offer the range of state-of-the-art technologies and services customers require. And it is becoming increasingly recognised that superior telecommunications can be a competitive edge in domestic and international business. New products and services have continued to come on stream in price cap countries. But the long-term success of efforts in these areas will depend importantly on whether adequate levels of internal -- and external -- funding are available to a telecommunication operator. This again raises the question of the "appropriate" rate of return under the price cap scheme. It may well be the attitude towards this issue which determines the impact the price cap system has on longer-term telecommunication performance.

5.5 Equity concerns in price cap regulation

As noted earlier, another function of sub-caps has been to address equity concerns about the potential sharp rises in the prices of individual services that could result from uninhibited price rebalancing. *Indeed, the conclusion reached by this study is that in practice, price cap schemes may well have been more concerned about -- and at any rate have been more effective in addressing -- equity objectives than about efficiency ones.* That is, in practice the price cap appears to have been effective not so much in achieving efficiency objectives, but with:

- -- customers obtaining a "fair" share of productivity gains;
- -- the regulated firm earning a reasonable or "fair" rate of return;
- -- cushioning the impact of price rebalancing on needy and vulnerable customers through the use of sub-caps; and
- -- "fair" competition.

However, some countries with rate of return regulations have been effective in meeting equity objectives.

This regulatory focus on equity is not surprising. After all, many regulatory activities have long been initiated and driven by perceptions of fairness (which are far more understandable to policy-makers and the electorate) rather than the esoteric (to non-economists at any rate) concept of economic efficiency.

However, it would be more cost-effective for such non-economic goals to be addressed *via* transparent, specifically-targeted subsidies, rather than through the extended use of "sub-baskets" which restrict pricing flexibility. Moreover, the results of such arrangements should be freely available so that they can be subject to public debate and Parliamentary scrutiny. To the extent that the presence of such schemes serves to allay fears about the inequitable impacts of price rebalancing, there may be freer progress accorded to efficiency-oriented policies. Indeed, when the primary importance of equity in price cap schemes is acknowledged, there may be more attention given to articulating and installing such specifically-targeted, cost-effective schemes to address equity concerns.

The developments in the United Kingdom (such as the "low-user" scheme) and in the United States (such as the "Lifeline" and "Linkup America" schemes) in regard to special targeted assistance demonstrate that such concerns

in regard to low users can be addressed by specific arrangements. These schemes provide a starting point for deliberations concerning the type of schemes appropriate to other countries.

If pricing restrictions are nevertheless the preferred approach, categories of services should be segregated into relatively few "sub-baskets", defined primarily by degree of exposure to competition, with each "sub-basket" subjected to an appropriate level of regulation. Moreover, the use of such "sub-baskets" should be seen as a short-term "transitional" measure. The aim should be to phase out as quickly as possible, the policies and practices that promote inefficient pricing. Accordingly, the content of each "sub-basket" should be reviewed regularly, to ensure that service categorisation has not been rendered inappropriate by changes in competitive conditions.

5.6 Increased simplicity, transparency and reduced regulatory costs

Has price cap regulation in practice lived up to its promise to be a step toward administrative simplicity and transparency/openness?

Certainly, price cap regulation is rather more complex than the simple RPI-X might suggest. In the United Kingdom, the United States and Australia, attempts to fine-tune the price cap scheme have resulted in a *complicated, more intrusive, less transparent* system than was originally intended. There is wide agreement that, as competition increases, there should be less rather than more regulation. And that regulation should be based increasingly on stable, clearly understood rules, rather than on regulatory discretion. Observing its application in practice indicates that this has not happened in the case of price cap regulation.

For example, the United Kingdom regulatory regime has received a lot of recent criticism, particularly as it has been, in practice, far from the stable, hands-off regulation of prices that was originally envisaged. Critics argue that price cap regulation in the United Kingdom has evolved into a system where negotiations and regulatory personality are becoming its most important features. In Veljanovski's view (Tasman Economic Research, 1993, p. 56):

> *"Regulation U.K. style is evolving into a discretionary system where negotiations and personality are becoming its most important features. It is turning into a "game" between industry chiefs and regulators because regulation does not provide a clear and certain set of rules within which the industry can take economic decisions. Rather, investing in influencing regulators and changing the rules of the game*

are becoming an industry in themselves, consuming resources and increasing the burden of regulation."

So it appears that the promise of improved administrative simplicity and transparency has not been met. But the failure in this regard is not an intrinsic deficiency of price cap regulation. Part of the regulatory complexity has arisen primarily from the tendency to seek to fine-tune the (potentially) basically simple price cap approach. The fine-tuning or "increased sophistication" as AUSTEL (1993) put it, could, if it is not restrained, result in an increasingly complex and intrusive web of regulation. This outcome has to be considered against the repeatedly-proclaimed desire of governments in the United Kingdom, the United States and Australia to see regulation *decrease* rather than increase.

It is doubtful, too, whether the cost of regulation has fallen under price cap regulation. Protracted debates over the appropriate rate of return have continued under price cap regulation, as observed in the United Kingdom, the United States and Australia. Moreover disputes over a range of other parameters such as the potential rate of productivity improvement and other aspects influencing the "X" factor, appear to have replaced the issues of contention under a rate of return regime.

5.7 Quality of service

There may be a need to ensure that less-profitable customers also benefit from quality improvements. In the United Kingdom, provisions in the Competition and Service (Utilities) Act 1992 have strengthened the powers of the Directors General of Telecommunications, Gas Supply, Electricity Supply and Water Services. In essence, the Act empowers the Director General of Telecommunications to set standards of service to be achieved in individual cases, to determine compensation, and to set standards for overall performance. The legislation also requires that research be carried out amongst consumers before these standards are agreed upon.

5.8 Limited and transitionary role of price cap regulation

Price cap regulation has been an appropriate step in the direction of acknowledging that effective competition is the best regulator. But it should be seen as a scheme with the limited function of controlling price rebalancing during the transition to effective competition. Regulation should avoid using the scheme to do much more than this by fine-tuning it so that it becomes complicated and intrusive and impedes competition. Improperly configured, a price cap mechanism can become burdensome and constraining. Where the price cap is

overly complex with a large number of baskets and service categories, the principal effect could be to inhibit the regulated firm's price flexibility and by so doing insulate new entrants from competitive market forces.

The benefits of price cap regulation will exceed costs only if this interim step does not proliferate impediments which unduly delay the development of effective competition. Therefore, in applying price cap regulation, it is important to develop specific criteria for identifying competition for particular services, as well as to establish thresholds that might trigger the withdrawal of a service from a price cap basket. The price cap scheme should include no more baskets than are necessary to protect those customer interests that are identified as requiring specific protection. Where alternative providers of a service are available and/or where the price of a service is falling beyond price cap requirements, that service should be considered for withdrawal from the price cap scheme. A performance review should be conducted periodically to assess more generally whether any changes to the price cap mechanism are appropriate.

It is cause for concern therefore that (as Table A1 in the Appendix shows), the United Kingdom price cap scheme has become more complicated and has extended rather than reduced its coverage of services over time. When it was first introduced, the price cap scheme covered 48 per cent of BT's group turnover, whereas now it covers 71 per cent. The Australian scheme has also become more complicated as Figure A1 (in the Appendix) shows. The United States scheme for AT&T is also very complicated. As noted earlier, however, in November 1991, the FCC did streamline the United States price cap scheme by dropping most of Basket 3 services from the scheme. However, the FCC's 1994 performance review plan for the LECs does convey the impression that price cap schemes can be fine-tuned to contribute to a broad range of policy objectives. This is something this paper warns against.

The setting of the "X" factor has also become far less transparent and productivity-oriented than originally intended. While the United States scheme does focus essentially on expected productivity improvements, the "X" factor in the United Kingdom scheme appears to be set on the basis of a range of considerations, especially the rate of return considered appropriate. Notably, in the United Kingdom, the inclusion of international services allowed the "X" factor to be sharply increased from 4.5 per cent to 6.25 per cent. The susceptibility of the size of the "X" factor to the inclusion/exclusion of services as well as revenue considerations explains in part the wide range in the size of the "X" factor in various countries (see Appendix).

Price control schemes can cause significant distortions particularly if applied for a long period. The function of price cap regulation is more appropriately the narrow and temporary one of moderating sharp changes while the market is in transition. Attributing too much to price cap regulation could distract from the fact that it is a scheme to facilitate the transition to effective competition and could also distract from the need to think strategically beyond a preoccupation with prices in order to focus on the interfaces of effective competition and less about the regulated firm itself.

So, in conclusion, the evidence to date suggests that, in practice, the most distinguishable effectiveness of price cap regulation has been its ability to contain the sharp price increases that could result from price rebalancing as has occurred in some non price cap countries. However, it has also been possible to contain prices from rising too steeply in some countries without price cap regulations. Apart from containing price increases in non-competitive services, the evidence is not conclusive that price cap regulation is superior to other forms of regulation. Indeed, critics have asserted that, in terms of the way it has actually been applied, price cap regulation is becoming little different from modified rate of return regulation. This is true to some extent. Certainly, the incorporation of rate of return considerations into price cap schemes can be expected to blunt the promised efficiency incentives of the price cap scheme. And the periodic reviews of the price cap formula can nurture "strategic behaviour" with inefficient results not unlike those which have stemmed from rate of return regulation. Even so, the extended period in between reviews can have beneficial "regulatory lag" benefits. Perhaps most important is that price cap regulation is an important step away from regulator-determined prices and towards the direction of competively-determined prices.

Appendix

PRICE CAP REGULATION POLICIES IN VARIOUS COUNTRIES

A.1 Price cap regulation in the United Kingdom

As Table A1 shows, since it was initially applied in 1984, the United Kingdom price cap formula has been progressively tightened. The formula was RPI-3 per cent in the initial scheme which operated from 1984 to 1989; revised to be RPI-4.5 per cent from 1989 to 1991; RPI-6.25 per cent from 1991 to 1993, and RPI-7.5 per cent for the 4-year period July 1993 to July 1997.

The initial "basket" of services included in the price control comprised the rental of the local exchange line and tariffs for directly-dialled local and national calls. In addition to the overall cap, an agreement between OFTEL and BT restricted the increase in residential line rentals to RPI+2 per cent.

As a result of a review of the price cap arrangements in 1988, operator-assisted calls within the United Kingdom were added to the basket of services subjected to the overall RPI-4.5 per cent price cap. The RPI+2 per cent restriction to increases in residential line rentals was continued and extended to include business line rentals and connection charges as well. In 1989, the price control arrangement was extended to cover domestic private circuits (which became subject to an overall price cap of RPI-0).

In the current price cap (July 1993-97), the coverage was again extended. International outgoing calls -- which had been making sharply increasing contributions to BT's total profits -- were included in the price controlled basket for the first time (OFTEL, 1992*a*, p. 6). Private leased circuits (which had been the subject of considerable concern among large business users, particularly in the financial services industry because of volatile price changes from year to year) continue to be covered by a separate price cap. In addition, the annual increase of every price in the private circuit basket is not to exceed the RPI.

Another significant change introduced in the current scheme was the exclusion of quantity discounts from the price cap basket. This is because it was

recognised that where these discounts are permitted to pull average prices down, the scope to increase other prices is increased. Thus, the exclusion of discounted prices in effect made the revised RPI-7.5 per cent price cap formula in the United Kingdom more stringent than it appears.

A.2 Price cap regulation in the United States

A.2.1 Price cap regulation of AT&T

In 1989, price cap regulation was applied to three baskets of AT&T's services.

Basket 1 contains residential and small business services, including the general schedule of interstate and international per call long distance rates.

Basket 2 services included 800 Services, which provide toll-free inbound calling, generally to businesses.

Basket 3 included services used by large businesses, such as private network, private line, and data transmission services.

The FCC explained that three baskets were created rather than a single one in order to prevent AT&T from financing price reductions in the highly-competitive third basket services through price increases in the less competitive services in Baskets one and two.

Within each of the three baskets, the FCC also placed limitations (+ or - X per cent) on the rate of price changes of each service category relative to the basket index. The FCC explained that this mechanism was designed to enable the FCC to prevent price discrimination within the service baskets and to fulfil other regulatory policies such as the protection of evening discounts to residential subscribers. However, no restrictions were placed on the ability of AT&T to adjust the relative price of mileage bands within a service category, provided that the overall service cap was within the service price band and under the basket cap.

The basic basket structure reflects concerns that unless business and residential services were separated, AT&T might raise rates to residential customers in order to cross-subsidise services subject to more aggressive competition in the commercial market. This led to the construction of Basket 1 (Residential) and Basket 3 (Commercial) services baskets. The third basket (for 800 Services) was separated from Basket 3, since it was felt that AT&T still possessed significant market power in these services.

Table A1. Changes in the price cap and basket of controlled services

Value of the price cap and date applied	Elements in the basket of services detailed in licence and subject to price control	Other main constraints on services	Services where no price constraint applies	Percentage of BT's group turnover under price control
RPI-3 (1984-89)	1. Residential and business exchange line rentals 2. Local and national direct dialled call charges	1. Residential exchange line rental (maximum RPI+2)	1. Telephone rental 2. International calls 3. Operator services including directory enquiries 4. Calls from public telephone boxes 5. Connection charges	48%
RPI-4.5 (1989-91)	1. Residential and business exchange line rentals 2. Direct dialled local and national call charges 3. Operator assisted calls and directory enquiries service	1. Residential and business exchange line rentals (RPI+2) 2. Connection charges for new lines and charges for installation (RPI+2) 3. Private circuits (RPI+0) 4. Low user scheme up to 120 units per quarter (rentals limited to up to 60 per cent of normal rental) 5. Introduction of representative residential bill (informal control)	1. Telephone rental 2. International calls 3. Calls from public telephone boxes 4. Priority fault repair and new services	54%
RPI-6.25 (1991-93)	1. Exchange line rentals 2. Local and national call charges 3. Operator assisted calls 4. International calls 5. Quantity discounts and alternative tariffs to high volume users	1. Residential and single line rental (RPI+2): multiline rental (RPI+5) 2. Hard wired phone rental 3. Connection charges (RPI+2) 4. Private circuit basked (RPI) 5. Median residential bill (RPI) 6. Lows user scheme (up to 120 units per quarter)	1. Telephone rental (althought regulatory action led to a reduction in 1992-93) 2. Public telephone boxes 3. Priority fault repair	69%
RPI-7.5 (1993-97)	1. Exchange line rentals 2. Local and national call charges 3. Operator assisted calls 4. International calls 5. Connection charges	1. All exchange line rentals (to RPI+2) 2. Hard wired telephone rentals (RPI) 3. Maximum connection charge 99 +VAT 4. All individual prices in basket limited to RPI including connection charges 5. Extension of low user scheme to 240 units 6. Private circuit basket (RPI)	1. Calls from public telephone boxes 2. Priority fault repair	71%

Source: National Audit Office.

A.2.2 Price cap regulation for local exchange carriers

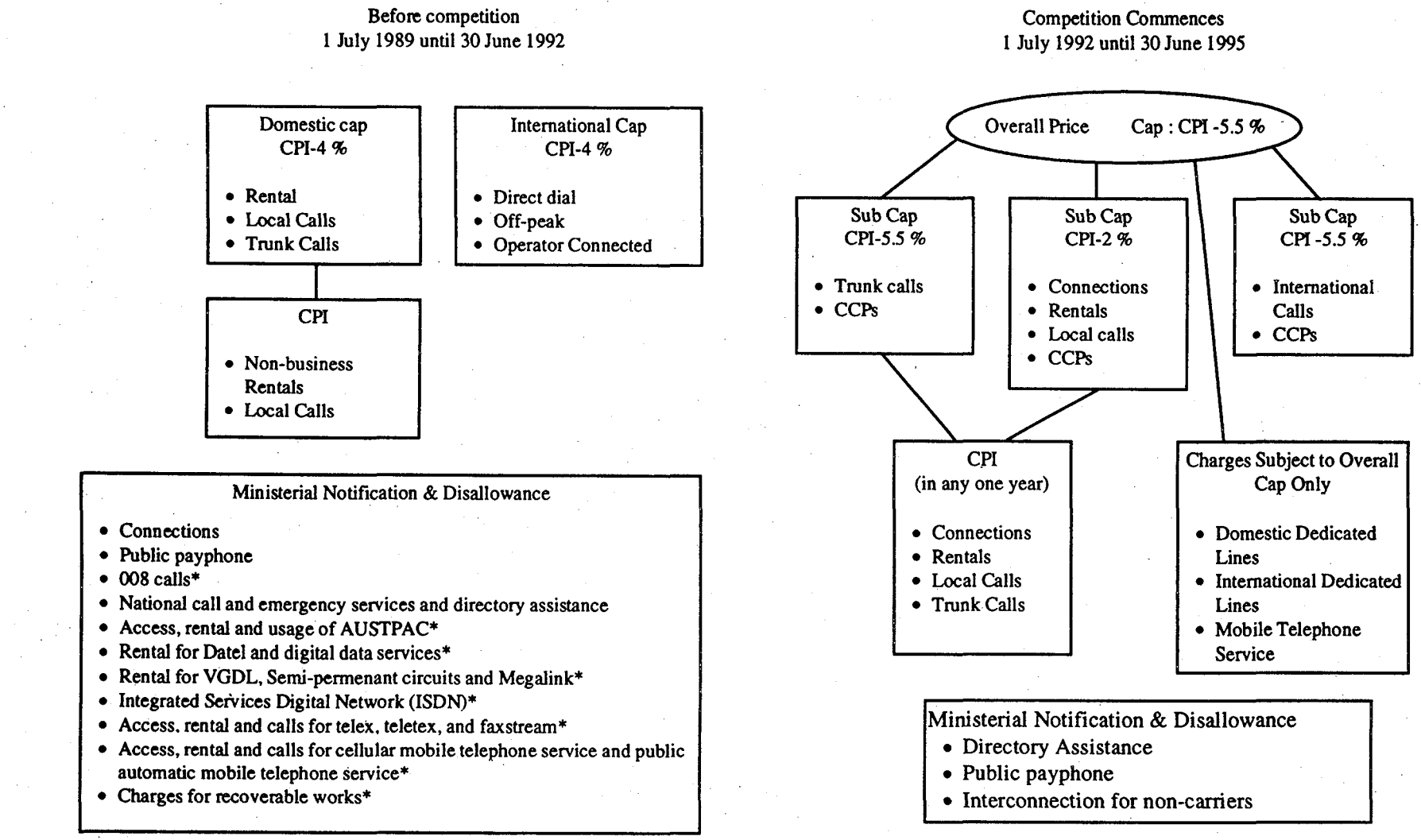
In January 1991, price cap regulation was introduced for Local Exchange Carriers (LECs) operating in the United States. The LEC price cap scheme established four price cap baskets: Common line, Traffic Sensitive Switched, Special Access, and Inter-exchange services. Each basket is subject to its own price cap. Within these baskets, services are grouped into separate service categories, each of which has its own pricing constraints, designed to limit the LECs' ability to offset increases in the prices of certain services within a basket by reducing the prices of other services in the basket.

A.3 Price cap regulation in Australia

Price cap regulation was introduced in Australia in July 1989. The first scheme, which applied for the three years between July 1989 and June 1992, was a CPI-4 per cent formula which covered standard telephone service rentals (business and non-business), the local call fee and STD charges (by time of day and distance).

Following a review of the price cap arrangements, from 1 July 1992 the cap was adjusted to CPI-5.5 per cent. In the first price cap, in addition to the overall price cap, separate caps were also placed on the rate of change of non-business rentals and local call charges in order to contain price increases here. The second price cap went further and placed caps on individual classes of service and on three "sub-baskets" of services (Local/Access, STD and International). Figure A1 summarises details of the two Australian price cap schemes.

Figure A1. The two price control arrangements for Telecom Australia



* Included in January 1991.

Source: AUSTEL, 1993.

A.4 Price cap regulation in France

During the period 1991-94, France Telecom was obliged to contain its price increases each year to no more than the Consumer Price Index -3 per cent. A single price cap basket covers all services. Ostensibly, this would appear to allow the maximum degree of price rebalancing. However, regulatory approval is required for price increases for non-competitive services.

A.5 Price cap regulation in the Netherlands

The Netherlands has introduced a price cap scheme for the years 1994-98. The scheme differentiates between two packages of services:

- -- the overall package which contains almost all services supplied under the concession, *i.e.* telephony, telegraphy/telex, telephone boxes, directory distribution, the 06 service, mobile communications (including radio paging) and teleplus; and
- -- the small user's package which contains the services considered representative for the individual and the small business user, *i.e.* telephone services supplied on single line connections and cell-phone calls.

The increase in the index of both packages may not exceed the increase in the consumer price index. The regulated firm is permitted in any given year to anticipate inflation by raising tariffs in line with the expected rise of the Consumer Price Index for both the year in question and the subsequent year, provided that (by 1997) the overall rise in small user tariffs does not exceed the overall level of inflation. This rule was introduced to provide an opportunity, if needed, for accelerated rebalancing. The regulated firm may apply to the government for approval for further rebalancing if it finds that the price caps do not provide sufficient room to rebalance to cost-effective levels. In considering such an application, the government will take into account "international revenues, the extent to which inflation has diverged from the predicted 2.5 per cent p.a. level, and the level of efficiency within PTT Telecom. In any event, the additional overall increases in tariffs permitted to accommodate rebalancing will not exceed 3 per cent".

The European Union's Open Network Provision Directive requires that leased line tariffs satisfy "the basic principle of transparent and cost-orientated tariffs" from 1 January 1994. In order to implement this principle, a separate tariff control system for leased lines has also been introduced.

A.6 Price cap regulation in Germany

Germany introduced price cap regulation in January 1993. Initially, the price cap of Consumer Price Index -4 per cent applies only to the monopoly services used for digital cellular mobile radio. However, a comprehensive price cap is scheduled for introduction in 1995 (Federal Minister of Posts and Telecommunications of Germany, 1993).

The individual services covered by the current price cap over digital cellular mobile radio are allocated to two baskets:

Basket 1: telephone service;

Basket 2: transmission services/interconnection.

Any price differentiation (such as a discount system) requires approval before it can be considered for the price cap.

A.7 Price cap regulation in Sweden

In 1991, the Swedish Parliament decided to introduce a price cap for telecommunication services which would limit price increases to 70 per cent of the inflation rate. However, with the onset of the first Swedish Telecommunications legislation, the implementation of this decision was postponed. In 1993, when Televerket was turned into a limited liability company (Telia AB), a price cap was put on Telia AB, for the period 1993-96, in order to protect customers in market segments with no or low competition. During this period, no other operator will be subject to price caps which cover basic service for households and smaller companies. The price cap is formulated as the Retail Price Index (RPI) minus 1 per cent. The National Post and Telecom Agency will control the price cap and monitor the market situation and price development for different services. The Agency can propose different changes in the price regulation to government.

A.8 Price cap regulation in Denmark

Motivated by the prospect of increasing liberalisation of telecommunication markets especially after 1998, Denmark will introduce price cap regulation for the first time in 1995. Two price cap baskets will be used:

Basket 1. the first group will comprise basic telecommunication services, including international calls; and

Basket 2. the second comprises leased lines, including international leased lines.

For both groups, the price cap formula to be used during the first price cap period which is to be 1995-1997 is NPI (the inflation index) -3 per cent. In addition, the price increase of each individual service within both baskets is capped to NPI -1 per cent.

The Danish National Telecom Agency (NTA) explained that its "X" factor is lower than the 7.5 per cent used in the United Kingdom because telecommunication prices in Denmark are lower than prices in the United Kingdom so that the potential for further price reductions is less. The NTA estimates that if subscription prices are also taken into account, the "X" factor for the United Kingdom price cap would adjust to about 4 per cent.

The NTA also explains that the NPI-1 per cent cap on each individual basic service will be applied because substantial price rebalancing had already occurred and there is a need to protect customers of such services from further sharp rises. The NTA can approve exemptions from this individual price ceiling where it is determined that the price of a specific service warranted greater adjustment than that permitted by the ceiling.

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