Competition Policy and Regulation of Prices in Natural Monopolies: Information, Incentives and Governance

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1. Introduction

I am most grateful to Cyril Lin and the Cairncross Foundation, the Academic Council of AMC and the Competition Policy Centre of UIBE for their invitation to deliver this year's Cairncross Foundation's Lecture. I knew Sir Alec Cairncross quite well, when he was the UK Government's Chief Economic Advisor, and later at Oxford University. An outstanding figure in the Economics profession he, almost alone in the UK saw very early on the future economic significance of the Chinese economy and, with great foresight, introduced a programme of rigorous economic training, that was directed by Cyril, for some of China's top economics graduates; and I much enjoyed being involved in that programme and in supervision of research. This led on to my own work on reform of state-owned enterprises in China in the 1990s, which only ceased when I was appointed Chairman of the UK's Monopolies and Mergers Commission, subsequently renamed the Competition Commission and, as of this year, the Competition and Markets Authority.

It is as a result of this experience that I am now engaged with both Chinese, UK and US scholars on a project funded by the Cairncross Foundation to consider the current state of China's emerging competition policy regime, seeking to identify successes and problems to date; and, on this basis, and utilising western experience where relevant, seek to identify future obstacles to the development of powerful and effective markets. This in the view of many, and as re-affirmed in the recent Plenum, is a critical factor in the development of China's socialist market economy; to Government plans to make the transition to a high-income economy, and also, as outlined in the latest five year plan, to re-balance the economy towards consumer spending and deepen reforms. This project, though building on previous work done for the Cairncross Foundation, and indeed on extensive research and analysis by a number of Chinese economists, is at an early stage – and there are no easy solutions to some of the factors that still hold back the contribution which competitive markets can make to China's rate of economic growth; and so a lecture on that topic must await other occasions next year.

But an immediate and familiar aspect of the current situation is the classification by the authorities of different industries in China into 'strategic', pillar' and 'natural monopoly' groupings, in which, to differing but substantial degree, and for different reasons, there is no presumption, nor perhaps much intention that they be exposed to the full rigours of market competition. One difficult, but inevitable issue that any consideration of China's competition policy must address is the extent to which it is right to provide such protections; and certainly the classification, if applied to high income economies, would

reveal very much fewer industries in these classifications. But natural monopolies, by definition, cannot be subject to competition in any normal sense. Setting prices in such industries – primarily utilities, communications and transport industries where networks are essential – which optimise their economic impact is far from straight forward. I recognise that there is a very extensive programme of reform in China designed to tackle this, including both structural change, maximum price caps set centrally, and guidance on how to determine such prices at the local level, in terms of cost, demand, and industrial policy factors. But if China finds this an uncertain and, indeed, very problematic area then it is in very good company internationally.

As a UK economist who has worked off and on on the Chinese economy for 25 years I am not totally persuaded that the UK and its economic experience have a huge amount that it can usefully say to a country such as China about the progress and direction of its economic development; but if it does it is mainly , I would suggest, in two areas. One is in relation to the role and limits of active industrial policy exercised directly through state ownership – a matter which will inevitably form part of the Cairncross Foundation's project on which I am embarked. The other is the topic of today's lecture, on the regulation of prices in natural monopoly. This is concerned with how the regime has fared in the UK, but I hope that some of the emerging conclusions will be of interest and relevance to the issue in China.

While dealing with natural monopoly might appear the polar opposite of competition policy, there are two very strong links between them. First, the benchmark for much of the UK regime that I will be speaking about is the competitive market outcome which would maximise economic welfare if only it were possible; and second, reflecting this, the final arbiter in the UK of disputes between a sector regulator and the companies it regulates is the Competition Commission which I chaired for 8 years. I was thus not only able to observe the development of the regime at close quarters, but play an active part in implementing it against the benchmark of the competitive outcomes which it was our duty to implement in other parts of the economy, through merger control, and through intervention in markets which were not operating in a fully competitive manner.

I start, however, with a little history.

2. A Little History

In the 1970s and early 1980s Britain's economy was widely known as 'the sick man of Europe'; and its economic performance, in terms of growth, productivity, employment and commercialisation of innovation rather justified this epithet. It was often asserted, though the research on this is rather more ambiguous, that a significant factor in this was the poor performance of its state-owned natural monopolies, comprising all the

main utilities, major transport industries (bus and rail), telecommunications, plus some potentially - and indeed internationally – competitive industries such as steel and automobiles. Whether true or not, the UK government decided in 1983 to start to tackle the issue by privatising British Telecoms. There is every sign, looking back, that this was a rather rushed decision. There had been virtually no mention of a policy of privatisation at the previous election; and the rather obvious objection – that this would just create a private sector monopoly – appears to have been addressed only rather late in the day.

At the time, price levels in such industries were determined in a manner not unlike that which I understand prevails in China. There was no set time at which prices were set, though they were rarely changed more than once a year; and the four main determinants were production costs, the general level of price rises, the government's stance at the time on dealing with inflation, and policy on subsidies for such basic goods and services. Clearly little of this would continue to hold under privatisation.

Therefore, primarily stemming from work by Professor Stephen Littlechild, and quite late in the process, a new regulatory regime was put in place, the essence of which was the now very familiar RPI –X control, allowing prices to rise each year by a specified amount, X%, less than the rise in the Retail Price Index. (As an aside, Professor Littlechild had been a member of the Monopolies and Mergers Commission which had introduced just such a control in one of its monopoly investigations)

Two initial points can usefully be made. First, there was, of course, the example of many years of regulatory price control of such industries in the US - which had almost entirely eschewed state ownership. Its regime was implemented by placing a cap on the rate of return on capital that such industries could earn. But Littlechild rejected this approach in favour of RPI – X, not just because of the unwelcome incentive the US approach generated to overinvest – if the rate of return on capital is capped then to maximise profits, it pays to increase capital investment beyond what would otherwise be optimal – but also because it undermined incentives to be efficient. A cost which might otherwise lower profit presented no problem if it could just be passed on in higher prices designed to maintain the rate of return at the capped level. In contrast, RPI – X gave a very strong incentive to efficiency, because the gains from lower costs had no consequences for price over the regulatory period; and hence passed straight through to higher profits. This is familiar now, but the history of regulation in the US serves to indicate how easy it is, even for an economy hugely committed to private market capitalism to get incentive arrangements wrong. Second, Littlechild explicitly regarded RPI – X as something of a stopgap, until active competition could be introduced to telecoms, a process which he envisaged would occur fairly soon.

In three respects, as we now know, events turned out very differently from what Professor Littlechild envisaged. First, competition was much slower to emerge in telecommunications than anticipated. 17 years later, BT's share of telephone lines was

still over 80%. Second, RPI – X far from being a stop-gap, turned out to be the core feature of a whole new regulatory regime. Within a decade [see chart 1] it was a fundamental feature in the privatisation and regulation of gas, airports, water, electricity, rail, and postal services in the UK. Over a longer period it was increasingly adopted, with variations to reflect local circumstance in Latin and Central America, the Caribbean, Australia, parts of Europe and Central and South-East Asia, and even on occasion in the US.

Third, Professor Littlechild had seen the approach as relatively simple and 'light touch' regulation, so that it would not be too bureaucratic or time-consuming. But in practice a huge industry has arisen around the implementation of RPI – X, in a way that perhaps should have been foreseen but no-one did – a matter to which I will return in a moment. My own involvement arose because, increasingly, the price determinations made by the relevant regulators were challenged by the companies concerned; and appeals – often very detailed and lengthy - under the UK's institutional arrangements go to the Competition Commission.

But there was one other factor which may have caused Professor Littlechild, and many others, some surprise; and that was the scale of inefficiency that historically must have existed, revealed by the new incentive mechanism under which these utilities now worked. The early controls were, quite soon, seen as having been much too lax, so much so that one of the early price determinations, almost immediately after it had been made, had to be reviewed, once it became clear how much cost cutting could be achieved if only the incentive was there. It was also interesting to see how, in a number of industries, the value of X increased over time, as the full scope for efficiency improvements became clear.

3. The RPI – X Mechanism

The first price control in telecoms was, by subsequent standards, relatively straightforward, with X based on a rough estimate made of the likely productivity gains BT could reasonably be expected to achieve per annum over the five years of the price control. But quite soon after that the regime began to develop a structure which, with ever more complications and embellishments, has become the standard approach. First, any part of the industries concerned that was not, of itself, a natural monopoly was split off and reconfigured with a competitive structure. So, for example power generation was split off into competing private companies. Competitive power supply companies came into being, buying power from the generators and paying the natural monopolies – transmission, distribution, pipelines – the price regulated by RPI – X. In rail,

competitive rolling stock companies were created; and train operating companies competed for periodic franchises to run services, acquiring trains, trucks and coaches from the rolling stock companies and paying a regulated charge to the rail network company. Second, uncontrollable costs, mainly essential fuel and other inputs, plus government charges and levies etc. were allowed as a 'pass through'; and third, X was determined in order to give a price for the natural monopoly charge (in practice this comprised a whole structure of tariffs that could vary, amongst customers, through time etc. but around the regulated price). Though this will be familiar to many, it will underpin my later comments if I very briefly summarise how this was carried out in practice. [See Chart 2].

In essence, for each price control period (usually five years) the Regulator identifies i) the value of the company's assets at the start of the period (the Regulatory Asset Base or RAB in period 0) generally, though not always, on a replacement cost basis; ii) the depreciation charge on the assets over that period; iii) the new investment (CAPEX) envisaged over the five years (periods 1 to 5); and hence iv) the RAB at the end of the price control; v) the operating expenditures (OPEX) envisaged over the five year period; and vi) the cost of capital finance over the period, expressed as a percentage of the RAB, to give the permitted minimum necessary or 'allowed' return. These constitute the building blocks of a complete cash flow model over the five year period, with the value of X then being the solution of the model that allows the operating costs, depreciation and allowed return to be covered from the revenues (price times output) generated. In principle, the company is then left alone for five years, to perform as it wishes. If it can perform more efficiently than anticipated, it will keep the rewards of that for the rest of the five years. If it is less efficient it will lose money. And the whole process starts again five years later, hopefully and, in practice, starting from a significantly lower cost base in real terms.

This generates a 'ratchet' mechanism, shown in Chart 3. In this stylised diagram, unit costs start at 100 and, without any incentive mechanism to reduce them it is assumed that they would stay at 100. But if the regulator bases price on allowed costs of 100, under the RPI – X there is a strong incentive to reduce costs, e.g. to 80 over the first regulatory period; the company makes extra profits of area A; but the regulator then imposes a new X reflecting allowed costs of 80. Assuming this drives costs down to 60, the company makes a profit of area B. If costs are then at a minimum and stay at 60, the total gains from RPI – X regulation are A + B + C, with the company getting A + B and consumers getting C. By allowing prices to diverge for a time from costs (thus breaching the principle of allocative efficiency) maximum productive efficiency is obtained, with a significant proportion of the gains accruing to consumers.

The key properties of this approach when working properly are, first, in the shorter term, there are very strong incentives to productive efficiency; and second, in the longer term,

as price generally follows costs down (in real terms) including the cost of capital, the generation of long term allocative efficiency. In fact the long term trajectory of price is broadly the same as that which competition would generate, i.e. minimum costs, minimum necessary return and, therefore, minimum prices. As an aside, this also roughly equals what, in medieval times was thought of by philosophers as the 'just price' of a product, whatever its actual price might be; and it is also similar to the baseline for determining what constituted profiteering during time of war. In short, it can generate not only optimally efficient prices but ones that are generally seen from an ethical position to be 'fair'.

4. The Impact of RPI – X

As mentioned above, the early, rather scattered early evidence as to the impact of this new incentive-based control mechanism suggested a much higher degree of inefficiency previously than had been expected; and a very powerful incentive effect. Since then there have been a significant number of studies of the economic performance of these industries. They differ in the industries they look at, time period, measures used etc; and so do not give a totally clear picture of the outcome. Moreover, they do not explicitly examine the impact of RPI – X regulation because, in virtually all cases, it was introduced at the time of privatisation; and so the impact of the two cannot be disentangled. But the picture that emerges is nonetheless of interest.

A not unrepresentative set of results is that in the first 8 years after electricity was privatised and subject to the RPI - X regime, charges to consumers fell around 26% in real terms, and to industrial users by up to 35% in real terms. A longer term review by the regulator found that charges had halved. In gas, charges fell 35% in real terms over 11 years, and a further 20% when full competition was introduced. Telecommunications saw a 48% fall over 11 years, though the impact of new technology and competition were greater in this industry. The big exception is in water, where charges rose by up to 40%. However, in this case there were two special factors: first the dramatic lack of investment in the past, leaving a crumbling 19th century water distribution and sewage system that needed a drastic but very costly overhaul; and second, the impact of a string of directives from the European Union as to the quality of drinking water and the disposal of sewage, both of which added substantial investment costs to the industry. But it is estimated that, abstracting from the special features noted above, unit costs were up to 20% lower. The general thrust of all these academic results was broadly supported by a subsequent study by the OECD.

These results are not definitive as to the impact of the new regimes introduced. In some studies (though by no means all) there has been some evidence that the gains in telecommunications, in gas and electricity may to some extent have been continuing

gains that had started to materialise in the 1980s, before privatisation and RPI - X started. There is also the interesting case of rail privatisation. While privatisation and regulation of the rail network in the UK led to a dramatic turnaround from the long and, it appeared, almost terminal decline in both passenger and freight traffic, with an abrupt reversal to growth of over 7% p.a. emerging after privatisation, the network enterprise itself failed financially and had effectively to be re-nationalised However, against these negative results,, it is noteworthy that the productivity gains in telecommunications and gas, the first two industries to be privatised, were smaller initially, which is consistent with the finding that the value of X was set much too low initially, with the full impact only coming through as the scope for gains became clear and the value of X tightened. (Also important is the issue of quality and reliability of service performance, which is addressed below).

More generally, the thrust of several studies is that competition or, where it cannot exist, incentive-based regulation, are likely to be more significant than ownership *per se* in generating improvements in economic performance of such industries. What seems most important is that, if ownership is in public hands, this must be exercised in such a way that it does not interfere with the competitive or regulatory mechanisms which generate superior performance. It is then an empirical and policy issue as to whether the State can so organise its affairs to ensure this holds. I return to this point at the end of the lecture.

5. RPI – X in Practice.

It is therefore very easy to assess this type of regulation as having been a great success. Its properties, in theory but also in practice, have been economically beneficial, addressing a problem which is not easy to solve; and it has become the main method of such regulation in a number of countries. But nearly thirty years of experience of the regime in the UK has also thrown up a number of problems, none necessarily fatal, but not insignificant; and it is unsurprising that both the UK Government and individual Regulators are exploring reforms of the regime. Here I briefly list four that have been significant.

i)<u>OPEX and CAPEX</u> The Regulator ideally needs to identify the future course of minimum operating expenditure necessary; but this will be unknown, not only to the Regulator but, to some extent to the company itself. Typically the Regulator employs outside engineering or other contractors to identify the extent of inefficiency currently existing, and a reasonable time period for eliminating it. But it is often hard in such industries to find contractors who are genuinely independent, i.e. not likely to be dependent on future business from the company; and there will inevitably be considerable information asymmetries between them and the company's managers. Usually the contractor will, if

possible, carry out a comparison with similar operations. This is relatively straightforward in the case of local distribution companies, because there will be a substantial set of other local distribution companies with which to compare each of them, though even here there is regularly much scope for argument that one or other is a special case, because of geographical, demographic or historical factors that set it apart. For national transmission the only possible comparison is with abroad, but then different cost structures and national differences generally make this unhelpful. The rate of past improvement is sometimes used as a guide, but then companies usually argue, with increasing merit, that the more they have squeezed inefficiencies out of the system in the past, the less scope there is to do so in the future. It is not difficult to see that determining this key item can become a quite problematic negotiation between the regulator and regulated; and it is one that has still not fully been resolved. The saving grace is that, whatever these problems, the company has a strong incentive to cut OPEX, and this reduction can then be incorporated in the next five year period. If there is a problem it is largely one of delayed price reductions.

Conceptually similar problems arise with planned capital expenditure over the coming five years, but here there is considerably more uncertainty. Investment for expansion depends heavily on the growth of output, itself a very uncertain variable, while replacement and refurbishment, particularly of major items of capital, will depend on future rates of deterioration of capital. Innovative investment by its very nature is hard to foresee; and across all categories, the investment that eventually appears sensible may differ considerably from that which was in a company's previous five year investment plan; and so companies may legitimately wish to expand, decrease or alter those plans significantly. In general, regulators will accept a company's own plans, provided they pass a reasonable inspection by an independent contractor, knowing that extra investment, if warranted, will pass into the RAB and hence get both a depreciation allowance and a return, while under investment will not appear in the RAB. The real problems only arise if, as can happen, the Regulator determines that an unforeseen CAPEX was unnecessary and will not be allowed for in the RAB, or the company argues that the absence of planned CAPEX was due to efficiencies in the management of the company. If all such CAPEX is automatically excluded, then there ceases to be any incentive for managers to seek such efficiencies.

An added complication is that If reductions in OPEX give the company unanticipated profits for up to five years; and unanticipated CAPEX, subject to a sanity check, is allowed into the RAB, then companies have an incentive, wherever possible, to carry out investments – for example those embedding greater automation of processes – which cut OPEX. There is then a real risk that the company will be rewarded twice, for the planned OPEX that didn't occur and for the unplanned CAPEX which did occur. Yet determining, in complex engineering based industries, which CAPEX and to what extent had this effect; and which was merely not anticipated in the original plans in the light of technological advance, or 'added on' afterwards to obtain double reward, is in practice very difficult. It is not clear how much of a

real problem this is, but it can generate a lot of conflict because of the sound bite that 'customers are paying twice'.

ii)The Weighted Cost of Capital (WACC) [See Chart 4] There is now a standard model for determining the return on capital that the regulator should allow, based on the Capital Asset Pricing Model (CAPM) which I will not rehearse here. Essentially the amount allowed is a weighted average of the cost of debt finance and the cost of equity finance, where a)the weights are the proportions of debt and equity financing of the company; b)the cost of debt is the interest rate on the company's bonds (including, therefore, a default risk element); and c) the cost of equity is the sum of the riskless rate of interest plus the equity risk premium for the company, the latter being the overall market equity risk premium multiplied by the extent to which the company's value varies in relation to, and is therefore correlated with, movements in the equity market as a whole (universally known as the company's beta). This is the minimum amount that investors must expect to receive if they are to make capital funds available; and so, in order that such companies can finance themselves, this amount must be allowed for by the regulator.

This is all well established – I used to lecture on it to students in the 1970s – but almost every aspect of it has become a minefield in the RPI – X regulatory regime. Should a company's actual debt gearing levels be used, or what the regulator considers to be the optimal (i.e. lowest cost) gearing? If the debt premium to cover the prospect of default is higher than for similar companies, should the lower figure evidenced elsewhere be used? Betas are calculated for companies as a whole, not just their regulated activities, for which a lower figure might be appropriate. And what might be thought the least contentious point, the value of the market equity risk premium, is often the most contentious. Over what period should it be measured? If too short, then it may reflect only temporary conditions or passing appraisals of risk; and may well not be appropriate for regulating companies making forty year or even longer investment decisions. So regulators have sometimes looked at up to 100 years of data. But then, it may be argued, what possible relevance does the assessment of risk between the two world wars have for optimal pricing today. And most arcane of all, whatever the period used, there will always and necessarily be a difference between the annual figure calculated as an arithmetic mean and the annual figure calculated as a geometric mean, which is always lower. (I mention this only because, believe it not, this can have a not insignificant effect on everyone's electricity bill!) Unfortunately, depending on the measure and the period, the upper range of the WACC can easily be double the lower range, When multiplied by the huge aggregated capital of typically very capital heavy utilities, this can make a significant difference to both the trajectory of prices and profitability, with no 'right answer' if only it could be found.

ii)The Po Drop. It is understandable that the setting of the value of X over the period of five years would come to be seen as the key matter in RPI – X regulation; and so it is. But also very important is what has become known as the 'Po drop'. [See Chart 3 again] A great

strength of this type of regulation is that, even if the regulator is too lax in a period, and the company makes substantial profits from cost efficiencies which should have been foreseen and included in the price control, at least the cost gains will be passed onto consumers in the next price control. The price level at the beginning of the next period, Po, will be reduced to eliminate the extra profits made in the preceding five year period. But companies know this; and so they have an incentive to sequence the implementation of their efficiency improvements, concentrating them at the beginning of a five year period – which maximises their gains from them – and having few if any in the last year or two, thereby minimising the Po drop in price. As a result some regulators phase in the initial price reduction. There is a trade-off between the potentially higher price than otherwise for a year or two, as against the lower costs likely to be achieved in the later years of a price control.

iv)Quality Issues All the above ignores one potentially huge gaping hole in this form of regulation. With such strong incentives to cost cutting, it is a clear invitation to cut the quality of service, be this measured in terms of loss of supply, speed or effectiveness of repairs, responding to consumers' complaints etc. There has therefore built up a substantial substructure of quality indices, with targets set and penalties for not achieving them. While this has worked well to improve a number of dimensions of quality , it has greatly increased the complexity of the regulatory process, not least because of the need to establish an achievable trade-off between costs allowed and quality provided; and the need to identify the optimal point on this trade-off. Specific targets include, for example, in the Energy sector, targets in relation to measures of safety, reliability, speed of connection, customer satisfaction data and social obligations etc. As a result, in all these industries, and on virtually every metric, this type of regulation has generated substantial improvements in reliability and quality of service.

The result of these issues, and others not covered today, is that the relatively simple, non-bureaucratic, 'light touch' regulation of the first application of the RPI – X regime has now become a major exercise on the part of both the regulator and the regulated, often starting two years or more before the new regulatory period is due to start, involving very substantial data transfer from companies, a number of third party reviews of operations, numerous meetings between the parties, a vast amount of data, continual monitoring of the acceptability of assumptions made at the time of a price review and, increasingly, resort to appeal against a regulator's price determination because, for the company it is quite likely to be the single most important decision for it in the whole five year period. This does not by any means lead to the conclusion that this style of regulation should cease - it has, in my view, been spectacularly successful, delivering cost and quality improvements unimagined at the beginning and helping to producing some world class companies in their respective fields. But it is clearly a quite different animal from that envisaged at the start; it involves considerably more 'game-playing' between regulator and regulated than foreseen; and has become so detailed and complex that it is not really feasible for those outside the process to

understand to what extent the interests of consumers have or have not been fully protected. With energy prices, rail fares and postal charges all rising substantially in recent years, even if for reasons unconnected with almost all of the above, there is understandable concern that an increasingly opaque regulatory regime is not delivering. Both the energy and water regulators have recently conducted major reviews of their regulatory regimes; and seem to be headed towards still more complex arrangements. Significant changes are being examined in postal services, airports and rail. More may follow in other sectors. Whether all the evident gains of the regime can be held onto while avoiding some of the complexities and tensions that have emerged over the years remains to be seen.

6.Underlying Issues: Information, Incentives and Governance.

In the interim, it is worth focusing on three deeper seated aspects of the RPI – X regime, each of which perhaps helps to point to some key elements of what needs to be held onto in any reform process.

i)Information It is widely recognised that a potential problem facing any regulator is that of information asymmetry – the company knows a lot more about what it can and cannot achieve, and has every incentive, in what it supplies to the regulator, to submit higher costs than it believes it can achieve; and to reclassify feasible activities as infeasible. A powerful mechanism for countering this, in situations where a number of local monopolies exist, e.g. in power distribution, but to date used only sparingly, is 'yardstick competition', in which each company may increase its price by an amount dependent on *all the other companies' cost increases.* This retains the powerful incentive to cut one's own costs, as all the benefit is retained for up to five years; but thereby contributing to bringing down all costs and hence industry prices; but it does nonetheless, and rightly, allow prices to rise where the cause is an extraneous cost increases that applies to all such companies. It rather neatly reproduces a competitive outcome, in that more efficient companies will make higher profits while less efficient ones will make losses. To date, however, this has only been used in the UK in the water industry, and then only in the less formal sense that price increases have been benchmarked by reference to other water companies' costs. This is mainly because businesses, even though in the same industry, will nonetheless differ in terms of scale, type of customer, physical environment, legacy of past investment etc. all of which can undermine the validity of a straight comparison of their costs.

But the information problem goes rather wider, in that companies themselves face very considerable uncertainty about very many aspects of their operations - future demand, technological change, skills available; their capacity to determine how best to meet these challenges; and the likely success they will achieve in implementation. The greatest advantage of a competitive market - in the long run even more than its tendency to sustain only the most efficient producers, selling goods and services at minimum sustainable prices

- is the process of discovery, of revelation that it generates. Above all else it incentivises enterprises to find out about demand, not just today's but tomorrow's; to find out new ways of making things and new ways of meeting future demands – it is a trite but nonetheless informative point that when the Berlin Wall came down, the shock wasn't how much cheaper things were in the competitive economy of West Germany, indeed they weren't at all; it was the shock of, for example, comparing a BMW with a Trabant motor car, of how much further product and process innovation had gone under competitive conditions.

But the competitive mechanism is not available in natural monopoly; and so the regulatory regime has to create it. It has to establish incentives for the natural monopolist to embark on the same process of discovery – at the high end, this includes top quality research and development, but below that, just lots of little ways of being more efficient, improving the product or service. Again by analogy with a competitive market this will at times require arrangements which will allow companies to make extra profits if they can – a regulatory regime that precludes this can never expect companies fully to take on the role of seeking and then exploiting new data and new opportunities. In short, neither regulators nor regulated companies can know the future, nor should they act as if they did. So a high priority for any regulatory regime is to provide incentives for the world to become more fully revealed, so that the best can then be obtained from it. To build on an analogy first put forward by Hayek, a regulator cannot be a craftsman, seeking directly to fashion the outcome he would wish to see. He is more like a gardener, seeking to create the right conditions in which what he hopes for will emerge.

ii)Incentives In one sense this hardly needs mentioning again, as it is a theme that has run through much of what I have had to say. But, in the context of review in the UK, and perhaps further afield, it needs re-iterating that incentives are the key to everything in this field. As I have indicated, not only was RPI – X successful because of the very powerful incentive mechanism it generated – to be more efficient and to discover better ways of doing things - but the subsequent elaborations of the regime have all centred around channelling or, where counterproductive, neutralising companies' incentives – to modify data, to switch OPEX to CAPEX, to manipulate the timing of productivity improvements, or to let quality of service delivery suffer. And in numerous regulatory appeals, controversial issues have been settled by reference to the benchmark of what the equivalent incentive effects would be in the case of a competitive market structure.

Indeed, this is arguably just another example of a more general proposition, that incentive effects are in themselves more important than market structure or ownership in determining efficient outcomes, with the latter two only exerting effects via their impact on incentives. If so, we need to delve one level deeper. Most of the companies subject to RPI – X in the UK (though not all – postal services until this year has been an exception) were privatised; and it is natural to think of their incentive as maximising profit. But this is only

correct to the extent that the management of these companies are either remunerated in relation to profitability, or their promotion and career prospects are largely tied to this metric. That is increasingly the case in the UK – the point of unpacking this point being that the same incentives will arise, and the same effects achieved, if the remuneration and/or careers of the management are broadly tied to the financial performance of the business, irrespective of the actual ownership. This may be simpler and more transparent in the case of private ownership, but the fact that RPI – X came in on the wave of privatisation, and as the answer to the problem of monopoly power in the private sector, does not mean that its advantages (or its disadvantages) only apply in a private sector context. In short, there are many advantages of competition and of private enterprise, but the RPI – X mechanism, for all its problems can, because of and via its incentive effects, in principle produce similar outcomes even in conditions of state-owned monopoly.

In short, State ownership is not incompatible with obtaining the benefits of incentive effects, but I would suggest that three conditions are necessary for this to be the case.

i)The incentives for the enterprise must be related, and only related, to the economic performance of the enterprise. Otherwise, incentive regulation will not drive performance towards maximum efficiency

ii)The enterprise's operations must be ring-fenced, so that subsidies, extra obligations or other interventions do not inhibit the working of the incentive mechanism;

iii)Industrial, social or environmental policies must be transparent, so that their impact can be separately accountable and outside the implementation of the mechanisms of incentive regulation.

These propositions lead on to my final point

iii)<u>Governance</u> There are four levels of activity involved in the delivery of services by natural monopolies in utilities or other industries: a) Management, Ownership, Regulators and Industrial Policy, the latter broadly conceived of as any intervention to alter outcomes from market determined ones. In the UK, until the 1980s, the latter three were all State functions, with management then responsible to institutions of the State for operating the facilities involved. Thirty years later, it has rather gone to the opposite extreme: the Government still determines and enacts industrial policy, though on a much lesser scale; but regulators are independent, with appeals going to the independent Competition Commission (or possibly beyond, through judicial review to the courts); the companies are virtually all privately owned; and management operates to private sector norms subject to the regulatory framework and targets set by the relevant independent regulator.

There is no universally right answer to the form of these governance arrangements and, as noted above, while there are many advantages to private ownership, there is no irrefutable argument that it is essential in dealing with the problems thrown up by natural monopoly.

However, on the basis of thirty years of development of the regulatory regime in the UK, I would suggest that there are undoubted benefits of the separation of powers that prevail in the UK regime. The incentives that are the motive power for the companies' actions are then clear; the regulator can specify an incentive-based regime that, if designed well can generate optimal outcomes today and clear gains from innovative activity for the future. The owners will derive the appropriate minimum return necessary to finance the activity; and industrial policy interventions will of necessity have to be separate and therefore transparent. This puts maximum pressure on the authorities to be clear on the purpose of the intervention, the potential gains (and the potential gainers) as well as the potential costs and the potential losers.

Neat as that seems, one has to admit that it has come under considerable and growing pressure in recent years. The products and services involved are, for the most part, absolutely essential to most people; and so if their price rises significantly, there is understandable pressure on the government of the day to 'do something'. The response that it is not a matter for the government but for the independent regulator finds little traction; but explicit subsidies to ease price rises run up against the (currently severe) constraints of public sector debt. This can quickly lead to the convenient assumption that utility companies must be making excessive profits, though currently there is scant evidence for this. And so the focus of attention moves to the regulatory regime itself with calls for reform.

These are all understandable pressures; the current spate of reviews of the regime in the UK is no doubt timely; and may have useful implications for such regimes elsewhere. But there are signs that the result will be more rather than less complexity; and this may hold some dangers for the future of the regime. More important in my view, these should not put into question the advantages of the separation of activities which, combined with an incentive-based regulatory regime has, I believe, been a fundamental factor in the turnaround of performance in these industries in the UK and elsewhere. If these conclusions are correct, then I hope that, in time, they may be of value in the Chinese context.

Chart 1: Privatisations and roll-out of RPI-X regulation

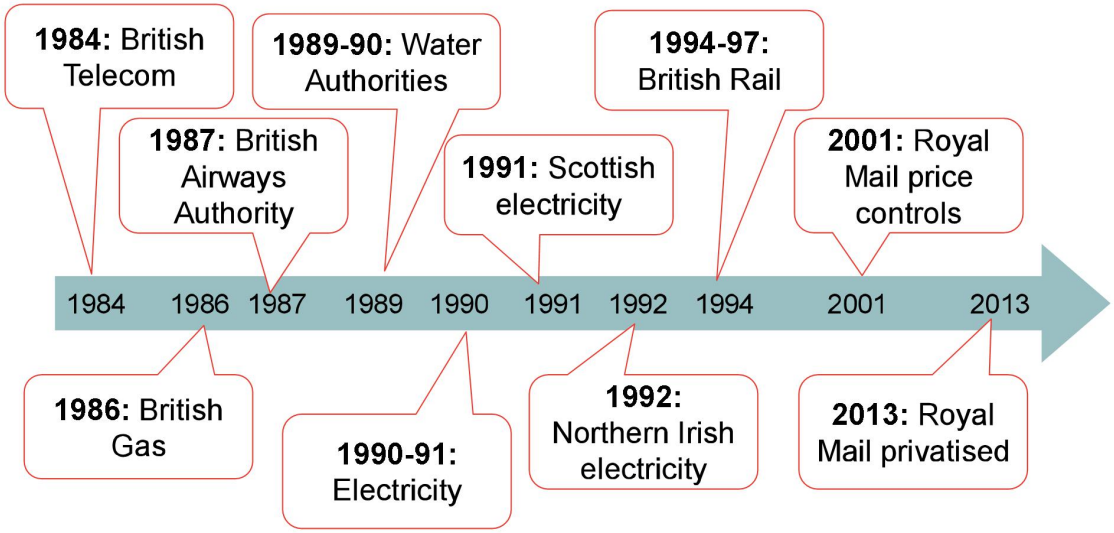

Chart 2: Building blocks of the RPI-X mechanism

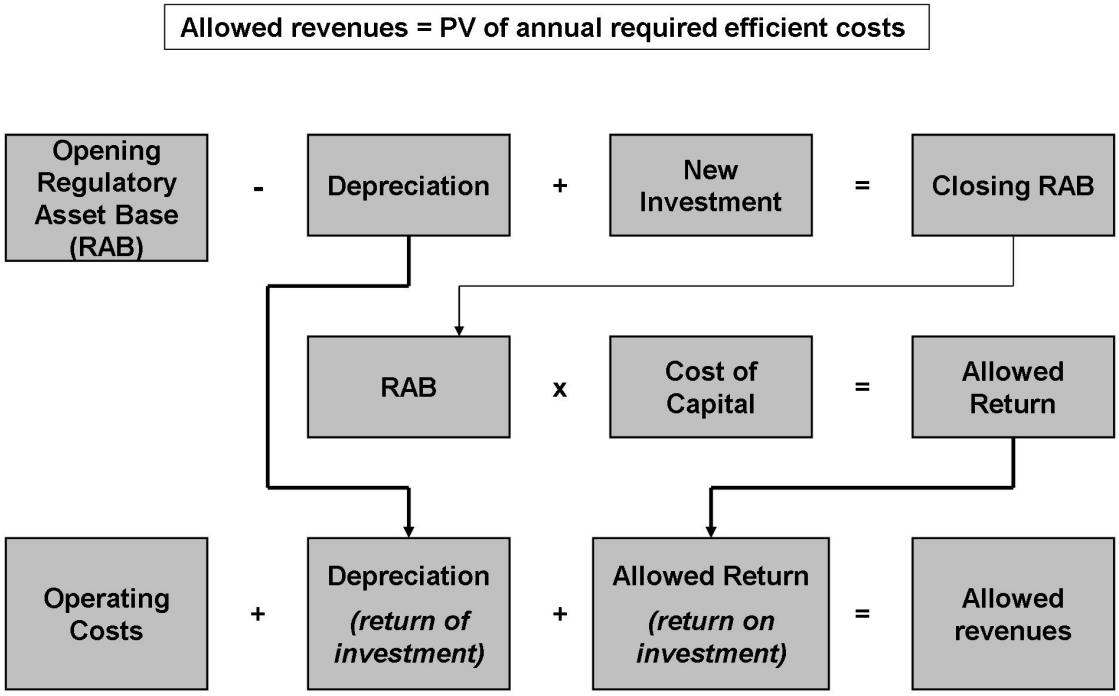

Chart 3: Illustrative ratchet mechanism

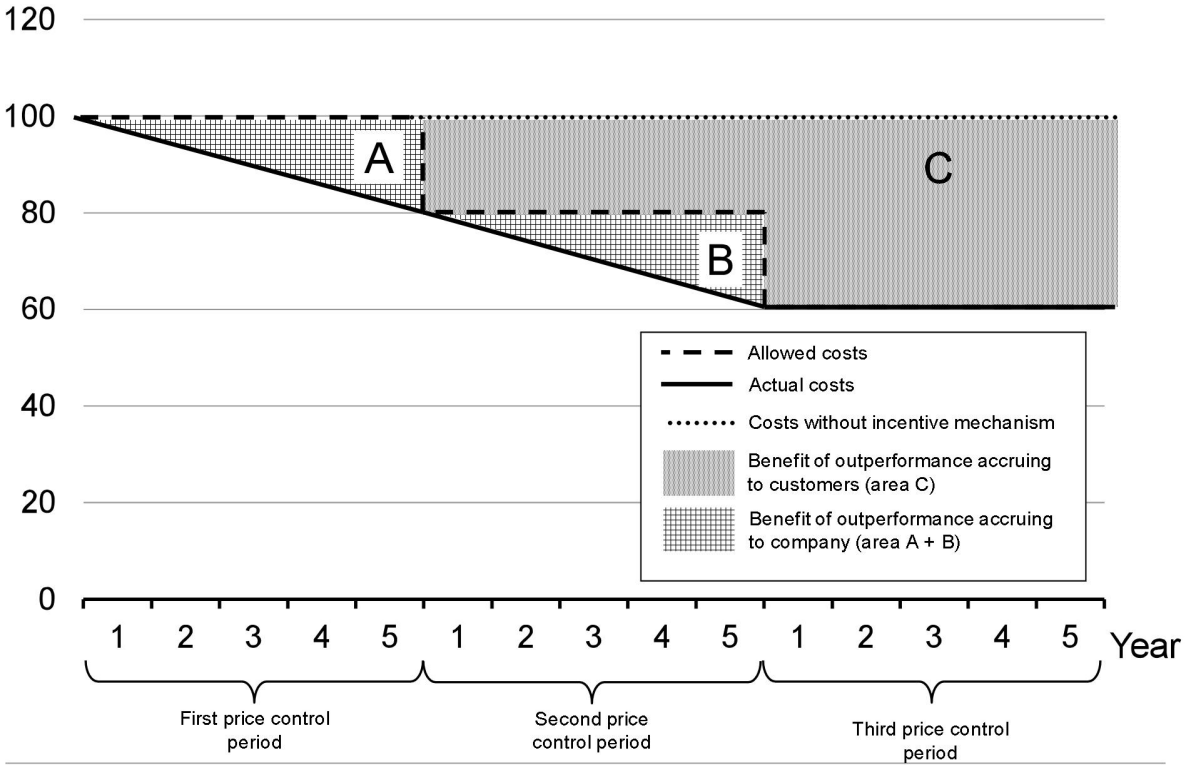

Chart 4: The Weighted Average Cost of Capital: The Capital Asset Pricing Model

1) The WACC = Cost of Debt x Proportion of Debt +
Cost of Equity x Proportion of Equity

2) Cost of Debt = Riskless Rate of Interest + Debt Risk Premium
(= Cost of Company Bonds)

3) Cost of Equity = Riskless Rate of Interest + Company Equity Risk Premium

4) Company Equity Risk Premium = BETA x Market Equity Risk Premium

5) BETA is a Measure of the Degree of Correlation between the Value of the Company and the Value of the Stock Market as a Whole