

Exercise Sheet 3. Privatization and Regulation: Answers

1. (a) X-inefficiency is inefficiency that arises because firms fail to minimise their costs. It can be due to poor management control, inefficient working practices, strikes and so on.

It can be a problem in publicly-owned firms because controls on inefficiency may be lacking. Arguments frequently focus on the idea of principals and agents whereby the principal (the Government) appoints an agent (the managers) to run the firm. If there is asymmetric information whereby the Government cannot observe in detail the conduct of managers, the latter may allow costs to rise. For example, they might choose an 'easy life' and not strive to minimise costs. Instead, they allow inefficient working practices, give in to pressure from trade unions for increased wages and, more generally, fail to squeeze down on costs. Added to this, managers may simply be less able than in the private sector e.g. because they are paid less, or there is no effective market for corporate control. The net result is that nationalized industries tend to become inefficient, and indeed this inefficiency cumulates over time.

Added to this, inefficiency may arise if Governments intervene in the day-to-day operations of the firm in their own political interest e.g. they intervene to end a strike by allowing workers to gain higher wages than they might otherwise have done. (This was a feature, in the past, of some Labour governments, although not so now).

These problems might be overcome (or reduced) if the Government can appoint a strong board with significant powers to pressurise managers to reduce costs. In practice, however, such boards may be weak or virtually non-existent, so that any controls depend on the relevant government department. They (or the boards themselves) may not be strong enough or may lack sufficient information to reduce costs. In addition, they (or the boards) may be captured by the firm and hence become lax in reducing costs.

The Government could also set targets for cost-cutting in nationalised industries although similar problems arise e.g. can they identify the cost savings available? Also what do they do if there are cost over-runs?

The Government could try to bring in commercial expertise from the private sector; as, for example, in the recent proposed part-privatization of Royal Mail. Issues arise as to who would have control in this case in that, if a private firm has a minority interest, it might find it difficult to get the firm to implement cost saving measures it proposes.

- (b) (i) Initially, consumer surplus is abp_1 and producer surplus is the area enclosed by $bghp_1$ (less any fixed costs). Alternatively, producer surplus can be measured as $(p_1 - LAC_1)q_1$. In this case, we have a first best welfare optimum (given costs) since $p_1 = LMC_1$.

If the firm is privatized and costs fall to LAC_2 and LMC_2 , consumer welfare is unaffected if price remains at p_1 but producer surplus rises to the area enclosed by p_1bfij (less any fixed costs). Alternatively, it is $(p_1 - LAC_2)q_1$. The cost saving involved goes entirely to the firm.

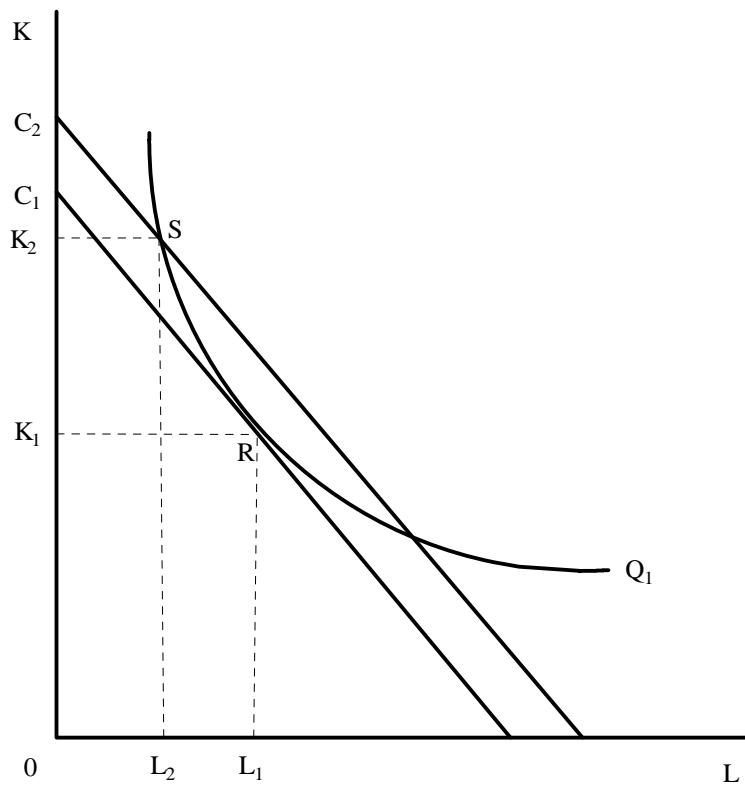
(ii) If price rises to p_2 , there is a trade-off. Consumers lose area p_2cbp_1 although most of this p_2cdp_1 is a transfer to the firm. The deadweight loss from this source is cbd . There is also a deadweight loss due to the firm restricting output to q_2 equal to area $dbfk$. The producer surplus is the area enclosed by p_2ckij and the producer surplus gain is p_2cdp_1 less $dbfk$. Producer surplus can also be calculated as $(p_2 - LAC_2)q_2$

The firm is exerting monopoly power in raising its price to p_2 moving away from the welfare maximising outcome. This would be with a price corresponding to point e such that price equals marginal cost. Consumers would gain and overall welfare would increase.

2. (i) Rate of return regulation has been used extensively in the US to control public utility pricing. It operates by setting a maximum 'fair' rate of return which firms are allowed to make. It has the advantage that it is politically popular since it prevents, directly, the exercise of monopoly power (by setting the maximum return that can be earned). It is also easy to implement, at least in principle, since it involves simply picking a 'fair' rate of return. This is qualified in practice if there is a need to generate funds for new investment (requiring a higher 'fair' rate of return). Controls on accounting methods are also needed to ensure an accurate measure of returns being earned.

It has weak efficiency properties, however, because managers have no incentive to reduce costs (since a reduction in costs is simply passed on to consumers in the form of lower prices). The result is X-inefficiency as discussed in question 1. It also suffers from the so-called Averch-Johnson effect because it encourages managers to overinvest in capital thereby generating extra profits for shareholders (see below). This also raises costs. The US evidence also suggests that regulatory capture is likely to be a problem with regulators tending to adopt the firm's perspective, thereby failing to push down on the level of costs.

The Averch-Johnson effect is illustrated below:



As drawn a firm producing output shown by isoquant Q_1 will minimise costs by moving to point R such that it is on its lowest isocost line C_1 . The optimal quantity of capital is K_1 and labour L_1 . Under rate of return regulation, however, the firm has an incentive to increase the amount of capital. For example, it might move to point S with capital K_2 and labour L_2 . This implies higher costs, shown by isocost line C_2 . If we set the price of capital equal to one, the distance between C_1 and C_2 measures the extra cost involved.

(ii) Since 1984, the UK has mainly used RPI-X price-capping to control prices of regulated firms. These allow firms to raise their price each year by the increase in the Retail Price Index (RPI) less a factor X which allows for cost savings to be made in the industry. The value of X is usually set as an average price over a number of different products. Normally, X is set by the regulator for a period of 5 years in the UK after which a review takes place. At this review, the regulator considers the experience over the preceding 5 years (including the rate of return, in fact, earned) and the prospects for future cost savings and it uses this information to set a new value of X.

RPI-X has the following advantages: (1) it gives strong incentives for firms to reduce costs since any cost savings above the level X can be retained in the form of extra profits; (2) it does not create a bias in investing in too much capital as in rate of return regulation (although see below); (3) it is relatively simple to use since the regulator has just to set the value of X five-yearly, and ensure that the firm is setting appropriate prices; (4) it provides certainty for firms and (5) it provides gains for consumers because if X is positive, real prices will fall.

There can however be problems with it. (1) an early criticism of it was that the Government set X too low (e.g. X for BT was originally 3, for British Gas 2 when much higher levels might have been used); (2) only some parts of a firm's output is usually regulated e.g. in the case of BT at the time of privatisation, only local and long distance call charges, plus line rental were included in the product basket. This gives scope for the monopolist to conform to the price control for the products included but to charge much higher prices for those not; (3) using a weighted average price control gives an incentive for the firm to minimise the impact of the price control on profits by changing the weights (known as *rebalancing*). For example, if last year's sales are used as weights, a firm may attempt to manipulate these so that a relatively high weight is given to a product where it raises price moderately. The problem arises because the weights are not exogenous so that the firm can change them using strategic behaviour. In addition, if the firm faces competition in one part of the market, it might reduce price by more in that market in order to weaken its competitor. This was claimed in telecoms where BT made large reductions in price in peak long distance calls soon after privatization, the area in which its only competitor at the time (Mercury) earned most of its revenues. Arguably, this policy was used strategically to weaken Mercury, thus contributing to its demise. (4) Yarrow and Vickers have argued that firms may behave strategically at the time of the periodic review by, for example, investing in too much capital (thereby lowering the rate of return) or by letting costs rise to get a more favourable outcome for the next 5 year period. They argue that rate of return would again be important so that the difference from rate of return regulation would be small. This argument, however, seems weak in that a properly functioning regulator should be able to spot this kind of behaviour; (5) regulators, however, can be affected by lobbying and over time may be 'captured' by the industry (i.e. start adopting the industry's viewpoint in dealing with regulated firms). If this is so they may fail to protect the consumer interest.

3. 'Yardstick competition' involves setting price controls for a natural monopoly based on levels of cost of comparable natural monopolies. It can be applied where the regulator is unable to assess cost savings that could be made by a firm and where a number of independent local monopolies exist. It is an alternative to 'cost of service' regulation where the regulator allows a natural monopoly to raise its price each year in line with increases in its costs (as is often done in Government procurement as well as natural monopolies). This has poor efficiency incentives since firms know they can pass on any cost increases in the form of higher prices. It also gives incentives to misrepresent cost increases to gain higher prices.

Yardstick competition can be illustrated in the case where there are two local natural monopolies with similar cost and demand conditions. If the regulator is unable to observe the cost savings that can be made in these firms, it can, nevertheless, set a yardstick price such that each firm's price equals the unit cost of the other. Assume the respective unit costs are c_A and c_B , and that $c_A < c_B$ i.e. firm A has a lower unit cost than firm B. In this case, each firm

has an incentive to reduce its costs. In the case of firm A, $p_A = c_B$ and so $p_A < c_A$ and the firm will make a profit. Moreover, it has an incentive to reduce its cost more as this will increase its profits. In the case of firm B, $p_B = c_A$ and hence $p_B > c_B$ and the firm makes a loss. Hence, this gives it an incentive to reduce its costs in order to make a profit. It has been shown by Shleifer (*Rand Journal of Economics*, 1985) that this form of regulation leads to an efficient solution whereby the marginal benefit of cost reduction equals its marginal cost.

This outcome compares with 'cost of service' regulation where the regulator simply allows 'cost pass through' i.e. firms are allowed to pass on cost increases to consumers. This type of regulation has low efficiency properties i.e. there is no incentive for the firms to reduce their costs. Note, however, that it might be possible to use RPI-X regulation by selecting an arbitrary value for X although this might be relatively crude compared to yardstick control.

The main strengths of yardstick competition (as, for example, used by the water regulator OFWAT in the UK) are that it gives incentives for firms to reduce their costs. In particular, it penalises the most inefficient firms by forcing them to reduce their costs by more. Hence the policy is targeted at the least efficient firms which it wouldn't be if only one value of K was selected used in the RPI+K regulation in the water industry.

The weaknesses of yardstick competition tend to be associated with heterogeneity in cost and demand conditions between firms. In the case of the water industry, there are 10 major suppliers of water and sewerage in the UK plus another 11 smaller, water only firms. These firms face different conditions in each of the markets they supply e.g. wage differences between regions, the need to supply urban or rural populations, size of region covered and so on and these can account for cost differences between firms. Given this, it is necessary to use 'reduced form' regulation whereby unit costs are adjusted to take account of these differences. There are problems however: (i) the sample sizes need to control for these factors in regressions are sometimes small (currently 22 firms only in the water models) so that estimates are likely to be imprecise; (ii) the need to restrict the number of regressors because of limited degrees of freedom can lead to omitted variable bias i.e. important variables which influence differences in costs are left out which biases the effects of the other variables; (iii) some variables are inherently difficult to measure and hence are ignored. Added to this (1) yardstick company is not simple regulation and might be suggested that a simpler approach is required; (2) the method might discriminate against some regions e.g. some important variables are not included because they are difficult to measure; (3) it rules out mergers since sufficient comparators are needed to do the relative efficiency analysis, and mergers themselves may give rise to lower costs.