

WORKING PAPERS

GOVERNMENT INCENTIVE CONTRACTS WITH PRIVATE
COMPANIES : SOME LESSONS FROM THE CHANNEL
TUNNEL

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SOME LESSONS FROM THE CHANNEL TUNNEL

1 Introduction

In the Channel tunnel project which was abandoned in 1975, the British and French governments entered into partnership with two consortia of private companies, the British Channel Tunnel Company Ltd and La Société Française du Tunnel sous la Manche, who were to manage (and partly finance) the design and construction of the tunnel, on a risk-sharing basis. The contract drawn up to arrange this and to provide for the remuneration of the companies out of the tunnel's revenues contained a number of interesting and unusual features.

In this paper, we examine some implications for resource allocation of the incentive conditions in this contract, and draw some general conclusions about the design of incentive contracts for cases where governments involve private companies in revenue-earning projects. As we shall see, the contract put the private companies in a distinctive situation, having elements of both profit and revenue maximisation. We compare the resource-allocation consequences of this situation with those of orthodox profit maximisation.¹

2 The tunnel project

The tunnel was to have carried rail traffic only, comprising ferry trains operated from one tunnel terminal to the other (and carrying road vehicles loaded at these terminals), and also longer-distance conventional trains for both freight and passengers. The two private consortia were entrusted with the task of financing and managing the design and construction of the tunnel, which would then be handed over to a public operating authority, to be established by the two governments.

The British and French governments had previously collaborated on the design and construction of the Concorde supersonic airliner; no doubt

this experience influenced the choice of contractual arrangements for the tunnel. These arrangements included the designation of three separate contract phases:

- Phase I - the main technical, economic and financial studies;
- Phase II - the initial works (including the boring of trial lengths of tunnel), together with further studies;
- Phase III - the main construction of the tunnel system.

Put very roughly, these three parts of the project were expected to cost £5 million, £30 million and £450 million, respectively, at 1973 prices (cf Chapter 1 of [1]). In contrast to the Concorde case, the contractual arrangements provided for abandonment of the project at the end of Phase I or Phase II, on terms largely settled in advance. In this phasing, the intention was to eliminate uncertainty about both costs and the level of demand, as far as reasonably possible, before embarking on the major expenditure of Phase III.

In the event, the project was abandoned in January 1975, after the completion of Phase II (cf the preface of [3]).

3 Contractual arrangements on costs and revenue

In addition to managing the project, the private companies had the responsibility of raising all the required funds, albeit with the help of some important government guarantees. Under the terms of Agreement No. 1, signed by the governments and the companies in October 1972 (cf chapter 11 of [1]), at least 10% of the actual cost was to be financed by risk capital, in the form of shares issued by the companies. The remaining 90% (approximately) was to be raised by the companies through the issue of fixed-interest bonds, which would be paid off within twenty-five years of the start of the operation of the tunnel. While it was hoped that the bond holders would get their money from the tunnel's revenues, both the interest and the capital repayment were to be guaranteed by the two governments. The rate of interest was to have been simply that rate appropriate, at the time of issue, for securities guaranteed by the two governments.

Like the bonds, most of the shares were to have been issued in 1975 (at the beginning of Phase III); it was agreed that these shares should receive a flat return of 7% p.a. in the years before the tunnel came into service. Thereafter, under Agreement No. 1, shareholders were to receive

remuneration comprising two elements - a percentage of the gross receipts of the tunnel, and a percentage of the net revenue. The sizes of these components were to be determined at the time of issue, to give a level of remuneration "which would both be justifiable in the public interest and adequate to enable the required sums to be raised on the market" (section 11.15 of [1]). In the months following Agreement No. 1, further negotiations took place, as a result of which a third component was added, namely a fixed return on capital. Provisional figures were put forward for the three components, and these are shown in Table 1, together with other terms of the arrangement. This scheme was incorporated in Agreement No. 2, signed in November 1973 (see [2]), which included a provision that definite percentage remuneration figures should be determined in Agreement No. 3, to be signed just before the beginning of Phase III of the project. Also included in Agreement No. 2 were complex arrangements for financial settlement in the event of abandonment of the project (cf pp.48-62 of [2]); and it was under these terms that the companies received compensation when the governments abandoned the project at the beginning of 1975.

4 The expected financial outcome

In Table 2, we present predictions of the financial outcome, based on two alternative traffic levels. The figures for gross receipts and operating costs grow year by year because of assumed secular growth in traffic levels, and because of some implicit assumptions about inflation. In money terms, this yields a considerable growth in the operating surplus, a growth also influenced by operating costs increasing less than proportionately as traffic increases.

The debt service (on the fixed interest bonds) has first claim on this operating surplus, while the remuneration of the shareholders ranks second, and the governments receive the residual (if any). On both alternative traffic forecasts, the operating surplus is sufficient to leave such a residual, though it is small initially. In Table 2, the distribution of the operating surplus supposes the remuneration rates specified in Table 1; the detailed application of these rates is shown in Table 3.

If these traffic forecasts are about right, then the tunnel should have been an attractive proposition to the companies, and also to the governments - though additional expenditure would have been needed on rail links, and this was a matter of concern to the latter, and especially to the British government (cf [3]).

In return for providing 10% of the capital outlay, the companies and their shareholders would have received (on the so-called central forecast of traffic levels) some 21% of the operating surplus in the first year, declining to 13% by the year 2000; with time discounting at 15% p.a. over the full 50-year remuneration period, the present value of this remuneration is about 15% of the present value of the operating surplus (section 11.22 of [1]). Thus the governments would have received about 85% of the present value of the 50-year operating surplus, in return for taking the risk on 90% of the capital, through their guarantee on the fixed-interest bonds; this share of 85% includes the payments due to the bondholders. Furthermore, after 50 years, the governments would have owned the tunnel outright. Part of what is here dubbed the 'government share' has first claim on the operating surplus, while the rest has third claim. Thus, for lower traffic levels, the governments would receive a smaller proportion of the operating surplus while the remuneration of the companies' shareholders, though falling absolutely, would increase as a proportion of operating surplus - in present value terms, to 17% in the case of the so-called low traffic forecast.

Table 3 also reveals the relative importance of the three elements in the remuneration of the private companies. The share of gross receipts is important throughout, while the share of net receipts never rises above 21% of total remuneration in any one year, and is very much smaller than that in the early years. The re-negotiation which introduced the fixed-return element (in Agreement No. 2) greatly reduced the risk to which the shareholders would have been exposed; on this, see the apologia in Section 11.17 of [1].

5 Consequences of these financial incentives for resource allocation: design and construction of the tunnel

In section 11.7 of [1], the British government claimed that, because the companies receive no remuneration unless the operating surplus is more than sufficient to cover the debt service on the guaranteed bonds, the companies "would have every incentive both to keep the construction costs to a minimum and to design and construct the tunnel in such a way as to enable it to be operated as efficiently as possible". This proposition is examined here by comparing the contract situation of 'remuneration maximisation' with that of ordinary profit maximisation.

On design matters, the governments retained some powers of control (notably over specification of performance and over safety matters), but the companies apparently enjoyed significant discretion. Consider first the case of design alternatives leading to the same level of gross receipts. Such alternatives explore the trade-off between operating and capital costs. Here we interpret the case of profit maximisation (under certainty) as maximisation of the present (discounted) value of shareholders' net receipts, after allowing inter alia for the interest, and repayment of, any fixed-interest bonds issued by the profit-maximising company. Discounting will be done at 15% p.a.; in effect, this supposes that the companies have a 15% time-preference rate, which is greater than the 11% fixed-return rate paid on the shareholders' funds under the remuneration package. (If this relationship were reversed, the fixed-return component would by itself give the companies an incentive to increase the capital outlay to as high a level as possible; the effect would be similar to that noted by Averch and Johnson [4] for regulated industries in the U.S.). The optimal marginal condition for profit-maximisation is then: increase capital outlay until the last £1 expended from shareholders' funds yields an extra £1 (in present value terms) in net receipts (to shareholders) as a result of the reduction in future operating costs.

To yield a more specific analysis, suppose that the company finances 90% of the capital outlay by the issue of fixed-interest bonds, and that this percentage is held constant for any relevant change in outlay. Then the last £1 in capital outlay requires 10 pence from the shareholders, and on the optimality assumption, yields an increase in net receipts to shareholders which has a present value of 10 pence. (On the assumption of no change in gross receipts, this increase follows solely from a reduction in operating costs.)

In order to compare this with the Channel tunnel remuneration arrangement, suppose (for the present) that the fixed-interest bonds there are issued on the same terms as those issued in the profit-maximising situation; also suppose the provisional rates of remuneration given in Table 1. If the companies were to move to that margin which is optimal under profit maximisation, then the 10 pence outlay from shareholders' funds is rewarded in two ways: first, the 11% fixed return on this incremental capital outlay gives 1.1 p a year for 50 years, yielding a present value of approximately 7.3 p; secondly, the 3% of the consequent improvement of 10 p in net receipts gives a present value of 0.3 p. The total reward of 7.6 p is significantly less than the outlay of 10 p, and hence the companies have an

incentive to design for a lower capital outlay (and higher operating costs) than in the corresponding case of profit maximisation. However, the result depends on the rates of remuneration adopted, especially the fixed return on share capital; thus no general conclusion on bias can be drawn.

Because of the government guarantee on the bonds, the Channel tunnel companies presumably could raise these funds more cheaply than could a private company acting independently in an ordinary profit-maximisation situation. To be specific, consider some hypothetical terms: in both situations, the bonds are repaid at the end of 25 years, and until then, there are annual payments of interest only; the Channel tunnel companies raise these funds at an interest rate which is four percentage points lower than that paid by an independent profit-maximising company. The £1 of extra capital outlay at the margin requires the issue of £0.9 extra bonds, and on this amount the tunnel companies thus save interest of 3.6 pence p.a. for 25 years; this saving has a present value of about 23.3 p. Thus, at the profit-maximising capital outlay margin, the tunnel receives an extra 23.3 pence (in present value) compared with profit-maximisation, and hence the total improvement in net receipts is 33.3 pence. Only 3% of this goes to the shareholders, making the total reward some 8.3 pence instead of the 7.6 pence of the previous case. Thus the effect of the lower interest rate on incentives is slight. More generally, note that the benefit of the lower interest rate goes only into net receipts, and since the companies get only 3% of net receipts, almost all the benefit remains with the governments.

When design alternatives lead to differing levels of gross receipts (through variation in capacity or variation in the quality of service provided), it is more difficult to provide a general analysis, since the remuneration now depends on the ratio of gross receipts to net receipts. This ratio varies by project, and by year for a given project. However a brief, approximate analysis can be offered for the Channel tunnel figures of Tables 1 and 2. Let us extend the previous example: at the optimal margin for profit maximisation, the last £1 of capital outlay requires 10 pence outlay of shareholders' funds, and will (under profit maximisation) yield a present value of 10 pence in extra net receipts (now based on an improvement in gross receipts relative to operating costs, and again calculated after netting out the extra debt service payments to bondholders. In the case of remuneration maximisation (and assuming bonds issued at the same interest rate as under independent profit maximisation), the remuneration includes the same two elements as before, having present values of

7.3 pence and 0.3 pence, respectively. In addition, there is a reward of 8.7% of the increment in gross receipts. There seems to be little or no reason for supposing that the marginal ratio of gross to net receipts will differ significantly from the average ratio (especially since much of the difference between gross and net comprises the debt service on the bonds rather than operating costs). Accordingly an estimate of the average ratio will be used; this ratio is about 3 initially and declines to about 1.1 by the year 2000; bearing in mind the relative importance of the early years in a discounting calculation, it will be assumed that the present value of the gross receipts increment is 2.4 times the net receipts increment. Thus the incremental remuneration from the 8.7% of gross receipts will be about seven times that from the 3% of net receipts, giving a present value of 2.1 pence. Thus the total reward is about 9.7 pence (or 10.4 pence if we make the same allowance as before for the interest rate advantage of the government guarantee on the bonds). As it happens, the incentive to the companies on this aspect of the design is much the same as it would be under profit maximisation. Again, however, the result depends on the particular remuneration rates chosen.

The companies were also to manage construction of the project; as well as reimbursement for expenses incurred, the project managers were to receive a fee of about £11 million (in 1972 prices), about 60% of which was liable to reduction in the event of cost over-run (with the whole of this part being eliminated if the cost excess was 10% or more). Furthermore, the contractual arrangement appears to provide for any cost over-run to be financed (at least to the extent of 10% of it) by the issue of additional shares. Since such additional outlay would not increase gross or net receipts, the only extra remuneration for the companies' shareholders would be the 11% fixed return; as before, it may be assumed that this is less than the companies' time preference rate, in which case this too apparently provides an incentive to avoid cost over-run. However there is an escape clause (section 4.7 of Agreement No. 2) which may eliminate the direct incentive; under this clause, if the cost excess can not be financed by an increase of risk capital on "reasonable terms taking into account the forecast profitability of the tunnel, market conditions and the financial consequences for the then existing holders of risk capital" then the excess may be financed by the issue of further government-guaranteed bonds. There is still an indirect incentive: debt service on these additional bonds is a first charge on the operating surplus, and hence net receipts are reduced; but this incentive is modest, since the companies receive only 3% of net receipts.

All the analysis of this section has supposed implicitly that the tunnel's net receipts would be sufficient to cover all the remuneration due to the companies. If profits are not adequate, remuneration is postponed or not paid at all; this provides some additional (though, probably, modest) incentive to avoid design excesses or cost over-runs.

6 The operation of the tunnel

Once built, the tunnel was to be handed over to the Channel Tunnel Authority, established under Article 8 of the Treaty [2]. The companies were given rights to appoint some of the directors of the Authority.

Section 5.1.6 of Agreement No. 2 says that the Authority shall "manage the tunnel as a commercial enterprise with a view to securing the best possible earnings on capital employed" and may adopt "tariff differentials for particular goods and services and for peak and off-peak periods, and policies designed to make the tunnel competitive with other means of crossing the Channel". However, the governments may impose specific measures in conflict with this objective (section 5.6.2), in which case they must compensate the Authority for net loss of income.

Also, under section 5.1.7, if the Authority adopts prices which the companies consider to be in conflict with the commercial objective, the companies may seek revision of the pricing policy, with provision for arbitration if necessary. Implicit in this arrangement is the view that the companies will want to see the Authority maximising net receipts (or profits) i.e. that when it comes to pricing policy, there is no conflict between profit maximisation and maximisation of the remuneration due to the companies under the agreement. This view is now to be explored. With the tunnel built, the fixed-return component of the remuneration may be ignored. Accordingly pricing for profit maximisation may be compared with pricing intended to maximise a weighted combination of gross revenue and net revenue (the second and third elements in the remuneration package). In the next section, this comparison is made in the context of a greatly simplified static model, in which the enterprise sells only one commodity.

7 Remuneration maximisation: some general analysis

Consider a (monopolistic) enterprise with existing productive capacity; it makes q units of a single product; these units are to be sold at a uniform price p , where q and p are variables to be determined. The

variable costs of production are denoted $c(q)$. The demand function $q = f(p)$ has the usual inverse character, and we define the demand elasticity $e = -p dq/q dp$ so that it is positive.

The government has arranged that the enterprise's remuneration shall comprise a fraction $u > 0$ of gross revenue plus a fraction $v > 0$ of net revenue (which is gross revenue less variable costs). The aim now is to find the price and output policy for 'remuneration maximisation' i.e. the policy which will maximise the enterprise's remuneration

$$F = upq + v(pq - c) = (u+v)[pq - vc/(u+v)]$$

Suppose that the demand elasticity decreases continuously (becomes more inelastic) as the demand quantity increases, with the elasticity greater than unity at small demand quantities, and eventually becoming less than unity at large demands. (This is usually regarded as the normal case - cf R.G.D. Allen [6], pp.257-258 - and is the case employed in the sales (revenue) maximisation hypothesis, of which more below.) Then the gross revenue function (shown in Figure 1), has a single maximum at $q = q_s$ which is the optimal output level for sales (revenue) maximisation, provided that profit at this output satisfies any profit requirement there may be (i.e. the unconstrained case - cf Baumol [7]); at this output, $e = 1$.

For a preliminary special case (yielding a particularly simple exposition), suppose that the variable cost function is

$$c = k + gq$$

where k and g are constants, g being a strictly positive marginal cost. Then (in Figure 1), the profit-maximising output is q_m , the point at which the slope of the gross revenue function equals g , the slope of the total cost function. Thus $q_m < q_s$, and at the profit-maximising output, $e > 1$ (the usual result, since at any price at which $e < 1$, gross revenue and hence profit could be increased by raising price).

For remuneration maximisation with our special cost function, the maximand becomes

$$F = (u+v)[pq - v(k+gq)/(u+v)]$$

The second term in [] is linear in q , and has slope $vg/(u+v)$. The first-order condition which is necessary for maximisation leads to that output q for which this slope equals the slope of gross revenue pq . From Figure 1, we see that this remuneration-maximising output q_r lies between the sales-maximising and profit-maximising outputs, which is hardly surprising since the remuneration function is a weighted sum of profits and gross revenue. Furthermore, as may be seen from Figure 1, profits are traded for extra gross revenue as we move from q_m to q_s ; hence, as the weights u and v change, the remuneration-maximising output ranges between q_m and q_s ; profits in the remuneration function move the optimal point to the left, and gross revenue moves the optimum to the right.² At the remuneration-maximising output, demand is elastic.

A similar argument may be used to establish these results for a general cost function provided we assume non-decreasing marginal cost.³ As for the linear case, there is a unique point at which marginal revenue equals the slope of the weighted cost function, $vc/(u+v)$; at this point $e > 1$ and the optimal output lies between the profit- and sales-maximising outputs.

For the remuneration-maximising price, the first-order necessary condition $\partial F/\partial q = 0$ yields

$$p_r = \frac{v}{u+v} \frac{e}{e-1} \frac{dc}{dq}$$

Since $e > 1$ at this point, this expression is defined, and gives a positive price. In the case of profit maximisation, $u = 0$ and $v = 1$, and the expression reduces to

$$p_m = \frac{e}{e-1} \frac{dc}{dq}$$

the usual result, in which price exceeds marginal cost.

However the relation of the remuneration-maximising price to marginal cost is more complex, since in the expression for p_r , the first factor $v/(u+v)$ is less than one. Supposing that there is a (single) output level $q < q_s$ for which price equals marginal cost⁴, is it possible for the government to induce the company to select that output level? With a knowledge of the value of e at the desired point, it is clear that this can be done, by choice of appropriate values for u and v . Specifically, we require

$$\frac{u}{u+v} \frac{e}{e-1} = 1$$

which determines a unique ratio $v/u = e-1$ which is positive, since $e > 1$. Of course, the absolute values for u and v would have to be made large enough to persuade the enterprise to accept the remuneration contract and invest in productive capacity.

8 Some analysis of the operation of the tunnel

This static, single-product model is much simpler than the tunnel situation. Provided the tunnel is sufficiently successful to generate adequate funds for the remuneration of the companies, the large weight given to gross revenue in the remuneration function gives the companies an incentive to press the Channel Tunnel Authority a long way towards the sales-maximisation position. And this is in conflict with the profit-maximisation objective laid down for the Authority.

The remuneration-maximising price favoured by the companies will be below the profit-maximising price. However for the tunnel, operating costs are small relative to the capital cost, marginal cost is low, and even a pure sales-maximisation policy seems unlikely to push price below short-run marginal cost, even in off-peak periods.

Non-price policy measures (eg. advertising and other promotional expenditures) present a more severe conflict between the companies' interests and the commercial objective of the Authority. Profit maximisation would take advertising expenditures to a margin where the last £1 thus spent adds £1 to the 'semi-net' revenues of the tunnel (i.e. after netting out all incremental costs other than the advertising cost itself). In contrast, the companies have a considerable incentive to go further than that, since they receive 8.7% of the consequent increment to gross revenue at the expense of only 3% of the cost of advertising.

We may sum up by noting the irony of the situation: whereas a government often establishes a public enterprise in an attempt to avoid the output restriction of a private monopoly, in this case the governments instructed the public Authority to restrict output so as to maximise profits, while giving the associated private companies an incentive to expand output beyond that, in order to move towards a sales-maximising output level.

9 Some general conclusions on the design of incentive contracts

Given all the difficulties revealed by analysis of the Channel tunnel contract, we might wish to question whether it is ever wise to institute a sharing arrangement. Perhaps it would be better to have the financial responsibility carried wholly by the government or wholly by private enterprise.

But each of these two opposites has fundamental disadvantages. If the government accepts all the financial risk, it is difficult to restrain the public-sector empire-builder and the private entrepreneur, both of whom may be happy to promote their own interests by encouraging 'excessive' expenditure, financed by the taxpayers. Alternatively, if the project is proposed for private enterprise alone, it may be difficult to find an entrepreneur willing to undertake a project even when it is soundly judged to be in the public interest. For infrastructure projects, in particular, this problem may occur if the project is so large as to make it difficult to raise the necessary capital privately; even when the large capital sum can be raised, there may be very few companies competing for the privilege of doing so. The infrastructure project may also be unattractive to private companies if its financial success requires the creation of a favourable environment by other government actions, since the companies may doubt whether such support will be forthcoming if the government has no financial stake in the project. Even if one or more companies are willing to undertake the project as a purely private enterprise, the government may doubt whether it will be well placed to exercise appropriate public control over (for example) pricing policy.

On the other hand, if the financial responsibility is shared by government and private companies, then there will be two relatively independent appraisals of the financial prospects of the project, and this should reduce the chances of adopting an 'unwise' scheme. Our analysis illustrates the need in such cases for careful consideration of the incentive terms of the contract, to avoid conflict between the aims of private enterprise and government. Thus there is much to be said for having a symmetrical contract in which both parties have the same style of financial interest. In particular, if the government wishes to have the project operated in a commercial manner, then both parties should be rewarded with shares of the profits; the shares need not be equal, but should, of course, be proportional to the capital sums raised by the two parties.

Risk considerations also support the case for symmetry. In the Channel tunnel case, the governments were at risk on the guaranteed bonds; although the servicing of these bonds took first claim on the operating surplus, the governments' reward for taking this risk ranked after the remuneration of the private shareholders. Such asymmetry leads to the possibility of conflicting aims: it also illustrates the difficulty of determining arrangements which are equitable for the two parties.

To avoid both of these kinds of difficulty, a profit-maximising project might be shared by arranging for both parties to have shares in the one class of risk capital. Fixed-interest bonds might also be issued; but such bonds should be shared in the same proportions as the risk capital. As usual, interest on these bonds would have first claim on the profits. The private sector would float its bonds on the private capital market. For its share, the government could do likewise, on the same terms; or it could issue them as government-guaranteed bonds, presumably bearing a lower rate of interest. In the second case, the government would meet the interest out of its own funds in the first instance; but it would have a claim on the profits of the project; this claim would rank equally with that of the privately-issued bonds, and its size would be calculated by applying the same rate of interest as on the private bonds.

Projects not intended to pursue profit maximisation may be less amenable to such symmetrical contracting. The least that can be said, however, is that contractual details should not be adopted without very careful scrutiny of the consequences for incentives.

FOOTNOTES

- 1 This study does not consider the pros and cons of continuing with the project; on that issue, [3] may be consulted.
- 2 A different derivation of these results (based on slightly different assumptions) is given by Domar [5], who was led to consider this remuneration function by Kosygin's 1965 proposal that Soviet enterprises should replace output targets with sales targets and should give greater attention to profits.
- 3 Similarly (but not equivalently), Domar assumes (p.15) that price equals marginal cost at one and only one value of q in the region where $e > 1$.
- 4 We need the additional assumption; our earlier analysis ensures that there is a single output level (in the appropriate region) for which marginal cost equals marginal revenue; but this does not ensure a point at which marginal cost equals price.

Table 1: Basis for the remuneration⁺ of private risk capital

<u>Element</u>	<u>Provisional basis</u>	<u>If insufficient profits, liability</u>
Fixed return	11% (of capital)	Carried forward
Share of gross receipts	8.7%	Carried forward
Share of net receipts	3.0%*	Extinguished

Gross receipts : total receipts

Net receipts : gross receipts less operating costs and less debt service

*Share of net receipts is reduced once the guaranteed debt is amortised (i.e. after 25 years).

⁺All elements of remuneration are subject to the existence of sufficient profits (i.e. net receipts), and all cease after 50 years, when the companies' interests lapse.

Table 2: Financial results (in out-turn prices) for selected years

Year:-	Central Forecast			Low Forecast		
	1981	1990	2000	1981	1990	2000
	£ million			£ million		
Gross receipts	128	371	907	112	286	604
Operating costs	18	39	81	17	35	63
Operating surplus	111	332	827	95	251	541
Debt service	69	89	89	69	89	89
Net receipts	42	243	737	27	162	452
of which:						
payment to companies	23	50	110	22	40	75
residual (to government)	19	190	625	5	120	375
		(%)			(%)	
Companies' remuneration as % of operating surplus	21	15	13	23	16	14
Operating costs as % of gross receipts	14	11	9	15	12	10

Source: Based on the tables on pp.32 and 51 of [1]. There are some discrepancies between these tables, which result in some small inconsistencies above.

Table 3: Amounts of private remuneration for sample years

Year:-	Central Forecast			Low Forecast		
	1981	1990	2000	1981	1990	2000
	£ million			£ million		
Fixed return *	11.0	11.0	11.0	11.0	11.0	11.0
8.7% of gross	11.2	32.3	79.0	9.8	24.9	52.6
3% of net	1.3	7.3	22.1	0.8	2.7	13.6
Total remuneration	23.5	50.6	112.1	21.6	38.6	77.2

*Assumes private risk capital of £100 million.

Source: Calculation based on forecast financial results in estimated out-turn prices given on p.51 of [1] and reproduced here in Table 2.

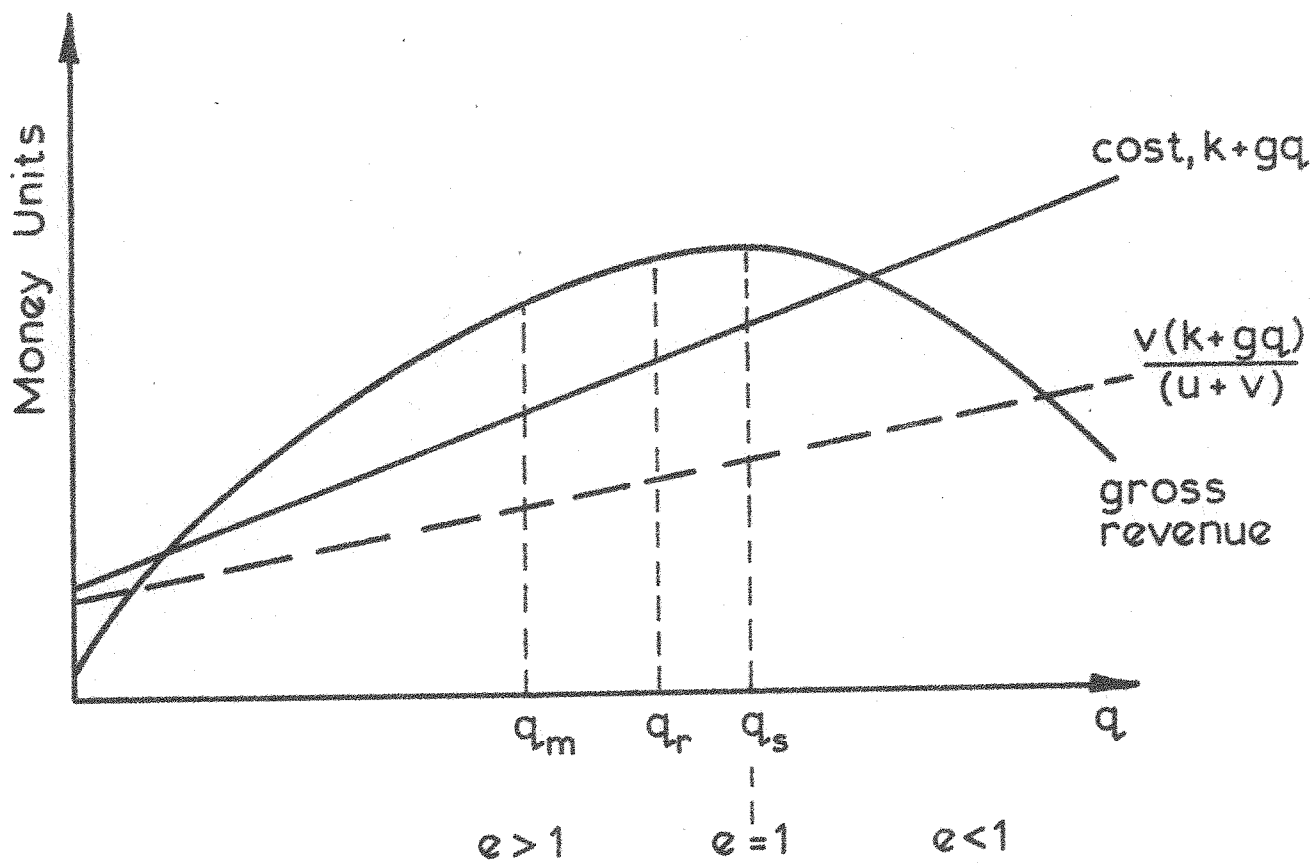


FIGURE 1

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