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Anticipated Profitability of Mergers : An Analysis of  
the Characteristics of Acquired and Acquiring Firms

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NUMBER 127

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This paper is circulated for discussion purposes only and its contents should be considered preliminary.

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### Abstract

Measurement of merger gains using post-merger data is difficult and highly conjectural. Thus, it is difficult to test merger theories and to estimate merger gains using such data. The approach in the current paper is to use pre-merger data in an econometric model, in order to test the managerial and neoclassical theories of merger, to estimate the size of anticipated merger gains, and to examine a variety of diversification measures, including the traditional approach, the OFT's approach, and others. The results support a managerial theory of merger, but questions the accuracy of the OFT's diversification classifications.

## I. Introduction

It is now widely accepted that the intense merger activity experienced by almost all developed countries in the post-war period, and in particular in the late 1960's, has had a major impact on the market structure in individual industries, and on overall concentration. In both spheres, merger activity has contributed to a major shift of economic power and influence in favour of a relatively few, large, corporate organisations.<sup>1/</sup> Concern at the apparent lack of accompanying efficiency or other welfare gains has now led to official reviews of public policy towards mergers in at least two major European countries, Britain and West Germany.<sup>2/</sup>

Previous studies of the effects and welfare gains, if any, from mergers in the economics literature have mainly tested for improved performance in the reported, post-merger results of merging firms. On the whole, results have been at best neutral, and mainly negative.<sup>3/</sup> Some insights into these matters may also be gained from the analysis of another type of evidence, potentially a rich source but at present comparatively little explored, namely the pre-merger characteristics of acquired and acquiring firms. This source is especially useful in an evaluation of the view that mergers are the outward sign of the workings of the market for corporate control (Dewey 1961, Manne 1965), or as a mechanism for economic natural selection (Singh, 1975). On this argument, there is at least a theoretical possibility that merger benefits exist which analysis of a post-merger performance may not pick up. Thus, if the economic role and rationale of mergers is indeed to transfer resources from inefficiently-run to more efficient companies, and especially if the acquired firms are relatively small, a systems benefit may occur via bringing up the level of efficiency of resource utilisation in acquired firms, but without there necessarily

being any dramatic - or even measurable - post-merger gain in performance of the acquiring company, or of the weighted average of the acquiring and acquired firms' pre-merger performance. Or at least, if such effects are present, they are more apt to be revealed by examination of the characteristics of acquired and acquiring firms prior to the merger than by anything that can be observed subsequently.<sup>4/</sup>

Of the variables likely to be available for analysis, the relative pre-merger profitability of the merging firms is of especial interest in this context, in that it more nearly than others may be expected to reflect efficiency differences. Existing findings in this area are mixed. Thus, depending on the sample chosen, time-period, and basis for comparison (which has variously been between acquired and acquiring firms; matched or non-matched surviving firms; and firms in general) the pre-merger profitability of acquired firms has been found significantly higher, lower and insignificantly different from that of the comparison group (c.f. Binder 1973, Boyle 1970, Mandelker 1974, Melicher and Rush 1974, Singh 1971, 1975, Smiley 1976, and Stevens 1973).

Such inconclusiveness is not, however, surprising since most previous studies have not attempted to make systematic allowance for other factors affecting the attractiveness of a merger between firms of given, relative profitability. Two such factors seem particularly important a priori: relative size and merger type - whether conglomerate, vertical or horizontal. Given the relative profitability of the acquired and acquiring firms before the merger (and assuming future profits expectations are based on extrapolations of current levels at recent trends), the attractiveness of a merger will obviously vary with the magnitude of expected merger gains i.e. of changes in the profitability of one or both

merging partners, due e.g. to the replacement of inefficient management, synergy, or increased market power. Hence even very unprofitable firms may be worth acquiring if expected merger gains are large, but not otherwise. And the size of potential merger gains may be expected to vary according to the type of merger concerned, as we argue in more detail in section II below. Relative size is important because, until merger gains as defined above are realised, the "impact effect" of the merger on profitability will be simply a (weighted) averaging of the firms' existing (and expected future) profitability. Other things being equal, the willingness and capacity of an acquiring firm to absorb an acquisition will therefore clearly depend on the proportion of the assets of the merged entity for which it accounts.

Thus when seeking a merger partner a potential acquiror will pursue a firm satisfying some desired combination of size, potential merger gain and existing profitability, and across a sample of actual mergers, differences in the relative profitability of acquired and acquiring firms should be explained by relative size and merger type. While existing empirical evidence indicates that in general acquired firms are significantly smaller than their acquirors,<sup>5/</sup> and that firms acquired in conglomerate mergers tend to be more profitable than those acquired in vertical and horizontal mergers,<sup>6/</sup> so far as the present authors are aware, there has been no previous study which attempts to link pre-merger profitability, size and merger type in the way demanded by our previous reasoning.

The first objective of the present paper is to carry out such an attempt, and we develop an appropriate econometric specification in the following section II. The model is then tested on a sample of 55 horizontal or conglomerate mergers undertaken in the UK in the late 1960's,

described in Section III, with significant results, as reported in Section IV. The analysis also yields some interesting by-products. Firstly, our model enables us to get some feel for the absolute magnitude of expected gains in profit due to merger. Such numbers are rarely quoted, and are thus of intrinsic interest. Moreover, as we show in Section V, the estimates we obtain may be deployed to draw inferences concerning merger motivation, and in fact we construe our results as further evidence suggesting the pursuit of managerial rather than neoclassical objectives by merging firms. Secondly, our analysis permits us in Section VI to evaluate a number of alternative methods of classifying mergers by type, and leads us to express reservations concerning both the official classification used in the application of UK competition policy, and also the classification most commonly employed by researchers in industrial organisation. Section VII briefly summarizes our main findings.

## II. Econometric Approach

In the absence of merger gains per se, the expected post-merger return of the combined firm  $r_c^*$  is simply the weighted average of what the merging firms would have earned independently:

$$r_c^* \equiv \frac{r_a^* K_a + r_o^* K_o}{K_a + K_o} \quad \dots \dots \dots (1)$$

The variables  $r_a^*$ ,  $r_o^*$  are the expected, no-merge rates of return on assets of the acquired and the original (acquiring) firm respectively, with  $K_a$ ,  $K_o$  denoting their total assets. Actual post-merger returns will also reflect merger gains. Three major sources of merger gain have been emphasised in the merger literature: increased monopoly rent; efficiency gains due to



scale economies or other synergistic effects; and the replacement of inefficient management. For analytical convenience we express each as a proportion of  $r_o^*$ , and denote the three types of gain  $M$ ,  $Z$  and  $I$  respectively. Relating merger gains to the combined, post merger asset base  $K_a + K_o$ , and taking merger gains into account,

$$r_c^* = \frac{r_a^* K_a + r_o^* K_o + (M + Z + I) r_o^* (K_a + K_o)}{K_a + K_o} \dots (2)$$

The total gain in profitability due to merger may be expressed as the increase in  $r_c^*$  over  $r_o^*$ , i.e.

$$\frac{r_c^*}{r_o^*} = \frac{K_a}{K_a + K_o} \cdot \frac{r_a^*}{r_o^*} + \frac{K_o}{K_a + K_o} + M + Z + I \dots (3)$$

Information on merger opportunities and the potential gains involved is not freely available to the potential acquiring firm. To acquire this knowledge the firm must incur non-trivial search costs. The nature of the search process, technology and costs have been examined elsewhere (Cable 1978). In the present analysis we assume that merger, and the search associated with it, is undertaken in an essentially sequential fashion. That is, the firm seeks the optimal merger opportunity in terms of its objective function, at a particular time, and implements this one merger, rather than seeking an array of merger opportunities all of which are undertaken subject to some minimum payoff criterion. We do not regard this assumption as unduly restrictive, but rather as a realistic description of the behaviour of all but a handful of merger-intensive firms.<sup>7/</sup> Search enlarges the known merger opportunity set, raising the maximum known merger payoff either via the discovery of additional potential acquisitions or via re-evaluation of already-known

opportunities in the light of additional knowledge. We assume that the known opportunity which maximises expected merger gain as defined in (3) is always chosen. Thus, differences in firms' objectives show up not in the form of different choices from a given choice set, but in differences in the order of the choice set itself, arising from differences in search intensity. Finally, we assume that over the period relevant for undertaking one merger, search is non-foreclosing; existing opportunities can be held until a choice is made.

On these assumptions we write a search production function

$$Q = \phi(\underline{X}) \quad \dots \quad (4)$$

where  $Q$  is search output (the increase in knowledge resulting from search) and  $\underline{X}$  is a vector of search inputs, defining the level of search undertaken. Since search is non-foreclosing, and as long as the marginal productivity of search remains positive, the maximum merger gain is a monotonically increasing function of search output. That is,

$$\frac{r_c^*}{r_o^*} = g(Q) \quad \dots \quad (5)$$

Hence the maximum known gain may also be expressed as a function of the level of search:

$$\frac{r_c^*}{r_o^*} = f(\underline{X}) \quad \dots \quad (6)$$

Combining (3) and (6) and solving for  $r_a^*/r_o^*$  yields

$$\begin{aligned}\frac{r_a^*}{r_o^*} &= f(\underline{X}) - M - Z - I + \frac{K_o}{K_a} [f(\underline{X}) - M - Z - I - 1] \\ &= \alpha + \beta \frac{K_o}{K_a}\end{aligned}$$

where  $\alpha = f(\underline{X}) - M - Z - I$   
 $\beta = f(\underline{X}) - M - Z - I - 1$

since  $\alpha = \beta + 1$

$$\frac{r_a^*}{r_o^*} = 1 + \beta \left(1 + \frac{K_o}{K_a}\right) \dots \quad (7)$$

Thus we obtain a relationship between the ratio of the expected future profitability of the acquired and acquiring firms, if no merger occurs, and their relative sizes. On the assumption that future no-merge profitability is a forward projection of current and recent past levels, denoted  $w(r_a)$ ,  $w(r_o)$ , and adding an error term, we obtain an estimating equation:

$$\frac{w(r_a)}{w(r_o)} = \alpha' + \beta \left(1 + \frac{K_o}{K_a}\right) + u \dots \quad (8)$$

As it stands (8) is uninformative since all forms of merger gain are captured by the single coefficient  $\beta$ , which also includes  $f(\underline{X})$ . To gain insight into the constituents of  $\beta$ , we dichotomize the sample according to a priori expectations as to whether a particular source of gain is high

or low/non-existent. The dichotomy most capable, in our view, of reflecting the magnitude of merger gains, at least when applied to UK data, is between horizontal vs conglomerate (diversifying) mergers. While it has been shown in the US literature that conglomerate mergers may have significant market power effects, in particular via effects on potential competition and reciprocity,<sup>8/</sup> these are comparatively subtle and indirect ways of securing increased monopoly rent. In the U.K., where competition policy imposes much less severe restrictions on firms' ability to undertake horizontal mergers, it is doubtful that firms would resort to such indirect methods, and the scope for increasing monopoly rent  $M$  is clearly more substantial in horizontal merger cases. Similar arguments apply to the case of scale economies and other synergistic efficiency gains ( $Z$ ). Again, some firm-level economies, e.g. in raising finance, may be available in conglomerate merger cases but, with the exception of gains from risk-pooling, these can also be exploited by horizontal mergers which may have the additional capacity to exploit synergies at plant level. And the evidence presently available shows very little indication of risk reduction via merger.<sup>9/</sup> Finally, since some managerial skills are industry specific, and since the ability of a potential acquiring firm to assess the extent and causes of managerial efficiency in a potential takeover victim is highest within its existing industrial boundaries, the most logical acquirer of a firm on grounds of replacing inefficient management is another firm from the same industry, so far as competition policy allows. Hence this form of potential merger gain  $I$  is also likely to be higher in horizontal than in diversifying mergers.

We therefore extend (8) to include a dummy variable  $D(H)$  with value 1 for horizontal mergers and zero otherwise. Since  $M$ ,  $Z$  and  $I$  are constituents of  $\beta$ ,  $D(H)$  is a slope dummy:

$$\frac{w(r_a)}{w(r_o)} = \alpha'' + \beta' \left(1 + \frac{K_o}{K_a}\right) + \gamma D(H) \left(1 + \frac{K_o}{K_a}\right) + u \dots (9)$$

From (7) and (8) we expect  $\hat{\alpha}'' = 1$ .  $\beta'$  captures the benefit to the firm of undertaking search to discover more profitable takeover candidates offering a given level of merger gain, and so we expect  $\hat{\beta}' > 0$ . With  $D(H) = 1$  for horizontal mergers and since  $M$ ,  $Z$  and  $I$  have negative signs in  $\beta$ , we expect  $\hat{\gamma} < 0$ . Moreover, the coefficient  $\hat{\gamma}$  may be interpreted as an estimate of the average gain due to merger in horizontal mergers or, more strictly, the net difference in horizontal as opposed to diversifying mergers, if such gains in the latter group are non-zero.

Our model is ex ante in that it relies exclusively upon pre-merger data to explain merger patterns. Thus it attempts to estimate anticipated gains from mergers, i.e. the gains expected to accrue, before consummation of the merger, by the managements initiating them.

### III. Sample, Data Sources and Specification of Variables

Our sample contained 57 UK mergers that took place between 1965 and 1970. Over this period some 449 horizontal 25 vertical and 72 diversifying merger proposals were listed by the (now) Office of Fair Trading, in the screening process to determine references to the Monopolies Commission. The 37 diversifying mergers in our sample took in all those for which full data was available out of 50 cases of consummated, diversifying merger. Similarly, the 20 horizontal mergers included represented those with full data availability out of 35 selected randomly from the OFT list. Two cases causing outlier problems with extreme values of  $K_o/K_a$  were later dropped from the sample. Our final sample thus contained 55 cases. The proximate data source

was a computer tape compiled by D. A. Kuehn. The principal ultimate sources were Extel and the Stock Exchange Yearbook.

The variables  $w(r_a)$  and  $w(r_o)$  were defined as the average pre-tax rate of return on assets of the acquired and acquiring firms in the five years prior to the merger. We thus assumed that firms' future profit expectations are extrapolations of historical data over a five year period. The use of unweighted averages implies not necessarily that more recent performance counts for no more than earlier results but, since we are dealing with ratios, that any discounting of less recent performance is symmetric for the two parties to the merger.  $K_o$ ,  $K_a$  were simply the respective total assets of the acquired and acquiring firm in the year prior to the merger.

Alternative D(H) dummy variables were defined as follows. HO was the official O.F.T. classification into the horizontal and diversifying categories. This classification is made according to the details of each case, and apparently uses rather narrowly defined markets in order to determine whether market structural effects are present. Thus the definition of diversifying merger is broad. When the (roughly three digit) activities of the firms, listed on the Kuehn tape, were compared, substantial overlap of (3-digit) industry level activities was apparent in many of the mergers officially classed as diversifying.<sup>10/</sup> We therefore constructed alternative horizontal/diversifying classifications utilising the only information available to us, namely, whether or not the firm was active in a given industry: no breakdown of the firm's sales, assets or employment by industry group was available. The dummy HM classes mergers as horizontal (HM = 1) where the main industry activity (determined from the Stock Exchange Yearbook) is common to both merging firms, and diversifying otherwise (HM = 0). HM thus corresponds most closely to usual practice in the literature, where firms

are first classified by industry group according to principal product, and 'conglomerate' mergers are those between firms classified in different industries (e.g. Kumps 1975). HP classifies a horizontal merger ( $HP = 1$ ) as where the acquiring firm enters no new industries: the firm acquired operates only in some or all of the acquiring firm's activity set. PC defines a horizontal merger as where the merging firms have any industry in common. Thus the only diversifying mergers ( $PC = 1$ ) are where there are no shared industries. Finally, we devised two semi-continuous 'overlap' variables. The variable  $O1$  was simply the ratio of the number of industries common to both parties to the number of industries of the acquiring firm. It is only semi-continuous in that considerable bunching occurs at  $O1 = 0$  and  $O1 = 1$ , but with some intermediate values. Note that under this measure, since the weight for all industries is equal, the weight attaching to the main industry of the acquiring firm varies inversely with the number of industries which it is in.  $O2$  is a variant of  $O1$  in which the acquiring firm's main industry is allocated a weight of 0.5, and its  $n-1$  industries a weight of  $0.5/(n-1)$ .

#### IV. Empirical Results

OLS estimates of equation (9) with all six variants of the horizontal/diversifying dummy are reported in table 1. While overall explanatory power is not high, as in most cross-sectional merger studies, the F-scores indicate a significant overall relationship at 5% or better. The intercept estimates are very close to the theoretical value, especially in equations 4-6, and in no case significantly different from unity. The  $\beta'$  coefficients are of expected sign and highly significant, except in equation 4. This deviation from the general pattern of results is apparently due to multicollinearity. The zero-order correlation coefficient between the explanatory variables included in this equation is 0.72, whereas it is less than 0.5 in all other cases.





Both the  $\beta'$  and  $\gamma$  estimates in equation 4 are therefore to be regarded as unreliable. The horizontal/diversifying slope dummy coefficients attract the expected signs in all cases except equation 2 (recall that the dummies assume a value of 1 for horizontal mergers in all cases except PC, and our specification requires a negative shift for horizontal mergers). However, disregarding equation 4 for reasons already advanced, only the 01 and 02 dummies yield significant results at the normal acceptance level. We comment further on the relative performance of the alternative dummy classifications in section VI below. In general, equations (5) and (6) clearly yield the most satisfactory results, in terms of both overall statistical fit and the performance of individual variables.

#### V. The Magnitude of Merger Gains and Merger Motives

The values of  $\hat{\gamma}$  reported in table 1 are direct estimates of the difference in expected merger gains, from all sources, on average, in horizontal as opposed to diversifying mergers. Recalling that M, Z and I were defined as propositions of  $r_0$ , and taking average values of  $r_0$  and  $(K_0 + K_a)$  of 0.175 and £77m respectively,<sup>11/</sup> the estimated absolute value of the merger gain difference, on average, amounts to £417,000 on the basis of equation (5) and £337,000 from equation (6).<sup>12/</sup> Obviously, the values must be regarded as approximate only.

If merger gains, as defined in this paper were negligibly small in diversifying merger cases, these estimates measure not only the merger-gain difference between merger types, but also the absolute level of (horizontal) merger gains themselves. Clearly, this need not be so. On previous arguments, however, diversifying merger gains, at least in the UK context, should be small. Suppose, in order to gain some feel for the relevant magnitudes, the level of

diversifying merger gains were equal to the average difference between horizontal and diversifying mergers. The estimated, expected gain in horizontal mergers doubles to £674,000-£834,000, which is around one per cent of the combined capital stock of the merging firms. Thus, although our results indicate the existence of statistically significant anticipated gains from mergers, in economic terms these are quite small. Suppose, for example we make the extreme assumption, most favourable to mergers, that the gains arise wholly from cost-savings. Since total costs will be typically of the order of twice as large as capital stock, or more,<sup>13/</sup> we are talking about a cost saving of at most one-half of one per cent in horizontal merger cases, and half this in diversifying mergers. Seen in this perspective of average annual productivity gains of around three per cent, it seems unlikely that merger activity can be plausibly regarded as a cost-effective method of securing efficiency gains.

The question which immediately arises is why mergers should occur at all if even the expected gains are so small. As is now widely accepted (e.g. Arrow 1975, Steiner, 1975) the possible motives for merger are manifold. Mueller (1978) distinguishes two broad groups of merger theory: neoclassical and managerial. Essentially, the former group assumes profit maximisation and merger gains accrue to stockholders. Under the managerial theories, non-profit maximising objectives are pursued, and it is the managers who initiate the mergers who are also the principal beneficiaries. In both cases, however, the merger process can be seen as raising potential profits, or the underlying rate of profit, in some sense, and the sources exploited to create the extra flow - synergy, market power, and so on - need not differ. The crucial difference is in the size of the profit gain, and in its distribution. Under stockholder welfare maximising assumptions, mergers will occur only if they generate gains which are large relative to the value of equity, since this is

necessary to provide significant benefits to individual shareholders. Moreover, the gain must be reported in post-merger profits, in which shareholders participate. Under managerial theories recorded profits need not rise, if the gains are disbursed or absorbed as costs in ways yielding utility to management. Also, mergers may be undertaken to secure gains which are significant relative only to the income of the controlling management group, who are comparatively few in number. Hence many merger opportunities may exist which generate a significant managerial, but not stockholder-welfare payoff.

The lack of previous evidence of improved post-merger performance in terms of recorded profits has already been noted. Although some studies have claimed to detect improvement (e.g. Weston 1971, 1972, Halpern 1973, Lev and Mandelber 1972, Mandelber, 1974) their conclusions are not immune to reinterpretation (Mueller, 1978). Moreover they are heavily outnumbered by other studies, and the general tendency both of the earlier literature, surveyed by Hogarty (1970) and of more recent studies reviewed by Mueller (1978) is towards the view that mergers have at best a zero effect on post-merger results. Clearly this evidence leans towards the managerial theories of merger rather than the neoclassical, but it is not conclusive, on account of some well-known problems of interpretation encountered with ex-post studies. In particular, the absence of positive results could arise because a significant proportion of (neoclassically motivated) mergers fail to secure their expected results; or because transactions costs or other extraneous post-merger events (including subsequent mergers) intrude on measured post-merger performance; or because an insufficiently long post-merger period is considered for merger gains to materialize.

Derived exclusively from ex ante data, our estimates of anticipated merger gains avoid these problems. Moreover, taken with the evidence on post-

merger results, they add significantly to the weight of evidence in favour of the managerial theories. Not only are post-merger gains in reported profits, shared by stockholders, not observed, but also the magnitude of anticipated merger gains, which presumably enter the calculations in merger decisions, is too small to warrant a neoclassical interpretation of merger motives. Thus the estimated merger gain of £674,000 - £834,000 is tiny in relation to the combined capital stock (and hence also total equity) in our sample, of £77m : it represents no more than one per cent. But in relation to the total income of the controlling management group, it is a very large sum.

Looked at in this light, the economic significance of the anticipated merger gains we detect may have less to do with either efficiency gains or market power than with income distribution. Over the period 1965-75, there were a total of 910 horizontal and 235 diversifying mergers, involving total combined assets of £32,718m and £8,775m respectively.<sup>14/</sup> Using our earlier estimates of  $\hat{\gamma}$  from equations (5) and (6) of table 1, and again assuming  $r_0 = 0.175$ , the annual, expected gains from the merger process as a whole amount to £286 - 354m and £38 - 48m for horizontal and diversifying mergers respectively. Thus, over the period as a whole, there may have been a diversion of real resources towards the managerial class of as much as £324 - 402m. Moreover, it should be noted that this is not simply a once-for-all transfer of wealth, but a continuing redirection of annual income streams that has come about as a result of mergers.

## VI The Classification of Mergers as Horizontal and Diversifying

Our results show very clearly the importance of taking into account all the activities of the acquiring and acquired firms, when classifying mergers

into horizontal or diversifying categories. Of the six variables we employed five (H0, HP, PC, O1 and O2) satisfy this requirement in one way or another (see above, section III). All attracted coefficients of expected sign, although the significance levels varied, indicating that the way activities are captured in the measure also matters. The one exception HM was insignificant and of wrong sign. The importance of this conclusion is that the classification procedure involved in this case, whereby firms are allocated to industries according to their principal products, and mergers between firms allocated to different industry groups are then classified as diversifying without regard to secondary activities, has been widely used. Such a procedure can clearly obscure important horizontal aspects of mergers involving the secondary activities of one or both parties. Although problems of data availability may leave open no alternative to this approach in some situations, our results suggest that little, if any, firm conclusions can be drawn from its use.

Also noteworthy is that the official classification H0 generates estimates of expected merger gains equal to only 50-60% of those indicated by our most successful variables O1 and O2. Underestimation of the gains will occur if there is any systematic tendency for mergers with horizontal significance to enter the diversified category. As we have remarked in section III above, examination of individual cases in our sample shows that the official classification employs rather narrow industry definitions, e.g. gas versus electrical, and traditional versus newer domestic appliances; diamond abrasive wheels versus cutting tools; animal feeds versus other agricultural products; different types of goods supplied to builders merchants, subsectors of the ethical pharmaceutical industry, and so on. While there is bound to be some arbitrariness in decisions over what constitutes diversification in practice, it is open to argument that the merger of firms engaged in narrowly

defined industries such as the above could lead to market power effects of a horizontal nature. Certainly, comparison of the (roughly 3-digit level) industrial activities of the partners among the 37 mergers officially designated as diversifying, using Kaehn's data, revealed only 15 instances where the acquiring and acquired firms had no industry in common. In the majority of the remaining 22 cases only one or two industries of several were common to both firms. But the exceptional cases included one in which there were two firms each with five industries of which four were common to both; three cases in which the acquiring firm operated in a single industry and the acquired in that industry and one other; one in which the acquiring firm operated in two industries and the acquired only in one of these; and one case in which both firms were listed as active in only one industry.

In view of this, and of the results we obtained with the HO variable, we are inclined to think that the official classification procedure may seriously understate the horizontal significance of certain mergers, which are then classified as diversifying. The significance for policy purposes is that the probability of a merger being referred to the Monopolies Commission for investigation seems to be much less one it has been classified as diversifying. Since 1965 only two diversifying mergers have been so referred, the Unilever/Allied Breweries and Rank/De La Rue cases.<sup>15/</sup> Both involved very large companies and there are grounds for suspecting that, on current policies, no further diversifying merger reference is likely unless it also involves firms of very large absolute size.

## VII Conclusions

Our model and empirical results go some way towards explaining the pattern of merger activity in our sample, taking into account the relative

profitability and size of the acquired and acquiring firms and the expected gains due to merger. Our results confirm that the magnitude of expected gains is a significant factor determining the choice of merger partner. They do not enable us to distinguish between gains arising from the replacement of inefficient management, from synergy and from market power effects, and so we are unable to pass judgement on alternative interpretations of the merger process as a mechanism for economic natural selection, or as the pursuit of monopolistic advantage. However, our estimates suggest that the absolute magnitude of anticipated gains, from whatever source, is small relative to the value of equity and total cost, but large relative to managerial income. This, taken with the general lack of evidence from other studies of post-merger gains in reported profits, in our view strongly supports managerial rather than neoclassical theories of merger motivation. While both the real efficiency gains and market power effects of the merger process in the U.K. may have been minimal, our calculations indicate a substantial, cumulative transfer of income to management over a ten-year period. Incidentally, our results lead us to be sceptical of the classification of mergers as diversifying or horizontal most widely used in the industrial organisation literature. We also find reason to suspect that the official UK classification may understate the horizontal significance of individual mergers with possibly adverse consequences for the procedure for referring cases for investigation to the Monopolies Commission.

### Footnotes

- 1/ For an assessment of the evidence relating to the UK see Cowling et al (1978) ch. 1. At least 50% or more of the increase in seller concentration at both levels may be attributed to mergers.
- 2/ The UK review was announced to Parliament by the Secretary of State for Prices and Consumer Protection on 28th November 1977.
- 3/ See below section V, and for a recent survey, Mueller (1978).
- 4/ In particular, use of only pre-merger data avoids the well-known difficulties arising from the intrusion of transactions costs and other extraneous influences (including the impact of further mergers) on recorded post-merger results.
- 5/ See, for example Singh (1971, 1975). This is also confirmed by results of parallel studies of the causes and effects of mergers in seven countries, still in progress. For details see Research Directory of the IIM Berlin, 1977.
- 6/ Boyle (1970).
- 7/ The comparative fewness of "conglomerates" in the popular sense is noted by Steiner (1975).
- 8/ See Steiner (1975) pp.
- 9/ See Mueller (1977) section D.
- 10/ See also section IV below.
- 11/ The average pre-tax return on assets for all quoted UK companies 1954-68, obtained from Kuehn's data, was 0.186. The average for a sample of 82 among the top 300 UK companies 1967-71 was 0.169 (see Steer and Cable (1978)).
- 12/ The absolute value is found as  $(M + Z + I) r_0 (K_0 + K_a)$ , using  $\hat{\gamma}$  from equations (5) and (6).
- 13/ Across the 82 firm sample (Steer and Cable 1978), total revenue was 2.82 times as large as capital stock. Economic profit may be assumed less than 30% of total revenue.
- 14/ Source: statistics supplied by the Office of Fair Trading.
- 15/ See  
and The Rank Organisation Ltd and De La Rue Co, Ltd., 298 H. of C. 1968/9.



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