

SIZE STRUCTURE, STABILITY AND
PERFORMANCE OF THE LARGEST BRITISH
AND EEC FIRMS

Alex P. JACQUEMIN and
Michel CARDON de LICHTBUER

Working paper n° 7219

SIZE STRUCTURE, STABILITY AND PERFORMANCE
OF THE LARGEST BRITISH AND EEC FIRMS

by Alex P. Jacquemin and
Michel Cardon de Lichtbuer*

Introduction

The entry of Britain in the European Economic Community (E.E.C.) raises many important questions for the economist. One of these concerns the consequences of entry for competition: what is the European trend of concentration, what is the relative performance of Continental and British firms, who is challenging whom?

The present paper is addressed to one specific aspect of these broad problems, that is a comparison of the top 100 British and EEC industrial corporations.

The first part compares the aggregate concentration, size and stability of these firms, while the regression analysis in the second part ascribes the observed differences in the profit and growth rates to differences in nationality, size or industry.

* The authors are respectively Professor of Economics and Research Assistant at the University of Louvain. They wish to express their thanks to E.T. Penrose, A. Babeau, J.P. Binamé and D. Weiserbs for their helpful comments and criticisms .
This paper gives some specific results of a general study presented at the International Symposium on The growth of the large multinational Firm, organized by the Centre National de la Recherche Scientifique (C.N.R.S.), Rennes, septembre 1972.

PART I. - SIZE AND STABILITY

Our sample has been selected from Fortune annual directories of the 200 largest industrials outside the U.S., ranked by sales (1). A few adjustments have been made (2).

a. Size

We first noticed that the share of the largest EEC and British industrials in their economies seriously increased during the last years. Concerning the EEC the following table shows, for each size class, a remarkable increase of concentration .

TABLE I

Shares of the largest EEC firms in the gross domestic product of extractive and manufacturing industries (3).

Size class	1960	1965	1970
1 - 4	5,8 %	6,8 %	8,1 %
1 - 8	10,4 %	11,8 %	14,6 %
1 - 20	20,9 %	22,5 %	29 %
1 - 50	35,1 %	35,1 %	45,7 %

- (1) It is well-known that each measure of size has its own advantages and disadvantages. Using sales, we have computed the rank correlation coefficients between this criterion and assets and employees : they show a statistically sufficient convergence between them. The Spearman's rank correlation coefficients are indeed, for 1971: $R_{\text{sales-assets}} = .77$ ($t=12$); $R_{\text{sales-employees}} = .75$ ($t=11$).
- (2) All companies on the list must have derived more than 50 per cent of their sales from manufacturing and/or mining. Except a few cases, sales do not include taxes. Some problems rise concerning consolidation. As a general principle, figures of only those subsidiaries more than 50 % owned are consolidated. In a lot of cases however, figures of less controlled subsidiaries are fully consolidated or prorated. Figures not always cover the year ending December 31.
- (3) Let us notice that gross domestic product equals added value, while sales are the numerator : this biases upwards the obtained results.

As is shown by table II, the British situation is similar.

TABLE II

Share of the 100 largest quoted firms in the total
net manufacturing assets (4)

Size class	1948	1957	1968
1 - 4	10,2 %	11,4 %	14,7 %
1 - 12	17,8 %	20,6 %	26,2 %
1 - 50	35 %	39,9 %	50,8 %
1 - 100	46,5 %	50,7 %	63,7 %

Concentration increased from 1957 to 1968, and mergers as well as take-overs made an important contribution to this process (5).

In the outlook of the enlarged Common Market, one may then ask if this evolution has modified the relative size of British and Continental firms.

We first notice that, despite some preconceived ideas, size supremacy of British firms is limited to a tiny leading group, while we have an inverse situation for the following classes. Furthermore, Continental firms' size increased relatively between 1962 and 1971 (table III).

(4) G. Whittington [15] p.16.

(5) On mergers' role, see M.A. Utton [13] and Department of Trade and Industry [5].

TABLE III

Size ratio of the largest British and EEC firms

Size class	$\frac{\text{G.B.}}{\text{E.E.C.}}$ 1962	$\frac{\text{G.B.}}{\text{E.E.C.}}$ 1971
1 - 5	2,35	1,55
6 - 10	0,84	0,78
11 - 20	0,64	0,54
21 - 30	0,68	0,46
31 - 40	0,65	0,50
41 - 50	0,75	0,57

A comparison on a country by country and firm by firm basis gives the following table : (Table IV - p.5.)

Table IV shows the size supremacy of British firms in 1962, as compared with each EEC country, except for Germany : in this case superiority is restricted to the top five class.

But once again, the evolution until 1971 shows an important recovering for all EEC countries.

This global approach may be disaggregated at industry level. A comparison, on the basis of a two-digit industrial classification (6) shows for 1962 and 1971 that 80 of the top firms belong to the same six important industries : iron and steel (27 in 1962, 24 in 1971), chemicals (12 in 1962, 16 in 1971), food (8 in 1962, 11 in 1971) electrical engineering (10 in 1962, 11 in 1971), vehicles (17 in 1962, 11 in 1971) and oil (6 in 1962, 8 in 1971) (7).

(6) The industrial classification used is very broad. Still, many firms fall into several groups.

(7) The other industries are coal (4-4), tobacco (2-2), textile (3-1), paper (2-3), editing and printing (2-1), rubber (3-2), glass (1-2), mechanical engineering (3-4).

TABLE IV

Relative size ratio by country

Firm's rank	GB/Deutschland		GB/France		GB/Italia		GB/Benelux	
	1962	1971	1962	1971	1962	1971	1962	1971
1	3.77	2.56	6.06	4.64	4,77	3,89	3,90	2,45
2	3,06	1,96	4,99	3,04	4,90	2,54	5,90	3,24
3	2,11	1,49	3,31	2,17	4,20	2,39	4,50	3,24
4	1,93	1,07	3,05	1,70	3,51	3,44	3,76	2,75
5	1,57	1,002	2,90	1,68	2,90	4,02		
6	0,90	0,98	1,79	1,55				
7	0,96	0,88	1,74	1,32				
8	1	0,85						
9	0,92	1,08						
10	0,91	1,10						
11	0,84	0,92						
12	0,75	0,84						
13	0,78	0,86						
14	0,88	0,89						
15	0,90	0,82						

Between 1962 and 1971, there is a stable distribution among these broad groupings. The constant presence of the largest firms in a few sectors seems to be a characteristic phenomenon of the industrialized countries (8).

Furthermore, these industrial groups show a high level and a persistent increase of concentration : the figures concerning Great-Britain in table V are particularly impressive.

TABLE V
Evolution of concentration by industry in Britain (9)

Industry	% of industry net assets held by the 10 largest firms		number of firms holding 50 % and more of the industrial assets	
	1954	1965	1957	1967
Food	65,7	72,1	7	4
Drinks	41,6	74,9	12	4
Chemicals	81,6	87,7	2	2
Iron & Steel	62,8	73,0	6	4
Mechanical engineering	33,8	29,0	-	-
Electrical engineering	61,4	64,6	5	3
Automobiles	50,1	76,4	5	2

There is a lack of comparable data for the EEC; nevertheless existing informations confirm the situation observed in Britain. At a general level, the EEC Commission First Report on Competition Policy, April 1972, states that during the 1966-1970 period, one

- (8) Comparing the 50 largest American and British firms, P.S. Florence notes their concentration in 5 industries: food, chemicals, iron & steel, electrical engineering and transportation equipment. P.S. Florence, Hearings [7], p.3573.
- (9) M.A. Utton [14] p.195 and Department of Trade [5] p.38.

observes an obvious increase of the international interpenetrations and of the industrial concentration tendencies within the EEC [3]. In Germany, it is obvious that in Oil, Chemicals, Iron and Steel, Electrical Engineering and Automobiles, the share in the industry total held by the largest firms greatly increased over the period 1960-1969 (10).

In France, a recent study confirms that the increases were particularly large in Oil, Electrical Engineering, Automobiles and Chemicals (11).

To summarize, there is a clear convergence between the European evolution of overall concentration and industrial concentration. The growing weight of the giant firms in the manufacturing sector as a whole is confirmed by their growing importance in each particular industry.

At industry level, one may again compare the relative size of British and EEC firms. (table VI, p.8)

It appears that there is no systematic dominant position. In 1962, the leading British firm is larger than the Continental one in Chemicals, Oil, Food (which is exclusively in British hands) and non-ferrous. But over the period, the Continental firms reduce the gap in Chemicals and Oil, while they become larger in non-ferrous. On the other hand, due to nationalisation of the British steel industry and mergers in the British electrical engineering and automobile industries, the giant British firms have maintained or improved their relative positions in these sectors dominated by the EEC firms.

(10) See H.W. de Jongh [4] p.81 and H.Arndt [1], p.420.

(11) Bulletin d'Information Economique de la Caisse des Marchés de l'Etat [2].

TABLE VI

Size ratio of the largest British and EEC firms by industry

Firm's rank	Chemicals		Oil		Iron & Steel		non-ferrous		mechanical engineering		electrical engineering		automobiles	
	1962	1971	1962	1971	1962	1971	1962	1971	1962	1971	1962	1971	1962	1971
1	4,12	2,15	7,25	5,31	0,74	1,11	3	0,88	1	0,70	0,39	0,43	0,55	0,57
2	1,63	1,14	3,51	2,39	0,66	0,48	0,37	0,53	0,52	1,08	0,41	0,28	0,33	0,22
3	0,6	0,53	-	0,35	0,49	0,34	0,3	0,65	0,89	-	0,55	0,31	0,29	-
4	0,6	0,28	-	-	0,54	-	-	-	-	-	0,74	0,36	0,41	-
5	0,34	0,55	-	-	0,60	-	-	-	-	-	0,63	0,34	0,55	-
6	-	0,59	-	-	0,49	-	-	-	-	-	0,96	-	0,60	-

b. Stability

The compared stability of the largest European firms through time provides us supplementary information concerning their dynamism.

A first table (Table VII) shows how the 100 largest British and EEC firms maintain their position in the same size class, from 1962 to 1971.

Two conclusions can be drawn from table VII. First, life is very secure for the top 50 while, at the level of the 100 largest firms stability is less obvious.

Let us recall that Kaplan's result for the U.S.A. (12), concerning the 100 largest firms over a 12 year period (1948-1960), is a "death rate" of 2 companies per annum, where the European annual death rate would be about 2.8.

Secondly, a comparison between British and Continental giants suggests that, while the positions in the top 50 class are very similar, things are different in the top 100 class where EEC firms survive much better in their class than the British ones.

This is confirmed by tables VIII and IX (13) .

(12) A. Kaplan [10] table 7.1.

(13) Comparing homogeneous classes of the 40 largest British and the 40 largest EEC, we obtain a survival rate of .67 for G.B. and .82 for the EEC.

TABLE VII

Survival of the largest firms in similar rankings

Rank in 1962	Number of firms in 1962		Total surviving in similar rankings in 1971	Number of firms in 1971		Proportion surviving in 1971	compared surviving proportion in 1971	
	G.B.	E.E.C.		G.B.	E.E.C.		G.B.	E.E.C.
1-12	5	7	8	4	4	.66	.80	.57
1-25	8	17	17	6	11	.68	.75	.65
1-50	16	34	40	13	27	.80	.81	.79
1-75	31	44	62	24	38	.83	.77	.86
1-100	43	57	74	29	45	.74	.67	.79

TABLE VIII

Survival of the largest firms in the top 100 class

Rank in 1962	Total surviving in the top 100 in 1971		Proportion surviving in the top 100 in 1971 (14)	
	G.B.	E.E.C.	G.B.	E.E.C.
1 - 12	5	7	1	1
1 - 25	8	17	1	1
1 - 50	15	32	.94	.94
1 - 100	29	45	.67	.79

TABLE IX

Compared number of British and EEC firms in the largest firms' class

Rank	Total in 1962		Total in 1971	
	G.B.	E.E.C.	G.B.	E.E.C.
1 - 5	5	0	3	2
1 - 10	5	5	4	6
1 - 50	16	34	16	34
1 - 70	28	42	24	46
1 - 100	43	57	39	61

(14) Proportion is obtained by comparison with Table VII, 2^d column.

Further information can be derived from a comparison between tables VII - VIII and IX.

Tables VII and VIII show that 4 firms of the 1-12 class, 8 from the 1-25, and 9 from the 1-50 class in 1962 did not maintain their rankings in 1971, but nevertheless remained in the top 100 class.

It is also confirmed that the stability of the largest British and Continental firms is almost perfect: 94 % of the 1962 top 50 remain in the 1971 top 100 class. The relative position of the British and EEC groups is also very stable at the top 50 level : we find an identical survival ratio (table VIII) and the same proportion of firms in 1962 and 1971 : 16 and 34 (table IX). But the top 100 class situation is quite different. According to table VII, 14 GB firms fell out of the top 100 between 1962 and 1971, while this happened only for 12 EEC firms. Comparing tables VIII and IX , it appears that 29 GB firms survive in the top 100 until 1971, and that we have, for this year, a total of 39 GB firms in our sample : thus, 10 new entries have occurred during the period. A similar computation indicates 16 entries for the EEC group. Final results, appearing in table IX give us a net increase of 4 EEC firms (12 out, 16 in) and a net decrease of 4 GB firms (14 out, 10 in): the relative number ratio of British and EEC firms drops from .75 in 1962 to .64 in 1971 (15).

These results are confirmed by a previous study on the relative concentration among the 100 largest EEC and British firms.

Using the entropy coefficient (16) as relative concentration measure, A. Jacquemin and A.M. Kumps establish that

(15) A closer look at the firms promoted to the top 100 class reinforces the image of the stability among the largest firms : 26 % of these "new" firms were located between the 101 and 133 ranks in the 1962 list. The other promotions are essentially due to mergers between firms not listed on the 1962 top 100.

(16) Entropy coefficient, written $E = \sum_{i=1}^n P_i \log \frac{1}{P_i}$, where P_i is the share of the i th firm in the total amount accounted for by the n firms of the group, has a minimal value ($E=0$) where concentration is maximal, as in the case of monopoly where $P_i = 1$. See H. Theil [12] chapter 8.

- the set of EEC firms is characterized by a marked decline in relative concentration,

- on the contrary, the set of British firms shows a stable degree of relative concentration,

- finally, there has been an increasing size disparity between the EEC group and the British group (17).

As it appears from table X, this trend is confirmed for the more recent years.

TABLE X

Relative entropy of the largest EEC-GB firms (*)

Year	Total Entropy	Entropy between two sets	Entropy within separate sets	
			E.E.C.	G.B.
1962	89.16	96.58	85.41	90.83
1963	89.35	94.95	86.31	90.70
1964	89.64	93.63	86.93	90.97
1965	89.78	94.20	86.95	91.32
1966	89.91	91.32	87.67	90.97
1967	90.37	92.83	88.26	91.19
1968	90.25	93.78	88.29	90.15
1969	90.77	92.75	89.36	90.42
1970	90.91	91.90	89.27	90.97
1971	91.17	87.65	90.44	90.13

(*) Relative entropy is actual entropy as a per cent of maximum entropy (equals to the logarithm of the number of firms).

(17) See A. Jacquemin and A.M. Kumps [8] and for a previous period A. Jacquemin [9].

PART II. - COMPARATIVE GROWTH AND PROFIT

The evolution of the size structure noticed in the first part of the paper requires an analysis of the growth process of the largest European firms. Besides, the growth aspect must be confronted with the profitability of these firms in order to determine whether the two types of performance are convergent.

a. Growth

First, let us compare the annual average growth rates, in terms of sales, for the whole British group and the whole EEC group of firms.

Between 1962 and 1971, this rate is 11.3 per cent for the British and 21.5 per cent for the EEC group, that is almost the double. This implies that with a similar level of sales in 1962, i.e. \$ 33 billions for the British firms and \$ 34.5 billions for the EEC firms, we have in 1971 \$ 66.6 billions for the British firms and \$ 101.5 billions for the EEC firms.

This impressive difference may arise directly from a slower growth of the British firms which have survived in the top 100 during the period under consideration, as well as from the entry and exit movement previously examined.

Using multiple regression analysis to precise the phenomenon, we assume that the growth rate, g , is a function of size, S , nationality, N , and industry I . The growth is measured by the average annual percentage change in sales over the same period. Sales are the measure of size and firms have been ranked according to their opening size (18). A set of dummy variables is used for

(18) By comparing growth rates of firms ranked by a terminal size, we would fall in a well-known "regression fallacy". See UTTON [13].

industry (19) as well as for nationality : $N = 1$ for a British firm and 0 for an EEC firm.

The following estimation is obtained :

$$\begin{aligned}
 g_{1962-1970} = & \frac{73}{(3.3)} - \frac{4.4 \log S}{(2.6)} - \frac{3.5 N}{(1.4)} + \frac{5 I_1}{(1.2)} \\
 & + \frac{4 I_2}{(.18)} + \frac{.19 I_3}{(.04)} - \frac{1.6 I_4}{(.4)} + \frac{10 I_5}{(2)} \\
 & - \frac{6.7 I_6}{(1.2)} + \frac{6.3 I_7}{(1.5)} + \frac{8 I_8}{(1.7)}
 \end{aligned}$$

$$R^2 = .26 \quad S_n = 9.6 \quad n = 80 \quad (20).$$

First, the coefficient relating size to growth rate is significantly different from zero : for the largest European firms, growth is clearly a decreasing function of size (21). A second result is that the British nationality has also a negative, but weaker, effect on growth.

b. Profit

While Continental European firms grow faster than the British, their profitability appears to be much lower.

A multiple regression relating profit rate, π , in 1971, to size,

(19) Firms are classified into nine sectors : Chemicals (I_1), Oil (I_2), Food (I_3), Iron and Steel (I_4), Non ferrous metals (I_5), Machinery (I_6), Electrical Engineering (I_7), Vehicles (I_8). The dummy for an arbitrary industry (miscellaneous), assumed to be industry n , is excluded for econometric reasons, so that we have the following equation : $g = a + b \log S + c N + \sum_{j=1}^{n-1} d_j I_j + u$

(20) The t-values are in parentheses.

(21) For a confirmation, see R. ROWTHORN and S. HYMER [11], p.40.

nationality and industries, gives the following results (22) =

$$\begin{aligned} \pi_{1971} = & 2.42 - 0.002 S + 2.6 N - 0.45 I_1 + 2.40 I_2 \\ & (2.34) \quad (1.07) \quad (3.94) \quad (0.39) \quad (1.6) \\ & - 0.57 I_3 - 2.08 I_4 - 1.78 I_5 - 1.36 I_6 - 0.77 I_7 - 0.60 I_8 \\ & (0.48) \quad (1.7) \quad (1.49) \quad (0.97) \quad (0.62) \quad (0.39) \end{aligned}$$

$$R^2 = .32 \quad S_r = 2.75 \quad n = 100$$

First, π is not an increasing function of size.

Second, the relationship between π and nationality is clearly positive. Given a constant term of 2.42, the British group has, ceteris paribus, a double rate of profit as compared with the Continental firms (23).

An immediate question is then the association between profitability and growth. On the one hand, the low British growth rates could be explained by a high level of profit, while the low profitability could be explained by a superior growth : there would be a trade-off between the two objectives. On the other hand, a positive two-way relationship between growth and profitability may be expected on an a priori reasoning. A growing firm requires finance for expansion,

(22) Our dependent variable is the consolidated rate of profit on consolidated sales, and measures the price-cost margin. Alternatively, we may express profits as a percentage of assets : this will express the return on total capital. Such a regression leads to similar values :

$$\begin{aligned} \pi_{1971} = & 1.92 - 0.009 S + 1.72 N - 0.01 I_1 + 0.90 I_2 + 0.73 I_3 \\ & (2.60) \quad (-0.68) \quad (3.63) \quad (-0.02) \quad (0.85) \quad (0.83) \\ & - 1.54 I_4 - 1.36 I_5 - 0.57 I_6 + 0.11 I_7 + 1.09 I_8 \\ & (-1.74) \quad (-1.58) \quad (-0.57) \quad (0.12) \quad (0.99) \\ R^2 = & .35 \quad S_r = 1.98 \quad n = 100 \end{aligned}$$

(23) A similar result is obtained for the preceding years.

and the finance supply, whether originating internally from ploughed-back profits or externally from new issues, is related to the firm's profit record. Furthermore the faster growing firms are likely to have a higher productivity than rivals and will tend to be more profitable (24).

To test this hypothesis, let us introduce as a new independent variable, the profit rate and estimate parameters of the new equation :

$$\begin{aligned}
 g_{1962-70} = & 74 - 5 \log S + 1 \pi + 4.7 I_1 + 4.1 I_2 \\
 & (3.4) \quad (3) \quad (2.7) \quad (1.1) \quad (0.8) \\
 & - 3 I_3 + 1.4 I_4 + 10 I_5 - 4.5 I_6 + 7.5 I_7 + 11 I_8 \\
 & (0.6) \quad (0.3) \quad (2.1) \quad (0.8) \quad (1.7) \quad (2.4) \\
 R^2 = & .31 \quad S_r = 9.3 \quad n = 79
 \end{aligned}$$

We clearly see that growth is an increasing function of profit. Furthermore, the coefficients for the industry dummy variables are significant in three cases, non ferrous metals, electrical engineering and vehicles.

But then, a difficulty arises. On the one hand, British nationality has a positive impact on profit rate which itself has a positive effect on growth; on the other hand, nationality is negatively correlated with growth.

In order to solve the problem, we reestimate our model, using two-stage least squares (T S L S). In the first stage, we have regressed π on N and the constant :

$$\begin{aligned}
 \pi = & 2.39 + 2.6 N \\
 & (6) \quad (4.4) \\
 R^2 = & .2 \quad S_r = 2.6 \quad n = 79
 \end{aligned}$$

(24) K. GEORGE [6], p.64.

With this estimate of $\hat{\pi}$, the second stage in TSLS then yields for the estimating equation :

$$g_{1962-1970} = \frac{7.1}{(3.2)} - \frac{3.8 \log S}{(2.4)} - \frac{1.4 \hat{\pi}}{(1.6)}$$

$$R^2 = .1 \quad S_r = 10 \quad n = 79$$

Hence, it is obvious that the difference between the profit rates induced by nationality has indeed a negative effect on growth. But this effect is more than compensated by the important residual value of the profit variation explained by variables other than nationality.

A better specification of our equation where the "nationality effect" is distinguished from the "profit effect" confirms this result :

$$\begin{aligned} g_{1962-1970} = & 69 - 4.5 \log S + 1.6 \pi - 7.5 N + 4 I_1 + 1.7 I_2 \\ & (3.3) \quad (2.9) \quad (3.8) \quad (3) \quad (1) \quad (0.3) \\ & + 0.09 I_3 - 0.8 I_4 + 10.3 I_5 - 3.9 I_6 + 7.8 I_7 + 10 I_8 \\ & (0.02) \quad (0.2) \quad (2.2) \quad (0.7) \quad (1.9) \quad (2.2) \end{aligned}$$

$$R^2 = .4 \quad S_r = 8.8 \quad n = 79$$

The positive effect of the profit rate on the growth rate is stronger and more significant ; British nationality as well as size has a significant negative influence ; the coefficients of the industry dummy variables are also significant in three cases.

*
* *

To summarize, our main conclusions are that the largest European firms are already well stabilized at the top of the industrial

pyramid and that their industrial as well as aggregate concentration is increasing. Inside the group itself, the British firms show a marked decline of their size superiority over the EEC firms as well as a lower survival rate.

At performance level, the actual increase in economic concentration does not carry with it superior results in terms of profit or growth. This is reinforced by the positive correlation between profit and growth.

Finally, the effect of a lower British survival rate is strengthened by the fact that the surviving British firms grow systematically more slowly than the Continental firms.

On the other hand, the largest British firms have a much higher rate of profit. One consequence is the already substantial expansion of the British firms into the EEC : at the level of the giant British firms, the enlarged Common Market is already realized.

BIBLIOGRAPHY

- [1] ARNDT H., Economic Concentration, Berlin. N.F. 1971.
- [2] Bulletin d'Information Economique de la Caisse des Marchés de l'Etat, n° 54. 1^{er} Trim. 1972.
- [3] Commission de la C.E.E., Premier rapport sur la politique de concurrence, Bruxelles, Luxembourg, avril 1972.
- [4] DE JONGH H.W., Ondernemingsconcentratie, Stenfert Kroese, Leiden 1971.
- [5] Department of Trade and Industry, A Survey of Mergers: 1958-1968 London, H.M.S.O. 1970.
- [6] GEORGE K.D., Industrial Organization, George Allen and Unwin Ltd, London, 1971.
- [7] Hearings before the Subcommittee on Antitrust and Monopoly of the Committee of the Judiciary, U.S. Senate, 90th Congress, 1968, Part 7.
- [8] JACQUEMIN A. et KUMPS A.M., Changes in the Size Structure of the Largest European Firms : An Entropy Measure, Journal of Industrial Economics, Vol XX, n° 1, november 1971.
- [9] JACQUEMIN A., Dimension, stabilité et performances des 40 plus grandes entreprises européennes 1956-1967, Revue d'Economie Politique mars-avril 1970, n° 2.
- [10] KAPLAN A., Big Enterprise in a Competitive System, The Brookings Institution, Washington D.C., 1964.
- [11] ROWTHORN R. and HYMER S., International Big Business, 1957-1967 University of Cambridge, Department of Applied Economics, Occasional Papers n° 24, University Press of Cambridge, 1971.
- [12] THEIL H., Economics and Information Theory, North-Holland, Amsterdam, 1967.

- [13] UTTON M.A., Mergers and the Growth of Large Firms, Bulletin of the Oxford University Institute of Economics and Statistics, Vol.34, may 1972, n° 2.
 - [14] UTTON M.A., The Effect of Mergers on Concentration : U.K. Manufacturing Industry, 1954-1965, The Journal of Industrial Economics, n° 1, november 1971.
 - [15] WHITTINGTON G., Changes in the Top 100 Quoted Manufacturing Companies in the United Kingdom, 1948 to 1968, april 1972, mimeographed.
-