INSTITUTE OF STATISTICS
Monograph No. 1

Small and Big Business

Economic Problems of the Size of Firms

BY
JOSEPH STEINDL

BASIL BLACKWELL
OXFORD
1945

MONOGRAPH SERIES

OF THE

OXFORD UNIVERSITY INSTITUTE OF STATISTICS

The Oxford Institute of Statistics introduces this new series of monographs as an outlet for research results too long for journals but too short to form a complete book. They are intended to present research work of outstanding interest, sometimes even when it is still incompletely developed, in the hope that its early publication will suggest and stimulate research on related subjects and will provoke critical discussion.

The monographs will be published at irregular intervals and will deal with problems in applied economics and statistics.

D. G. CHAMPERNOWNE,

Director.

Printed in Great Britain for BASIL BLACKWELL & MOTT, LIMITED
by A. R. MOWBRAY & Co. LIMITED, London and Oxford

INTRODUCTION

THE problem of small business—its chances of survival and the policy to be adopted towards it—is arousing some interest to-day. This monograph outlines an analysis of the relevant economic circumstances which have to be considered before a reasoned policy can be arrived at. No definite policy is advocated here in detail, though the facts given implicitly rule out certain policies and indicate a broad line of approach. The inquiry does not contain any original statistical material or calculations, but is based on statistical material already published. This relates almost entirely to the United States of America, a choice which is largely determined by the relative quantity and quality of material available.

In an analysis of the importance of size of firms it is convenient to start from the writings of Alfred Marshall on the subject. Even though his conclusions are open to doubt, they are important as the expression of the thought of an era, and they lend themselves without constraint to a first exposition of the main problems involved.

The mathematics used in Part III are elementary and are indispensable for the strict presentation of the argument. The results of every important step are, however, expressed in verbal form, so that the non-mathematical reader may follow the argument.

I am indebted to my colleagues in the Institute, especially to Mr. M. Kalecki and Mr. G. D. N. Worswick, for reading the manuscript, and suggesting important corrections and improvements.

CONTENTS

SMALL AND BIG BUSINESS

I

MARSHALL AND THE REPRESENTATIVE FIRM

A. STATEMENT OF MARSHALL'S THEORY

A THEORETICAL discussion of the problem of size must start from the so-called 'economies of large scale'; their existence is generally recognized by all economists and, as will be shown, among all the factors influencing the relative fortunes of firms of various size, they are probably the *primary* factor. It will be convenient to start with an exposition of the views of Alfred Marshall on the problem.

Marshall distinguishes 'internal' and 'external' economies, the former depending on the size of the firm, the latter on the size of a group of firms. It is the former we are mainly concerned with here. These internal economies (that is, the reduction in cost per unit due to an increase in the scale of production) are demonstrated by Marshall as by other economists mainly by reference to examples from industrial experience. It is not maintained that large scale economies are a *general* phenomenon, nor can it be predicted where we should be certain to find them. Marshall had, it is true, a strong tendency to assume that they are characteristic for manufacturing, but not for 'extractive' industries;[1] but even this broad distinction between industries liable to 'diminishing' or 'increasing returns' has ceased to be plausible, since in mining large scale economies often assume paramount importance.[2]

Recognizing the importance of large scale economies in a good many industries, Marshall at once comes up against the question which is foremost in his mind during the whole discussion of the problem: Should not the existence of large scale economies in the industries concerned lead to a cumulative advantage of a growing firm which would inevitably end up in a concentration of output and the establishment of a monopoly position? To this Marshall makes two answers:[3] (1) The growth of the firm cannot continue indefinitely because the abilities and energy of the entrepreneur (or of his heirs) are likely to decay after a

[1] *Principles*, 8th edition, p. 282.

[2] Especially in the extraction of low-grade ores from large surface deposits, but also in coal mining.

[3] *Principles*, pp. 285–6; see also pp. 315–16, pp. 457–8.

certain time; this 'decay of entrepreneurial faculties' is a kind of sociological law postulated by Marshall.

(2) In many industries large scale economies are counteracted by the difficulty of enlarging the firm's market.

This second point requires some comment. It is apparently assumed here that the individual firm finds some difficulty in expanding its sales which can only be overcome by a price cut; in other words, it assumes what we nowadays call *imperfect competition.* This seems a rather surprising interpretation of Marshall; indeed, his equilibrium of the firm in general presupposes perfect competition, since prices are equated to marginal prime cost.[1] There can, however, be no doubt about the interpretation of the above argument, as the following quotation shows: 'But these are the very industries in which each firm is likely to be confined more or less to its own particular market; and, if it is so confined, any hasty increase in its production is likely to lower the demand price in that market out of all proportion to the increased economies that it will gain; even though its production is but small relatively to the broad market for which in a more general sense it may be said to produce.'[2] This is an unambiguous statement of market imperfection.

Great stress is laid by Marshall on the first factor, the decay of entrepreneurial faculties (which is thought by him to apply in principle also to joint stock companies). Any industry must be imagined as composed of firms some of which grow, while the others decay or die, being replaced by new and growing firms. At any time, within this constantly changing group of firms, one can discern one particular size of firm which is in a sense 'normal': The *representative firm.* Of this representative firm we learn that it is neither a 'young,' growing firm, nor a decaying firm; that it is not a firm of unusually big size, or with unusual advantages; that the 'normal' economies which can be got in this industry (with the given size of the industry) are open to firms of such a representative size; and that the representative firm tends to increase in size as the industry expands.

Bearing in mind all that Marshall said about the representative firm, we may deduce that he thought of a balance, existing in any industry of given size, between the economies of large scale and the difficulties of expanding the individual firm's market. The representative firm is just the firm which is able to use possible large scale economies within the limits allowed by the difficulty of marketing. Up to the representative

[1] Subject to the qualification that, in case of depression, 'fear of spoiling the market' will prevent prices from falling to the level of marginal prime cost; it appears that it is an *oligopolistic* situation which Marshall has in mind here.

[2] *Principles*, p. 458.

size large scale economies out-weigh the cost of expanding sales; above this size the opposite is the case. It is easy to see why this representative firm should increase in size if the industry expands. In this case a new market accrues to the existing firms without any particular sales effort. Firms will grow to bigger sizes and realize new large scale economies.

The peculiarity of this theory is that besides the representative firm there exist always smaller firms which are due to grow to full size. The limitation to the size of the representative firm, to sum up, is due to the limits of the market and, as is obviously assumed, to the large scale economies becoming less important from a certain size on.[1]

We may now ask the following question: If the representative size in many industries is rather large, may it not be that the supply of entrepreneurs capable of making use of these economies is restricted, so that they will enjoy a permanent advantage in the form of 'abnormal' profits? Marshall does not ask this question in so many words, but he is obviously trying to answer it all the way through Chapter XII of Book IV. His answer is, quite clearly, that in the long run the supply of entrepreneurship (capital combined with managerial ability) is elastic: '. . . the supply of business ability accommodates itself, as a general rule, to the demand for it' (p. 313); '. . . wherever there is work on a large scale to be done in such a country as England, the ability and the capital required for it are pretty sure to be speedily forthcoming' (p. 312).

The elasticity of supply of entrepreneurs is again demonstrated by putting the factor of personal efficiency in the foreground. The requirement of an initial capital is recognized, but it is nevertheless believed that the rise from unpropertied worker to small entrepreneur and from then to big entrepreneur is possible and plays an important role (pp. 308–10). Ability always finds the necessary capital, whereas inability loses it. In addition, no limit to the amount of borrowing is assumed. We hear of an efficient entrepreneur being able to 'borrow in one way or another almost any amount that he may need' (p. 311).

'There is thus, on the whole, a broad movement from below upwards' (p. 310). If the supply of entrepreneurs with the necessary capital is so elastic, they will naturally compete with each other and the rate of profit will be kept down to a 'normal' level.

We may still ask how it can happen that in Marshall's 'forest' small firms exist side by side with big ones, and not only exist, but even grow, in spite of the fact that the bigger firms enjoy the advantage of large scale economies.

[1] The latter point is stated clearly in *Industry and Trade*, p. 249.

The first part of the question—the mere co-existence of big and small firms—is easily answered, if indeed imperfect competition may be assumed. Small firms are protected by their 'goodwill,' the attachment of customers, the individual markets which they possess, and which the large firms can conquer only at a certain expense. But how can these small firms grow and catch up with the larger ones? There is only one explanation of this: it is the superior ability of the 'younger,' striving entrepreneur, which makes it possible for them to exist and *grow* besides big ones in *spite* of a technical disadvantage, and while it is assumed that the big ones themselves earn only a 'normal' profit.[1]

The above is an attempt to give a fair account of Marshall's view; there is no denying that it leaves us puzzled as to the exact meaning of all the details. What precisely the importance of market imperfection is, whether it was little more than an occasional idea or whether it can be fitted as an essential part into his system, there is no saying. The representative firm in any case remains a vague concept. But the broad tendency of Marshall's thought cannot be misunderstood.[2]

B. CRITICISM

There are two major objections which must be raised against Marshall: He greatly over-estimated the importance of personal ability of the entrepreneur; and he gave a completely unrealistic picture of the ease and readiness with which big entrepreneurs, possessed of large capital, appear fresh on the scene, having grown up out of the ranks of minor capitalists. A few facts will shed some light on these points.

(1) There are enormous differences in the size of enterprises as they exist to-day. American corporations range in size from the group with assets below $50,000, which comprises about half the number of all corporations, to the group with assets above $50 millions, the famous 'six hundred corporations' which account for more than half the assets of all corporate enterprise; the average assets of these six hundred

[1] It only apparently contradicts the above interpretation, that Marshall often describes the new entrepreneur as 'struggling for business' with a subnormal profit or no profit. This struggle for a market can apply only to certain phases of growth: there must be other times when he makes a profit, otherwise he could not grow, and the theory would become incomprehensible.

[2] The representative firm and the problem of increasing returns have been dealt with in a series of articles, for example:

A. C. Pigou: The Laws of Diminishing and Increasing Cost. *Economic Journal*, 1927.
A. C. Pigou: An Analysis of Supply. *Economic Journal*, 1928.
D. H. Robertson, G. F. Shove, P. Sraffa: Increasing Returns and the Representative Firm: A Symposium. *Economic Journal*, 1930.
L. Robbins: The Representative Firm. *Economic Journal*, 1928.
Allyn Young: Increasing Returns and Economic Progress. *Economic Journal*, 1928.
R. F. Harrod: Notes on Supply. *Economic Journal*, 1930.
R. F. Harrod: The Law of Decreasing Cost. *Economic Journal*, 1931.
D. H. Robertson: The Colwyn Committee and the Income Tax. *Economic Journal*, 1927.

corporations were $240 millions in 1933.[1] Growth from the 'ranks' of corporate enterprise (not to mention the small unincorporated business men) would have to be *several thousandfold* to reach the size of a big firm. Not only would a growth of this kind take so much time as to make the theory irrelevant for any practical application; it is also extremely unlikely, in view of the very high death rate among small firms (about which more will be said below) that any of the small entrepreneurs will in fact succeed in completing his ascent to anything near the size of a big firm. The simile of the forest is out of place. Growth does indeed take place, but this growth is slow; and in most cases the tree never grows up and therefore also the decay and death of big firms can only be slow, otherwise there would be nothing to replace them. From which it follows directly that the decay of entrepreneurial faculties cannot play the paramount role ascribed to it by Marshall. Moreover, the growth and decay of small firms will mostly move in a small circle only, not because of an early decay of the entrepreneur's energy, but because of high accidental losses due to business risk.

(2) Contrary to Marshall's assumption, there are in fact very strict limits to *borrowing*, especially to borrowing by small entrepreneurs. In practice, it is in the first instance the creditors who see to it that the proportionate indebtedness of a firm is limited. To give but two examples from American experience: Among the reasons given for refusal of credit by banks, 'inadequate net worth' (that is, too high proportion of debt to own capital) occurred in 40 per cent of all cases of refusal;[2] and from a study of credit difficulties by the Department of Commerce[3] it appears that the percentage of firms reporting credit difficulties increases strongly with the ratio of debt to own capital.

The latter report also shows that credit difficulties decrease with the size of the firm. Apart from this all evidence shows that the obstacles against borrowing by small firms are particularly hard to surmount. The long term credit market is open to them only at a prohibitive cost, and their predominant reliance on short term credit makes them 'illiquid,' and therefore, by the creditor's standards, undeserving of further credit.

Quite apart from the attitude of creditors, the entrepreneur himself has to keep his proportionate indebtedness within certain limits, because

[1] The differences become still more pronounced if the corporations' own capital (share capital plus reserves), instead of their assets, are compared.

[2] *Hardy-Viner Report*, quoted from *Temporary National Economic Committee* (T.N.E.C.), Monograph 17, p. 224.

[3] *Survey of Reports of Credit Difficulties*, Department of Commerce, 1935. See *T.N.E.C. Monograph* 17, p. 224 seq.

with any increase in it his risk becomes greater. This has been recognized in modern economic theory by the 'principle of increasing risk.'[1]

(3) There is evidence to show that losses are more frequent, and more serious, and in fact that *mortality* is higher in the case of small business.

The proportion of corporations making no profit decreases considerably with the size of the corporation, as the following figures for U.S. manufacturing corporations show:

TABLE I

PROPORTION OF TOTAL ASSETS OF 'DEFICIT CORPORATIONS' TO TOTAL ASSETS OF ALL CORPORATIONS IN EACH SIZE CLASS IN MANUFACTURING

Size class[1]	1931	1932	1933	1934	1935	1936
0	77%	85%	74%	66%	63%	56%
50	65%	81%	64%	54%	50%	40%
100	64%	79%	59%	51%	44%	33%
250	65%	76%	55%	47%	40%	28%
500	64%	75%	52%	45%	38%	24%
1,000	65%	76%	50%	42%	33%	19%
5,000	64%	73%	53%	41%	32%	17%
10,000	59%	73%	50%	41%	31%	13%
50,000	60%	69%	45%	47%	32%	8%
100,000[2]	—	—	—	—	—	13%

[1] Lower limit of size class, in 1,000 $ of assets. [2] Available for 1936 only.
Source: Crum, *Corporate Size and Earning Power.*

The lowest size group shows that even in times of relatively good business a consistently high proportion of corporations earn no net income. Moreover, the average losses of these 'deficit corporations' (measured as a percentage of their share capital plus surplus) are very high. In 1931-36 these losses varied from 40 per cent to 30 per cent in the lowest size group (under $50,000 of assets) in manufacturing.

TABLE II

PERCENTAGE LOSSES OF CORPORATIONS IN THE DEFICIT CATEGORY IN MANUFACTURING

Size class[1]	1931	1932	1933	1934	1935	1936
0	41	38	31	30	30	30
50	23	20	15	14	13	14
100	18	16	12	11	11	11
250	10	13	8	9	8	9
500	11	11	8	8	8	9
1,000	10	9	7	6	5	7
5,000	8	9	5	5	5	5
10,000	7	8	6	4	3	5
50,000	2	3	4	1	0	5
100,000	—	—	—	—	—	1

[1] Lower limit of size class, in $1,000.
Source: Crum, *Corporate Size and Earning Power.*

[1] M. Kalecki, *Essays in the Theory of Economic Fluctuations.*

We should be inclined to conclude from the frequency and seriousness of losses among small corporations that their 'mortality rate' must be rather high, in any case higher than that of big enterprises.

This agrees with the results of various investigations into the mortality of small business (dealing, however, not only with corporations, but also with unincorporated business). They show a high mortality rate in lines where small business certainly predominates, for example, retail trade: 'To the extent that local studies in scattered communities of the United States represent the general experience, approximately 30 per cent of retail firms discontinue business within the first year. An additional 14 per cent dissolve before reaching their second anniversary.'[1] The same is true for crafts and small scale service enterprises.[2] A study of mortality in manufacturing firms in Minnesota seems to suggest that the mortality rate is the greater the smaller the entrepreneur's capital.[3]

The (negative) correlation between mortality rate and size of firm is supported by the results of a recent investigation by the Department of Commerce.[4] The number of business discontinuances between June, 1940, and July, 1942, was found for each size class in various industry groups, size being measured by number of employees; this number of discontinuances, expressed as a percentage of the number of firms existing in 1939, is given in Table III. The decrease in the 'mortality rate' as size increases is very striking; only two cases, construction and retail trade, do not quite conform to the pattern, probably owing to special circumstances, such as the closing down of the big automobile dealers in 1942.[5] But the data, as is pointed out in the investigation, still suffer from the fact that 'business discontinuances' comprise both liquidation of firms and transfers (by sale, etc.); the latter, it is argued, should really be excluded.[6] Such an exclusion has been undertaken in the investigation mentioned, and it appears from it that the proportion of actual liquidations in total discontinuances decreases again with the size of firms (Table IV). It follows that the exclusion of mere 'transfers of business' only strengthens our argument: namely, that the *mortality rate* decreases with the size of the firm.

[1] *T.N.E.C. Monograph* 17, p. 7. [2] *Ibid.*, p. 7 seq.
[3] E. A. Heilman, Mortality of Business Firms in Mineapolis, etc. *University of Minnesota Press*, 1933. See *T.N.E.C. Monograph* 17, p. 48.
[4] *Survey of Current Business*, November, 1943.
[5] *Ibid.*, p. 17.
[6] Though, in fact, sale of business may often be a symptom of failure.

TABLE III

BUSINESS DISCONTINUANCES, 1940–42, IN PER CENT OF NUMBER OF BUSINESSES OPERATING IN 1939, ACCORDING TO SIZE OF BUSINESS

Employees	*All groups excl. transport and finance*	*Mining*	*Con-struction*	*Manufac-turing*	*Wholesale trade*	*Services*	*Retail Trade*
1–3	22	72	29	29	17	44	11
4–7	14	28	16	14	10	40	7
8–19	14	26	21	16	8	27	9
20–49	12	18	9	11	8	29	10
50–	6	6	13	6	4	10	4

TABLE IV

PROPORTION OF LIQUIDATIONS IN TOTAL BUSINESS DISCONTINUANCES, 1940–42 IN PER CENT

Employees	*All groups incl. transport and finance*	*Mining*	*Con-struction*	*Manufac-turing*	*Trans-port*	*Wholesale trade*	*Retail trade*	*Services*
1–7	45	64	81	47	52	56	41	34
8–19	43	60	73	47	41	40	37	31
20–49	42	51	72	42	35	40	37	31
50–	39	50	78	38	22	29	20	28

Source: G. B. Wimsatt, Business Discontinuances, 1940–42. *Survey of Current Business*, November, 1943.

(4) There is nothing in the evidence available to suggest 'a broad movement from below upward.' On the contrary, it seems to be a more realistic assumption that most small businesses die before they have time to grow. This frequent death is largely compensated, it seems, by corresponding new entrants. There is thus a very high turnover which makes it plausible that in the case of these small entrepreneurs their supply is indeed elastic. But what happens to the supply of big entrepreneurs? If, as Marshall assumed, they come into existence as a result of growth of smaller entrepreneurs, then their supply must be very inelastic. They can only slowly increase in numbers as a result of growth out of the next lower size groups; and this growth has partly to compensate for the disappearance of large entrepreneurs through bankruptcy, etc.

It may be thought that large enterprises can come into existence in other ways than through the growth of small ones: by forming of new joint stock companies, or by mergers. The former presupposes, however, the existence of concentrated wealth, because only rich people can profitably form a joint stock company and find a public market for their shares (in the small companies the 'public' usually hold no shares, or very little). The formation of joint stock enterprises is thus limited. Mergers, again, will very often disguise the simple process of buying up of one firm by another, in which one of the parties, after

having suffered some loss, is transformed more or less into a rentier. Or else, if the merger represents a real 'merging' of various enterprises into one another, without being to the predominant advantage of one of them, we can invariably observe that this process takes place only when firms are already rather big, and an oligopolistic situation prevails in the industry concerned.

Thus, we must conclude that, contrary to Marshall, the supply of 'large' entrepreneurs (and this applies to almost the same extent also to medium enterprises) is rather inelastic; their profits therefore need not be *normal*, or bear any relation to those of small entrepreneurs whose supply is (at least relatively) elastic. Unless the 'demand' for these large entrepreneurs is sufficiently small (that is, unless there is less 'work on a large scale to be done' than there are correspondingly large entrepreneurs available), they will not by competition reduce their rate of profit, and the latter will remain permanently above the 'normal' profit rate.

(5) In addition, Marshall's problem (that is, why large scale economies do not lead to monopolistic domination) has been affected by developments already occurring in his own time, and intensified since. There is in fact a very great proportion of our present economic system which is already subject to *monopolistic domination*.

For monopolistic domination in the market of a product to be achieved, it is not necessary that concentration should go so far as to combine the whole, or virtually the whole, output in one hand. Much the same result is achieved when the concentration has gone far enough to give to one or to each of a few firms a *substantial* proportion of the output. For it is then that the market will correspond to *oligopolistic* conditions, and it is likely that in its effect on prices, oligopoly will mean much the same as monopoly.

The characteristic of oligopoly is that the cross-elasticities of demand are finite; that is, if one firm increases its price, other firms will experience an increase in their sales. Once one firm has got, say, half the output in the market, then the influence of its price policy over the rest of the producers, if they are smaller, is very great. An increase in its price will increase the sales of the others approximately as much in proportion to their sales as it decreases its own sales. On the other hand, a price change by one of the numerous other firms will affect the big firm's sales very little proportionately. On the basis of such conditions *price-leadership* inevitably arises; that is, the large firm will set a price, and the others will adjust themselves to it. If there are a few large firms, together accounting for a substantial part of the output of the industry, then there will be a likelihood of a tacit or open agreement between them, so that they can

exploit their dominating position by establishing themselves as price leaders.

These oligopolistic conditions are not fundamentally different from a monopoly in the industry, in the sense in which Marshall understood it. They involve an increase in prices in the industry; the limiting factor to this increase is the danger of potential new entrants into the industry (or the desire to squeeze existing competitors out). There may, of course, be differences in the degree of market domination, depending on the share of the market secured by the big firms and on their financial strength. But the point when monopolistic domination begins to become practicable is reached when the size of the firm gives it a *substantial* share in the market; and large scale economies, therefore, need be effective only *up to this point* in order to bring about a tendency towards monopoly.

C. AN ALTERNATIVE VIEW

This analysis suggests that the supply of 'large entrepreneurs' is in fact inelastic; only for small entrepreneurs (that is, those which possess a modest capital of their own), can Marshall's assumption of an 'elastic' supply, which keeps the rate of profit down, be admitted.

On this view we can explain why large scale economies, though they are not ubiquitous and though we cannot easily make any generalizations about their occurrence, may nevertheless lead to a *general* advantage of the bigger firm. The point is this: If certain economies are available for a certain size of plant, then only those firms which are big enough to afford the capital investment required for this plant will be able to make use of these economies; any smaller sized firms—size of a firm is measured in terms of *capital* here—will not be able to do so. On the other hand, if there are economies open to small plants—and a technical development may sometimes favour small scale equipment[1]—then *any* bigger firm may make use of them just as well as a small firm, because there is nothing to prevent it from investing in a number of smaller plants. From this asymmetry it follows that small firms can never (in the long run) earn higher profit rates than big firms—because all technical advantages which are open to them are open also to big firms; whereas big firms *may* earn higher rates of profit than small firms, because some advantages open to them are *not* open to small firms.

This statement requires some qualifications which may be shortly discussed. There is the possibility that in the management and organiza-

[1] A nice example is given by J. M. Blair (*T.N.E.C. Monograph* 22, p. 198) from the lumber industry. The introduction of mobile and flexible logging equipment (tractors, trucks, etc.) has made small scale production advantageous ('selective logging' from scattered stands).

tion of the firm there occur certain diseconomies (the idea of 'bureaucracy of the big firm *versus* initiative and adaptability of the small firm' falls under this heading). This might lead to a superiority of smaller firms in spite of the above argument. But these diseconomics of management, in spite of the importance attributed to them by some economists,[1] seem to have only minor importance in practice.

A second qualification arises from the existence of imperfect competition. This might quite clearly lead to inferiority of the big firm if it has to extend its market in one and the same industry. But it may be thought that this big firm could enter new lines. This may, however, involve certain initial costs (which partly depend again on imperfection, like advertising) and it will mean that the 'entrepreneur' has to deal with a variety of lines which he cannot know as well as his own line, and that may increase his risk.[2] The disadvantage imposed by market imperfection on the bigger firm may be reduced in the way just described, but it will probably still play a role. We have therefore, here, a serious qualification to the above rule that small firms cannot be superior in the long run.

Another qualification is of a rather different type: A larger firm may earn a lower rate of profit than small firms, because it chooses to do so, and because it can in this way get greater safety. This exchange of greater 'safety' against a higher profit rate is achieved by a reduction in the proportion of borrowed capital (for an explanation of this mechanism see Chapter IV). The greater safety for bigger firms will, however, mean that the frequency and extent of their losses will be reduced, and that *on the average* they will be more successful than smaller ones.

The above qualifications, however, lose their importance, if we develop further the above-mentioned '*asymmetry*.' Let us assume that large scale economies, sufficient to outweigh the difficulty of expanding the market, and requiring heavy capital investment, are available in a great many lines; and that 'entrepreneurs' with sufficient capital to exploit these opportunities are restricted in number. Then these large entrepreneurs will go into those lines where the greatest large scale economies are available, because they will be able to get a more than 'normal' profit there. For each 'size class' of entrepreneurs the rule will be that all the technical opportunities of lower sizes are open to it, *and* in addition the opportunities which can be only used with this size of capital, but not the opportunities which require a greater capital.[3] Thus

[1] See, for example, Austin Robinson, *The Structure of Competitive Industry*.

[2] See M. Kalecki, *Studies in Economic Dynamics*, p. 62.

[3] To the technical opportunities must be added opportunities of exploiting monopolistic advantages open only from certain sizes upwards.

a 'hierarchy' of profit rates will be established,[1] with a *smooth* increase of profit rates as size of the enterprise, measured in capital, increases. It is the fact that the statistical investigations of Mr. Crum[2] show just such a smooth increase in *all* the various lines of business which makes the above explanation necessary.

[1] See Joan Robinson, *An Essay on Marxian Economics*, p. 68 seq.
[2] *Corporate Size and Earning Power.*

II

GENERAL SURVEY OF FACTORS INFLUENCING THE RELATIVE POSITION OF LARGE AND SMALL FIRMS

AMONG the factors influencing the relative position of firms of various sizes we may distinguish *technical factors* such as large scale economies; *market factors*, such as imperfect competition on the one hand, and oligopoly on the other hand; and finally, the cost of borrowing. These factors will be dealt with in turn.

A. LARGE SCALE ECONOMIES

1. Large scale economies are the reductions in the cost per unit of output which arise with an increase in the size of the producing unit. This unit may be a plant, if it is a case of economies in production costs proper, or it may be a firm, if it is, for example, a case of economies in purchase of materials. Large scale economies are in practice very difficult to isolate, because there are also other influences at work in determining costs of units of various sizes. We could observe the effects of large scale economies in a pure form in an industry working as nearly as possible under conditions of perfect competition: the product of the various plants and firms would then be identical. The plants would all be used to optimum capacity; that is, each plant would produce a *yearly output* which would minimize its cost per unit (in the case of industries subject to seasonal fluctuations the 'optimum capacity' must obviously take into account the given pattern of seasonal fluctuation). All firms and plants would specialize as much as is necessary to reduce unit cost to a minimum; that is, they would not be firms or plants producing simultaneously or consecutively a variety of lines involving additional cost as compared with specialized and continuous production. Finally, the price of the product, and the prices of the factors (material, labour, etc.) would be identical for all firms.

To the extent to which these conditions are not fulfilled in practice, the existing or potential large scale economies may be concealed.

2. Little has been said to explain how large scale economies arise and why they gained importance in so many industries. The classical explanation connected it with the division of labour which creates

specialized units (either persons or machines or tools) which must be used to capacity to be fully effective (Adam Smith). Most of the subsequent explanations have not gone very far beyond this. Professor Sargant Florence has attempted to throw some light on the question.[1] He lists three principles which are responsible for the existence of large scale economies: The '*principle of bulk transactions*' implies that the cost of dealing in large quantities is sometimes no greater than the cost of dealing in a smaller quantity, or else it is less than proportionately greater (a long and a short railway train). A particular case of this principle is found in the rule that the volume of containers, etc., rises more than in proportion to the area of the containing walls. This necessarily leads to decreasing cost (especially important for boilers, furnaces, etc.). The '*principle of massed reserves*' implies that if reserves are kept against certain contingencies, their effectiveness will increase (or their cost decrease) with the size of operations. If credit is given to customers, for example, then the losses due to default, etc., can be more accurately estimated the greater the number of customers; the smaller therefore will be the financial reserves necessary to guard against these risks. This principle has, as Professor Sargant Florence states, a very wide application (for example, to stocks of goods, materials, etc.). It is based on the statistical rule that errors are the more likely to cancel out in a number of cases the larger this number is. Wherever uncertainty plays a role and some form of 'reserve' is kept as a safeguard, this principle will apply.

Lastly, the '*principle of multiples*' implies that if various specialists and specialized machines are used in one and the same process, and have different 'optimum capacities' of production, the full employment of all of them will be secured only at a level of output which is the lowest common multiple of the optimum capacities of them all. This principle will make the optimum scale of integrated process much greater than the optimum scale of each of the constituent processes.

As Professor Sargant Florence shows, it is not only greater size of plant which yields economies; the combination of several plants under one *firm* is also an important source of economies. One reason for this are the economies achieved in purchase of materials and sale of products (the principle of bulk transactions will be active here). On account of this, production of *various* products may be often combined in one firm, if it is a case of products diverging from, or converging to, one and the same process.[2] In the first case the joint purchase, in the second the joint sale of the various products will realize economies.

Another source of economies connected with the size of the firm are

[1] *The Logic of Industrial Organization*, 1933, p. 16 seq. [2] Sargant Florence, p. 21.

research departments. Finally, the 'principle of massed reserves' gives a number of advantages to the bigger firm as such. The greater number of debtors and also of creditors will make the risk of financial difficulties more easy to estimate. The firm may engage in various lines or over a geographically wider area, and in this way again make its risks easier to estimate and therefore to guard against.

It will be noted that the type of advantage which 'massed reserves' gain in these cases may be either a reduction in cost—a smaller reserve can be used to the same effect; or it may be a reduction in the riskiness of the business as a whole—the same reserve can be used to greater effect against possible contingencies.

3. Evidence of large scale economies can best be secured in the case of production proper (in the case of distribution cost they are more difficult to disentangle from the effects of imperfection of the market). In many cases, however, it will be found that the products of plants of various sizes differ; it can even be said that they must, very often, necessarily differ, because the production on a large scale is standardized production, whereas on a small scale many varieties can be produced. Thus, the choice between large scale and small scale production will often mean a choice between a cheaper standard product on the one hand, and 'individuality' or 'variety' on the other hand. In many cases the value of the latter is purely fictitious (non-standardized gardening tools!), but this cannot always be assumed; in principle, it is in these cases only possible to indicate the 'cost of individuality,' and leave it to further consideration whether the 'variety' in the particular case in question is not perhaps too dearly bought, in view of the prevalent poverty of our economic system.

These complications are avoided if we look for evidence of economies in production of standard goods. The descriptions of the *technique of production* offer plenty of examples.[1] In the steel industry, for example, the automatic strip mill has reduced direct man-hour requirements by 97 per cent as compared with the obsolete hand-mill process used in the early 'twenties, while the necessary capital investment in an efficient modern steel works is about $100 millions.[2]

More evidence is provided by cost comparisons for plants of various sizes which have been made, for example, by J. M. Blair.[3] He shows the

[1] See *T.N.E.C. Monograph* 22, Technology in Our Economy, p. 199.
[2] *Ibid.*, p. 111.
[3] The Relation between Size and Efficiency of Business. *The Review of Economic Statistics*, 1942. (This article is a criticism of *T.N.E.C. Monograph* 13, in which, by means of indefensible statistical methods, the conclusion was reached that large firms tend to have higher cost than medium ones.)

average unit cost of plants in various size classes (size being measured according to annual production). The tendency for unit cost to decrease with size of plant is clearly brought out in all the industries for which data are given (cement, iron ore, pig iron, ingots, crude petroleum, beet sugar, milk distribution, and bread).

An indirect method of demonstrating the existence of large scale economies has been used by the same author.[1] The amount of electrical energy used per man employed, in plants of various sizes, indicates the extent to which labour is replaced by mechanical power. The data show for most industries a significant increase in the proportion of electrical energy used, as size of plant increases (see Table V).

TABLE V

ELECTRIC ENERGY USED, IN KILOWATT HOURS PER MAN-HOUR BY SIZE OF PLANT, IN TWENTY-ONE MANUFACTURING INDUSTRIES, 1937

	Number of wage earners per plant.						
	1–5	6–20	21–50	51–100	101–500	501–2500	*over* 2500
Flour and grain mills	3.14	5.56	10.82	11.77	17.11[1]	—	—
Cereal preparations	1.35	1.49	2.82	3.80	7.39	9.53	—
Petrol refining	4.08	4.44	8.29	7.93	13.60	17.29	20.20
Feeds for animals	3.25	3.84	4.90	5.40	7.84	—	—
Lime	0.75	2.23	3.94	3.84	5.92	—	—
Glass	—	1.98[2]	2.25	1.92	3.66	6.86[3]	—
Aluminium products	0.67	0.86	1.39	1.23	2.32	5.16[3]	
Other non-ferrous metal products	0.81	0.85	1.44	1.94	3.29	5.73	5.34
Wrought pipe	0.26	2.23	1.23	2.25	4.64	4.40	—
Insecticides, etc.	0.65	1.13	1.53	2.28	1.75	—	—
Soap	0.80	1.41	1.28	2.96	4.45	3.77	—
Steel barrels	0.78	0.94	1.11	2.32	1.70[1]	—	—
Tin cans	1.29	1.13	0.99	1.37	1.58	1.66	—
Stamped and pressed metal products	1.05	0.84	0.90	1.16	1.71	2.75	—
Wirework	0.62	0.73	1.02	1.06	1.56[1]	—	—
Electrical machinery	1.61	1.01	1.35	2.48	1.86	3.12	3.53
Machine tools	0.62	0.99	0.96	1.00	1.30	1.41[3]	—
Machine shop products	0.98	1.15	1.36	1.76	2.46	2.66[3]	—
Engines, turbines, etc.	1.10	0.74	0.77	1.30	1.61	2.27[3]	—
Refrigerators	0.55	0.56	0.85	1.10	1.66	3.34	2.78
Motor vehicle bodies	0.63	0.53	0.68	0.61	1.00	1.94	2.01

[1] From 101 to 2,500 wage earners.
[2] From 1 to 20 wage earners.
[3] More than 500 wage earners.
Source: *T.N.E.C. Monograph* 22, p. 205.

Another indirect indication is found in the relation of value added to number of employees for different size classes of plants, which can be extracted from Census figures. In manufacturing in the United States, according to the Census of Manufactures for 1937, the number of

[1] *T.N.E.C. Monograph* 22, p. 202.

employees per $100,000 of value added was almost twice as big in the smallest size class as in the largest, as the following table shows:

Size by value of product[1]	*Number of employees per $100,000 of value added*
5	49.5
20	46.3
50	43.8
100	42.4
250	41.3
500	39.8
1.000	36.5
2,500	31.4
5,000	26.7
25,000	26.0

[1] Lower limit of size class in $1,000.

The number of workers per $ of value added is only an imperfect indication of cost; it does not take account of overhead cost which may increase with size. On the other hand, the proportion of skilled labour is likely to decrease with size, so that *wage costs* probably decrease even more than the above figures suggest. The value added depends also on the price of the product, and therefore on the market factors to be discussed later.

4. In the course of technical development up to now the most efficient size of plant in many industries has steadily increased. It may be asked whether this process has a limit or not. It is difficult to predict future technical developments. There is, however, a specific field in which large scale economies can be realized only by very big firms. This is the field of industrial research. The advantages and the superiority which it may give to a firm, in the form of patents, etc., are obvious. Its cost is such that it pays only for very large firms. Large laboratories in the United States have annual budgets of several million dollars. In 1938 *one-third* of all research workers in the United States were employed by the thirteen companies which had the largest research staff. One half of all industrial laboratory personnel was employed by forty-five research laboratories.

Even if no other economies were available for firms beyond a certain size, the advantages of industrial research would still give a technical superiority to the biggest firm.

B. IMPERFECT COMPETITION AND OLIGOPOLY[1]

1. The imperfection of the market generally makes increases in the firm's output (and sometimes in the plant's output) more difficult and therefore counteracts large scale economies. This difficulty of expansion of the market may appear in one or several of the following forms:

(1) In lower prices for the larger firm.

(2) In greater sales cost per unit (for example, advertisement cost).

(3) In greater cost due to a smaller degree of capacity use.

(4) In additional cost due to the production of several lines in one plant or by one firm[2] (multi-product firm).

Similar tendencies will appear where there is imperfection in the market of the materials and the labour which the firm buys. If the material is an agricultural product which has to be collected over a wide area (milk, sugar beet) an extension in the scale of the plant will lead to increasing raw material cost. Particularly important, however, is the case of labour. Small firms may get cheap labour supply outside the industrial centres. It is a fairly general rule that labour is less easily organized in small production units, which again makes it likely that small firms will very often have a cheaper supply of labour. Whatever rules there are established to safeguard the workers, are less easy to control in small units (the latter were in an earlier stage of social legislation entirely exempt from control, and still are even now exempt in backward countries, e.g. India). Thus, the imperfection of the labour market proves an important advantage to small firms.

2. The difficulties which imperfection in the market of the product creates for an expanding firm may be considerably reduced if the whole industry happens to be expanding. A new market for its products may then accrue to the firm without any particular sales effort, because new customers which have not yet been attached to any particular firm are coming into the field. An expansion in an industry will therefore, as Marshall stated, be favourable to the growth of the firm and the exploitation of available economies of large scale.

3. If a firm (or a small group of firms) comes to dominate a substantial proportion of the market of a product, it will be able, as shown earlier

[1] The following articles and books deal with the problems considered in this paragraph:
P. Sraffa: The Laws of Return under Competitive Conditions. *Economic Journal*, 1926.
E. Chamberlin: *The Theory of Monopolistic Competition.*
J. Robinson: *Economics of Imperfect Competition.*
R. F. Harrod: Doctrines of Imperfect Competition. *Quarterly Journal of Economics*, 1934.
N. Kaldor: Market Imperfection and Excess Capacity. *Economica*, 1935.

[2] 'Each firm or plant tries to supply the whole gamut of varieties, and thus . . . only succeeds in conducting small scale operations.' (Sargant Florence, *The Logic of Industrial Organization*, p. 26.)

on, to increase the price without fear of losing sales, because the other firms will adjust themselves in their price policy. At a certain point, therefore, growth offers the advantage of monopolistic exploitation of the market. This advantage can only increase with further growth, because this makes it possible, for example, to gain similar control over nearly related substitute products.

The advantage of the price increase also accrues, however, to the other, smaller firms in the industry. Nonetheless the oligopolistic factor will create an advantage for the bigger firm, if the economy *as a whole* is considered: because there will be industries in which big firms dominate, mainly on account of large scale economies, and where monopolistic power keeps prices high in relation to cost, so that profits are correspondingly high; whereas in industries in which small firms predominate and 'competitive' conditions prevail, prices will be low in relation to cost, and profits correspondingly low.[1]

4. The combined effect of large scale economies, imperfect competition and oligopoly will be seen in the *proportion of total cost to sales* (cost excludes here interest paid on borrowed capital). With an increase in size, large-scale economies will tend to reduce cost in proportion to sales, and oligopoly power will tend to increase price and therefore sales in proportion to cost; whereas imperfection will tend to reduce prices, and, or, increase cost for bigger firms as compared with smaller ones. If we call total cost π and sales s, then $\frac{s}{\pi} - 1$ will be the *net profit margin*, expressed as a proportion of cost. This net profit margin will increase with an increase in the size of the firm, if the effects of imperfection are outweighed by the two other factors, as is probably the case in a considerable number of industries.

C. THE COST OF BORROWING

The basic fact with regard to the cost of borrowing is that the long term capital market is open to small firms only at a prohibitive cost.

The differences in cost of floating security issues can be seen from Table VI. They do not tell the whole story, because in most cases the small companies issuing securities will be able to sell only a small part of them.

Thus the small firms have to rely predominantly on short term credit. Here, again, the cost increases strongly with a decrease in the sum borrowed (Table VII).

[1] See *T.N.E.C. Monograph* 21, Competition and Monopoly in American Industry.

TABLE VI

EXPENSE OF SECURITY FLOTATION, BY SIZE OF ISSUE FIRST SIX MONTHS OF 1937

Size of Issue[1]	*Number of cases*	*Expense of Issue in percentage*
Common Stock		
0	33	22.4
250	19	19.9
500	21	19.1
750	10	18.2
1,000	22	15.7
Preferred Stock		
0	9	17.3
250	11	19.5
500	8	11.8
750	3	15.7
1,000	17	9.3
5,000	2	3.7
10,000	2	3.3
25,000	2	3.0
Bonds, notes, and debentures		
0	5	9.2
250	7	9.3
500	5	9.8
750	2	4.2
1,000	15	4.8
5,000	3	4.8
10,000	13	3.1
25,000	8	2.3

[1] Lower limit of size class in $1,000.

Source: J. L. Nicholson, The Fallacy of Easy Money, *Harvard Business Review*, 1938, p. 33.

TABLE VII

AVERAGE SIZE OF LOANS MADE AT DIFFERENT RATES BY BANKS IN NEW YORK CITY, SEPTEMBER 1–15, 1938

Interest Rate Charged	*Average Size of Loan*
1–2 p.c.	$88,000
2–3 p.c.	54,000
3–4 p.c.	21,000
4–5 p.c.	18,000
5–6 p.c.	5,000
6–7 p.c.	3,000

Source: *T.N.E.C. Monograph* 17, p. 220.

We find here the effects of large scale economies at work, but in addition there is a further factor. Since small firms have to rely on short term finance, and since, on the other hand, they are driven to borrow relatively much by the inadequacy of their own capital in comparison to the funds required for a reasonably efficient conduct of the business, their financial position is almost always rather insecure (see below, Chapter IV). This again increases the cost of borrowing.[1]

D. THE IMPORTANCE OF LARGE SCALE ECONOMIES

Whatever the relative weight of the various factors mentioned, it is certain that in a sense large scale economies are the *primary factor*. They

[1] Interesting material on these points is given in *T.N.E.C. Monograph* 17, p. 207 seq.

are basic, because without them firms would hardly grow to the size at which they are able to exercise monopoly power, by becoming '*price leaders*,' combining with others in the formation of a cartel, or by amalgamation.

The cost of borrowing, again, is partly directly influenced by the 'principle of bulk transactions,' and the 'principle of massed reserves.' In another sense the financial condition of the small firm and its consequent high cost of borrowing is influenced by large scale economies in the production (or distribution) process itself. It is just because small size is such a technical disadvantage that small firms are driven to supplement their own capital by extensive short term borrowing at unfavourable terms.

However much monopoly power and financial conditions may contribute to the advantages which big firms enjoy, these advantages are in the last resort based on technical conditions.

III

THE PROBLEM OF CAPITAL INTENSITY

A. PROFIT MARGIN AND PROFIT RATE

1. We have now to consider the specific problems arising from the variations in capital intensity. There is a good deal of evidence to show that the amount of fixed capital employed both in proportion to output and to number of employees increases with size of plant (*and* with the size of the firm).

This problem could be easily dismissed if we were justified in assuming that capital intensity and size are determined separately by different circumstances: so that with a given size the proportion of capital to labour could be freely varied and would be adjusted on the basis of certain price relations. In fact, however, this is almost certainly not the case. Large scale economies are in reality *technically* inseparable from capital intensification, so that the greater plant, if it is to make use of large scale economies, has also to use a greater proportion of capital to labour. Consequently the greater *firm*, in so far as it possesses also greater plant, will be more 'capital intensive.' Thus we start from the assumption that large scale economies and capital intensification are in a very large number of cases inseparable (though, of course, not always; there may be a 'capital saving' with an increase in size).

The statistical material available relates mainly to the proportion of capital to *sales* per annum. Theoretically, there are two factors mixed up in this concept of 'turnover of capital,' as it is sometimes called. One is the proportion of capital to *output capacity*, and the other the degree to which this capacity is used (actual output to output capacity). As the proportion of fixed capital to sales p.a. (see Table VIII) increases *strongly* with size, the *first* of the two factors (capital in proportion to capacity), which we call capital intensity, must play a large role; the second factor alone could not account for such strong variations. As to the second factor, degree of capacity use, we have no direct statistical evidence, but we can make the plausible assumption that, with increase in the size of firm, the degree of capacity use will tend to decrease somewhat, because of the difficulty of finding a sufficient market for the product. Thus, the increase in the proportion of capital to sales with increasing size is partly explained by capital intensification, and partly by lower degree of

capacity use as the size of the firm increases; but the first factor is by far the more important.

TABLE VIII

RATIO OF VARIOUS CAPITAL ASSETS TO GROSS SALES P.A., IN PER CENT OF GROSS SALES (U.S. MANUFACTURING CORPORATIONS, 1937)

Size Class by Assets[1]	1 *Capital Assets*[2]	2 *Inventories*	3 *Cash, notes, and accounts receivable*	1 + 2 + 3 *Total*
0	13	8	13	34
50	17	11	14	42
100	21	13	15	48
250	24	15	15	53
500	27	17	15	59
1,000	31	20	17	68
5,000	59	22	18	99
10,000	42	23	19	85
50,000	46	26	19	91
100,000	48	20	19	87

[1] Lower limit of size class in $1,000.
[2] Land, buildings, plant, and equipment exclusive of depreciation.

Source: *Statistics of Income*, 1937.

In Table VIII the proportion of fixed capital (land, buildings and plant and equipment) to gross sales p.a. is given for manufacturing industry as a whole. The proportion increases steadily up to the $5-10 million size groups; from that onwards the development is irregular, and the highest size classes show again a lower proportion. A substantial increase can also be observed in the proportion of *inventories* to sales (the better financial position of greater firms makes it possible for them to buy on a greater scale). The sum of fixed capital, inventories, cash, notes, and accounts receivable, form an approximation to the capital sum invested in the business (the bulk of the 'other assets,' which are excluded, are securities and investments in other firms); this sum, in proportion to gross sales, shows again a definite increase with increasing size of firm up to a certain size class.

The same tendencies as in manufacturing can be seen in mining, trade, and most of the sub-groups of manufacturing (see Table IX). It must be noted, however, that this increase in capital to sales is in part due to conditions of ownership: small firms are often likely to rent buildings, etc., whereas big firms more often possess all the land and buildings used in the business, and even more. It is unlikely, however, that this factor should account for more than a part of the general tendency mentioned above.

Another point must be mentioned here. It may be thought that the

TABLE IX

PROPORTION OF CAPITAL ASSETS (LAND, BUILDINGS, AND EQUIPMENT MINUS DEPRECIATION) TO GROSS SALES IN SELECTED GROUPS OF U.S. MANUFACTURING INDUSTRIES

Size of Corporation in terms of assets[1]	*Food and kindred manufactures*	*Textile mill products*	*Leather and its manufactures*	*Rubber and its manufactures*	*Paper and pulp*	*Chemicals and allied products*	*Metals and products*	*Motor vehicles, complete or parts*
	PER CENT OF GROSS SALES							
0	15	11	6	15	15	14	16	11
50	19	15	7	21	18	18	21	15
100	22	20	7	18	22	20	24	19
250	21	26	8	23	25	22	25	23
500	20	30	11	32	33	26	28	20
1,000	22	38	13	32	51	30	29	20
5,000	29	48	—[2]	—[2]	63	37	34	25
10,000	35	—[2]	—[2]	—[2]	—[2]	47	—[2]	22
50,000	—[2]	—[2]	—[2]	—[2]	—[2]	40	—[2]	15
100,000	—[2]	—[2]	—	—[2]	—[2]	51	—[2]	23
Classes Grouped[3]	16	48	16	21	93	—	56	—

[1] Lower limit of size class. [2] Classes have been grouped to avoid disclosure.
[3] Embodies those classes referred to in the preceding footnote.

Source: *Statistics of Income*, 1937, Part II.

increase in capital intensity with size is simply due to the fact that big firms manufacture different products, which require more capital for their production, whereas small firms devote themselves to the production of those goods which require only simple equipment. Further, it may be that bigger firms are more integrated vertically which would automatically mean greater capital in proportion to sales.[1] Again, it is not likely that both of these circumstances suffice to explain the increase of capital-sales ratio with size shown by the figures given. A strict statistical demonstration of this would require more material than is available in the published 'Statistics of Income.' But it is plausible that also in the manufacture of the *same* product capital intensification should go together with increase in size; it has been shown earlier (p. 16) that power consumption per unit of labour employed increases with size, and this makes it likely that also the amount of machinery and equipment must increase. Moreover, in individual industries (steel) it is known that large-scale production methods are at the same time more capital intensive. We can therefore assume that the rule holds often enough to make its implication worth studying. In the following analysis we shall assume that we have to do with industries in which firms are vertically integrated to the same degree, and in which the products do not differ too much. In other words, the delimitation of the industry must be narrow enough to make it not too heterogenous.

2. The problem of capital intensity will now be analysed in algebraical form. As we have seen, the technical factors (large scale economies) and the market factors (imperfect competition, etc.) determine the proportion of cost to sales $\frac{\pi}{S}$ for firms of different sizes in an industry. We shall make the assumption that the large scale economies outweigh the counteracting force of imperfect competition so that $\frac{\pi}{S}$, the proportion of cost to sales, decreases with size; or $\frac{\pi}{S} = F_{(z)}$ is a decreasing function (within certain limits); (z measures the size of firm according to capacity output). From this it does not follow that the *rate of profit* on the capital employed will increase with increasing size of the firm. We shall find the conditions which must be fulfilled in order to give superiority to the greater firm in terms of the *profit rate*. The

[1] In the broad industry groups shown in Table IX the opposite tendency is, however, sometimes at work. The big firms in the food group, for example, are largely meat packers, with an unusually great proportion of raw material cost, which explains the sudden decline in capital sales ratio in the highest size class.

ratio of capital employed, I, to annual sales, s, is an increasing function of size, z: $\frac{I}{s} = k = \Phi_{(z)}$

Now if the rate of profit (inclusive of interest paid) on the capital employed in the firm is e, we can write the following equation:

$$e\,k = 1 - \frac{\pi}{s}$$

or $$e = \frac{1 - F_{(z)}}{\Phi_{(z)}}$$

If *e* is to increase with increasing size, the first derivative of the above function must be *positive*:

$$\log e = \log (1 - F_{(z)}) - \log \Phi_{(z)}$$

$$\frac{1}{e}\frac{de}{dz} = -\frac{F_{(z)}'}{1 - F_{(z)}} - \frac{\Phi_{(z)}'}{\Phi_{(z)}} > 0$$

$$\frac{\Phi_{(z)}'}{\Phi_{(z)}} < -\frac{F_{(z)}'}{F_{(z)}} \cdot \frac{1}{\left(\frac{1}{F_{(z)}} - 1\right)} \qquad (1)$$

Let us interpret the expressions which make up the condition (1). $\frac{\Phi_{(z)}'}{\Phi_{(z)}}$ is the *proportionate* increase in the ratio of capital to sales, consequent on a certain increase in size. This, we assume, is largely dependent on technical data. $-\frac{F_{(z)}'}{F_{(z)}}$ is the *proportionate* reduction in the ratio of cost to sales, consequent on an increase in size. This, again, will be largely determined by technical conditions, namely the *reduction in cost* which can be achieved with large scale production; but the counteracting factors, say reduction in price or increase in advertisement cost, also influence this expression. That we consider the *proportionate* and not the absolute reduction in the ratio of cost to sales has good reasons: an equal absolute reduction in the ratio of cost to sales is correspondingly more difficult the smaller the ratio of cost to sales. The *proportionate* reduction in the cost to sales ratio, on the other hand, indicates approximately *in what proportion costs have been reduced.* The last expression occurring in the above condition, $\frac{1}{F_{(z)}} - 1$, is nothing else but the profit margin, *expressed as a ratio of cost.*[1]

This condition for the profit rate e being an increasing function of the

[1] It must be stressed that throughout this chapter the profit margin referred to is always a percentage of *cost*, and not of *sales*.

size of the firm can be put in words in the following way: If the size of the firm increases, the *proportionate* increase in the ratio of capital to sales must be smaller than the *proportionate* decrease in the ratio of cost to sales, divided by the original profit margin. This may be made clearer by an arithmetical example. Let us assume that with a given size of firm the proportion of cost to sales $\frac{\pi}{S}$ is 0.95, and the profit margin $\frac{S}{\pi} - 1$ is therefore $\frac{0.05}{0.95}$. The proportion of capital to sales is, say, 0.10. If the size increases by a certain amount of output capacity, the ratio of cost to sales can be decreased, let us say, to 0.85, that is, in proportion to the original ratio, by $\frac{0.10}{0.95}$. The proportionate decrease in the ratio of cost to sales, divided by the original profit margin, is: $\frac{0.10}{0.95} / \frac{0.05}{0.95} = 2$. If the ratio of capital to sales has increased from 0.10 to 0.30, so that the increase in the ratio (0.30—0.10) in proportion to the original ratio (0.10) is just 2, then the rate of profit will be unchanged. Indeed, it was originally $\frac{0.05}{0.10} = 50$ per cent, and it is now $\frac{0.15}{0.30}$, that is, again 50 per cent. The ratio of capital to sales would therefore have to be less than 0.30 with the greater size in order to give a higher rate of profit.

From this treatment of the relations of profit margins and rates we can now extract a result of considerable importance: if we consider firms of various sizes, the ultimate success of the bigger firm as compared with the smaller, measured in terms of *profit rate*, will depend (1) on the proportionate reduction which can be effected in the ratio of cost to sales, by making use of large scale economies, taking due account of the adverse effects of market imperfection; (2) on the proportionate increase in the ratio of capital to sales which becomes necessary in the bigger firm for technical reasons; (3) on the *absolute profit margin* (measured as a ratio of cost) obtaining with the smaller firm. It follows from (1) that the smaller this profit margin $(\frac{1}{F_{(z)}} - 1)$ the greater are the chances that an increase in the size of the firm will mean an increase in the rate of profit.

It can be shown further that, if an increase in size leads at all to any reduction in the ratio of cost to sales, and if the magnitude of this proportionate reduction is given, as well as the proportionate increase in the ratio of capital to sales, then we can always find a maximum positive magnitude for the profit margin, which will result in a superiority of the bigger size in terms of the rate of profit. Indeed, it follows from (1) that if

$$\frac{1}{F_{(z)}} - 1 < -\frac{F_{(z)}'}{F_{(z)}} \Big/ \frac{\Phi_{(z)}'}{\Phi_{(z)}},$$

then the increase in size will result in an increase in the profit rate. As long as $F_{(z)}'$ is negative (that is, the cost-sales ratio *decreases* with size), there is a *positive* profit margin $\frac{1}{F_{(z)}} - 1$ which will fulfil the above condition.

Thus, if the profit margin for a certain size is small enough, even a small proportionate reduction in the ratio of cost to sales, despite a considerable increase in capital-sales ratio, will make the bigger size more profitable. Whereas, on the other hand, if the profit margin for a certain size is rather high, then even considerable proportionate reductions in the ratio of cost to sales, involving a certain 'capital intensification,' will not make the bigger size more profitable.

It follows that the average magnitude of profit margins in the economy will have an influence on the relative profitability of firms of various sizes. In discussing the *shifts of the function* $F_{(z)}$ which take place *over time*, we must distinguish two cases. In the case of *cyclical fluctuations* (booms and depressions), there will be changes in the degree of capacity use, which will influence the relative cost of firms in so far as their proportionate overhead costs are different. This will make the effect of the fluctuations on the relative position of different firms rather complicated. To discuss it we must analyse cost further. We shall make the simplifying assumption that costs can be divided into one part—prime cost—which varies strictly with output (sales) and another part—overhead cost—which remains constant within a certain range of fluctuation of output.

Let us write for prime cost $\frac{\pi_1}{S} = \Theta_{(z)}$; for overhead cost in proportion to 'normal output' S write $\frac{\pi_2}{S} = \Pi_{(z)}$; and the proportion of actual output (sales) to 'normal output' be σ. 'Normal output,' in this context, is not the technical capacity, but takes into account the market normally expected for the products of the firm; so that we can assume that the proportion σ is the same for all firms, and that it changes proportionately for all of them.

The profit margin is then:

$$1 - \Theta_{(z)} - \frac{\Pi_{(z)}}{\sigma}$$

Differentiating with respect to size we obtain

$$-\Theta_{(z)}' - \frac{\Pi_{(z)}'}{\sigma} > 0$$

$$-\Theta_{(z)}' > \frac{\Pi_{(z)}'}{\sigma}$$

as the condition for the profit margin increasing with size. In other words, the increase in overhead cost with size must be smaller than the decrease in prime cost. The increase in overhead costs from one size to the next depends, however, as the equation shows, on the proportion of actual output to normal output. If this generally declines, as is likely to happen in a depression, and assuming that it declines in the same proportion with all firms, then the overhead cost in relation to sales will grow and the greater firm may lose its costs advantage or even come to have a disadvantage.

This need not *necessarily* happen in a depression; if the reduction in σ is small and the depression has its effects more on prices rather than on volume of output, then the cost advantage of the greater firm may persist. In this case its profit rate relatively to that of the small firm will increase (because its profit margin is proportionately less reduced than that of the small firm, with a given price cut). If a depression, however, strongly reduces the proportion of actual to normal output then it is quite possible that the cost advantage of big firms will temporarily disappear. We should not draw any hasty conclusions from this about the general effect of cyclical depression on big and small firms; it will be mentioned later (see below, p. 45) that there are other factors to be considered in this connection.

We shall now turn to the more important case of *long run changes*. We shall make the assumption that the degree of capacity use on the average of boom and slump remains approximately unchanged in the long run. Let us assume, then, that there is a general proportionate reduction of prices with unchanged cost, or a general proportionate increase in cost with unchanged prices in an industry. That means that $\frac{\pi}{S}$ will be increased by a constant factor κ and become $\kappa\frac{\pi}{S}$. Under these assumptions, as also $F_{(z)}'$ will become $\kappa F_{(z)}'$, $\frac{F_{(z)}'}{F_{(z)}}$ will remain the same as before; that is, the relative change in the cost-sales ratio from one size to the other will be the same as before. The profit margin, however, has decreased, and therefore, according to what has been said above, the relative position of any size as compared with a smaller size has im-

proved, in terms of the rate of profit. Methods of capital-intensive production which were not profitable before become profitable now, on account of the lower profit margins.

These conditions of a long run shift in the function $F_{(z)}$ seem to give a fairly accurate picture of the process by which technical progress has developed in the past. Increased competition, induced by expansive tendencies and cost reduction of growing firms, shifted the function $F_{(z)}$ upwards; as a consequence of this, some small firms were eliminated, whereas, on the other hand, new possibilities for more capital-intensive and large-scale production become attractive, on account of the lowered profit margin.

This process, however, is not likely to be the rule any more in the present stage of development, in which the desire for monopolistic domination plays the chief role.

3. As we have now arrived at the result, that the relative position of firms of various sizes depends entirely on the cost-price relations (net profit margins) obtaining generally in the economy, it would seem that it is impossible to arrive at any general verdict with respect to the chances of bigger or smaller firms; the reason being that the general cost-price relations (the function $F_{(z)}$ for the whole economy) are extremely variable and depend entirely on the state of trade. There are, however, in fact some very important general conclusions which we are able to draw.

Let us consider the position of 'small firms.' By small firms we shall understand those which require only a very moderate amount of entrepreneur's capital, such as is possessed or can be acquired by a not too small number of people; in other words, the small firms are those for which, in accordance with what was said in Part I, we can assume an elastic supply of entrepreneurship. It can be shown that these small firms are very likely to have, over the average of the trade cycle, a very *small profit margin*. In support of this assumption we may quote first of all the statistical evidence, which shows that (1) profit rates are very low for these firms and (2) they work with a small ratio of capital to annual sales, which in most cases is substantially lower than one, so that the profit margin is even smaller than the profit rate.

Crum's figures for corporations in U.S. show that on the average of 1931–36 the smallest corporations (those with assets up to $50,000) had a loss of 16 per cent. This period, it is true, was one of prevailing depression. But even for a relatively good year like 1936 the average losses in this size class were almost 7 per cent.

It is very likely that the average level of profit, over the period of a

trade cycle, will at all times be very low for small firms. As their supply is elastic, and as, moreover, the field in which they can work is very restricted as compared with the number of small entrepreneurs trying to enter it, they will compete very sharply and bring the profit rate down to the very minimum. Moreover, this minimum which is sufficient to keep the small entrepreneurs in business, is very small indeed. We must assume that the small entrepreneur, by the very nature of his position, conforms to a gambler; that is, he is taking rather high risks for a low expectation of profit. The high mortality and shortness of life of small entrepreneurs which has already been mentioned (see Chapter I) are direct proof of the high risks which the small entrepreneur bears. He is, however, willing to bear this risk at a very low remuneration. This is due to the fact that small entrepreneurs are desperately trying to maintain themselves in their social status, rather than become employees (to become rentiers is no practical alternative for them, because their capital is too small for this purpose). Thus a small entrepreneur will very often prefer to work in his own business without getting any more out of it than he would get as an employee. And the hope, against very heavy odds, of gaining at long last will, according to all experience, keep small entrepreneurs in business in face of an almost hopeless situation.

Thus, on the *average* of a trade cycle, in ordinary times, the small firms will *always* have a very low profit rate, and therefore a very low net profit margin. From this follows that bigger sized firms, if they can realize large scale economies, will almost inevitably earn higher profit rates, even though they may need much more capital in relation to sales. *The scales are almost invariably turned against the small firm, wherever it is, in fact, technically inferior* (that is, wherever it has a higher proportion of cost to sales). There is one exception to this: In times of general scarcity of equipment, which would necessarily be accompanied by a price inflation (unless the inflation were controlled), profit margins would rise generally, and would be much above their ordinary level even for small firms. In such times the inferiority of small firms may change into *superiority*. Owing to their modest capital requirements they may then earn much higher rates of profit than big firms.[1] It would be mistaken, however, to expect this result in *any* kind of inflationary situation where profit margins are allowed to rise generally. If the inflation is due to labour shortage, then equipment (for example, in the civilian sector of a war economy) may actually be redundant, and the result will be an elimination of small firms much quicker than could ever happen in peace

[1] This tendency will be strengthened by the influence of the capital structure (gearing) which will be discussed in Chapter IV.

time. The above-mentioned case of 'golden opportunities' for small business is most likely to happen in an uncontrolled reconstruction boom, when consumption goods are in very high demand, while labour is available from demobilization, and equipment is the main bottleneck.

The resulting generalization with regard to small firms is confirmed by Mr. W. L. Crum's investigation (to which detailed reference will be made later). It shows that the smallest size classes of corporations in the United States in 1930–36 earned *markedly* lower profit rates than any bigger size.

4. Let us now pass to the problem of medium and big firms. If a firm has reached a size greater than that of 'small firms' we must not any more assume that the profit margin of this firm will be small, because the large scale economies which in most industries will be available to this medium-sized firm will make its profit margin greater than that of small firms. As the profit margin thus increases with size, it will become more and more difficult to increase profitability (the rate of profit) further. This we can show very easily by going back to our formula:

$$\frac{1}{F_{(z)}} - 1 < -\frac{F_{(z)}'}{F_{(z)}} \Big/ \frac{\Phi_{(z)}'}{\Phi_{(z)}}$$

Let us assume, for the sake of argument, that $\frac{F_{(z)}'}{F_{(z)}}$, the proportionate reduction in cost-sales ratio, remains constant as the size is increased; in other words, large scale economies as measured by the proportionate cost reduction they afford, remain of fairly constant importance as size becomes bigger and bigger. At the same time, let us assume that $\frac{\Phi_{(z)}'}{\Phi_{(z)}}$ the proportionate increase in the capital-sales ratio necessitated by a certain growth of size, remains constant, too, as size increases.[1] Then it is quite clear that the above condition will soon cease to hold, because the profit margin increases with size, whereas the right-hand side of the expression is constant; the rate of profit must therefore soon begin to fall as size increases. This, under the assumption of constant proportionate growth of capital-sales ratio, could only be obviated if $\frac{F_{(z)}'}{F_{(z)}}$ were to grow at an increasing rate, which is very unlikely to be the case.

[1] The above assumptions appear more plausible if we imagine that z measures not size but the *logarithm* of size; so that with, say, successive doubling of size the proportionate cost reduction remains constant, and the proportionate increase in the capital sales ratio remains constant too.

The above assumption of a constant growth of the capital-sales ratio (constant $\frac{\Phi_{(z)}'}{\Phi_{(z)}}$) may seem unwarranted and requires therefore further elucidation. Let us start from a slightly different concept. The natural thing is to assume the *ratio of capital to cost* to grow in constant proportion with size; the capital-cost ratio is more nearly related to the usual measure of capital-intensity, 'capital per man' (as long as we assume equal degree of vertical integration). Our assumption is, then, that with a constant proportionate increase in this capital-cost ratio there will be a constant proportionate decrease in the cost-sales ratio, both associated with a growth in firm's size. If we write for the capital-cost ratio $O_{(z)}$ our assumption can be interpreted as stipulating a production function of the logarithmic type[1]

$$\log \frac{I}{F_{(z)}} = a \log O_{(z)}$$

where a is a constant and $\frac{I}{F_{(z)}}$, the ratio of sales to cost, is a measure of productivity. In other words, constant proportionate increases in 'capital-intensity' give constant proportionate increases in productivity.

Now the relation between the capital-cost ratio and the capital-sales ratio can be easily presented:

$$\Phi_{(z)} = \frac{I}{s} = \frac{I}{\pi} \cdot \frac{\pi}{s} = O_{(z)} F_{(z)}$$

where I is capital. By derivation we find that

$$\frac{\Phi_{(z)}'}{\Phi_{(z)}} = \frac{O_{(z)}'}{O_{(z)}} + \frac{F_{(z)}'}{F_{(z)}}$$

As long as $\frac{F_{(z)}'}{F_{(z)}}$ (which, according to our assumptions, must be negative) is smaller than $\frac{O_{(z)}'}{O_{(z)}}$, $\frac{\Phi_{(z)}'}{\Phi_{(z)}}$ will be positive and constant, and our above conclusions will therefore hold. The assumption $-\frac{F_{(z)}'}{F_{(z)}} < \frac{O_{(z)}'}{O_{(z)}}$ is nothing else but the law of diminishing returns to capital: it means assuming $a < 1$ in the above logarithmic productivity function (that is, the percentage increase in productivity must be smaller than the percentage increase in capital intensity).

As long as we can stipulate diminishing returns to capital—and this is

[1] As used by P. Douglas, *Theory of Wages*.

a plausible assumption—we can therefore say that the proportionate growth of sales-cost ratio and of capital-sales ratio will be constant and that the condition (1) will from a point onwards cease to hold; the rate of profit on capital must then decline.

This discussion leads us to the important conclusion that *in spite of continued possibility of exploitation of new large scale economies, the profit rate is bound to decrease from a certain size onwards owing to the increase in the capital-sales ratio.*

This decrease in the profit rate from a certain size on is, of course, *potential* and not necessarily *actual*: firms of this size will simply not try to exploit further large scale economies (involving further capital intensification). They will instead concentrate on other ways and means of improving their position, for example, on the building up of monopolistic power, or on the spreading of their risk over several lines of business.

According to our results technical progress may very likely be held up by too high profit margins of medium and big firms: there may be large scale economies open to big firms and involving heavy capital intensification which are not in fact used because the high profit margins of medium and big firms make a further capital intensification appear unprofitable. If profit margins were generally squeezed, then the profit margins of medium and big firms might become low enough to make a further capital intensification appear profitable. In this process, however, small firms would clearly be eliminated. We shall come back to this point in the chapter on technical progress. Suffice it to note here that large scale economies may exist and not be made use of, on account of the existing cost-price relationships.

The results obtained above may contribute again to the explanation of Mr. Crum's figures which show that with the increase in size, the increase in profit rate slows down considerably if we pass to medium and big firms, and in the highest size classes there is sometimes a decrease of the profit rate, especially in years of good trade. This slowing down of the increase in the profit rate with size may indeed partly be due to an exhaustion of the opportunities for further large scale economies from a certain size onwards (that is, to $\frac{F_{(z)}'}{F_{(z)}}$ decreasing and becoming zero). But the above considerations make it likely that the curve of the profit rate (correlated with size) will tend to flatten out *before* large scale economies are exhausted (that is, before $\frac{F_{(z)}'}{F_{(z)}}$ decreases or is reduced to zero).

5. It has been mentioned that the preceding analysis applies to industries in which the products are not too heterogenous. One might be tempted to apply it to broader industry groups in which related products compete to a certain extent, and in which large scale production of some products may advance at the expense of smaller scale production of somewhat different but still competing products. An example of such competition between large and small scale production of different products may be found in textiles (artificial *versus* natural fibres). But in this case we cannot any more assume parallel changes in prices or cost; the competitive struggle may here lead to a much greater reduction in price of the products of large scale industry as compared with that of small scale industry; and the latter may evade the price pressure by cutting wages if it has a separate labour market competing only imperfectly with that of the large scale industry. Thus the function $F_{(z)}$ will, for the industry group as a whole, be liable to changes in its shape. The process of squeezing of profit margins will not proceed here in the same simple way as before, and the profit margin of the small scale industry will be more resilient.

Another limitation of our analysis is that integrated and non-integrated firms cannot be compared. The analytical apparatus could, in fact, be easily adjusted for this purpose. If we deduct the cost of materials, etc., bought by the firm from the total cost on the one hand and from the sales on the other, and use the resulting concepts of 'cost exclusive of material cost,' and 'value added' instead of 'cost' and 'sales,' we can apply the analysis also to a comparison of firms of various degree of vertical integration. The terms to be used would be slightly less simple and familiar than in the above analysis.

Vertical integration often yields economies in the same way as large scale production, and is thus only another way of making use of the advantages of large capital. There are again some counteracting factors, which sometimes offset the technical advantages of vertical integration. If there are a great number of small firms which are sub-contractors to, or buyers from, a few big firms, we should expect the former to have a much smaller profit rate than the latter. This should, theoretically, counteract integration, because the large firm would take over the function of the small sub-contractors only if it could gain about as high a rate of profit on the additional capital involved as on its old capital.

While in the case mentioned the main contractor 'exploits' sub-contractors, there is another, perhaps more frequent, case where the big firm is induced to concede to small firms a high profit margin. This will be the case if, for example, a number of big firms use as distributors

small retailers and each of the former tries to induce the retailer to 'force' its own product. The retailers will then get high profit margins, which, in the last resort, are due to the imperfect competition between the products which he sells. His *profit rate*, of course, will by competition among retailers be reduced to the level usual among small entrepreneurs, and the high profit margin will pay for the resulting excess capacity. An integration of distribution with production would in this case seem favourable provided that the excess capacity could be eliminated; but for this there is no chance owing to imperfections.

Vertical integration is thus, like large scale economies, prevented from realizing its full technical advantages.

B. THE MEASUREMENT OF EFFICIENCY

It would seem that in a discussion of the size of firms one of the most important questions is how efficient firms of various sizes are. *Efficiency* is to be distinguished from *success*, which may be easily gauged from the average profit rates earned by firms in different size classes. Efficiency should measure the degree to which a firm is economical in the use of factors of production. A convenient measure of this might be the money cost per unit of production (the use of this measure will be, in the first instance, restricted to standardized products which make comparison between firms possible).

So far so good. But if the *proportions* in which various factors are combined to yield a certain product *vary considerably* as between different sizes, then the outcome of the cost comparison will depend on the relative prices of the various factors in terms of money. If firms of greater size use a smaller proportion of skilled labour as compared with common labour (as is very likely the case) then the relative efficiency of big firms will depend on the relative wages of skilled and common labour. If bigger firms use more electrical power in proportion to labour, the relative price of electricity will influence the comparison of efficiency. And finally, if bigger firms use more capital in proportion to all other factors taken together, then the cost of capital in relation to all other factors will influence the comparison. But what is the 'cost of capital'? It would be quite unsatisfactory to calculate it on the basis of some—more or less arbitrarily chosen—market rate of interest. The only correct measure of the cost of capital is its *opportunity cost*—that is, the rate of profit which it could earn in an alternative investment. In other words, if we have two firms and the one uses twice as much capital per unit of output, then the unit cost of all other factors in this firm must be so much lower than in the second firm as to give the same rate of profit on

capital; we could only then call the first firm 'as efficient' as the second. But it can be seen immediately that such a measure of efficiency will be entirely dependent on the *absolute* level of the profit margin in the second firm (see above, section A).

Now, the variations in the proportion in which various factors are used do not constitute an insuperable difficulty in practice, as far as, for example, the proportions of skilled labour and of electric power used are concerned. These proportions vary indeed according to size of firm, but the relative wages of skilled and unskilled workers are not liable to such strong short run changes as would make cost comparison useless. We can simply take the relation established in a certain period as basis, and must restrict the conclusion to this period. The cost of electric power will not undergo such fluctuations in a relatively short period as would upset any comparability. The proportion of raw materials to other factors, again, is not likely to vary too strongly with size. Thus we may for practical purposes very often disregard the problem of varying proportions and simply judge efficiency *on the basis of existing cost relationships.*

This is, however, not possible where these relationships are liable to quick and strong short run changes, which is precisely the case with regard to the general level of profit margins. *It is therefore a quite hopeless, and indeed nonsensical, undertaking to take account of the cost of capital* as a measurement of efficiency.[1] The best we can do is to measure efficiency in terms of *non-capital factors* (which include, of course, depreciation), that is, leaving out of account the proportion of capital used.

But, it will be asked, is not such a measure of efficiency misleading? Is it not useless to measure efficiency and leave out of account the need for economizing in the use of capital as well as of other factors? I do not think so. Since the advent of Lord Keynes' General Theory most economists have come to agree that neither the rate of interest nor the rate of profit have anything to do with scarcity of capital.[2] To use any such rate in calculating the 'cost of capital' to the community—and it is in that that we are interested when talking about efficiency—would be senseless. Moreover, in our existing system (in normal peace time) there is no scarcity of capital; in fact, it is a problem to find sufficient opportunities for investment, and any additional opportunity for making

[1] Professor Jewkes (The Economies of Large Scale Production; *Transactions of the Manchester Statistical Society*, 1931–32, p. 77) criticizes the Samuel Commission and others for using cost per unit of output as a measurement of efficiency as it fails to take account of the amount of capital used; he does not give any indication, however, as to how the cost of capital should be taken into consideration without introducing an arbitrary element.

[2] In the sense of scarcity of *saving*; the rate of profit *has* something to do with the amount of actually *existing* capital stock.

use of capital is a welcome contribution to the problem of increasing employment. If more capital per unit of production is used, that does not use up any resources which would otherwise be used elsewhere; it only increases employment (during the period when the new capital-intensive processes are being introduced), and the 'opportunity cost' of this capital is nil.[1]

It might well be different in a community, organized on a basis of socialist planning, which is poor in equipment. Such a community will have to economize in capital, and may have to rule out certain capital intensive processes on that account. But in the capitalist economy of our times there is no question of that, and a measurement of efficiency which neglects the cost of capital is therefore quite relevant and important under these conditions.

C. REAL WAGES AND INTEREST

In economic literature capital intensity is usually connected with real wages or, alternatively, with the rate of interest. It is useful to clear up the relation between these two conceptions and the preceding treatment of the problem.

Under certain, rather unlikely conditions, real wages will mean the same as what we called cost-price relations. In reality the two concepts will differ for the following reasons: Real wages will be very strongly influenced by the cost of imported food (and other consumers goods), or by agricultural prices at home, by rent, etc., factors which are distinct from the relation of cost and prices in industry. And further, the cost-price relation in industry will be influenced not only by the relation of wages to prices in industry, but also by the cost of raw materials and fuel and by overheads (which will again depend on the degree of capacity use) in proportion to prices.

Taking into account these considerations we can thus say that an increase in industrial wages in proportion to industrial prices at home, unless it is offset by a decrease in material costs or salary rates, or by an increased use of capacity, will make capital intensive production appear more profitable. *Only in this sense* can we say that high real wages favour the big firms.

It may not be superfluous to stress that an increase in *money wages* does not necessarily lead to the above result. It will do so only if it is

[1] See Lord Keynes: *General Theory of Employment, Money, and Interest.*
J. Robinson: *Introduction to the Theory of Employment.*
J. Robinson: *Essays in the Theory of Employment.*
M. Kalecki: *Essays in the Theory of Economic Fluctuations.*
M. Kalecki: *Studies in Economic Dynamics.*

not accompanied by a corresponding price increase, and therefore leads to a squeeze in profit margins. This will doubtless be the case if the wage increase is confined to individual industries, but it need not be the case if there is an *all-round* increase in money wages.[1] Conversely, *wage subsidies* will favour the small firm only if they are not accompanied by a corresponding price decrease. The most that can be said about the effect of all-round changes in money wages, or wage subsidies, on the relative position of small firms, is that it will be rather limited, if indeed there is any effect at all.

Capital intensity was also thought to be influenced by the rate of interest, a lower interest favouring more intensive capitalist methods of production. As the effect of the rate of interest on investment in general is already doubtful and certainly limited, the effect on capital intensity can be neglected. On the other hand, the rate of interest has a much more direct importance for the position of small firms. If a depression reduces profits all round, the first to be driven out of business are small firms, because the difference between their rate of profit and the rate of interest is smallest. But if the rate of interest is lowered, this will afford some breathing space for the small firm, because it will restore the minimum difference between expected profit rate and interest rate, which induces them to continue in business. A low rate of interest therefore can only be beneficial to small firms.

[1] See Lord Keynes' *General Theory of Employment*, and M. Kalecki, *Essays in the Theory of Economic Fluctuations*.

IV

THE FINANCIAL STRUCTURE OF FIRMS AND THE PROBLEMS OF RISK

A. STATISTICAL EVIDENCE AS TO PROFIT RATES IN U.S. CORPORATIONS

THE most comprehensive statistical material available with regard to the question of profitability and size has been published by W. L. Crum on the basis of the American *Statistics of Income* for corporations.[1] These data show that the rate of profit (profit exclusive of interest paid, in proportion to common and preference share capital plus reserves) increases with the size of the corporation (size being measured by value of total assets). The increase is steep in the lowest size classes and flattens out in the high size classes. In Table X (column A) the profit rates are shown for all corporations and broad groups and as an average of 1931–1936. The significant result of Mr. Crum's investigation is, however, that the same relation obtains in all groups and sub-groups of corporations, and in all the years for which data are available (that is, 1931–1936); the only qualification is that in some years, and in some industries, there is a decline in the profit rate in the highest size classes.

TABLE X

SIX YEAR AVERAGE (1931–1936) OF RATES OF PROFIT ON EQUITY IN U.S. CORPORATIONS[1]

Size Class[2]	*All Corporations*			*Mining*			*Manufacturing*			*Trade*		
	A	I	D	A	I	D	A	I	D	A	I	D
0	–16.3	10.8	–34.5	–33.0	24.5	–74.7	–17.2	11.1	–33.5	–12.5	9.0	–26.4
50	– 4.7	8.5	–14.3	– 6.2	11.6	–16.9	– 5.2	9.4	–16.5	– 3.9	7.4	–13.4
00	– 2.7	8.0	–11.8	– 3.0	10.5	–11.1	– 2.4	9.4	–13.0	– 1.9	7.3	–10.9
250	– 1.4	8.1	– 9.6	– 1.4	8.7	– 8.6	– 0.3	9.4	– 9.7	– 0.3	8.8	– 9.0
500	– 0.8	7.9	– 8.7	– 1.5	7.4	– 7.0	0.8	9.5	– 9.3	0.6	7.9	– 8.7
1,000	– 0.1	7.5	– 6.8	0.6	5.5	– 4.0	1.6	8.8	– 7.3	1.9	8.1	– 8.0
5,000	0.4	7.3	– 6.2	0.1	4.1	– 3.0	2.5	9.3	– 6.0	3.2	9.0	– 6.6
20,000	1.4	7.3	– 4.9	—	—	—	2.5	8.2	– 5.4	—	—	—
50,000	2.6	6.0	– 1.0	—	—	—	3.6	7.1	– 2.0	—	—	—
Classes grouped	—	—	—	–0.3	4.4	–2.5	—	—	—	5.5	9.7	– 5.5

[1] A All Corporations in the size class. I Income corporations. D Deficit corporations.
[2] Lower limit of size class in 1,000 $ of assets.

Source: W. L. Crum, *Corporate Size and Earning Power*, Appendix, Table B.

[1] *Corporate Size and Earning Power.*

There are two main objections which might be raised against the view that Mr. Crum's figures are significant and relevant. It has been maintained that part of what is theoretically profit appears in the compensation of executive officers who are at the same time owners of small corporations. If this compensation of officers is included in the profits, the relation of profit rate and size is indeed completely reversed and the small corporation comes out on top. This procedure is, however, as Mr. Crum shows, not justified,[1] because the officers' compensation in the case of small companies is for the greatest part a salary for work. The rate of compensation paid (in 1935 $3,000, in 1936 $4,000 per corporation in the smallest size class) suggests that hardly more than an ordinary salary is paid to these officers.[2] This salary is very important for the question why the small corporation's owner stays so tenaciously in business while there is no profit (the business provides a job for him), but it is probably for the greatest part a cost element. I do not believe, therefore, that Mr. Crum's findings are invalidated on this account.[3]

The other objection concerns the correctness of the valuation of assets. This is indeed open to considerable doubts. Is there any *systematic* tendency with regard to valuation which could have affected the result?

It must be borne in mind that *over-valuation* will reduce the absolute

[1] *Ibid.*, p. 312.

[2] According to a sample of 215 corporations in the smallest size class, taken in 1939, 20 per cent of the reported officers' compensation was the wage of employees who were at best only nominal owners. Excluding this part we have, for 1935 and 1936 respectively, a salary of $2,400 and $3,200 per corporation. The average number of compensated full-time owner-officers per corporation in the smallest size class was, according to this sample, 1.1. (See J. L. McConnell: Corporate Earnings by Size of Firm, *Survey of Current Business*, May, 1945.) We thus have an annual salary of about $2,200 and $3,000 per officer-owner for the two years respectively, which does not suggest a substantial absorption of profits into officers' salaries.

[3] In the article quoted above Mr. McConnell tries to divide officers' compensation into a part corresponding to the 'market value' of the services rendered by officers, and another part which is regarded as profit. By thus adjusting the profit calculation he comes to the conclusion that the larger corporations in times of good trade have in general no marked advantage. The market value of the officers' work is determined on the basis of the average salary paid to officers in those corporations where there is a sufficient dispersion of stock-ownership. This 'market rate' is for the three smallest size classes respectively, $2,000, $4,000, and $6,000 per officer in 1939. I suggest that the lower remuneration of officers in the companies mentioned is not due to control of stock-holders, but to a bias. The dispersed ownership in small companies is a symptom of weaker financial position as compared with small companies in which the owner-officers hold all the stock. This explains why owner-officers in these companies can allow themselves only very low salaries. Further, the strong increase in the assumed 'market-value' of officers' services with increase in the size of the corporation cannot be wholly explained by greater qualifications of owner-officers who serve the larger corporations. It seems that in Mr. McConnell's adjustment differences in profit rates are being concealed behind differences in 'market value' of the work rendered by the owner-officers. It seems to me that the adjustment thus obtained is a distortion and that the unadjusted figures as used by Mr. Crum are much nearer to the true picture.

magnitude of profit rates whether they are positive or negative. A general over-valuation would therefore *flatten out* the curves.

One possibility is that small firms may over-state their assets to make a better impression on their creditors. As the data in question indicate for small firms in most of the years negative profits, such an overstatement of assets could only have made their position look better than it actually was.

Another possibility is that of 'capitalization' (or 'over-capitalization') of high profits. That is, that companies with high profits tend to have a greater amount of 'good will' or other fictitious items in their assets. It is known that the amount of this sort of assets increases in the higher size classes. There is, moreover, here a tendency for the over-valuation of capital to take place among the *profitable* companies much more than among others. Thus a definite tendency for understatement of profit rate with large companies is introduced.

These conjectures, for what they are worth, seem to indicate that the most likely systematic errors in valuation can only have weakened the tendency of profit rates to increase with size.

Another consideration is mentioned by Crum himself:[1] his results appear with remarkable regularity in the different years investigated, and in the different groups and sub-groups of corporations, and most of the curves are remarkably smooth. 'The probability of these errors operating in just the manner and to just the degree to bring substantially similar results in nearly all the cases tested seems very slight.'[2]

It is not claimed that the regularity of the results disproves the suggestion that they have been shaped by intentional or unintentional errors in valuation. But uniform results such as those of Crum constitute a fact which has to be taken seriously: it has to be explained, either by pointing out the particular bias in the valuation which brought about the uniform result, or by a theory which takes the results for what they appear to mean. The following paragraphs will show that, if taken at their face value, Mr. Crum's results are very easily explained by the theory.

B. PROFIT RATES, FINANCIAL STRUCTURE, AND RISK

Before we pass to the discussion of further details of Mr. Crum's results, a few algebraical formulae must be given to show the importance of the financial structure of the firm.

When the rate of profit e was considered in the preceding chapter, this profit included interest paid to debenture holders and other creditors; on the other hand, it included only profit made in the business, not

[1] Crum, *ibid.*, pp. 15, 16. [2] *Ibid.*, p. 15.

interest received on investments in fixed interest bearing securities. What are the relations between this rate of profit and the rate of profit which is the object of Mr. Crum's investigation? Let us call the latter p, that is the rate of profit (excluding interest paid) on 'equity' (shareholders' capital + reserves; let e′ be total profit, including interest paid, on all assets; r the average rate of interest paid; I′ total assets; and C equity, that is, common and preference share capital plus reserves. Then we have

$$C\,p = I'\,e' - r\,(I' - C)$$

$$p = \frac{I'}{C}(e' - r) + r \qquad (2)$$

Now e′ still contains the interest received on investments in fixed interest securities. Let us call e the rate of profit (exclusive of this interest received) on the business capital, that is, total assets minus fixed-interest investments; I the business capital in the above sense; r′ the average interest received on investments.

Then we have

$$e'\,I' = eI + r'\,(I' - I)$$

$$e' = \frac{I}{I'}(e - r') + r' \qquad (3)$$

and from (2) it follows that

$$p = \frac{I}{C}(e - r') + \frac{I'}{C}(r' - r) + r \qquad (4)$$

From this formula we can see the importance of what is called '*gearing*' of a company. In financial language, gearing is usually understood to be the proportion of bonded debt to share capital. Theoretically, however, the ratio of *all* debt is important, and, moreover, the extent to which indebtedness is offset by investment in fixed interest bearing securities, is just as important. We shall call the ratio $\frac{I}{C}$ (the proportion of business capital to equity) the *net gearing ratio*.

It can be seen from equation (4) that the rate of profit on equity p will be the greater the higher the net gearing ratio—if the rate of profit on business capital e exceeds the rate of interest by a given amount. A high gearing ratio therefore yields a particularly high profit rate on equity *in case of success*. If the profit rate e on business capital falls short, however, of the rate of interest, then the higher the net gearing ratio, the lower will the profit rate on equity be. High gearing will therefore lead to a particularly severe rate of loss *in case of failure*. This is why an increase

in the net gearing ratio increases the risk.[1] If we consider a group of firms over a certain period there will be a certain proportion which will make losses of various percentage amounts on their own capital. If the losses, say, in another group of firms are more frequent and more severe, we shall say that the risk there is greater. In this sense it is quite clear that a greater net gearing ratio will increase the risk because it will increase the frequency and severity of losses (measured as percentages on the firm's equity).

We see that, according to the above definition, as long as we consider large groups of firms, the risk will express itself fully in the average profit rate of these firms. Whereas for an individual firm, considered by itself, risk and profitability may seem to be two separate things, for a large group of firms both will be expressed in the average rate of profit in the group: a high risk, over a certain period, making for frequent and severe losses.

C. GEARING AND SIZE

If we consider the proportion of a company's assets to the equity $\frac{I'}{C}$ —we may call it gross gearing ratio—we find a fairly widespread uniformity: The gross gearing ratio decreases with an increase in the company's size except in the highest size classes where there is often a reversal of this trend (see Table XI).

TABLE XI

FINANCIAL RATIOS FOR SELECTED YEARS: MANUFACTURING CORPORATIONS

Size class[1]	*Total assets as a proportion of equity*		*Short-term debt as a proportion of total debt*	
	1932 %	1936 %	1932 %	1936 %
0	176	199	86	85
50	150	161	80	81
100	140	149	77	79
250	131	140	71	75
500	126	136	69	72
1,000	122	128	59	69
5,000	122	128	44	56
10,000	121	125	44	56
50,000	123	127	42	55

[1] Lower limit of size class in 1,000 $ of assets

Source: *U.S. Statistics of Income.*

[1] See 'The principle of increasing Risk' in *Essays in the Theory of Economic Fluctuations* by M. Kalecki.

This tendency not only holds for manufacturing as a whole, but for most individual groups it is similarly outstanding.

Unfortunately it is less easy to get information about the proportion which companies of various sizes invest in fixed interest bearing securities. It is, however, a pretty safe guess that the smaller companies' holdings of such securities are very small, because these companies are in a very tight financial position. We can therefore assume with some confidence that the *net gearing ratio* will, at least up to a certain size, decrease at least as much as the gross ratio.

From this follows that there is a tendency for risk to decrease with size (except in the highest size classes), and that, in any case, the risk of small companies is probably fairly high — a conclusion which squares with the facts as shown in statistics of profit rates and of mortality of small firms. The consequences of a high gearing ratio for small firms are reinforced by two further factors: The smaller firms often *rent* buildings, etc. (which would more normally be owned by big ones), which means nothing else but a borrowing of these capital items *in natura*. The rent provides a fixed charge, like interest, with similar effects on the risk. More important, the relatively greater indebtedness of the small firms takes for the most part the form of short-term debt (Table XI). This makes the risk even greater (if no renewal of credit is obtained, the firm will have to engage in forced selling).

All this does very little to support the claim which has sometimes been heard, that small firms, being in some way more adaptable, are better fitted to weather the storms of a crisis. This claim is based on the assumption that large firms have higher overhead cost per unit of sale, and therefore suffer more from a reduction in volume of sales. As far as this factor is effective (see above p. 29) it seems, however, to be overshadowed by the effects of the financial position.

D. INCOME-CORPORATIONS AND DEFICIT-CORPORATIONS

The U.S. Income Statistics give separate figures for companies which are earning a profit and companies which make a loss in any particular year. If the 'income corporations' (which are of course not identical from year to year) are considered separately it appears that the rate of profit on equity is *decreasing* rather than increasing with size. (The effect of this on the total of all companies is offset by a sharp decrease in the rate of loss in the deficit corporations; see Table X.)

This peculiarity in the behaviour of income and deficit corporations has thrown some light on the results of earlier investigations. Two

investigators of the question of profit and size, R. C. Epstein[1] and W. A. Paton,[2] found, on the basis of fairly large samples, a tendency of the rate of profit on equity (and of the rate of profit inclusive of interest on total assets) to *decrease* with size. It is unnecessary here to analyse and give an interpretation of their results, because this has been done satisfactorily already.[3] The samples of both these investigators are almost certainly biased in that they contain too few 'deficit corporations,' and the relation between profit rate and size which they show therefore resembles the relation characteristic for the income corporations.

What is the explanation of the peculiar behaviour of income corporations? The first explanation which suggests itself, is the gearing ratio. As small companies are highly geared, they will, in case of failure, have particularly high losses; those which are lucky and succeed, however, will have higher profit rates on equity owing to the higher gearing.

This must account to a certain extent for the high profit rate on equity in small firms of the income category. But it does not explain the whole story, because it seems that the rate of profit (inclusive of interest paid) on all assets (e' in equation 3) also shows a regressive tendency in the income category, though this tendency is weaker than in the case of the profit rate on equity (Table XII).

TABLE XII

PROFIT RATES IN THE 'INCOME CATEGORY': MANUFACTURING

Assets size class	*Ratio of profit inclusive of interest to total assets*			*Net rate of profit (excl. interest) on equity*
	1931–33	1934–36	1931–36	1931–36
0	8.2	9.3	8.8	11.1
50	7.2	9.0	8.1	9.4
100	7.4	8.9	8.2	9.4
250	7.6	10.0	8.8	9.4
500	7.8	10.3	9.1	9.5
1,000	7.4	9.6	8.5	8.8
5,000	8.2	9.6	8.9	9.3
10,000	6.9	8.6	7.8	8.2
50,000	5.8	7.8	6.8	7.1

Source: *T.N.E.C. Monograph* 15: Financial Characteristics of American Manufacturing Corporations, p. 31, and Crum, *Corporate Size and Earning Power*.

This would be easy to explain, if we could assume the proportionate holding of bonds to increase with size, so that the net gearing ratio would be further increased. But it is not likely that the holding of bonds

[1] *Industrial Profits in the United States.* [2] *Corporate Profits as shown by Audit Reports.*
[3] *T.N.E.C. Monograph* 15: Financial Characteristics of American Manufacturing Corporations, Chapter II.

plays such a large role. The facts can nevertheless be explained in a fairly plausible way.

Holdings of securities in general increase considerably with size, and these holdings play a large role in the highest size classes, accounting for a considerable part of the profit there. Most of the holdings are probably shares and thus yield a fluctuating return like the profit from the corporation's own business. But dividend payments are usually more stable than profit rates, and, as only part of profit is distributed, they are lower. This might explain why profit rates on assets (e') show a decrease particularly in the highest size classes in the income category; the very big companies have greater stability from a large income from dividends which is, however, lower than the profit rate in a successful company, especially in times of good business.

At the other end of the scale, the small corporation is characterized by a particularly risky position owing to the high ratio of its short term liabilities to its liquid assets (like inventories, short term claims, etc.).[1] The small corporation tries to economize in the use of capital in all possible ways: by having a small inventory, giving less credit, holding little cash and deposits. This makes it particularly vulnerable, but as long as matters go well a firm which economizes in capital in this way will of course be able to earn higher rates of profit. This, in fact, seems to be a plausible explanation of why the small companies, if they earn at all, are relatively successful.

To sum up, the regressive tendency of the profit rates in the income corporations is due to small corporations taking higher risks in exchange for the chance of increased profit in case of success; whereas with the increase in size of the corporation, safety increases steadily, which involves, however, the foregoing of certain chances of very high profits.

[1] See *T.N.E.C. Monograph* 15: Financial Characteristics.

V

SOME EVIDENCE OF CONCENTRATION

A. CONCENTRATION IN U.S. MANUFACTURING, 1914–1937

FROM what we have seen of the handicaps of small size we should expect to find a relative increase of big units—both plants and firms—in the economic system; moreover, we should expect to find evidence of elimination of small units. Let us turn to an examination of U.S. manufacturing industries between 1914 and 1937.

Prior to 1914 the Census data are not comparable with the later ones. This earlier material allows us only to trace the growth of the average number of workers per establishment.[1] From 1914 onwards we can compare the proportion of wage-earners in different size classes of establishments (Table XIII, p. 55). Establishments of over 1,000 wage-earners accounted in 1914 for 17.5 per cent of all wage-earners, in 1919 for 26 per cent, and in 1937 for only little more. Establishments of over 250 wage-earners accounted for 45.6 per cent in 1914, 52.5 per cent in 1919, and 55.5 per cent in 1937. The first world war had apparently a powerful influence on relative concentration of establishments; but the process has continued, although more slowly, in the interval between the two wars.

Evidence of elimination of establishments in particular industries can be found for earlier periods,[2] but the *total* number of establishments in manufacturing as a whole seems to have increased up to 1919. From that time onwards, however, we can observe a definite downward trend in the number of establishments (Table XIV, p. 56). From 210,000 in 1919 it declined to 207,000 in 1929 and to 167,000 in 1937.[3] These three years chosen for comparison are all years of prosperity and thus fairly well comparable. The number of establishments in 1937 is even smaller than in 1914—167,000 against 174,000. Most of the reduction occurred in the smallest size class of up to 5 wage-earners. It appears thus that a period of absolute concentration of establishments had set in in 1919, causing a general retreat of the small establishment in manufacturing.

This development may be illustrated by showing a frequency distribution of wage-earners in various size classes of establishments (see graph, p. 49). In order to show the distribution size has been plotted

[1] See Willard L. Thorp, *The Integration of Industrial Corporations.*
[2] Thorp, op. cit., p. 46 seq. [3] Figures in the text are rounded off.

logarithmically, so that the whole picture is contracted in the horizontal direction. The height measures the frequency (number of wage-earners)

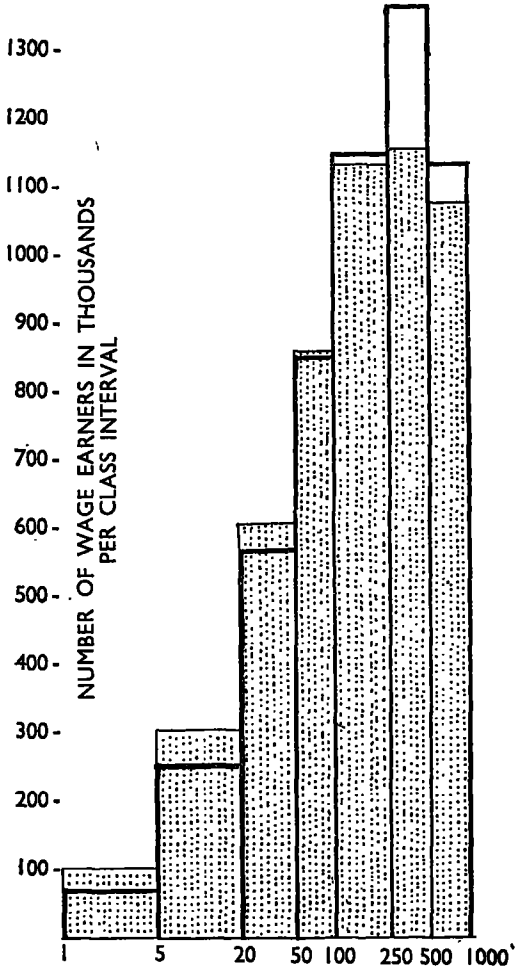

FIG. 1. *Distribution of wage-earners among different size classes of establishments in U.S. manufacturing industries in* 1919 *and* 1937

Abscissa: Size of establishment, measured by number of wage earners (logarithmically plotted).
Thin line: Distribution in 1919 (shaded). Thick line: Distribution in 1937.

per class interval, so that the area of the rectangles indicates the correct proportions of wage-earners in the various classes. The upper class

(establishments over 1,000 wage-earners in 1919 and over 2,500 wage-earners in 1929 and 1937) had to be omitted because no class limit is known.

The graph shows distinctly the reduction in number of wage-earners in the lower size classes up to 100 wage-earners, and the increase in the size classes above that level, especially in the modal class of 250 to 500 workers. The median of the distribution developed as follows:

1914	207	workers	per	establishment.
1919	284	„	„	„
1929	274	„	„	„
1937	318	„	„	„

That means that half of the workers in manufacturing in 1914 were in establishments with more than 207 workers, and half in 1937 were in establishments with more than 318 workers.

As we can assume that very small establishments are usually held singly by one small firm, the reduction in small establishments most probably means a reduction in small firms.

B. ABSOLUTE AND RELATIVE CONCENTRATION

The conclusion just reached is confirmed if we turn to statistics of operating firms which are available from 1929 onwards.[1] The firm, in these statistics, is defined as 'a private business conducted for profit and operated under a single management'; corporate subsidiaries are treated as separate firms.[2] We find that the number of firms in manufacturing declined from 251,300 in September, 1929, to 214,200 in September, 1939. In the course of the war there was a recovery to 228,600 in September, 1943, but even so the number of firms remains below the 1929 level. (That the number of firms is greater than that of establishments in the Census is due to the fact that the latter excludes establishments below a certain level of output.)

For the last decade before the war absolute concentration in manufacturing seems to be an undisputable fact. If we turn, however, from manufacturing to other industries, we find a radically different picture (Table XVI, p. 57).

The total number of operating business firms in U.S. increased by about 10 per cent from 1929 to 1939. The bulk of the increase took place in retail trade, while service industries and transportation also showed an important growth in the number of firms. Some other industrial

[1] H. R. Bowen, D.W. Paden, and G. B. Wimsatt: The Business Population in Wartime. *Survey of Current Business*, May, 1944.

[2] *Ibid.*, p. 9.

groupings show a moderate decline in numbers: mining, construction, real estate, and finance. More light is thrown on this development in another article by Mr. Bowen in the *Survey of Current Business*.[1] The writer remarks that expansion is shown in some lines of retail trade and services whereas in others absolute concentration (that is, a decline in number of firms) is found. The same is also true for manufacturing, only that here the effect of concentration in one part of the industries outweighs that of the expansion in the other. It is further pointed out that there was a mushroom growth of firms in 'small business industries' which are either relatively new, or rapidly expanding recently: eating and drinking establishments, filling stations, radio repair shops, beauty shops, etc. The number of firms in these industries is indeed not inconsiderable. (In September, 1939, there were 295,700 eating and drinking places, 226,700 filling stations, together almost a third of retail shops; and there were 203,400 barber and beauty shops, again a third of establishments in the service industry.) The suggestion is that the surprising increase in the total number of firms is due to the development and expansion of 'small business industries' which are chiefly the domain of small, often *very* small firms. The circumstance that these industries are mostly non-essential from the point of view of the war effort incidentally also explains the rapid decrease in the number of firms which has taken place during the war (see Table XVI), and makes it appear likely that this decrease as such is mostly a temporary war-time phenomenon. Once non-essential supplies are again available, the number of filling stations, etc., will increase again. The more lasting effects of the war on size structure are less obvious now, but will probably reveal themselves later. Just as in the last war there is likely to be, together with the war-time incentive to technical development, an increase in size of establishments, from which a further concentration in manufacturing may result.

To sum up the evidence: Absolute concentration in manufacturing as a whole can be observed from 1919 onwards. In industry as a whole, however, the number of firms never ceased to increase, not even in the decade 1929–1939, when the secular development of the system as a whole showed no rapid expansion. This fact requires some discussion. We should expect that the technical advantages of larger enterprises in a period of only very slow growth, or almost stationary development, would oust small firms in great numbers.[2] That this is not the case in the

[1] Howard R. Bowen: Trends in the Business Population. *Survey of Current Business*, March, 1944.

[2] For a demonstration of this see my article, Risk and Capitalist Enterprise, *Oxford Economic Papers*, No. 7.

economy taken as a whole has, it is true, very little bearing on the growth of monopoly and concentration of economic power. Small scale industries with little capital and hundreds of thousands of entrepreneurs may persist without making any difference whatsoever to the monopolistic domination of the system, if the rest of industry, embodying the great bulk of the capital equipment, is concentrated in few hands. But the continued existence of a numerous class of small entrepreneurs has a certain social and political importance, and the question is therefore worth attention.

Making use of the above quoted explanations we can say that the growth in the total number of firms is due to a relative expansion of the 'small business industries' which covers up the effects of absolute concentration going on meanwhile in other industries. Indeed, we can even say that this process of expansion of small business industries must hasten the process of absolute concentration elsewhere, provided that the growth of the economy as a whole is slow as compared with the rate of relative concentration in old, 'large business' industries, and that the expansion of 'small business industries' takes place partly at the expense of other industries.

The remarkable fact is that, if we take the economy as a whole, the smallest firms are not necessarily those which are pinched out first by the process of concentration; the reason being that, as far as they are in small business industries, they are sheltered from the competition of other industries, having a separate market which is only little related to other markets of substitutable goods or services. Thus the pressure of competition will not easily drive them out, and instead it is fully concentrated on small firms in the industries where large scale production competes with them; and in these industries not only small but even medium firms may indeed be driven out while very small firms in small-business industries still resist the competitive pressure.

This still leaves the question open why large firms do not enter the small business industries. The first answer would be that they are just not suited for large scale technique. This answer is not quite satisfactory. Many industries which once seemed suitable for small scale operation only have seen technical development and economies of large scale emerging from it; this may happen again. An explanation may perhaps be found in the fact that the 'small business industries' are often relatively new, and in any case, with respect to the total capital engaged in them, less important. It may be that large capital simply does not bother to enter such industries as long as it considers them insignificant. That would mean that the historical development, in which the small entre-

preneur preceded the big capitalist, is being repeated in newly developing industries.

C. CONCENTRATION OF CAPITAL

The most relevant measure of concentration (from the point of view outlined in Chapter I) is the concentration of capital in controlling units; that is, including in a corporation subsidiary firms and corporations controlled by a holding of the majority of shares. Such a measurement of concentration has been attempted for the sphere of corporate enterprise and excluding financial corporations (banks, insurance companies, real estate) by A. A. Berle and G. C. Means,[1] and an improved estimate was published more recently by the National Resources Committee.[2] These measures involve a comparison of the largest 200 non-financial corporations (measured by value of assets), each of which includes subsidiaries and majority-controlled companies, with the total of non-financial corporations. To compare assets without double-counting, the taxable investments were deducted from total assets (thus excluding intercorporate holding of securities). An alternative method is secured by comparing only physical assets held by the giant corporations and the total non-financial corporations respectively. The resulting proportions are shown in Table XVII, p. 58. It appears that the 200 corporations in 1933 held 55 per cent of assets excluding taxable securities, 60 per cent of physical assets including inventories, and 64 per cent of land, buildings, and equipment of all non-financial corporations. It is further estimated that if all industrial wealth inclusive of that owned by non-incorporated firms is considered, the proportion of physical assets controlled by the 200 units is 46–51 per cent.[3]

A lesser but sufficiently formidable concentration is found in manufacturing taken by itself. The 100 largest corporations in manufacturing controlled (in 1935) 21 per cent of the manpower, 25 per cent of the value added, and 32 per cent of the value of products in the industry. The proportion of capital must be much greater than that of manpower, and is estimated by the National Resources Committee at no less than 35 per cent.[4]

Unfortunately, the figures of Table XVII do not cover a sufficiently long period to serve as evidence as to the present trend of concentration.

[1] *The Modern Corporation and Private Property*, 1933. Also: G. C. Means, The Growth in Relative Importance of the Large Corporation in American Economic Life. *American Economic Review*, March, 1931.

[2] *The Structure of the American Economy*, Part I, Washington, 1939.

[3] *The Structure of the American Economy*, p. 106. [4] *Ibid.*, p. 103.

The increasing concentration they show between 1929 and 1933 is obviously influenced by the cyclical depression. But it is quite sufficient to look at the absolute value of the proportion in order to realize that a tremendous concentration of control over capital has gone on in the past, and that a very high measure of concentration of economic power has been reached already. Since Marx wrote *Capital* his theory of concentration has been vindicated indeed.

TABLE XIII

WAGE-EARNERS IN ESTABLISHMENTS OF DIFFERENT SIZE CLASSES AS PERCENTAGE OF TOTAL WAGE-EARNERS, U.S. MANUFACTURING

Size of Establishment in No. of Wage-Earners	1914	1919	1921	1923	1929	1933	1935	1937
1 to 5	2.8	2.9	3.3	2.6	3.3	2.7	2.6	2.0
6 to 20	9.1	7.1	9.0	7.3	7.0	7.6	7.1	6.0
21 to 50	11.2	9.5	11.7	9.7	9.5	10.1	9.4	8.8
51 to 100	11.8	10.2	11.7	10.4	10.3	10.9	10.3	9.9
101 to 250	19.5	17.8	19.3	18.2	18.0	19.2	17.9	17.8
251 to 500	15.4	13.7	14.2	15.1	14.8	15.6	15.1	15.9
501 to 1,000	12.7	12.8	11.5	13.4	12.9	12.9	13.6	13.2
Over 1,000	17.5	26.0	19.3	23.3	24.2	20.9	24.0	26.4
TOTAL	100	100	100	100	100	100	100	100

Source: *T.N.E.C. Monograph 27*, The Structure of Industry.

TABLE XIV

NUMBER OF ESTABLISHMENTS IN DIFFERENT SIZE CLASSES, U.S. MANUFACTURING

Wage-Earners per Establishment	1914	1919	1921	1923	1929	1933	1935	1937
1 to 5	74.766	105.080	93.144	86.544	102.097	61.285	76.929	69.049
6 to 20	53.033	53.419	52.751	53.581	52.410	39.492	46.163	46.402
21 to 50	22.380	24.592	23.278	24.612	24.330	18.160	20.910	23.138
51 to 100	10.728	11.986	10.619	11.932	12.057	8.919	10.373	11.911
101 to 250	8.090	9.548	8.047	9.519	9.690	7.175	8.251	9.745
251 to 500	2.882	3.326	2.658	3.567	3.579	2.619	3.141	3.911
501 to 1,000	1.200	1.570	1.075	1.592	1.579	1.097	1.421	1.660
Over 1,000	577	905	576	849	921	578	755	978
All Establishments	173.656	210.426	192.148	192.196	206.669	139.325	167.916	166.794

Source: *T.N.E.C. Monograph* 27, The Structure of Industry.

TABLE XV

DISTRIBUTION OF WAGE-EARNERS AMONG SIZE CLASSES OF ESTABLISHMENTS,[1] U.S. MANUFACTURING INDUSTRY

(Thousands of wage-earners)

Size Classes of Establishments (in wage-earners)	*Size-Class log. measured*	*Number of Wage-Earners per Class Interval (Class Interval:* 0.301)			
		1914	1919	1929	1937
1–5	0.699	78	104	119	73
6–20	0.602	291	302	292	257
21–50	0.398	547	607	597	567
51–100	0.301	766	858	862	852
101–250	0.398	1,050	1,132	1,140	1,150
251–500	0.301	998	1,153	1,241	1,363
501–1,000	0.301	825	1,077	1,079	1,133
(Over 1,000)		(1,131)	(2,196)	(2,027)	(2,262)
1,001–2,500	0.398	—[2]	—[2]	786	816
(Over 2,500)		—	—	(985)	(1,182)

[1] The figures given in this table are used in graph, p. 49.
[2] Not available.

Source: *T.N.E.C. Monograph* 27.

TABLE XVI

ESTIMATED NUMBER OF OPERATING BUSINESS FIRMS IN U.S.[1]

(in 000)

	1929	1933	1935	1939	1943
Total, All Industries	3,060.0	2,850.4	3,025.4	3,316.7	2,861.6
Mining	22.8	21.4	22.3	21.4	26.2
Contract Construction	235.6	191.0	180.9	202.1	158.1
Manufacturing	251.3	169.0	199.3	214.2	228.6
Transportation, Communication, and Public Utilities	166.6	151.6	177.6	207.7	188.0
Wholesale Trade	120.4	116.5	127.8	144.8	114.8
Retail Trade	1,361.1	1,340.0	1,425.1	1,601.4	1,330.4
Finance, Insurance, and Real Estate	306.2	276.2	273.5	286.4	261.2
Service Industries	596.0	584.0	618.9	638.7	554.8

[1] Data refer to 30th September of the year.

Source: *Survey of Current Business*, May, 1944.

TABLE XVII

PROPORTION OF ASSETS OF ALL NON-FINANCIAL CORPORATIONS IN U.S. HELD BY THE TWO HUNDRED LARGEST AMONG THEM

Proportion of	1929	1930	1931	1932	1933
Total Assets	49.4	54.0	57.0	55.5	57.0
Total Assets less Taxable Investments	47.9	54.3	55.5	54.8	54.8
Land, Buildings, and Equipment (less Depreciation) and Inventories	52.4	—	—	—	59.7
Land, Buildings, and Equipment less Depreciation	58.0	60.1	63.3	63.1	64.2

Source: National Resources Committee, *The Structure of the American Economy.* Part I, p. 107

VI

WHAT FACTORS MAKE FOR THE CONTINUED EXISTENCE OF SMALL FIRMS?

THERE is no doubt that small firms have, in spite of many adverse influences, shown a great tenacity in surviving. This is especially surprising in view of the apparently very low profits and the frequent failures. The reasons for the tenacious defence put up by small business are summarized below.

1. The basic factor which explains why small firms are only slowly losing ground, is the fact that they can do so only to the extent to which bigger firms grow, and this again depends on their accumulation of capital which takes place at a certain pace, and therefore needs time. Big scale entrepreneurial capital does not spring from the ground, even if there are many large scale economies available for it; it comes into existence mainly by the growth of already existing large entrepreneurial capital (it is only a technical difference, whether this growth takes place, as it does in Britain, *inside enterprises*, or whether the profits distributed as dividends to the big shareholders who control the companies are accumulated and reinvested). The process of growth of big capital at the expense of small capital is therefore a gradual process which takes time. The pace of this process is very much influenced by a few further factors.

2. Imperfect competition by protecting the small firms' market constitutes an important factor in its ability to survive. The imperfection may be due to *rational factors*, like transport cost, which can hardly be eliminated. It may be due to differentiations in taste; that is, there may be an individuality of product to which the consumers really attach a significance. And finally the differentiation of the product and attachment of customers to particular firms may be simply due to irrational factors; that is, force of habit, ignorance of relevant facts, or laziness. The irrational factors are probably the most important; they account for a considerable cost to society without offering any advantage (gardening tools can be standardized without harm to individualists).

It may be asked whether imperfection of the market can be such an important force in protecting small firms in view of the fact that these firms have a high mortality and are again and again replaced by new small firms. It is true that the small firms which die lose their 'good-

will'; but the new small firms come in on a wave of good trade and acquire a limited small market quite easily from new 'unattached' customers without any particular cost; and once they have got it, the goodwill is established, and helps them to endure the crises longer than they could without it.

Imperfection in the labour market is perhaps even more important than that in the market of the product. A great part of the small firms are in the industries of unorganized cheap labour supply, where pressure on prices is more easily passed on to wages, and where there is thus little incentive for technical advancement by labour saving devices. In other industries, small firms competing with big ones often exist on the basis of a cheaper labour supply (such as can be secured in small towns for example).

3. Oligopolistic conditions in an industry are apt to secure the continued existence of a certain number of small firms in that industry. The reason is that the big firms which have established themselves as price leaders there have in most cases little to gain from the elimination of small firms which account only for a small part of total supply (and, on the other hand, they will successfully obstruct the replacement of these firms by a new big entrant). A certain high proportionate share in the market of an industry gives practically all the control over prices which can be desired. At the same time, the retention of the remaining small firms is desired by the dominating concerns as a matter of policy; they will, if need arises, render conclusive proof that there is no 'monopoly' in the industry, and in any collective representation they will appear as so many 'independent representatives' to support the policy of the leading firm. An enterprise with an expansive tendency, seeking an outlet for its accumulating capital, will therefore stop short of absorbing the whole of an industry and will rather expand into other industries in order to achieve influence over prices there.

What has been said above applies similarly to a cartellized industry. Indeed, a (voluntary) cartel could in most cases be correctly described as a means of strengthening the oligopolistic position of a few big firms in an industry, while at the same time tolerating the continued existence of small firms for political reasons.

4. Tenacious survival of small firms, lastly, is explained by the 'gambling' attitude of small entrepreneurs. It may seem odd to call them gamblers, but they certainly are, in the sense that they accept unusually high risks at very low remunerations. To judge from American data, a steady stream of small entrepreneurs is entering industry, only in order to fail after a short time and be replaced again by new hopeful candidates.

The explanation of this phenomenon is very easy: The social position of the entrepreneur ('to be his own master') is valued as such, and any small entrepreneur will struggle to the last to retain it, sustaining losses and still not giving up hope of success until he is financially unable to carry on. In the same way the potential entrants into the ranks of entrepreneurs will value this position highly, and will therefore not be deterred by the low average profits and high risks from the hope of succeeding and acquiring permanently a higher social status.

The position of the entrepreneur, apart from all social advantages, gives also a tangible immediate economic advantage, namely the possibility for the small entrepreneur to give employment to himself, and perhaps also to members of his family. This factor will gain the more importance the greater the unemployment among wage-earners. The small entrepreneur will then be the more determined to stick to his business, and a certain number of new entrants will appear simply as a consequence of general unemployment. Indeed, the self-employed small entrepreneurs are in a position to reduce their remuneration in real terms to any amount, whereas as wage-earners they would not be able to get employment by offering themselves at a lower rate.

It is therefore likely that high unemployment (especially of a secular character) contributes considerably to the determined 'holding on' of small firms as a group. This factor probably played a certain role in the United States in the 1930's.

The survival of small firms is thus dependent on a series of factors not very creditable to our economic system: Monopsonistic exploitation of labour, imperfection of markets due to 'irrational' reasons, unemployment, and the 'gambling preference' of small entrepreneurs, with all the waste of energy attendant on the high 'turnover' of small businesses. In other cases their continued existence is only due to toleration by big business, and affords a mere semblance of independence. For this a further example may be found in the vertical disintegration of certain processes, parts of which can be performed on a small scale. This type of vertical disintegration was mentioned by Marshall[1] as offering the prospect of new opportunities to small entrepreneurs. But in fact these 'subcontractors,' or small processors and distributors of products made by big firms, being numerous and small partners in a bargain with few big firms, are economically quite weak and their independence is largely fictitious.

This fact of gradual loss of economic—and consequently political—

[1] *Industry and Trade*, pp. 244 seq.

independence of small entrepreneurs is worth attention. If small business would, for example, be faced with the choice of either adopting co-operative methods and accepting a greater degree of government interference, or of opposing such measures, they might well consider that the latter alternative only means falling more and more under the domination of big business.

VII

TECHNICAL PROGRESS AND THE SIZE OF THE FIRM

IF it is taken for granted that technical progress and an increase in the productivity of labour is a desirable aim, it follows that a rigid policy of preservation and protection of small business in its present form could not be pursued without disadvantage. This disadvantage would arise in all those cases where the unit cost of production in the small operating units is greater, given identity of the product of the various firms; and it would also arise where the small firms produce differentiated products which cannot be directly compared with the standardized product of a large unit, but which cost so much more that on a reasonable judgement we should decide that the price of this 'individuality' is too high. As has been shown above (Chapter III) it does no harm if the reduction in unit cost of production can be achieved only with a greater use of capital (greater capital intensity); this will only be a valuable help towards the achievement of full employment. Examples of relative inefficiency of small scale production have been given for America (see Chapter II, page 15). In Britain the chief industries offer examples which are all too familiar (in the steel industry, coal mining, cotton spinning, in many branches of distribution, such as coal, milk distribution). The superseding of this small scale production by bigger units has been a permanent but not always too successfully realized aim of industrial policy in pre-war Britain. It is thus difficult to deny that the immediate interests of small producers are often opposed to technical progress.

(On the other hand, however, the gradual process of expansion of large concerns and the corresponding gradual displacement of small business is not, in the conditions of our time, a guarantee of technical progress and cost reduction.) An expanding large firm will always try to turn its greater size to special advantage, but for this other ways than cost reduction are available. First, the very large concern may aim at a 'spreading of risks' by acquiring holdings in various lines. Second, and more important, it may aim at 'monopolistic,' or rather 'oligopolistic,' domination. This aim will be realized by acquiring a large enough share in the market of an industry. If the scale of production is already fairly large and the capital investment necessary for an efficient producer heavy, then new entrants will find it difficult to come into the industry and the firm (or the group of firms) which has secured a large share will

be able to increase prices. A further growth of the concern will find new profitable fields for activity in the industries producing near substitutes, or providing a source of supply to the first-mentioned industry, or processing or distributing its products.

The large and growing concerns, having at their disposal these means of turning their greater size to advantage, will not only use them, but they will tend, in the conditions so created, to neglect cost reduction and technical progress. They are able to acquire a greater share in the market by the buying up of existing plant. Once they have secured a substantial part of the industry's equipment they are less keen on technical progress and the replacement of old plant by new large scale plant, because this implies scrapping their own equipment. As long as industry had not reached the stage of 'oligopoly,' technical progress was much more likely to occur, because in a rapid expansion of an enterprise under these conditions, the equipment which was displaced and rendered valueless was largely the equipment of competitors.

Another reason for neglecting technical progress may be found in a point elaborated earlier (p. 34): Big firms in oligopolistic industries will have high profit margins and these make it difficult for capital intensification to appear profitable. The big firms, if they wish to expand, are then driven to extend their monopolistic domination into new fields, because in this way they can often avoid the decline in the rate of profit which they are likely to experience when trying methods of capital intensification while their profit margin is high.

It is not possible to judge *a priori* how far this circumstance is responsible for the general slowing down of technical progress (at least of the capital-intensifying type) in the era of monopoly capitalism. It may be that this phenomenon is explained by other factors. But on the face of it the argument is one or a part of the possible explanations. The point is that in a time of predominant competition high profit margins gained by new methods always tended to be reduced again by a shift of the cost-price relation ($F_{(z)}$) and the elimination of high cost producers. Under oligopoly this squeezing of profit margins is not likely any more because no new competitors are entering. It might be thought that profit margins under these conditions could still be squeezed by a secular depression. But that would not have the desired effect on the calculations of the entrepreneur, because he would not base them on the profit conditions obtaining with an abnormally low capacity use. He would first eliminate the excess capacity or at least *plan* to eliminate it, before he would consider capital intensification. He will always, if he considers installation of equipment, plan its capacity so as to have it 'normally' used on the

average with the expected level of demand.[1] On this basis of 'normally' used equipment he will compare the effects of capital intensification with the methods previously used, and on this basis profit margins will again appear high (prices being notoriously rigid under oligopoly), even though in fact they remain low as long as the abnormal excess capacity is not actually scrapped.

Under oligopolistic conditions, therefore, the long run shift in the function $F_{(2)}$—the squeezing of profit margins—does not take place any more, and this would seem to imply that an incentive for capital intensification has vanished How important this is in determining the trend of technical progress must be left open. There are obviously a series of other factors which may bring about the same result in a simpler way: The neglect of technical progress may result from the mere concentration of the entrepreneur's interest on the securing of monopoly positions, simply because this forces on him a particular outlook, training, and a particular organization of industry ('finance capitalism').

In any case there are sufficient grounds to believe that the cause of technical progress in the present stage of development is not served well by either big or small business. There seems to be something wrong with both of them. In popular discussion the issue presents itself somewhat as follows. The protagonists of small business say: Big enterprises have a monopoly position, and they use it, and get their advantage from it, they care little about efficiency. Whereas the defenders of large business say Small business is technically backward, and unable to use modern methods of large scale production, only large concerns can produce efficiently. Unfortunately, the two statements are not necessarily contradictory, and they are to a large extent both correct.

Some broad conclusions as to the policy to be adopted with regard to small business may be drawn here. One line of approach frequently suggested is that of combating the monopolistic advantages of big business by anti-monopoly legislation. The other is that of offsetting them by giving to small business compensating advantages in their turn, in form of protection of one kind or another.

The first of these policies is largely futile and ineffective. The monopolistic power rests on the concentration of a large part of output in few hands, and not on any legal or contractual framework; price leadership and tacit agreement cannot be prevented by any anti-trust legislation. The forms of monopolistic domination may be different in Britain, where cartels are fitted into the framework of government policy, and in the United States of America, where they are outlawed, but the

[1] That does involve a certain degree of excess capacity which might be called 'intentional' or 'planned' excess capacity

essence of monopoly is the same here and there. The only effective attack on monopolies is that which through the control of prices and profit margins leads to nationalization.

The policy of protection for small business can only be effective in so far as it limits the free entry into the respective line of business (for example, by licensing). 'This is the policy which was common in various continental countries, to protect small retailers, etc. It will protect one section of small business against those who are left outside, and against the consumer. Its effectiveness remains in doubt, because it does not prevent the continuing encroachment of big business into the sector of small firms. Other than restrictive measures cannot protect small business, in view of the relatively abundant supply of small entrepreneurs. If, for example, tax relief or even direct subsidies were granted to small business, these would very largely either be passed on to the consumer, or they would be absorbed in the cost of greater excess capacity due to an influx of more competitors, or they would go into the pockets of the big business man where he is supplier or main contractor to the small firm, and owing to his strong bargaining position will not grant more profit to the small business man than the minimum which will just keep him in business.

It can easily be seen that there is one condition which must be fulfilled if small business is to make the best of its situation: It is 'a high and stable level of employment.' This will reduce the pressure of supply of small entrepreneurs, because with good employment prospects people with small capital will not crowd into business just to give employment to themselves. At the same time it will give scope for the activity of 'small business industries' (for example, service industries).

A reasonable policy for small business would have to go to the root of the trouble which lies in the diseconomies of small scale. In many cases this disadvantage may be eliminated or reduced by some kind of co-operative action. If large scale economies are conspicuous in one particular function of the business (for example, in purchase) this function may be split off and performed in common by a co-operative of small entrepreneurs, controlled by themselves. Financial disadvantages of small business could be reduced by government action (for example, by letting of premises or granting of credit). This, in turn, would presuppose co-ordination of small business with the interests of public policy. It may be that the prospects of small entrepreneurs co-operating with each other and gladly adjusting themselves to the objects of government policy are not too bright; but clinging to individualist attitudes will hardly alter or hold up the trend of technical development.