THE NEW INDUSTRIAL ORGANIZATION AND SMALL BUSINESS

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Abstract

The small business sector is an important part of the American economic landscape, in both absolute and relative terms. Despite its absolute growth, however, the sector accounts for a diminishing share of private sector activity. But its importance, and changes in importance, vary across industrial sectors of the economy.

Drawing on the theoretical and empirical insights developed in recent books by John Sutton, we suggest that the presence or absence of endogenous strategic behaviors of the larger firms with respect to advertising, promotion, research and development, and other sunk cost expenditures may well play an important role in explaining the differing levels of small business importance, both cross-sectionally and over time. We conclude the paper with suggestions for research directions that could shed further light on these ideas.

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I. INTRODUCTION

When asked why he robbed banks, Willie Sutton was reputed to have explained, "Because that's where the money is." If asked why they study large profit-making enterprises, most industrial organization economists would probably answer, "Because that's where the interesting questions are." (Some might give Willie Sutton's response as well.) But while large profit-making enterprises clearly raise interesting and important questions, so do nonprofit organizations, public enterprises, and small businesses. This paper focuses on the role and importance of small business, and on the economic research issues that they raise. We are particularly interested in the implications of the so-called "new industrial organization" for small business.

This paper begins with an analysis of the importance of small business in the U.S. economy. As the analysis makes clear, small business constitutes a major sector in the economy, but equally importantly, it is of differential importance in different industries and over time. One concern highlighted by this review is the number of industries where the role of small business has diminished over time, raising a question as to whether this is the result of market forces or of less benign factors. That question is addressed is the second part of this paper. There we discuss an important framework from the new industrial organization that provides one explanation as to how

small business may be systematically disadvantaged by strategic behavior undertaken by larger companies. We will then show how this framework can help explain small businesses' differential success among industries and indicate what further research would help clarify the mechanism and its policy implications.

II. THE POSITION OF SMALL BUSINESS IN THE U.S. ECONOMY

In this section we describe and discuss the recent (1988-1996) aggregate absolute and relative position of the small business sector in the U.S. economy. As our discussion at the end of this section indicates, these data are consistent with earlier findings.

Our definition of small business encompasses firms that have either fewer than 100 employees or fewer than 500 employees. Both are standard benchmarks,[1] although an enterprise with 499 employees would strike many observers as "small" only in a comparative sense.[2]

Our measure of the position of small business is the aggregate employment in those firms.[3]

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[1] See, for example, Acs and Audretsch (1990).

[2] After all, if the labor cost per employee were $50,000 and employee value added were 50% of the firm's revenues, a 499 employee firm would have about $50 million in revenues.

[3] In principle, the value added in enterprises would be a better measure of their economic importance; in practice these data are not available. Two other potential measures, which are available -- the number of firms and the number of establishments -- are less indicative of the absolute and relative importance of a sector. A final potential measure is aggregate payroll, which is available (and which, of course, is a component of value added). Payroll data are less evocative of relative importance, however, than is employment. Accordingly, we will focus on employment. It is worth noting, however, that the payroll data show a similar pattern to that which we report for employment -- i.e., an absolute increase but relative decrease for the small business sector over the 1988-1996 period.

The employment data come from the Small Business Administration's Office of Advocacy.[4] The data pertain to "private employer firms," which encompass private-sector enterprises that have employees. The data exclude the self-employed; farms; railroads; the U.S. Postal Service; households (e.g., as employers of domestic workers); and large pension, health, and welfare funds. The data do, however, include enterprises in the non-profit sector.[5]

As can be seen in Table 1, the aggregate employment in small businesses, under both definitions, increased over the years 1988-1996.[6] For the under-100 category, the percentage increase over these years was 9.6%; for the under-500 category, the increase was 11.0%. In all years except 1991 (a recession year), the annual change in both categories was positive.

The overall private sector was growing during these years (except for 1991) as well, however. As the last column of Table 1 indicates, overall private sector employment by these "employer firms" rose by 16.3% during the 1988-1996. Thus, in relative terms, the small business sector lost ground. Further, it is worth noting that this loss of ground occurred during a period that (with the exception of 1990-1991) encompassed strong economic growth for the U.S. economy.

This loss of relative position is revealed dramatically in Table 2. Regardless of the category of small business that is used, the relative importance of the small business sector declined steadily

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[4] The data are posted on the Office of Advocacy's Website. The sources of the data are files compiled by the Bureau of the Census.

[5] For further descriptions of the data, see Armington (1998) and Robb (1999, 2000a, 2000b).

[6] It is important to note that these data constitute a contemporaneous "snapshot" of employment in firms of each size category in each year. By contrast, other estimates of the importance of small business -- especially those that emphasize job growth -- sometimes trace the subsequent employment totals for firms that were initially (as of a base year) in a small business size category. See, for example, U.S.SBA (1999).

through the 1988-1996 years. For both categories the rate of decline has been almost one percentage point for every three years of changes.

This relative decline can be explored in somewhat greater depth by examining the employment data for broad (one-digit) sectors of the U.S. economy. In Table 3 we present the small business shares for 1988 and 1996 for the broad sectors. For the first five sectors shown in the table, the relative positions of small business within the sectors did not change substantially over the 1988-1996 period; in some instances, the relative position of small business even increased. For the remaining four classifiable sectors, however, the relative decline of small business was substantial. The relative decline of small business in the services sector was especially sizable.

These sector-specific patterns raise the following question with respect to the pattern of relative decline of small business that is reported in Table 2: To what extent was the pattern of decline in the aggregate position of small business influenced by these sectoral changes and to what extent was it influenced by the changing relative importance of the various sectors (e.g., the decline in manufacturing and the rise in services)?

To address this question, we first report the broad sectoral employment percentages for 1988 and 1996 in Table 4. As can be seen, the services sector experienced a large increase in relative importance over these years. All but one of the other classifiable sectors experienced declines in relative importance; the decline in the importance of the manufacturing sector was the most sizable.

The changes in the manufacturing and services sectors illustrate the potential influence that

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changes in sectoral importance could play in determining the overall pattern of the relative decline of small business. Manufacturing was a sector in which small business was relatively less important in 1988 (only 21.3% of employment in that sector was in firms with less than 100 employees), but manufacturing experienced a decline in relative importance over 1988-1996. By contrast, services was a sector in which small business was relatively more important in 1988 (44.7% of employment in that sector was in firms with less than 100 employees), and services experienced a sharp increase in relative importance over 1988-1996. These changes in weights, with the rising importance of services, could offset declines within sectors.

In Table 5 we present the results of calculations that bring out these roles of the changing relative importances of small businesses within sectors and the changing relative importances of the sectors themselves. In the first two rows of Table 5 we reproduce the aggregate percentage figures from Table 2 for 1988 and 1996. In the third row we present the computational result of holding the relative employment shares (weights) of the sectors constant at their 1988 levels and allowing only the relative importance of small business within each sector to reflect their 1996 values. As can be seen, if sectoral employment weights had remained unchanged, the aggregate small business percentage share would have been even lower in 1996 than it actually was. The changes in the employment weights (especially the increase in the relative importance of the services sector) clearly did offset the more severe declines in the small business shares that were occurring within some sectors.

In the fourth row of Table 5 we present a somewhat similar computational result, in which we held the small business shares within each sector constant at their 1988 values and allowed only

the relative employment importance of the sectors to reflect their 1996 values. As can be seen, if the small business shares within each sector had remained constant, the changes in the employment shares would have caused the aggregate small business percentage to rise from its 1988 levels. Again, the powerful role of the services sector is primarily responsible for this result.

Thus, the actual changes in the relative role of small business in the overall economy were indeed the result of the interplay between the changes in relative positions of small business within the individual sectors and the changes in the relative importances of the sectors themselves.

The patterns that we have described in this study -- absolute increases but relative decreases for the small business sector, with the relative decreases influenced by changes in sectoral employment weights -- are consistent with the patterns reported in an earlier study by one of the authors (White 1981, 1984) for the years 1958-1977. The relative decline of the small business sector that we have found for 1988-1996 thus appears to be a continuation of a longer-term trend.

III. SUNK COSTS AND SMALL BUSINESS

As the above review makes clear, small business is of considerable importance in the U.S. economy overall, but there is enormous diversity in its prevalence across sectors, and there have been substantial changes in its importance in some industries over time. The traditional explanation for this diversity and change relies on exogenous cost considerations, specifically, on the interaction of scale economies and demand factors.[7] We shall show why that explanation leaves much to be desired and introduce a different framework from the new industrial organization. This alternative

view focuses on the endogenous, strategic actions on the part of leading firms that alter the competitive process in their favor and to the disadvantage of smaller businesses.

The traditional view of small versus large business is straightforward: Scale economies in an industry can be described by a declining-and-then-flattening long-run average cost curve such as that in Figure 1. The smallest output at which cost is minimized is the so-called "minimum efficient scale" (MES). No firm needs to be larger than this to achieve all cost efficiencies. Thus, if one knows the "size of the market" –– roughly, the output where the demand curve intersects the long-run average cost curve –– then the "necessary" degree of market concentration (i.e., the minimum level of market concentration that is consistent with all firms' being at MES) can be determined. One divides that market size S by the minimum efficient scale m to obtain the number of efficient-size firms that fit into the industry, N:

$$N = S/m \qquad\qquad\qquad (1)$$

This framework has several straightforward implications. Markets that are relatively large, with demand curves like D_1, allow numerous efficient-size firms and have correspondingly low concentration. Smaller markets like D_2 result in higher concentration, but market growth over time should result in deconcentration as rightward shifts of demand overtake scale considerations. On the other hand, if scale economies in an industry increase over time, so should concentration, other things equal. Finally, it should be observed that firms exceeding minimum efficient scale must have achieved such size for reasons other than scale economies.

This model of market concentration dates back to Bain (1956) and has been relied upon in

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[7] For example, see White (1982) and Acs and Audretsch (1990, ch. 4).

most subsequent research. While it provides important insights into the broad contours of industry structure, this model ultimately does not do a very good job at explaining the finer details of the structure of many industries. In their benchmark review of this literature, Scherer and Ross (1990, p. 114), for example, conclude that "least-cost plant sizes tend to be quite small relative to the national market -– too small to warrant [the] high levels of concentration" that actually occur. Even after allowing for regional markets for some industries and for multiple plants where those confer additional economies, their conclusion persists: In U.S. industry generally, concentration is greater, leading firms are larger, and smaller firms are less numerous than would be implied by the relationship of scale economies and market size.

Consider the often-studied brewing industry: In 1947 the industry was composed of over 400 companies and had a four-firm concentration ratio of just 21 percent. Over the next 35-40 years, while industry sales (in physical quantities and in constant dollars) more than doubled, the number of companies declined by about 85 percent, driving four-firm concentration up to 87 percent. Thus, instead of market growth's resulting in a reduction in concentration, it was accompanied by the largest concentration increase of any major industry over this period of time. True, the underlying technology of the industry caused some increase in minimum efficient scale. But this can account for at most a four-fold increase in size (Scherer 1996, pp. 405-406), whereas the average size of the top four firms has gone from $435 million to $3.66 billion (in 1992 dollars) -– a nearly nine-fold increase.

Such empirical anomalies have been a source of interest to industrial organization for a long time, but until recently there has been no comprehensive, compelling, and testable explanation for

them. That awaited the advent of the new industrial organization over the past fifteen years. The new I.O. has two manifestations. On the one hand, it models individual oligopoly firms using game theory and a dynamic framework, with a view to an improved understanding of how individual firms develop and exploit their unique market positions. This is in contrast to traditional theory, which focuses on how oligopolists collectively achieve cooperative outcomes and maintain above-competitive profits for all. The second characteristic of the new I.O. is its emphasis on careful empirical estimation of theoretical predictions and underlying phenomena rather than the more casual empiricism that often characterized the older tradition. Of course, in order to undertake estimation based on the new I.O., that theory must yield testable implications, and data must be available for measuring such novel concepts as sunk costs.

The new industrial organization consists of a diverse set of models and evidence, and by no means do all of them satisfy these criteria. One example that does this –- and that forms the basis for analysis of the key questions posed in this paper -- is the work of John Sutton (no known relation to Willie). Sutton (1991, 1998) integrates some observations from traditional theory with key elements of the new I.O. into a testable model of industry structure and evolution. The model explains a great deal of the variation in firm sizes and in the different fates of small versus large businesses in various types of industries.[8]

The last phrase is key, since Sutton's theory carefully distinguishes between different types of industries in terms of the forces that govern their structure and evolution. Specifically, Sutton (1991) shows that the simple model of equation (1) above is approximately correct only for an

industry characterized by <u>exogenous sunk costs</u>. Sunk costs are those that cannot be recovered when production ceases. These would be illustrated by capital investment that has no use outside the industry in question and hence is lost upon exit. Exogenous sunk costs are those that are determined by the underlying production technology in the industry. These are precisely the assumptions implicit in the discussion underlying equation (1), and Sutton concurs that in this case a larger market is generally associated with lower concentration. This proposition is illustrated by the line in Figure 2, which shows the declining relationship between market concentration and a variable representing the ratio of market size divided by minimum efficient scale (as a proxy for sunk costs).[9]

Sutton adds two refinements to this proposition. First, he notes that the actual relationship between seller concentration and market size also depends upon the strength of price competition in the industry. When such competition is stronger, fewer new competitors are attracted by market growth since the profit expectations for entrants are low.[10] Hence, the line in Figure 2 describes a lower bound on the relationship, rather than the exact estimate for all such industries. Second,

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[8] Major reviews of Sutton (1991) are provided by Bresnahan (1992) and Schmalensee (1992).

[9] See Sutton (1991, chs. 4 and 5) for further discussion of the development of these estimates.

[10] As an illustration of this apparently counter-intuitive proposition, consider an industry that produces homogeneous goods and in which there are no diseconomies of large-scale production. If competition in this industry is characterized by "tough" (i.e.,"Bertrand") rivalry -- i.e., each seller ignores the price reactions of others when it contemplates the setting of its own prices -- then as few as two firms will produce a zero (economic) profit equilibrium, regardless of the size of the industry. The prospective profit opportunities for entrants will generally appear dismal, entrants will be unlikely to enter, and seller concentration will remain high. As competitive conjectures among the incumbent firms "soften," a larger number of firms will be required to achieve a zero-profit equilibrium (or a limit-price equilibrium with positive profits for incumbents), and seller concentration will be lower.

Sutton distinguishes homogenous products industries from those characterized by product differentiation. Figure 2 holds (as a lower bound) for the former, whereas a differentiated products industry will lie above that bound to a degree that depends upon the extent of differentiation.

Sutton finds good evidence that these considerations apply to a number of industries. Figure 2 reproduces his scatter diagram for six homogeneous goods industries in six countries, showing that concentration does indeed persistently decline as the size/sunk cost variable grows, with the solid line denoting the lower bound.

If this were all that there was to Sutton's theory, it would represent at most a modest extension of Bain's theory of industry structure. But there is another class of industries that Sutton identifies and analyzes. The scatterplot of seller concentration versus market size for these other industries is depicted in Figure 3, and for these industries there is no tendency for market concentration to decline regardless of how large the industry grows. Firm sizes increase in tandem with market growth, smaller firms do not thrive, and high concentration persists. Which are these industries, and how does this occur?

The crucial element of this facet of Sutton's theory is endogenous sunk costs -- that is, sunk costs not determined by the underlying technology but rather by the strategic decisions of the leading firm (or firms) in the industry to make such an investment. The necessary characteristic of this investment is that it increases buyers' demand for the firm's product. Other firms that do not follow will lose customers and profits. But following entails higher fixed and sunk costs, giving rise to a larger necessary scale of operation and hence maintaining and even elevating the position of large leading firms, despite growth of the market. To extend our previous example of the

brewing industry, the discretionary sunk expenditure would be advertising. In other industries its role might be played by R&D or product development costs.

Sutton shows that for industries that conform to these not-overly-stringent assumptions, there is a <u>lower bound</u> on concentration regardless of market size: That is, the market will never converge to a fragmented state regardless of how large the market might become so long as further sunk expenditures continue to increase demand. The lower bound is higher as consumers are more attracted by the advertised product, but <u>any</u> demand shift will prevent deconcentration. The scatterplot in Figure 3 illustrates this non-convergence for fourteen advertising-intensive industries in six countries analyzed by Sutton. His regression analysis on the underlying data confirms that market size is a statistically insignificant explanator of concentration for these industries, although market size is highly significant in explaining concentration for the relatively unadvertised products in Figure 2.

In his second book, Sutton (1998) generalizes his earlier analysis by examining industries that are composed of several different groups or segments. Now couched in terms of R&D, this model focuses on a measure of the degree to which a firm that is spending more than its rivals on R&D thereby earns high returns. That, in turn, is a function of economies of scope among product groups as well as a parameter relating R&D to product quality and consumer willingness to pay. Sutton now demonstrates that for industries with low R&D/sales ratios, once again the lower bound of the relationship of concentration to market size is effectively zero, but where R&D (or advertising) intensity is greater, the lower bound of this relationship is an increasing function of the degree of homogeneity among product groups.

Sutton's theoretical approach, embodied in both books, provides a novel explanation for the failure of certain industries to become more fragmented as they grow. At the same time it suggests how fragmented industries can be transformed into highly concentrated ones, and how smaller businesses will lose ground. By initiating demand-shifting expenditures, large firms force smaller businesses to choose between the loss of customers and a heightened cost disadvantage (if the smaller firms attempt to match the larger firms' advertising or promotion expenditures). In this manner they alter the competitive process to their persistent advantage and preserve or even increase market concentration.

Among the prominent manufacturing industries that illustrate this theory are brewing, autos, computers, and coffee; a few words on each will highlight the mechanism.[11] In brewing the 1972 acquisition of Miller by Philip Morris resulted in a huge expansion of advertising expenditures and a bifurcation of the industry into a segment of large advertiser/brewers and a second tier of much smaller niche brewers (Scherer 1996). Consolidation of the auto industry in the 1930s and again in the 1960s coincided with periods of much more rapid (and expensive) style change, led by the larger firms at the time (Kwoka 1998). Computer platforms underwent shakeouts during the 1970s and 1980s as product development costs escalated (Bresnahan and Greenstein 1999). The coffee industry is notable since it consists of two segments –- roasted and instant –- both with high advertising but with very different setup costs. The roasted segment has low sunk costs and exhibits considerably lower concentration than the high-sunk-cost instant segment (Sutton 1991, ch.

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[11] These illustrations should not be interpreted as a claim that small business has largely or completely disappeared from manufacturing; the data in Table 3 clearly indicate otherwise.

12).

What does all this imply? Most importantly, it implies that the fate of small businesses is often in the hands of leading firms in their markets. Small businesses may be forced to compete on terms not of their choosing, and indeed on terms chosen strategically to disadvantage them. A further implication is that there is much to be learned from detailed study of particular industries, as has been undertaken by Sutton and the other named authors above. Sweeping generalizations simply cannot reveal the mechanisms that determine the structure and evolution of specific industries. Moreover, while any good industry study addresses all segments of the industry, industrial organization research would do well to devote more attention to the market and strategic environment in which small business operates. Such a focus would usefully complement the conventional preoccupation with large firms. It would help in understanding how the competitive environment is shaped and how small business must adapt to and operate within that environment. This would bring into sharper relief the constraints on small business and possibly suggest policies to address them.

IV. CONCLUSIONS

We began this paper by citing Willie Sutton's response to a question about the focus of his strategic behavior. We conclude with observations based on John Sutton's focus on the strategic behavior of large firms and their implications for smaller firms.

The small business sector is an important part of the American economic landscape, in both

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Nevertheless, the manufacturing sector does provide excellent illustrations of Sutton's theory.

absolute and relative terms. Despite its absolute growth, however, the sector accounts for a diminishing share of private sector activity. But its importance, and changes in importance, vary across industrial sectors of the economy. Among the likely reasons for these variances are the presence or absence of endogenous strategic behaviors of the larger firms with respect to advertising, promotion, research and development, and other sunk cost expenditures in specific industries.

If analysts and policy makers are to understand the reason for and role of small business in individual industries, the research base related to small business must be expanded. Sutton's explication of the strategic environments of industries suggests a number of research directions:

-- Why are some industries more prone to experience endogenous sunk costs (which tend to place small business at a greater disadvantage) than are others?[12] What are their important characteristics? What role does technological change -- exogenous or endogenous -- play?

-- To what extent are large firms' advertising and similar promotional expenditures focused solely on the firms' own perceived demand conditions and to what extent are they strategically aimed at disadvantaging their smaller rivals (i.e., "raising rivals' costs")?[13]

-- What potential counter-strategies are available to smaller firms when they face disadvantages of endogenous sunk costs? Why are the counter-strategies effective? Where and

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[12] As an initial observation, we note that the "commodityness" of an industry's output is likely to be a necessary condition for an industry not to be prone to endogenous sunk costs; but commodityness is probably not a sufficient condition. After all, it is difficult to think of a product that is more a commodity than is water; yet bottled ("designer") water has become an important market in the last two decades. Might we someday see "designer sugar" or "designer salt"?

[13] See Salop and Scheffman (1983, 1987).

when are they effective?

-- What are the welfare implications of Sutton's analysis and empirical findings?

-- Can Sutton's predictions and empirical findings be extended to a wider set of industries beyond the 20 that he examined? Can they be extended beyond manufacturing?

-- What policy implications, if any, follow from Sutton's analysis and empirical findings?

As we suggested at the end of the previous section, such research could sensibly be pursued through detailed case studies of individual industries as well as broader cross-sectional analyses.

In sum, the new industrial organization and its strategic implications open a new and interesting window on the prospects for small business. The opportunities for research that will open this window further appear quite promising.

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Table 1: Employment in Private Employer Firms
U.S. Economy, 1988-1996

Year	Employment in firms with fewer than 100 employees	Employment in firms with fewer than 500 employees	Employment in all firms
1988	35,153,344	47,914,723	87,844,303
1989	35,980,220	49,166,797	91,626,094
1990	36,621,948	50,166,797	93,469,275
1991	35,859,223	49,002,613	92,307,559
1992	36,057,451	49,200,841	92,825,797
1993	36,490,825	50,316,063	94,773,913
1994	36,889,313	51,007,688	96,721,594
1995	37,992,089	52,652,510	100,314,946
1996	38,524,694	53,174,501	102,187,297

Source: U.S.SBA, Office of Advocacy

<u>Table 2: Small Business Shares of Employment in All</u>
<u>Private Employer Firms in the U.S. Economy, 1988-1996</u>

<u>Year</u>	Firms with fewer than <u>100 employees</u>	Firms with fewer than <u>500 employees</u>
1988	40.0%	54.5%
1989	39.3	53.9
1990	39.2	53.7
1991	38.9	53.1
1992	38.7	53.0
1993	38.5	53.1
1994	38.1	52.7
1995	37.9	52.5
1996	37.7	52.0

Source: Table 1

Table 3: Small Business Shares of Employment in Private Employer Firms, by Sector, 1988 and 1996

Sector	Firms with fewer than 100 employees		Firms with fewer than 500 employees	
	1988	1996	1988	1996
Ag. svcs., forestry, fishing	77.4%	80.3%	87.0%	88.3%
Mining	28.3	27.8	39.4	41.3
Construction	73.7	75.1	88.4	89.5
Manufacturing	21.3	22.3	37.4	38.4
Trans., communications, utilities	25.6	25.5	35.4	36.0
Wholesale trade	53.1	50.2	68.4	65.9
Retail trade	45.4	40.9	56.2	51.2
Finance, insurance, real estate	32.3	31.3	44.7	42.7
Services	44.7	38.6	62.4	55.5
Nonclassifiable	70.1	100.0	54.5	100.0
All sectors	40.0%	37.7%	54.5%	52.0%

Source: U.S.SBA, Office of Advocacy

Table 4: Sectoral Shares of Employment in All Private Employer Firms in the U.S. Economy, 1988 and 1996

Sector	1988	1996
Ag. svcs., forestry, fishing	0.5%	0.6%
Mining	0.8	0.6
Construction	5.7	5.1
Manufacturing	21.9	18.2
Trans., communications, utilities	6.0	5.9
Wholesale trade	6.8	6.5
Retail trade	21.5	21.0
Finance, insurance, real estate	7.6	7.0
Services	28.7	35.0
Nonclassifiable	0.4	0.1
Total	100.0%	100.0%

Source: U.S.SBA, Office of Advocacy

Table 5: The Aggregate Effects of Changing Weights

|	Firms with fewer than 100 employees	Firms with fewer than 500 employees
Actual small business employment share in 1988:	40.0%	54.5%
Actual small business employment share in 1996:	37.7	52.0
Hypothetical small business employment share in 1996 if sectoral employment shares had remained unchanged at at their 1988 levels:	37.4	51.5
Hypothetical small business employment share in 1996 if small business shares in each sector had remained unchanged at their 1988 levels:	40.7	55.5
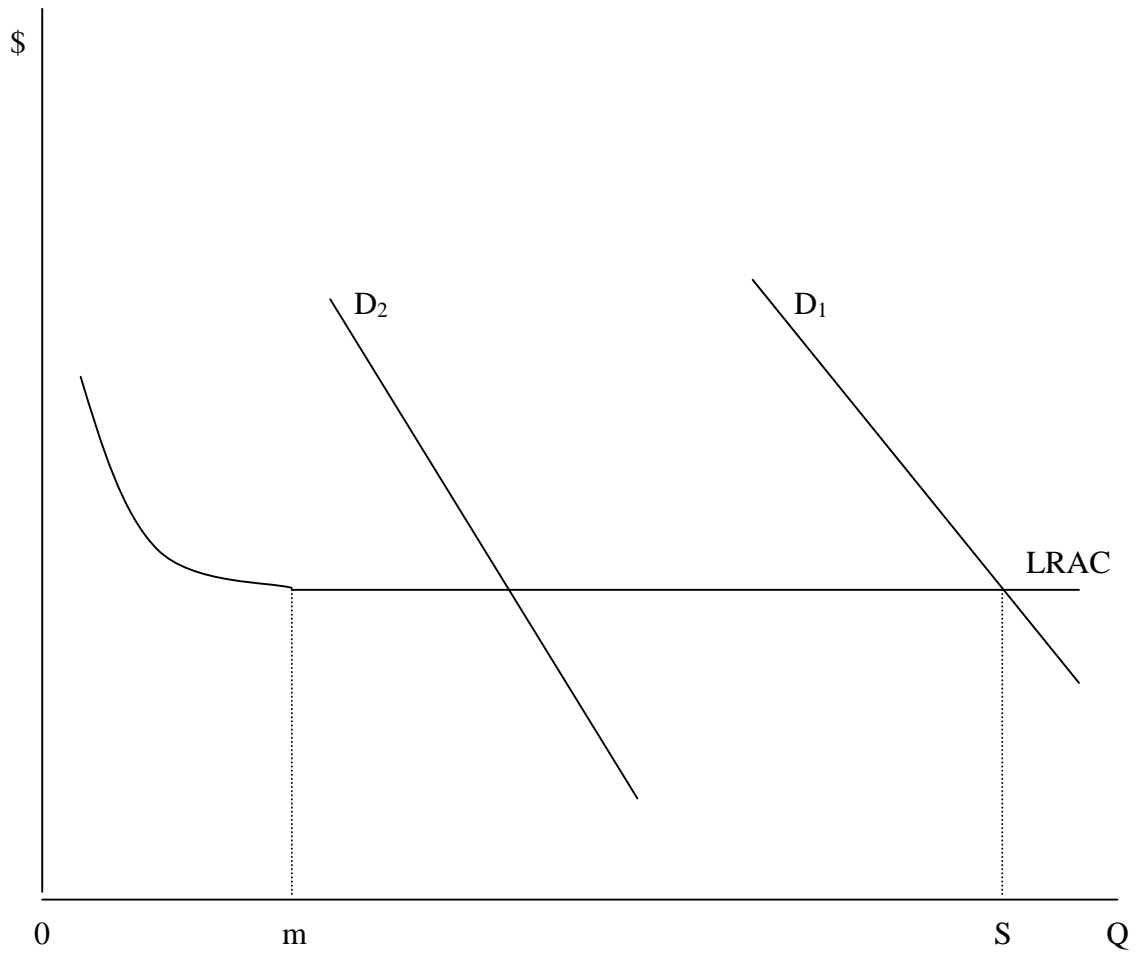
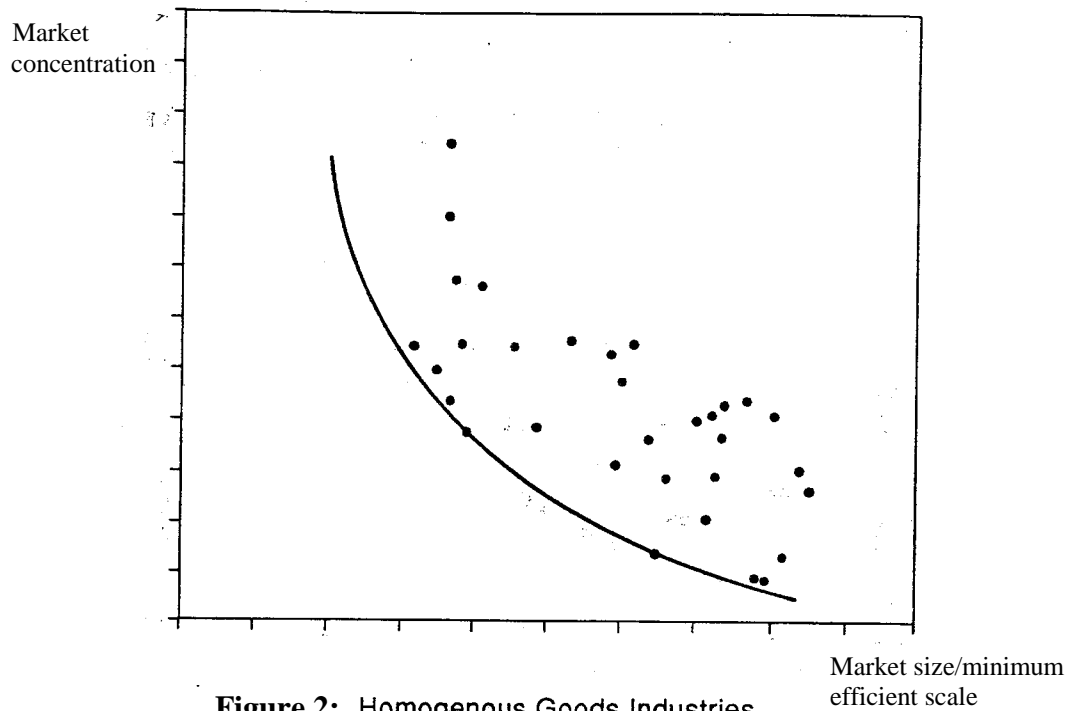Figure 1: The relationship between minimum efficient scale (m) and market size (S)

Figure 2: Homogenous Goods Industries

Source: Sutton (1991, Figure 5.4 (i), p. 118). The solid line is the estimated lower bound of the scatterplot representing six homogeneous goods industries in six countries. The vertical axis is the logit transformation of an industry's four-firm concentration ratio; i.e., it is $Y = \log (C/(1-C))$. The horizontal axis is the ratio of the corresponding industry's sales divided by Sutton's estimate of the industry's minimum efficient scale.
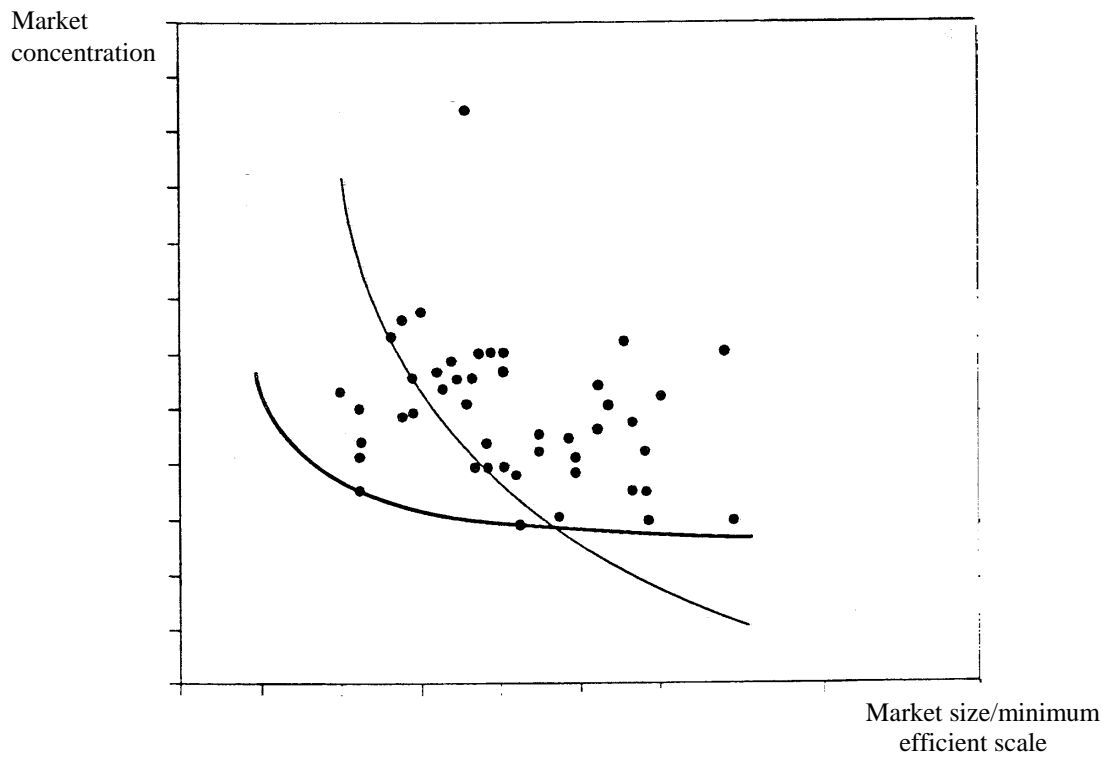
Figure 3: Advertising-Intensive Industries

Source: Sutton (1991, Figure 5.4(ii), p. 118). The shallow solid line is the lower bound of the scatterplot representing fourteen advertising-intensive industries in six countries. The steeper line is that for homogeneous goods industries, reproduced from Figure 2 for comparison. See Figure 2 for further descriptions of the axes.