# RECENT TRENDS IN THE DISTRIBUTION OF EMPLOYMENT BY BUSINESS SIZE AND INDUSTRY

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## 1. INTRODUCTION

The recent renaissance of interest in the small business sector has come about, in part, because of the acceptance of small establishments as the creator of a majority of new jobs in the United States, even during the recent 1974-1976 recession.[1] And while the size variable still is frequently considered "a matter of indifference" in the literature,[2] its importance is becoming increasingly well documented.[3,4]

Further recent studies on the small business sector indicate that its contribution to overall economic growth is declining in terms of its share of the Nation's GNP, (from 43 percent to 39 percent from 1963 to 1976), despite the growing numbers of small businesses.[5] Among the factors which have been put forth as causing this declining share of GNP have included regulatory policies and tax policies which discriminate against small businesses, the difficulties of smaller businesses in raising capital, and the lack of compensation to small businesses for assuming the risks of innovation, and for the training of workers for larger businesses, among others. Other discriminatory factors contributing to the decline in the share of GNP contributed by small business have included the lack of adequate representation of small business in the federal procurement process.

The list of factors above, while reasonably complete, suffers from a lack of quantification because of the inability to access micro data, and the absence of a pricing mechanism for some of the externalities listed above, such as the cost of assuming the risk of innovation without a guaranteed return. Employment data, however, at least on an aggregate basis, is one statistic which provides some insight as to those areas in which the small business sector may be declining.[6]

While small business' share of total employment has remained virtually constant from 1972-77, a redistribution seems to be occurring away from mining, wholesale-retail trade and services toward the transportation sector, manufacturing and construction. However the small business sector is declining in those industries which have had the fastest growth rates and which also have been the traditional mainstay of small businesses: services and the wholesale/retail sector. We observe that in the fastest growing sectors of the economy (e.g., forestry and agricultural services, coal mining, crude petroleum refining, insurance, and most of the service sectors) the growth in the small business share has been negative. It is highly likely that this negative growth will extend into the future because the non-manufacturing economy is growing at a faster rate than manufacturing, construction, and agriculture.

While the share of small business has not increased in 70 percent of the industries which are growing nationally, we find that in 13 industries whose employment declined between 1972-77, the share of small business increased in 9 (or 69 percent) of them (simple correlation coefficient = -.21, which is close to being significant). Thus, we come to the hypothesis that the small business share has recently increased faster in declining industries than it has in growing industries. Whether, in fact, there is a substitution of small for large business in declining industries will clearly depend upon many factors, some of which are discussed in the next section.

## 2. HYPOTHESIS TESTS

From the above discussions, the more difficult question is determining what causes the share of small business to change by industry, since it is not highly correlated with employment growth; these factors are discussed below.

### A. Profitability (=RP)

From the literature, we learn that economists have long believed that investments in firms where the efficient or optimum scale of production is large yield higher rates of return than where the optimum scale is small.[7] The reason for these differences across industries would appear to be the quasi-monopolistic capital cost barriers to entry which increase with size.[8] Therefore, within a given industry, it is not surprising that profit rates are higher in larger firms, making it more difficult for small firms to attract capital in this inequitable setting.

Has this hypothesized inverse relationship between firm size and profitability changed during the recent past? If anything, it appears to be getting stronger. In a recent study for the Office of Economic Research of the Small Business Administration, Joel Popkin studied changes in profit type return of the small business sector between 1972 and 1976.[9] Popkin's work - a first attempt to study dynamics - derives the share of gross product originating in the small business sector from 1963 to 1976.[10] Part of Popkin's work was concerned with changes in profits during the 1972-76 recession which was concentrated in large companies in durable goods manufacturing industries.

In Popkin's work, when the percentage of profits rose in the construction, transportation, communication, and utility, and service sectors between 1972-76, for large business, it fell in the respective small business sectors. Further, when the share of profits remained constant in the finance, insurance, and real estate industry for large business, it also fell in the small business sector. Thus, while we do not precisely understand how the transmission of industry profits works from large businesses to small businesses, large profits in big corporations may well not translate into profit gains in the small business sector.

Another recent study, based upon Federal Trade Commission data during the 1974-76 recession showed that in non-durable manufacturing particularly, profits rose in large companies (assets greater than $5 million) and declined in small companies.[11] Thus, once again, there may be a shift of profits (and sales) away from small firms during a recession. This needs further testing. Finally, in some rate of return calculations for available 2 digit industries from the IRS' Statistics of Income, we observe that the ratio of the return on equity of small to large companies varies substantially by industry. Further investigation will also need to be done to see if this is a direct result of varying amounts of capital per unit of output (across industries by size of firm).

In addition, when historical micro financial data becomes available in the future from our analysis of the Dun and Bradstreet Financial Statement files, further clarification of the profit relative variable will occur.[12]

B. Business Failures (=BF)

While it is obvious that a large percentage of business failures are normally associated with small businesses, the exact relationship between the distribution of such business failures, and the share of small business, by major industry, is less well known. In general, changes in the share of small business and business failure may vary directly. A good example is found in construction: between 1972 and 1977, the small business share rose 2.5 percentage points, while the business failure share rose 4.2 percentage points (6.4 percent in absolute terms).

There are, however, exceptions to the above generalization. The small business share in manufacturing increased almost 2 percentage points between 1972-1977, while the failure rate declined in both absolute and percentage terms. Therefore, while a positive relationship between probability of failure and size may be found, it is probably not so strong as previously thought. The source for the business failure data by industry is The Business Failure Record from Dun and Bradstreet, 1978.[13]

In another vein, we may note the difference between "measured" business failures - from which creditors lose money - and all other business failures - which may involve (non-public) insolvency, but which are often not recorded in existing statistics. Thus, it is often only the large mature companies - John Argenti's type 3 failures - which make it into the statistics.[14] Type 1 failures - those that never really get off the ground before failing - and type 2 - those companies that rise quickly to meteoric heights and fall just as quickly - often never make it into anyone's list of statistics.

C. Relative Wages (=RW)

For the first time, the Census Bureau has recently combined information from the (1976) Company Organization Survey and the (1977) Economic Census to produce an estimate of payroll per employee for companies of varying size.[15] The published data have been tabulated for 3 company sizes: those with less than 100 employees, those with 100 to 999 employees, and those with 1,000 or more employees. Our hypothesis concerning the wage variable is that the share of small business (by 2 digit SIC) and the relative wage rate vary inversely. That is, as more small companies come to dominate an industry, the wage differential between the small and large company widens.

Let us see why this negative relationship might be true. First of all, in a static situation, consider that small firms are usually price takers and that generally, other things equal, their benefit packages are lower (medical care might not be free in a small firm for example). This will account for a wage differential between small and large firms; how this varies by industry may be a function of such factors as the degree of unionization in small vs. large firms, product differentiation, and product mix within the 2 digit industries which comprise each major 1 digit cluster.[16]

In the transportation sector, the entry of small trucking, airline, and local transportation companies (an increasing share of the market) might also lead to a wider payroll differential between small and large firms. Clearly, however, the state of local labor markets, product elasticities and other factors facing each size firm will indirectly affect the validity of our hypothesis. The wage variable used in our model and our other data are available upon request from the author.

The construction of this variable for empirical testing deserves brief mention. In most 2 digit industries, we were able to construct a wage index of payroll per employee in establishments with less than 100 employees (a small business proxy) relative to payroll per employee in establishments with more than 1000 employees (a large business proxy) or:

$$RW_{(i)}\ (i=ind) = \left[\frac{\text{payroll/employee(establishment}\leq 100)}{\text{payroll/employee(establishment}\geq 1000)}\right]_{(i)}$$

As expected, in 56/68 or 82 percent of the industries for which data was available, this ratio was less than 1. It exceeded 1 mostly in selected mining and service industries.[17]

D. Availability of Capital (=RKL)

In most industries, it is hardly surprising that the capital-to-labor ratio for large firms is bigger than that for small enterprises. However, we hypothesize that the larger the share of small business in a given industry, the wider is the capital-to-labor ratio for small units compared to large firms.[18]

Consider for example, an industry like hotels.

Where there are several larger firms which dominate in specific tourist locations (like a Hilton, Sheraton, or similar chain), there may be pressure upon small business to equip their units similarly. For example consider a computerized reservation system or a cable TV or in-room movies as items a smaller motel may have to offer. But where much of the location or industry is dominated by small firms, much of the additional capital expenditures may be unnecessary. This argument could obviously be applied to many kinds of businesses (fast food franchises, various manufacturing operations, banking, etc.).

The data we are using to attempt to verify our hypothesis comes from the Source Book for Corporations from the Internal Revenue Service.[19] We use corporations with assets between $1 and $5 million to represent small business (although this is a bit high) and corporations with assets between $25-50 million to represent large businesses. The capital stock data are really stocks and bonds (e.g. obligations) issued by the corporation; the proxy we use for labor costs consists of the sum of salaries of officers of the corporation, contributions to pensions and profit sharing plans and other employee benefit programs. (Direct wage and salary information is not available from the Corporation Source Books.)

Therefore the capital-to-labor relative may be defined as:

$$RKL_i = \frac{E_i / (SA+P+PS)_i \text{ assets 1-5m}}{E_i / (SA+P+PS)_i \text{ assets 25-50m}}$$

where: RKL = capital to labor relative, industry i;

$E_i$ = stocks, bonds, other equity obligations issued by the companies in industry i by asset size class;

$SA_i$ = salaries of the officers of the corporation in industry i by asset size class;

$P_i$ = pensions (paid to) employees of the corporations in industry i by asset size class;

$PS_i$ = profit sharing monies paid to employees of corporations in industry i by asset size class.

E. Mergers and Acquisitions (=RMA)

The seemingly obvious hypothesis would be that mergers and acquisitions adversely impact the market share of small businesses because they (sometimes) eliminate locally based jobs and transfer resources to the parent companies. Some observers, however, disagree. George Benston, in a recently published study for the American Enterprise Institute, concluded that in periods of inflation, merger makes the purchase of capital assets cheaper, helps spread the burden of regulatory and payroll taxes more evenly, and encourages the founding of new businesses.[20] Therefore mergers, in this view, are beneficial to the small business sector.

Contrasted with this view, however, David Birch reports that recently acquired establishments (acquired from 1969 to 1976) have higher death rates and higher contraction rates after merger than before merger.[21] In addition, he reports "acquisition does little to mitigate the effects of a recession."[22]

Given these conflicting views, our hypothesis remains that small business employment shares and (increased) mergers and acquisitions are inversely related.

Insufficient data are available to test this hypothesis. We however have used "Mergers and Acquisitions: 1972-1974," a report by the Census Bureau of 6 major industries covered in the 1972 Economic Censuses. In Table 1 of that report are listed the number of establishments acquired by companies with 500 or more employees for the years 1972, 1973, and 1974. We have chosen to use 1974 as the latest available year.

Clearly, one must normalize most data to prepare it for econometric analysis. In this case, we have used the number of establishments (for similar industries) from the 1974 County Business Patterns. Therefore, the testable variable of interest is:

$$\frac{\text{Number of establishments in industry i acquired by companies of 500+ employees, 1974}}{\text{Number of establishments in industry i, 1974}}$$

(As an alternative denominator, we have also used the number of establishments with more than 500 employees.) Of course the expected sign on the variable in the econometric tests below is negative: the larger the acquisition activity on the part of large firms the smaller the expected small business share in that industry.

F. Employment Growth (=EG)

In section I above, we observed that the correlation between employment growth by industry and change in the small business share by industry was negative and insignificant. This is particularly surprising, because recent research has shown that 2/3 of the new jobs created between 1969 and 1976 were in small establishments.[23]

In theory, therefore, one would hypothesize a positive relationship between general employment growth and the small business share by industry. The problem, therefore, is the usual one of trying to answer a micro question with aggregate data: a refined theory of employment growth by establishment size awaits observations by individual firm. In the interim, we observe only a proxy relationship. Perhaps the segregation by nationally growing and declining industries discussed in section III will be more helpful.

G. Tax Variable (TRR)

While it is not clear what the hypothesized relationship between relative tax payments[24] and the share of small business employment ought to be, it may be reasonable to assume that when taxes are discriminatory (i.e., small firms pay more than their proportionate shares), the likelihood that a business will fail or have lower profits increases. As documented in a recent study by the Wharton school,[25] small business firms face non-corporate taxes which can be in excess of 50 percent of the cash flow before taxes; for large firms the ratio is about one-third. Therefore the burden of non-corporate taxes is higher, on average, by 1/3 in the small business sector. Included in these taxes are license fees, payroll (FICA) taxes, and unemployment compensation, among others.

The relative tax variable TRR which is used in our modelling efforts is more fully discussed in the econometric sections which follow.

## 3. ECONOMETRIC ANALYSES

Table 1 and structural equation (1) summarize the above discussion of hypotheses. Essentially, changes in the employment share of small business are expected to vary inversely with each of the variables in Table 1 - except employment change and business failures, which are expected to vary positively with small business shares:

$$(1) \quad SB_i = g\ [EG, RP, BF, RW, RKL, RMA, Z]_i,$$

where: $SB_i$ = small business share in industry i = (employment in establishments of 100 employees or less), 1977; and the other variables are as discussed above and listed in Table 1.

$Z_i$ = a vector of other exogeneous variables (to be discussed below).

Identification and Reduced Forms

In examining structural equation (1), it is possible that simultaneity exists. For example, one might hypothesize that relative profitability (RP) is an endogeneous variable, and should be related to those input factors and demand factors which jointly determine it. For example, profit could be a function of relative wages (RW), the relative capital-to-labor ratio (RKL), and other exogeneous demand variables[26] which we have not yet specified in (1). Thus,

$$(2) \quad RP_i = h\ [RW, RKL, Z]_i.$$

On a purely arbitrary basis, we shall hypothesize Z to consist of three relative variables. Each of them is defined for firms of $250-500 thousand in assets relative to the same variable for firms of $25-50 million in assets. (These proxy small to large business ratios, and reflect measurable phenomena.)[27] The variables are taxes paid as a fraction of gross receipts (TRR), relative inventories (RINV), and relative cost of goods sold (RCG). Each of these is expected to vary inversely with profitability since they are subtractions from cash on hand.[28] Obviously these variables could have been added as identities, (i.e. profit = receipts less taxes less cost of goods sold) but our profit relative variable (RP) is only a "dummy" variable, and so an identity is not correct. Equation (2) thus becomes:

$$(2A) \quad RP_i = h'\ [RW, RKL, TRR, RINV, RCG]_i.$$

We might also argue that business failures should be endogeneous in equation (1) above, and vary inversely with relative profitability and positively with employment growth (e.g. more new business failures):

$$(3) \quad BF_i = k\ [RP, EG]_i.$$

Thus business failures are a function of demand (EG) and derived demand (RP). Structural equation (1) therefore reduces to:

$$(4) \quad SB_i = g'\ [RP, BF, RMAI]_i,$$

and the order condition for identification is satisfied.

Therefore, the small business share, business failures and relative profitability are endogenous variables, yielding 3 equations with 3 endogenous variables. In summary, SB, RP, and BF are endogenous; EG, RW, RKL, RMA, TRR, RCG, RINV are exogenous.

Related Studies

It is certain that equations (2) - (4) above are structurally incomplete. Profitability of a company, for example, varies by gross sales, tax rates, location, extent of unionization, and a host of other industry-specific factors.[29] In addition, the paucity of data constrains us initially to a cross-section approach for something that by nature is essentially a time series. After these initial tests, we will (in future efforts) specify a time series model for those series for which data are available.[30]

Econometric Results

Equations (2) - (4) above were first estimated (with 2 stage least squares) in three different ways. The first was for all industries combined, the second was for industries which grew faster (slower) than the U.S. average between 1972-77, and the last was for industries in which the small business share grew more quickly (more slowly) than the U.S. average, 1972-77. Because of the disappointing results with 2SLS, the equations were re-estimated with OLS.

In Table 2, we observe that the best OLS all industry equation is the first one listed. Thus, the small business share across all industries rises .195 percent when general business failures rise 1 percent, and falls - .210 percent when relative mergers and acquisitions rise 1 percent. This first equation explained 45 percent of the variation in the small business shares, and confirmed the merger/acquisition and business failure hypotheses discussed above. The elasticities, however, were relatively small.

We observe from Table 2 that the merger and acquisition variable is only significant in fast growing industries - those in which employment growth

between 1972-1977 exceeded the national average - and those industries in which the small business share exceeded the national average.[31] In the first case, we mean industries such as coal mining and petroleum refining, air transportation, transportation services, finance industries excluding insurance, and most of the service industries. In the latter case are the industries already listed plus the addition of farming, wholesale and retail trade, and most of construction. Clearly (in equation 3) the policy relevant observation is that significant merger activity is responsible for an amazing 80 percent of the loss in market share in these fast growth industries.

In those industries, a one percentage point increase in mergers yields a .42 percentage point decline in employment shares.

Once again in Table 2, we observe that in the slower growing industries (most of manufacturing, general building contractors, finance excluding credit, department stores, communication, utilities, transportation excluding air) the merger and acquisition variable RMA1 does not appear to be a significant factor. However, the level of general business failures in this case is positively correlated with increases in the small business share. (We had already observed in part I above that small businesses are growing in industries with below average growth rates.) From these observations, it may be reasonable that the small business share rises in declining industries when the overall business failure rate increases because large corporations sell their unprofitable subsidiaries. In addition, persons with entrepreneurial talent who are forced to leave positions in large business corporations during recessions may start small business because their own personal opportunity costs decline to virtually zero when they become unemployed (e.g., or to the rate of unemployment compensation).

Subsidiary Hypotheses and Results

In equations 2A and 3 above, we had attempted to use the BF (business failure) variable and relative profitability (RP) variables endogenously in our 2SLS model. Despite the relatively poor performance of these equations, we decided to regress each of the dependent variables against the exogenous variables as above to see if any significant relationships emerged from these simple reduced form tests.

In Table 3, we display two OLS equations using BF as the dependent variable, and the tax rate relative variable TRR as the independent variable. Of the two equations shown, we note especially that the TRR variable has a different (and significant) sign in each of the equations. While the equations themselves are barely significant, let us try to understand what they might mean.

In Table 3, the first equation tells us to expect a decrease in business failures of 1.6 percent in traditional small business industries (generally non-manufacturing but with exceptions as noted above) when relative taxes paid by these companies rise 1 percentage point. I interpret this to mean one of two things. First, because small firms face higher tax burdens than large firms (by about 40 percent on average, in these industries), an increase in taxes might be capable of being shifted forward. If this is true, firms in these industries face relatively inelastic demand curves, which of course is good. On the other hand, only firms with positive profits pay taxes, while failing firms do not; therefore this equation might simply indicate an "ability" to pay taxes, regardless of product elasticity. It will be for future research to distinguish between the two.

In the second equation of Table 3, we observe a very elastic increase of 3.2 percent in business failures when relative tax payments rise 1 percentage point. This might mean that in those industries in which the small business share is small (part of mining, manufacturing, insurance, hotels, motion pictures, communication, utilities, etc.[32]) the role of taxes in driving firms out of business is much more critical.[33] Perhaps the reason is that small companies in these industries are price takers, have a small share of the markets in which they operate, face very elastic demand schedules for their products and therefore cannot shift taxes forward.

The policy implication is therefore to concentrate on tax neutrality by size class in these industries first, and study what percentage of total costs are accounted for by taxes in these industries, and the relationship (or percentage) of taxes to other input factor costs.

Relative Profitability

Table 4 indicates the most significant equations using the RP variable in single variable regressions. We note that the mean of the profit variable is negative; therefore a positive coefficient indicates a negative relationship. Several generalizations seem possible from the OLS regressions in Table 4.[34] First, from equations (1) and (2) in Table 4, we observe that mergers and acquisitions generally lower profits in small businesses. Thus, in industries where the small business share exceeds the mean (as in retail trade and services, for example), a 1 percentage point increase in mergers will lower profits about 2 1/2 percent. This may be because the loss of market power causes the demand curve which the firm faces to shift and/or to become more elastic in inflationary times. This same profit loss phenomena accompanying mergers appears in industries also where the small business share is less than the U.S. average, as in manufacturing (loss of -1.5 percent with an increase in mergers of 1 percentage point). Thus, as small business loses market power due to mergers, profits may also be expected to decline simultaneously.

In equations (4) and (5) of Table 4, we observe that in the "all industry" and "slow growth" industry cases a one percentage point increase in

taxes paid by small business relative to large lowers the profit rate by 4 1/2 percentage points (across all industries) and by 3 percentage points in industries with a smaller than average growth rate. We observe as well the lack of significance of this variable in the case of rapidly growing industries, however. Our tentative explanation for this phenomenon is that perhaps taxes can be shifted forward in rapidly growing industries with relatively inelastic demand curves, while taxes cannot easily be passed on in more slowly growing industries which face more elastic demand schedules for their products.

The irony of the above statement is that it is in the most rapidly growing industries in which mergers and profit declines seem to occur; in these industries, however, high taxes may be a less important factor in explaining why businesses fail than in the more mature industries like parts of manufacturing, finance and mining where in many cases small business already has a small market share (e.g., mergers and acquisitions cannot reduce it much more).

In general, the tax rate relative variable (TRR) in some other stepwise equations contributed toward our being able to explain about 80 percent of the total variation in the profit relative (RP) variable. In the case where the small business share exceeded the mean, for example, TRR explained 35 percent or about half the total of 68 percent of explained variation. And all of the equations in which this variable was significant had large negative elasticities associated with them.

Our final observation from Table 4 is associated with equation (3). In that equation, a 1 percentage point increase in capital intensity is associated with an increase in 2.64 percent in the relative profits of small business firms. Thus while a larger share of small firms in an industry is negatively associated with higher capital intensity - as discussed above - equation (3) in Table 4 indicates that the rate of return to small firms is extremely sensitive to increases in the capital - to - labor ratio, as we have crudely measured it. Therefore a long run policy goal - most directly targeted to rapid growth industries - is to raise the flow of capital to these firms.[35]

## 4. SUMMARY

We began this paper with a group of observations which concluded that the share of small business has been declining in rapidly growing industries, with much of the recent growth during 1972-78 confined to those industries whose growth rates have been below the U.S. average. We then developed an econometric model which investigated several factors which might be responsible for the phenomena observed above.

Although the estimates of the basic model were not as significant as we had hoped, through a combination of additional single equation OLS and stepwise equations we were able to show the extent to which significant merger activity has lowered the small business employment share, particularly in rapidly growing industries. Further, although some of the evidence has been conflicting, we have seen that the higher (non-corporate) taxes paid by small business, relative to large business, are regressive and have led to lower profits and higher business failures. Finally, we have also observed the extent to which more capital is needed for small firms to obtain a larger market share in rapidly growing industries; this was approximated through the use of a capital - to - labor ratio.

We concluded above that recessions increase general business failures and have also noticed a small but significant increase in the small business share in many industries when general business failures rise; once again, the relationships between overall employment growth, the small business share across industries, and general business failures could not be adequately modelled in this paper because the business failure data was not size specific.

Obviously this paper is the start of a much larger research effort. Much retesting and reformulation remains to be done as better time series data becomes available. Among the issues suggested for further study in this paper are the merger and acquisition effect on small business profits and market shares, a reformulation of the tax variable to include federal income taxes, and a study of the effects of specific types of taxes on small businesses, and to obtain business failure data by size of firm.


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## NOTES AND REFERENCES


1 See David L. Birch, "The Job Generation Process," Center for Neighborhood and Regional Change (MIT, 1979); David L. Birch and Susan McCracken, "Corporate Evolution: A Micro-Based Analysis." Prepared under grant #14151 from the U.S. Small Business Administration, draft, January 1981. See also Harvey A. Garn and Larry C. Ledebur, "The Renaissance of Concern for Small Business Enterprise in the United States," Urban Institute (Washington, D.C.), February 1980.

2 Robert E. Lucas, Jr. "On the size distribution of business firms." Bell Journal of Economics, Autumn, 1978, pp. 508-524.

3
Nonna A. Noto and Dennis Zimmerman, "Federal Assistance to Troubled Firms-An Analysis of Business Failure Data" (Library of Congress, CRS) December 1980 draft.

4
See, for example, Gellman Research Associates, "The Relationship Between Concentration and Technological Innovation." January 1981 (Philadelphia, Pennsylvania)

5
Joel Popkin, "Strategy for a Micro Data Base, Final Report," submitted to the Office of Advocacy, Small Business Administration November 1980.

6
The limitations of our major employment data source for small business-the Unemployment Insurance (U.I.) system of the Department of Labor need to be mentioned so as not to create misinterpretations. First, the system includes all private wage and salary workers, and excludes all self-employed persons and government workers. Therefore any implications regarding the growth or decline of small businesses are made without reference to the self-employed. Secondly, regarding the currency of the data, 1977 rather than 1978 has been used because of the lateness of reporting of several states. Lastly, the data is plagued by an SIC coding change after 1975. 1969-72 data are tabulated on 1967 SIC codes; 1975-78 data are tabulated using 1972 SIC codes; but data had to be retabulated using the consistent 1972 SIC codes to make absolute comparisons at the 2 digit level.

7
W.J. Baumol, Business Behavior, Value, and Growth. (New York, 1959). Quoted in Marshall Hall and Leonard Weiss, "Firm Size and Profitability," Review of Economics and Statistics, August 1967, pp. 319-31. The latter contains a bibliography of such studies.

8
Hall and Weiss, Ibid, p. 326. Their study uses data for the 400 top companies.

9
Popkin, op. cit.

10
The five components of gross product originating are employee compensation, capital consumption allowances, indirect business taxes, net interest and profits. The profit share, therefore, is the residual left over after the first four components have been subtracted. Popkin's study defined small businesses as those with less than 500 employees.

11
Meir Tamari, "Monitoring the Behavior of Small Manufacturing Firms in the Recession." Prepared for the SBA Office of Economic Research under a purchase order; progress report March 10, 1981. (The results were not statistically significant in durable manufacturing.)

12
At present, the relationships between the IRS concept of profits as a rate of return on equity and the rate of profit as calculated by Popkin is not known.

13
Unfortunately this data is not tabulated by company size.

14
John Argenti, Corporate Collapse (McGraw-Hill, London, 1976), Chapter 8.

15
These data are tabulated for all employees in the company, regardless of hours or weeks worked.

16
These kinds of offsetting effects are noted by Stanley Masters in "An Inter-Industry Analysis of Wages and Plant Size," Review of Economics and Statistics, 51, August 1969, pp. 340-345. Masters notes that higher quality labor might be needed in a small firm, (leading to higher wages), but such factors as higher capital intensity, more regimentation, and more unionization may also bid the wage up in large firms.

17
The variable was derived from Table 2 of the U.S. Bureau of the Census, County Business Patterns, #77-54: Enterprise Statistics. (GPO, 1979).

18
The author is unaware of any studies which have looked at precisely this formulation.

19
Internal Revenue Service,Source Book, Statistics of Income--1975, Corporation Income Tax Returns, publication 1053, (IRS, 1/79).

20
George J. Benston, Conglomerate Mergers: Causes Consequences, and Remedies (AEI, Washington, D.C., July 1980) pp. 3-16.

21
David L. Birch and Susan MacCracken, op. cit., p. 52.

22
Ibid.

23
David L. Birch, "The Job Generation Process." Center for Neighborhood and Regional Change,

Massachusetts Institute of Technology, 1979.

24
In the model developed below, non-corporate taxes are expressed as a fraction of gross receipts in 2 asset size classes: $1-$5 million, and $25-$50 million. The data is from the Corporation Source Book of the Internal Revenue Service for 1975.

25
Hans Stoll and James Walter, Tax Incentives for Small Business (Heller Small Business Institute Policy Papers), (Wharton, Philadelphia, Pennsylvania), 1980.

26
Preliminary correlations between RKL and RW were tested to avoid collinearity problems; all were negative and insignificant.

27
As discussed in more detail below, these variables come from the IRS' Source Book for Corporations. Equation (2) is more useful in completing the specification of our model, rather than including variables per se to test specific hypotheses. However, due to the structure of the model, that becomes the end result.

28
Relative inventories to a large extent reflect demand conditions. Generally, the larger the inventories held by a company, the lower its current demand, and the lower its profits. For further information see E.S. Mills, Price, Output and Inventory Policy (New York, Wiley, 1962).

These terms are defined in Eric L. Kohler, A Dictionary for Accountants, 5th Edition, (Prentice Hall), 1975.

29
See, for example, George C. Eddy. "The Small Business Owner: What It Takes to Succeed." Texas Business Review, July-August 1979.

30
At this time, RW and RMA are only available at 5 year intervals. BF is produced annually with incomplete coverage and SB is available only for years 1969-1972, and 1975-1978.

31
The growth rates of these industries are available from the author.

32
This list is not meant to be exhaustive; the actual data is available from the author.

33
Tax payments are about 12 percent higher on average, in the small firms than in large firms.

34
Because the RP variable has a negative mean (e.g., negative change in profit relative), all of the signs on the regression coefficients in Table 4 appear to be the opposite of what they really are.

35
The results with the RKL variable were not significant in slow growth industries.

TABLE 1

Summary of Hypotheses to be Tested in National
Small Business Model (Small Business Equation Only)

| | Expected Sign | Neumonic |
|---|---|---|
| 1. Employment Growth | + | EG |
| 2. Relative Profitability (Dummy) | - | RP |
| 3. Business Failures | + | BF |
| 4. Relative Wage | - | RW |
| 5. Relative Capital-To-Labor Ratio | - | RKL |
| 6. Merger-Acquisition Relative | - | RMA |

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TABLE 2
Significant OLS Regression Coefficients With Small Business Share (SB)
as Dependent Variable a/

Dependent/Independent:

| Industry Type | Constants | RMA1 | BF | $R^{-2}$ | F |
|---|---|---|---|---|---|
| All industries(1) | 38.0809 | -5.1348 (-.21) | 4.3371 (.195) | .4523 | 13.6 |
| All industries(2) | 36.1779 | | 4.8625 (.218) | .2830 | 16.2 |
| Fast growth(3) | 84.8959 | -132.5927 (-.42) | | .8048 | 28.9 |
| Slow growth(4) | 32.1928 | | 4.6744 (.214) | .3229 | 12.9 |
| Small Business Share Exceeds Mean(5) | 83.3293 | -121.5988 (-.12) | | .3650 | 8.6 |
| Small Business Share Less than Mean (6) | 24.0630 | | 2.8138 (.104) | .1660 | 4.4 |

Note: Elasticities at the respective means of the variables in parenthesis; omitted variables not included in the respective equations.

a/ All variables significant at $\alpha \leq .05$.

TABLE 3
Significant OLS Regression Coefficients With Business Failures (BF) as Dependent Variable a/

Dependent/Independent

| Industry Type: | Constants: | TRR | $R^2$ | F |
|---|---|---|---|---|
| Small Business Share Exceeds Mean | 9.2898 | -4.5622 (-1.642) | .234 | 4.6 |
| Small Business Share Less Than Mean | -2.2721 | 3.1631 (3.190) | .195 | 4.8 |

Note: Elasticities in parenthesis; ommited variables not included in the respective equations.

a/ All variables and equations significant at $\alpha \leq .05$

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TABLE 4
Significant OLS Regression Coefficients With Profit Relative (RP) as Dependent Variable a/

Dependent/Independent

| Industry Type | Constants | RMA1 | RMA2 | RKL | TRR | $R^2$ | F |
|---|---|---|---|---|---|---|---|
| Small Business Share Exceeds Mean (1) | -.0426 | .5631 (-2.341) | | | | .290 | 6.1 |
| Small Business Share Less Than Mean (2) | -.0051 | | .00053 (-1.4571) | | | .892 | 223.8 |
| Fast growth industries (3) | -.0104 | | | -.0221 (2.64) | | .233 | 5.5 |
| All industries (4) | -.0709 | | | | .0697 (-4.55) | .212 | 8.1 |
| Slow growth industries (5) | -.0885 | | | | .0934 (-2.99) | .303 | 9.1 |

a/ All variables and equations significant at $\alpha \leq .05$

Elasticities in parenthesis; omitted variables not included in the respective equations.