SOME ECONOMIC AND ACCOUNTING MEASURES OF BUSINESS ACTIVITY BY SIZE OF FIRM

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This paper presents statistical and accounting measures for small and large businesses. These estimates are of significant interest to those seeking data to evaluate the performance and profitability of businesses of varying sizes. The data are derived from a stratified sample of 94,000 corporate Internal Revenue Service (IRS) income tax returns selected from the 3 million active corporations that filed for the 1982 income tax year. These sample returns, the Statistics of Income sample, were linked with the employment and payroll data from the employer's federal payroll tax return. Employers are required to report the number of workers on the payroll for their week including March 12, as well as the payroll for the entire year on Form 941 or 943 to track withholding and social security taxes. The Form 941 is filed by non-farm employers and covers a calendar quarter. The Form 943 is filed by agricultural firms and covers four calendar quarters.

The employer payroll tax files are linked to the corporate tax return sample using the Employer Identification Number (EIN). Several complicating factors affect the linking process. First, aside from the EIN, there is no variable on the Form 941 which might be used as a confirming link variable. Payrolls are reported in both files, but they differ in some instances for a variety of reasons. The payroll and tax data covered might be different because of accounting practices in reporting payroll expense. But basically, the noncomparability of reporting units of the two files is the fundamental source of difficulty. Corporate tax returns are, for the most part, reported on a consolidated basis, but payroll tax returns are often prepared at the establishment level for each separate corporate plant or each retail outlet.

It is beyond the scope of this paper to provide a detailed description of how these data sets were linked, and the limitations and methodological issues involved. The paper, "Record Linkage and Imputation Strategies in the 1982 Business Employment and Payroll Study," by Gail Moglen, Charles Day, and Thomas Petska of IRS presented at this session and reprinted here, deal with these issues in considerable detail. No further need exists to detail the statistical acrobatics necessary to generate this data set, except to note that the basic final tabulation is labeled, "Tax Year 1982 Corporation Employment and Payroll (LINK) Study; Income Statement, Balance Sheet, Taxes, Employment and Payroll Stratified by Industry and Number of Employees, Matched and Unmatched Records, Post-Imputation, Post-Reweighting, Disclosure-Collapsed."

Each corporation's tax return includes a detailed financial statement to the IRS to comply with income tax requiremets on Form 1120. The balance sheet data include standard assets, liabilities and net worth items. The income statement includes total receipts and their sources, total deductions and their sources. In addition, there are detailed special statutory deductions and various credit items affecting the income subject to tax, and tax liabilities.

RATIO DEFINITIONS

These data allow investigation of some interesting questions regarding the differences between small and large businesses. For research purposes, comparisons are presented using ratio analysis of four aspects of financial strength: liquidity; debt obligation; activity; and profitability.

1) Liquidity

The financial ratios for liquidity measure a firm's ability to meet short-term obligations, which is fundamental to the health of the firm. Two measures of liquidity are presented--the current ratios and the quick ratio. The current ratio is defined as current assets divided by current liabilities. The quick ratio is defined as current assets less-inventories divided by current liabilities.

Current assets include cash, notes and accounts receivable, inventory, and other current assets. Current liabilities include accounts payable; mortgages, notes, bonds payable in less than one year; and other current liabilities.

2) Debt Obligation

Basically these ratios compare the proportion of risks borne by creditors with those borne by owners. The debt obligation position of a firm measures the amount of borrowed money (leverage) being used to generate profits.

The ratio of total debt to total assets measures the percentage of total funds provided by creditors. Total debt comprises current and long-term liabilities including bonds and mortgages.

The second leverage estimate is the"times-interest earned ratio," which is determined by dividing earnings before interest and taxes by interest charges. This ratio measures the extent to which earnings might decline without causing significant financial stress to the corporation.

3) Activity

Activity ratios are an important measure of a firm's effectiveness and efficiency. These ratios measure the relationship of sales to various assets. The inventory turnover ratio is computed by dividing sales, that is, business receipts, by inventories.

The ratio of sales to fixed assets provides a measure of how well fixed assets are generating sales over the year. The higher the ratio, the better the firm is at producing, using its plant and equipment. Similarly, the total asset turnover ratio--sales divided by total assets--indicates how all of a company's assets relate to productivity, as measured by sales.

4) Profitability

Profitability measures indicate how well a company is doing in relation to its sales, assets, and owner investments.

The profit margin on sales is computed by dividing net income after taxes by total sales; it measures merchandising efficiency and effective use of resources. Sales to fixed assets measures the efficiency with which a firm employs its fixed assets to generate sales. Similarly, sales to total assets measures a firms efficiency in using its total asset resources to generate sales.

5) Employment Ratios

Several employment ratios are presented. These include inventory, payrolls (Form 941), sales, pretax profits, total assets, and net worth.

FINDINGS

For purposes of this discussion, we compare small business (fewer than 500 employees) with large. Defining "small" and "large" is purely subjective. For research purposes, SBA designates firms as small if they employ fewer than 500 workers and this definition is followed here.

To simplify the analysis, only four industry tables are shown - manufacturing, retail trade, wholesale trade, and services. For several reasons, mining, contract construction, transportation, and finance are not presented, although these measures are available.

Liquidity Ratios

It appears that for the four major industries examined here, the liquidity measures for small corporations show greater strength than those for large business. The current ratios for small businesses are all greater than for large businesses, and only the quick ratio for retail trade is lower.

Leverage Ratios

The debt-to-total assets ratio measures the funds provided by creditors. Generally, small businesses show somewhat higher debt-to-asset ratios than large business (except in wholesale trade). However, earnings compared with interest charges are higher for small businesses (except retail), indicating that earnings for small firms could decline to a greater extent than for large firms, without causing financial difficulty.

Activity Ratios

Activity ratios, or sales to inventory, sales to fixed assets, and sales to total assets, show small business performance to be better than that of large business. Only for the ratio of sales to inventory is this trend reversed for manufacturing and retail trade and then only by a slight margin.

Profitability Ratios

Profitability ratios, that is, profit to sales, assets, and net worth, again, are generally higher for small businesses. Although profits per sales dollar are equal in manufacturing and wholesale trade, they are slightly lower in retail and services. Profits as a percent of total assets are strong for small businesses in manufacturing, wholesale and services and show considerable strength as a percent of net worth in manufacturing and services. In particular, the ratio of profits to net worth is significantly greater for small business in all four industries.

Per Employee Ratios

Inventory, payroll, sales, profits, total assets, and net worth as ratios to employment all strongly suggest that small business uses fewer resources per worker than large business. Payroll per employee is lower in all industries except service, confirming other sources which indicate that small business pays lower wages than large business. Sales per employee in small business is higher in retail trade and service, but lower in manufacturing and wholesale. Inventory per worker is higher in large business only in retail trade. Profit per employee is higher in all industries except wholesale. Finally, both ratios, total assets and net worth per employee, are significantly lower in small businesses than large.

CONCLUSION

Small and large businesses are fundamentally different in the way they operate, the way they are financed, and the way they borrow money. In conducting an analysis of this kind, it is important to note that, as expected, firms differ by industry.

Small businesses appear to be able to do more with less. Generally, they have fewer fixed assets, and lower net worth, yet their profits as a percent of sales, assets, and capital, are significantly higher than for large business.

The consistency of these ratios over time needs to be examined. Data for 1979 are available but are not now in machine-readable form. Data for 1982 reflect an unusualy year. With double digit interest rates for the prior three years and a sharp decline in inflation, businesses made extra efforts to keep inventories and other capital borrowings extremely low. There was an enormous uncertainty about when the recession might end.

Table 1

Manufacturing Financial Ratios by Employment Size

Ratio	Total	1-4	< 500	> 500
		Employment Size		
Liquidity				
Current	1.48	1.43	1.70	1.44
Quick	1.01	.97	1.06	1.01
Leverage				
Debt/Total Assets	.57	.71	.58	.57
Times Interest Earned	2.30	2.30	2.81	2.22
Activity				
Sales/Inventory	8.62	10.36	8.24	8.72
Sales/Fixed Assets	3.16	4.70	5.89	2.84
Sales/Total Assets	1.15	1.69	1.85	1.06
Profitability				
Profit/Sales	.043	.027	.037	.045
Profit/Total Assets	.050	.045	.069	.047
Profit/Net Worth	.116	.154	.162	.109
Per Employee ($000)				
Inventory	12.22	13.26	9.23	13.34
Payroll	19.20	26.79	16.69	20.14
Sales	105.28	137.38	76.02	116.31
Profit	4.56	3.68	2.85	5.20
Total Assets	91.29	81.45	41.19	110.17
Net Worth	39.33	23.93	17.44	47.50

Source: 1982 Linked Corporation File.

Table 2

Wholesale Trade Financial Ratios by Employment Size

Ratio	Total	1-4	< 500	> 500
		Employment Size		
Liquidity				
Current	1.31	1.51	1.48	1.10
Quick	.761	1.00	.85	.64
Leverage				
Debt/Total Assets	.71	.66	.67	.76
Times Interest Earned	1.96	2.79	2.13	1.69
Activity				
Sales/Inventory	9.56	13.65	10.26	8.38
Sales/Fixed Assets	14.57	17.39	16.18	12.06
Sales/Total Assets	2.79	3.09	3.17	2.23
Profitability				
Profit/Sales	.014	.018	.015	.012
Profit/Total Assets	.038	.054	.047	.026
Profit/Net Worth	.131	.159	.142	.109
Per Employee ($000)				
Inventory	24.77	20.91	22.54	29.81
Payroll	18.43	18.93	18.30	18.74
Sales	236.90	285.42	231.21	249.75
Profit	3.26	5.00	3.41	2.92
Total Assets	84.98	92.41	72.99	112.10
Net Worth	24.84	31.38	23.97	26.81

Source: 1982 Linked Corporation File.

Table 3

Retail Trade Financial Ratios by Employment Size

Ratio	Total	1-4	< 500	> 500
		Employment Size		
Liquidity				
Current	1.46	1.98	1.56	1.36
Quick	.71	.77	.63	.79
Leverage				
Debt/Total Assets	.67	.75	.70	.65
Times Interest Earned	2.03	2.12	1.98	2.07
Activity				
Sales/Inventory	8.57	6.83	8.35	8.91
Sales/Fixed Assets	8.75	9.40	12.70	6.00
Sales/Total Assets	2.59	2.70	3.35	1.95
Profitability				
Profit/Sales	.018	.017	.013	.024
Profit/Total Assets	.046	.045	.044	.047
Profit/Net Worth	.139	.179	.142	.135
Per Employee ($000)				
Inventory	8.93	13.99	9.80	7.84
Payroll	10.50	10.82	10.46	10.55
Sales	76.46	95.52	81.77	69.81
Profit	1.34	1.59	1.07	1.68
Total Assets	29.48	35.36	24.44	35.81
Net Worth	9.65	8.91	7.44	12.42

Source: 1982 Linked Corporation File.

Table 4

Services Financial Ratios by Employment Size

Ratio	Total	1-4	< 500	> 500
				Employment
Liquidity				
Current	1.19	1.27	1.21	1.14
Quick	1.02	1.13	1.05	.98
Leverage				
Debt/Total Assets	.70	.71	.72	.67
Times Interest Earned	2.10	3.21	2.26	1.89
Activity				
Sales/Inventory	31.39	48.52	38.11	20.12
Sales/Fixed Assets	3.39	5.09	4.39	1.97
Sales/Total Assets	1.61	2.20	2.04	.96
Profitability				
Profit/Sales	.033	.037	.029	.046
Profit/Total Assets	.053	.082	.059	.044
Profit/Net Worth	.179	.280	.213	.136
Per Employee ($000)				
Inventory	1.32	1.51	1.13	.85
Payroll	15.49	26.44	16.55	12.58
Sales	41.58	73.33	43.14	37.29
Profit	1.37	2.74	1.24	1.72
Total Assets	25.83	33.30	21.15	38.68
Net Worth	7.66	9.78	5.83	12.65

Source: 1982 Linked Corporation File.

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