

**Estimation of Small Business Wealth
Contract # SBA-HQ-00-M-0715**

Final Report

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By

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"The findings and recommendations stated in this report are those of the authors and do not necessarily represent the positions and policies of the U.S. Small Business Administration."

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EXECUTIVE SUMMARY

The purpose of this paper is to report the first research results of a project with the objective of estimating the proportion of total private business wealth represented by small (under 500 employees) and large businesses. Section I of the paper discusses several possible definitions of wealth and how they are related. It also provides a short history of estimates of wealth that have been calculated for the total U.S. economy and current thinking about how wealth fits into the broader framework of economic statistics today. Section II presents a method for segmenting estimates of U.S. corporate business wealth - as measured by market equity values - into the proportion associated with large and with small business. The methodology used to determine the proportions is to capitalize large and small business corporate profits using price/earnings ratios determined in financial markets and then to calculate shares of business wealth from the resulting levels. Once the shares of small and large business corporate wealth are determined using this methodology, they can be applied to Federal Reserve Flow of Funds (FOF) data for total corporate wealth. Next, the valuation of noncorporate business wealth is described and the appropriateness of adding corporate and noncorporate valuations is analyzed. In Section III, the corporate and noncorporate estimates are combined into a single estimate of total U.S. small business wealth. These estimates, along with that of large corporate wealth, and the share of each in total business wealth for the 1990-2000 period are presented in Table A.

Table A. Estimates of Business Wealth by Firm Size

Market Value of Corporate Wealth and of the Net Worth of Noncorporate Business

Year	Corporate		Noncorporate	Total	Small Business Share Of Corporate Wealth	Small Business Share Of Total Wealth
	Small	Large				
1990	\$ 909	\$ 2,328	\$2,478	\$ 5,716	28.1%	59.3%
1991	\$1,248	\$ 3,203	\$2,458	\$ 6,908	28.0%	53.6%
1992	\$1,764	\$ 3,214	\$2,404	\$ 7,381	35.4%	56.5%
1993	\$2,035	\$ 3,559	\$2,466	\$ 8,060	36.4%	55.8%
1994	\$1,920	\$ 3,603	\$2,625	\$ 8,148	34.8%	55.8%
1995	\$2,679	\$ 4,807	\$2,801	\$10,287	35.8%	53.3%
1996	\$3,062	\$ 5,978	\$2,957	\$11,996	33.9%	50.2%
1997	\$3,920	\$ 7,876	\$3,176	\$14,972	33.2%	47.4%
1998	\$3,751	\$10,026	\$3,508	\$17,285	27.2%	42.0%
1999	\$5,369	\$11,827	\$3,757	\$20,953	31.2%	43.6%
2000	\$4,288	\$11,108	\$4,039	\$19,434	27.9%	42.8%

Note: Net worth value of noncorporate wealth is from Flow of Funds' Table B.103, Balance Sheet of Nonfarm Noncorporate Wealth (assets minus liabilities). Calculation of corporate wealth shares by firm size is detailed in Table 1.

SECTION I - INTRODUCTION

A measure of wealth by business size would be a useful addition to the study of the structure of the U.S. economy. This research examines the feasibility of developing such wealth estimates. Its first phase was to examine the different definitions of business wealth. The analysis' next step was to develop a conceptually sound and feasible methodology for dividing corporate wealth into large and small business components. The method selected is based on equity market valuations. Then a preliminary estimate was made of total corporate wealth broken down into a small and large business size class. Those size class shares were applied to the Federal Reserve Board's Flow of Funds estimate of corporate wealth (as measured by the total value of U.S. equities). Once noncorporate wealth estimates were added to the small business corporate wealth estimates, an estimate of the small and large share of total business wealth resulted. The estimates cover the 1990-2000 period.

Wealth means different things to different people, it can be defined in different ways, and it can be measured at different points in the economy.¹ This study focuses on wealth as measured by the market value of businesses in the U.S. economy. Businesses are usually valued either at market value or at book value. Because businesses' assets are acquired over time, the book value of those assets represents the historical cost of that investment, net of depreciation. That value is usually different from the current cost of replacing those assets.² Furthermore, especially in the public stock and bond markets, the market value may reflect more than the cost of the tangible assets of the firm. It reflects the

¹ The value of household net worth includes the value of household's ownership of the businesses in the economy, either through securities or direct ownership.

² Technically, replacement cost reflects past inflation in capital goods and changes in technology that change the levels and mix of investment components used to produce the same output as the replaced items did.

market's valuation of the tangible and intangible assets of the firm and of the future returns they will generate. Consequently, there are definitional choices to be made in determining which of these valuations provides the definition of wealth most appropriate for this study.

This research project focuses on the market valuations of businesses rather than the book valuation because wealth is generally thought of as the value at a certain point in time and book values do not capture that concept. But there is a further consideration, especially for public corporations, in selecting the appropriate measure of wealth. Is wealth more accurately measured using net worth at replacement cost of the corporations or using the market valuations supplied by the stock and bond markets?³ A net worth valuation at replacement cost is a combination of the replacement cost of fixed tangible assets and the market determined values of financial assets held by a firm, less its liabilities.⁴ The second measure - the market value of common stock - incorporates the expectations about a firm's future that add or subtract from its replacement cost, as well as the market's valuation of any intangible assets, such as patents, that are not included in the replacement cost valuation.

Both measures could arguably be used in this analysis. Because the ratio of the market value of a company to the replacement value of its assets - frequently called Tobin's q - has been used to provide insights into a wide array of behavioral issues, the ability to estimate both of these measures of wealth by business size would be ideal.⁵ However, the

³ Net worth, as the value of the firm, is defined as assets minus liabilities. The market's valuation of a company's equities should also value the concept of total assets minus liabilities. However, many of the analyses that focus on comparing replacement value of assets to market valuations of firms move the liabilities to the other side of the equation and compare the capital market valuation (stocks plus bonds) to the replacement value of the firm's assets.

⁴ In equilibrium, replacement cost should equal the price the used assets would command if sold.

⁵ When Brainard and Tobin originally put forward the idea of " q " it was as a tool for explaining investment decisions and was based on a marginal increase in the market value of the firm compared to a marginal increase in its capital costs. A firm would continue to increase its investment in new capital stock as long as

methodology that this paper advances for producing measures of small and large business wealth focuses on the equity-based valuation of the firm. The issues involved in splitting the replacement cost of the assets (and liabilities) by business size are numerous and the lack of adequate business-size information probably makes the task impossible currently. Certainly, those issues require study beyond what could be accomplished in this preliminary project.

Wealth estimates are not new additions to the scope of economic statistics. The U.S. government conducted censuses of wealth as far back as 1850, but discontinued them after 1920.⁶ The estimation of U.S. levels of wealth, if not the conduct of a full Census, was resumed by the Federal Reserve Board in the late 1950s.⁷ The work was made possible by the publication of the Flow of Funds (FOF) accounts from which level values, or balance amounts outstanding, are derived.

The FOF is a record of all the market transactions in an economy, both those in which financial assets are exchanged for tangible ones, and those in which financial assets are exchanged for each other. Because of the relationship between the concept of stocks (outstanding balance levels at a single point in time) and of flows (income statements showing changes between two time periods), estimates of the latter permit the updating of the levels once a balance outstanding has been estimated for a benchmark year.

the market valued the increase in capital (by bidding up the stock price of the company) more than the cost to the company of the additional units of capital. However, that marginal value is not observable. The observable average q , the ratio of the market value of a company to the replacement value of its capital stock or assets, has been used to provide insights into the value of research and development and the value of intangibles like advertising and brand names (Hall, Cockburn and Griliches, Chauvin and Hirschey). It has also been used to test certain assumptions about market structure (Lang and Stulz, Eeckhout and Jovanovic). Since some of this research has implied differences between small and large firms, it would be a useful to have a data set that could provide further insights into those results.

⁶ For more detail on the history and methods for wealth measurement, see *Measuring the Nation's Wealth*.

⁷ The Bureau of Economic Analysis (BEA) also makes estimates of wealth; however, those estimates encompass only fixed reproducible tangible assets.

Just as both levels outstanding (in balance sheets) and income statements are the basic ingredients used in analyzing the economic condition of a firm, so too, are they the key ingredients in the analysis of the economy as a whole and its major markets and industry sectors. The need for integration of National Income and Product Accounts (NIPA's) with FOF accounts has long been recognized. For the U.S., that objective is closer to realization, now that the U.N.'s framework for national macroeconomic statistics has been adopted. That system, the System of National Accounts (SNA), calls for the integration of NIPA's and the FOF.⁸

As integration proceeds, it is timely to take a parallel view of statistics by business size in the SNA. For about 20 years, the SBA has been funding the development and using estimates of GDP by industry, also called Gross Product Originating (GPO). GPO is segmented by small and large businesses. Because they sum to GPO, these estimates by business size can be linked to the NIPA's.⁹

Since the income and wealth accounts are being integrated as part of the government's implementation of the SNA, it is timely to ask specifically, as SBA has, whether *wealth* can be broken down by business size? If so, integrated income and wealth estimates could be computed for the small business sector, as well as for the large one. This would provide a complete framework for the analysis of historical relationships in the small business sector and therefore would be useful in understanding small business and its policy needs. To that end, SBA's Office of Advocacy has funded this pilot study under contract SBAHQ-00-M-0715.¹⁰ There are three subsequent sections to this report. A data appendix and bibliography follow them.

⁸ See Popkin (2000)

⁹ Annual estimates of GPO by business size have been calculated by Joel Popkin and Company through 1999, and benchmarked through 1997, under contract SBA-HQ-00-C0001.

¹⁰ Joel Popkin and Company wishes to thank Dr. Richard D. Rippe, Managing Director and Chief Economist of Prudential Securities for his valuable comments on the earlier draft and his staff for their

SECTION II - METHODOLOGICAL APPROACH

Introduction Total business wealth is probably best measured by the Federal Reserve Board in its Flow of Funds accounts. The most straightforward approach to measuring the value of business wealth by firm size would have been to segment the FOF nonfarm, nonfinancial corporate and noncorporate business balance levels, at current replacement cost, into small and large business components.¹¹ However, because the underlying data are not collected by firm size, it would require that proxies be found to estimate the large and small business shares of each of the major components of the balance sheets. That was not feasible given the scope of this preliminary study of wealth by firm size. An alternative methodology is to capitalize relevant income streams by business size. There are two requirements to accomplish this. The first is to obtain income streams by business size. The second is the availability of capitalization rates appropriate to each business-size category.

The necessary income streams and capitalization rates are available for corporate business. Profits and profit-type income were available for small and large corporate business as part of the business-size GPO estimates mentioned earlier.¹² The small and large business shares of corporate profits could each be capitalized separately, using the most appropriate price/earnings (P/E) ratio for each. Appropriateness would be judged

generosity in supplying some of the financial market data needed for this study. JPC would also like to thank the staff at the SBA Office of Advocacy for their helpful comments on the draft.

¹¹ The Flow of Funds accounts do not present a balance sheet for *financial corporations* because the FRB does not have a good measure of the replacement cost of the fixed tangible assets of those corporations. Consequently, the available data would not allow a complete measure of business wealth to be made on this basis, even if they could be segmented by size class.

¹² There are other entry points than GPO. One considered was drawing random samples of publicly-traded companies, stratified by employment-size class, and following their equity values over time. This approach would be time-consuming. But, perhaps more importantly, it would require a conceptual framework for tracking small firms as they grow in size and become large businesses or may reach that threshold through merger or acquisition.

on general conformance with the 500 employee definitional cutoff reflected in the GPO estimates. This criterion suggested examining indexes covering different capitalization sizes, e.g. "small cap." The capitalized values for small and large businesses would then be summed. The total would be compared with total corporate wealth as measured by its market-based value in the FOF. If the two numbers were close for the last decade, this methodology for estimating shares of corporate wealth by firm size would be considered implementable. Those firm-size shares could then be applied to the FOF corporate wealth totals to generate levels of wealth by business size. Using this methodology, our study found that the results were quite good, particularly for 1992 and 1997, the latest two GPO benchmark years, and the years in between.

This capitalization method is not applicable for noncorporate wealth because there is no organized market from which to extract appropriate P/E ratios for that sector. For the small businesses in this sector there is reason to believe that the value of their assets at replacement cost would more closely approximate the valuation of the firm by the market than could be assumed for corporations since the majority of small firms do not have large intangibles.¹³ Consequently, there may be fewer issues that need to be considered when choosing the most appropriate valuation of wealth in this sector. The rest of this section details the data and methodology used for obtaining the corporate results. Table 1 summarizes the data and the capitalization methodology. Detailed data and source

¹³ Clearly, there are noncorporate firms to which this does not apply. Large accounting partnerships, for example, may have intangible wealth associated with their "brand name" and there are undoubtedly noncorporate businesses that are involved in significant amounts of noncapitalized R&D work that the market might value differently than the sum of the replacement values of their assets. However, especially in the latter case, those firms frequently become public when significant amounts of intangible wealth are built up.

Table 1. Methodology for Estimating Corporate Business Wealth by Firm Size by Capitalizing Earnings

Year	Column 1		Column 2		Column 3		Column 4		Column 5		Column 6		Column 7		Column 8		Column 9	
	GPO Profits Estimates (before taxes)		Tax Ratio		GPO Profits Estimates (after taxes)		P/E Ratio (12-month trailing)		Estimated Market Capitalization (in billions of dollars)		Total		Flow of Funds		Estimated Shares of Corporate Wealth			
	Small	Large	Small	Large	Small	Large	Russell 2000	Russell 1000	Small	Large	Small	Large	Market Value of Domestic Corporations	Share of Small Business	Share of Large Business			
1990	\$ 83,404	\$226,645	0.6498	\$ 54,197	\$147,277	15.5	14.6	\$ 840	\$ 2,150	\$ 2,990	\$ 3,237	28.1%	71.9%					
1991	\$ 84,851	\$257,686	0.6792	\$ 57,628	\$175,011	23.9	20.2	\$1,377	\$ 3,535	\$ 4,913	\$ 4,450	28.0%	72.0%					
1992	\$120,997	\$252,564	0.6829	\$ 82,629	\$172,477	24.4	21.3	\$2,016	\$ 3,674	\$ 5,690	\$ 4,977	35.4%	64.6%					
1993	\$134,483	\$290,387	0.6759	\$ 90,903	\$196,284	24.2	19.6	\$2,200	\$ 3,847	\$ 6,047	\$ 5,594	36.4%	63.6%					
1994	\$145,623	\$331,387	0.6744	\$ 98,208	\$223,487	19.4	16.0	\$1,905	\$ 3,576	\$ 5,481	\$ 5,523	34.8%	65.2%					
1995	\$166,279	\$389,232	0.6844	\$113,796	\$266,378	22.7	17.4	\$2,583	\$ 4,635	\$ 7,218	\$ 7,486	35.8%	64.2%					
1996	\$187,344	\$432,949	0.6921	\$129,668	\$299,661	24.5	20.7	\$3,177	\$ 6,203	\$ 9,380	\$ 9,039	33.9%	66.1%					
1997	\$215,341	\$468,322	0.7007	\$150,880	\$328,133	25.0	23.1	\$3,772	\$ 7,580	\$11,352	\$11,796	33.2%	66.8%					
1998	\$199,643	\$434,181	0.6688	\$133,529	\$290,397	24.9	30.6	\$3,325	\$ 8,886	\$12,211	\$13,777	27.2%	72.8%					
1999	\$206,158	\$448,349	0.6741	\$138,970	\$302,230	30.8	31.2	\$4,280	\$ 9,430	\$13,710	\$17,196	31.2%	68.8%					
2000	\$217,671	\$473,389	0.6789	\$147,766	\$321,360	22.5	26.8	\$3,325	\$ 8,612	\$11,937	\$15,396	27.9%	72.1%					

Column 1 (A and B) - GPO profits data represent small and large business corporate GPO profits, as calculated by JPC, in millions of dollars.

Column 2 - Tax Ratio (calculated by JPC) is ratio of profits after tax to profits before tax of corporate businesses with inventory valuation adjustment from National Income accounts. Tax ratio is applied to GPO profits before tax to obtain an after tax estimate (Column 3, A and B).

Column 4 (A and B) - Russell 2000 Small Cap and 1000 Large Cap price-earnings ratios obtained from Prudential Securities, 4th quarter ratios.

Column 5 (A and B) - After tax estimates for small business are multiplied by Russell 2000, and for the large, by Russell 1000, in order to estimate total market capitalization by firm size.

Column 6 - Total represents sum of estimated market capitalizations of small and large businesses, as calculated from GPO profits, in billions of dollars.

Column 7 - Federal Reserve's Flow of Funds, Table L.213 Corporate Equities, billions of dollars, amounts outstanding end of period, not seasonally adjusted. Line 20, Market value of domestic corporations (formerly line 19), end of the year values.

Columns 8 and 9 - Estimated shares of corporate wealth obtained by dividing Column 5 (A and B) by Column 6.

references are shown in Appendix A. Following the corporate analysis is a discussion of the assumptions underlying the estimation of noncorporate wealth.

FOF Data These data offer two approaches to valuing nonfinancial corporate wealth. Each was examined. In the Flow of Funds accounts published by Federal Reserve, net worth (assets minus liabilities) of nonfarm nonfinancial corporate business (Table B.102) is stated at market value rather than book value, i.e., it is the value at which the firm could presumably liquidate. Thus, assets represent a summation of tangible and financial ones. Tangible assets include real estate, equipment and software, and inventories; financial assets encompass checkable deposits and currency, foreign deposits, trade receivables, time and savings deposits, money market fund shares, and other miscellaneous assets. Liabilities include credit market instruments, trade payables, taxes payable, and other miscellaneous liabilities. There is no easy way to segregate this net value by firm size. It is difficult to estimate the market value of many assets, especially the tangible ones like real estate. It is even more difficult to determine a method by which to split each of those assets into large and small business components.

Therefore, as discussed at the beginning of this paper, it was decided that wealth valuation provided by the market value of corporate equities, wherever held, is more appropriate. So, for these calculations, table L.213 of the Flow of Funds, “Corporate Equities” outstanding, was used. From this table, the historical series for “market value of domestic corporations” (line 20 of table L.213) was extracted for the use in the analysis (shown in Column 7 of Table 1).

FOF’s market value of domestic corporations is calculated by summing “issues at market value” of nonfinancial corporate business and financial corporations, and then subtracting commercial banking, other insurance companies, closed-end funds, and exchange-traded

funds holdings from the total (this prevents the financial community's equity asset holdings from being counted twice). Issues and holdings at market value represent common and preferred shares issued by domestic corporations, and also include U.S. purchases of shares issued by foreign corporations (as well as shares held in the form of American Depository Receipts, or ADRs). The total does not include mutual fund shares since that would double count the equities they are holding in their portfolios. Shares of all corporations, both widely and closely-held, and both traded on organized exchanges and sold over the counter, are included in the total. Shares traded on Nasdaq, American Stock Exchange, and New York Stock Exchange comprise most of the total value of corporate equities.¹⁴

GPO Data It was the availability of profit-type income for U.S. firms with less than 500 employees that prompted consideration and adoption of the capitalization approach. These data provide an entry point into the task of disaggregating corporate wealth by business size.¹⁵ The GPO corporate profits estimates used as the starting point for these calculations are shown in Table 1, Column 1.

The profit-type income component is one of the five major categories into which the GPO data are disaggregated. The five are:

1. Compensation of employees
2. Consumption of capital
3. Net interest
4. Indirect business taxes
5. Profit-type income

¹⁴ Guide to the Flow of Funds Accounts, Volume 2: Instrument Tables, Board of the Governors of the Federal Reserve System, Washington, DC, 2000 p. 850-863

They represent the “income” side of the Bureau of Economic Analysis’ (BEA) National Income and Product Accounts and thus when summed equal the “product” side measure of GDP. But since each side is derived separately, there usually is a statistical discrepancy. The purpose of the GPO perspective as part of the NIPA’s is to provide a way to measure value added by industry sector.¹⁶

There are some definitional problems related to capitalizing GPO profits with P/E ratios. The profits before taxes, used in GDP estimates, are not identical to the earnings used to calculate P/E ratios. The first difference is that P/E ratios are calculated using after tax rather than before tax profits. In addition, there are several technical adjustments that BEA makes to IRS' corporate receipts minus deductions to produce the GDP definition of profits. BEA adds adjustments for unreported income, depletion of domestic minerals, state and local corporate tax accruals, interest payments of regulated investment companies and bad debt expenses. BEA subtracts from that total adjustments for gains from the sale of property, dividends received from domestic corporations, income on equities in foreign corporations, the costs of trading or issuing corporate securities and taxes paid by domestic corporations to foreign governments on income earned abroad. As a final adjustment, BEA adds the income received from equities in foreign corporations and branches by all U.S. residents net of corresponding payments.

These definitional differences have the potential for producing inconsistent estimates when deriving the level of wealth by firm size, especially if the relationship between these two profits measures changes significantly over time. This potential problem will be discussed further in the analysis of the results.

¹⁶ Wealth is appropriately measured at market values as are the GPO data used in this analysis. While GPO industry totals estimated in constant dollars are also available from the Bureau of Economic Analysis, they are in chained dollars and are not additive. The components of the value-added measure, such as profit-type income, are not shown in deflated terms.

Profits Taxation The GPO profits data are estimated before corporate income taxes. But P/E ratios are based on after-tax profits. Thus, it was necessary to multiply profits by a tax ratio (defined by JPC as the ratio of profits after tax to profits before tax of corporate businesses with inventory valuation adjustment from the NIPA's). In 1997, this ratio was 70 percent, implying a tax rate of about 30 percent. The average tax rate for all corporations was used in the calculations (shown in Table 1, Column 2). It is likely that tax rates vary by employment size of the firm; however, an examination of recent years' corporate SOI¹⁷ data tabulated by receipts-size of the businesses indicated that, on average, the difference between small and large business tax ratios did not vary by more than a couple of percentage points (although the differences by industry were somewhat larger). The share calculations would not vary a great deal based on that small of a difference in the tax ratios. Since accurate time series of tax rates by business size were not available, the average rate for all corporations was used in the final calculations.

Time-Frame JPC selected 1990-2000 as the time frame for testing the methodology because this decade contained two GPO benchmark years, 1992 and 1997 and because the most widely used P/E ratios were available for that period. The benchmark years provide the two points needed to test the trends yielded by the methodology. GPO profits data for 1998, 1999, and 2000 were projected into small and large business categories by 1997 shares - the latest ones benchmarked by JPC.¹⁸

Capitalization Issues The most direct way to derive a measure of the market value of publicly-held corporations is to sum the market capitalization of all of them. This, as discussed earlier, would not have yielded separate estimates of small and large business

¹⁷ *Statistics of Income* (SOI) is a publication of the Internal Revenue Service.

¹⁸ Slight discrepancies might occur between these years and the rest of GPO data because of updating done recently by BEA and unavailability of all the data for 1998, 1999 and 2000.

wealth not only because the companies would have to be allocated to a large or small business category, but also because such an allocation would vary over time. In using the income capitalization method proposed here, two factors need to be kept in mind:

1. Over time, the observed market behavior of stock indexes or of P/E ratios vary by business size. It was clear that business-size P/E ratios should be used in the capitalization process.
2. The profits estimates by business size that are the basis for the calculation include more than those of publicly-traded corporations alone. The methodology imputes P/E ratios for the privately held corporations. It was assumed, for the purpose of this exercise, that the capitalization rates were the same for private and publicly-held companies.

Consequently, the after-tax profits in Table 1, Column 3 (A and B) were capitalized by multiplying the profits (earnings) by the appropriate P/E ratios, shown in Column 4 (A and B). The choice of these P/E ratios will be discussed in the next section.

Stock Index Family Selection It was clear that business size P/E ratios were needed, but there are several large cap and small cap indexes to select from. The choice of which of these index families to use in the calculations was complex. It required considerable analysis. In addition to sub-indexes based on size of the firm, there are indexes with other scopes such as those for specific industries, which show variation as well. Upon initial screening of available data, it was determined that the three most relevant possible P/E ratios were provided by the index families that are also the best known ones: Russell, Wilshire, and Standard & Poor's. Appendix B describes these three index families in detail.

Russell provides three main indexes relevant to firm size (there are also several sub-indexes that are industry specific): Russell 3000, Russell 1000 Large Cap, and Russell 2000 Small Cap. The Wilshire has three relevant indexes: the Wilshire 5000, the Wilshire Top 750 Large Cap, and the Wilshire Next 1750 Small Cap. There is also another sub-index, Wilshire Micro Cap, but analysis showed that it is not usable because of high volatility in performance and turnover of component companies. Standard and Poor's provides the widely used S&P 500 and S&P 600 SmallCap indexes.¹⁹ Complete data for the Standard & Poor's and Wilshire indexes' P/E ratios are not available prior to the end of 1994, while the data for Russell indexes' P/E ratios were available from 1990 on.

The behavior of the P/Es for all these indexes is shown in the Charts 1, 2, and 3, and Table 2 shows wealth estimates obtained using these ratios. For large business, there is little difference among the indexes (see Chart 3). Russell 1000 and S&P 500 follow the same path while Wilshire Top 750 deviates only somewhat. For small business, there is little difference between the Russell and Wilshire, but the S&P small cap had risen less since 1997.

¹⁹ S&P 500 is used as representative of S&P index family's largest companies, since the complete data for S&P 100 Large Cap index was not readily available.

Chart 1. P/E Ratios for All Stock Indexes

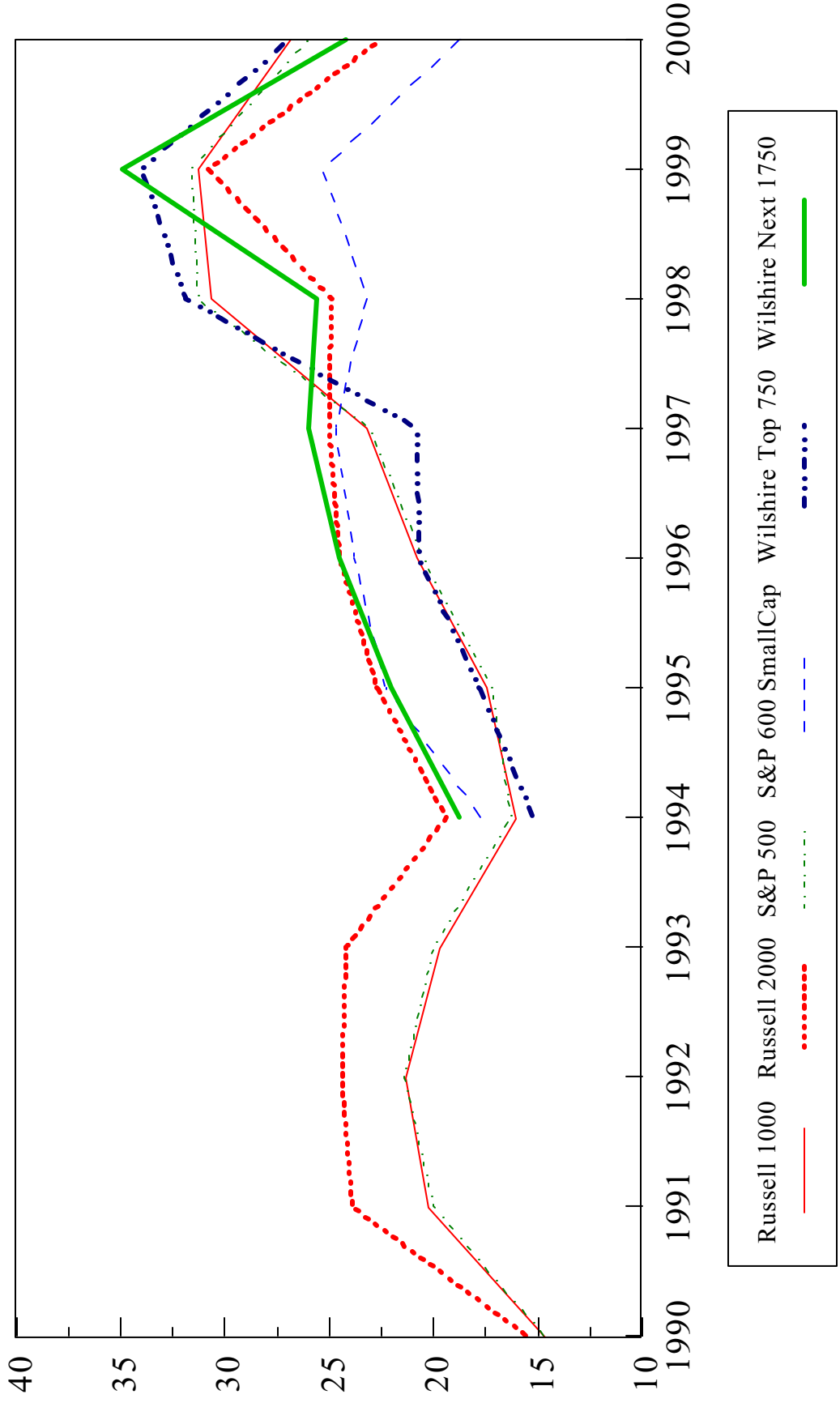


Chart 2. P/E Ratios for Small Cap Stock Indexes

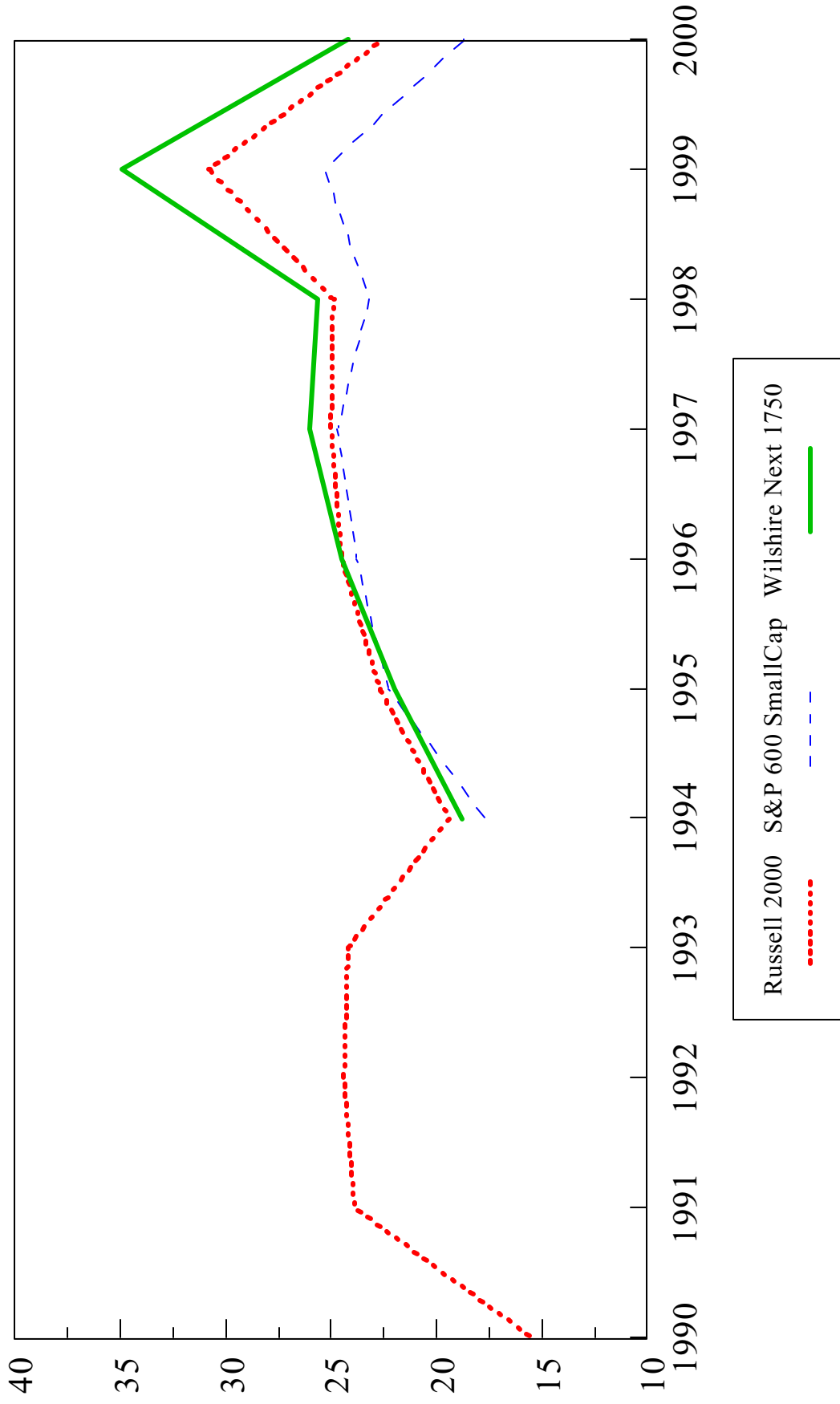


Chart 3. P/E Ratios for Large Cap Stock Indexes

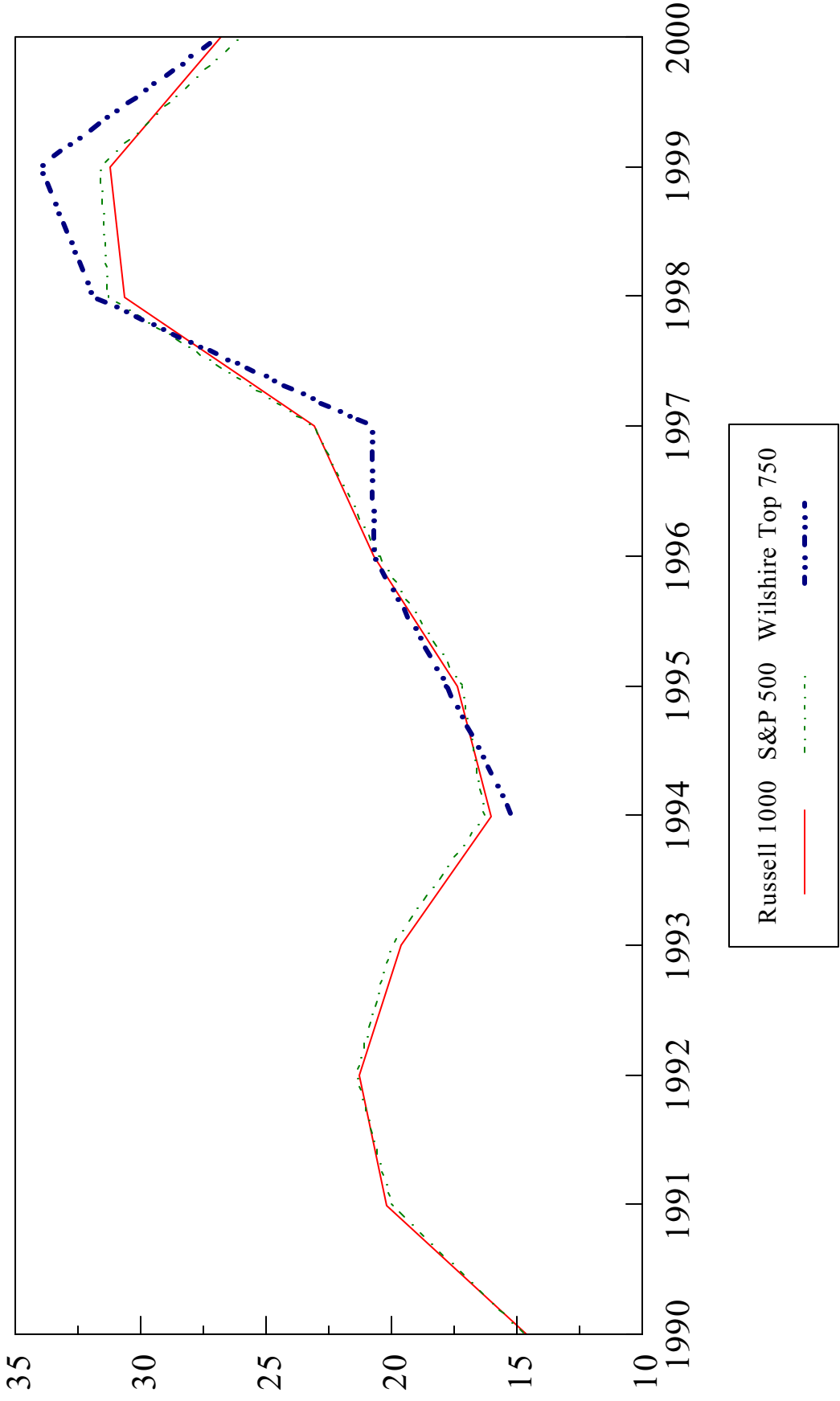


Table 2. Comparison of Russell, Wilshire, and S&P-based Estimated Market Capitalization of Small and Large Corporations with Federal Reserve's Flow of Funds Data (in billions of dollars)

Year	Russell				Wilshire				Standard & Poor's				Flow of Funds
	Small	Large	Total	Small Business Share	Small	Large	Total	Small Business Share	Small	Large	Total	Small Business Share	
1990	\$ 840	\$2,150	\$ 2,990	28.1%	n/a	n/a	n/a	N/a	n/a	\$2,165	n/a	n/a	\$ 3,237
1991	\$1,377	\$3,535	\$ 4,913	28.0%	n/a	n/a	n/a	N/a	n/a	\$3,500	n/a	n/a	\$ 4,450
1992	\$2,016	\$3,674	\$ 5,690	35.4%	n/a	n/a	n/a	N/a	n/a	\$3,691	n/a	n/a	\$ 4,977
1993	\$2,200	\$3,847	\$ 6,047	36.4%	n/a	n/a	n/a	N/a	n/a	\$3,926	n/a	n/a	\$ 5,594
1994	\$1,905	\$3,576	\$ 5,481	34.8%	\$ 1,846	\$ 3,397	\$ 5,243	35.2%	\$1,738	\$3,643	\$ 5,381	32.3%	\$ 5,523
1995	\$2,583	\$4,635	\$ 7,218	35.8%	\$2,504	\$ 4,742	\$ 7,245	34.6%	\$2,538	\$4,582	\$ 7,119	35.6%	\$ 7,486
1996	\$3,177	\$6,203	\$ 9,380	33.9%	\$3,177	\$ 6,203	\$ 9,380	33.9%	\$3,086	\$6,143	\$ 9,229	33.4%	\$ 9,039
1997	\$3,772	\$7,580	\$11,352	33.2%	\$3,923	\$ 6,825	\$10,748	36.5%	\$3,727	\$7,580	\$11,307	33.0%	\$11,796
1998	\$3,325	\$8,886	\$12,211	27.2%	\$3,418	\$ 9,264	\$12,682	27.0%	\$3,098	\$9,089	\$12,187	25.4%	\$13,777
1999	\$4,280	\$9,430	\$13,710	31.2%	\$4,850	\$10,276	\$15,126	32.1%	\$3,516	\$9,550	\$13,066	26.9%	\$17,196
2000	\$3,325	\$8,612	\$11,937	27.9%	\$3,576	\$ 8,645	\$12,221	29.3%	\$2,763	\$8,355	\$11,119	24.9%	\$15,396

Note: Estimated market capitalization calculated by JPC by capitalizing GPO profits with stock index P/E ratios.

The capitalized estimates of wealth calculated using each index family's P/E ratios, shown in Table 2, reflect these differences. Russell-based estimates track the FOF data very closely from 1990 to 1998. The FOF's 'Market Value of Domestic Corporations' rises faster than the Russell estimates in 1999 and 2000. The Wilshire follows this pattern, vis-a-vis FOF data, sometimes even more closely than Russell. Wilshire data, however, are available only since 1994, which prevents calculating estimates for the important GPO benchmark year of 1992. Standard & Poor's-based estimates (also only available from 1994) increase more slowly than Russell or Wilshire and, consequently, even slower than the latter two in comparison to FOF, in the last three surveyed years.

We concluded that Russell Indexes' P/E ratios are better suited than Wilshire's and Standard and Poor's for estimation of market capitalization of small and large businesses for three main reasons: (1) changes in Russell-based estimates for benchmark year levels and inter-years track more closely the FOF aggregate than do estimates using the other two index families; (2) the shares of estimated capitalization of small businesses are very comparable among the three studied index families; and (3), the Russell data are uniquely available for both GPO benchmark years and the entire last decade. Before making a final decision to use the Russell indexes, there was one last topic to be addressed. It was whether the decision was sensitive to the period of observation.

P/E Ratio Observation Date Since FOF and P/E ratio data are available quarterly, there remained the issue regarding the within-year dating of the P/E ratios.²⁰ This required two

²⁰ P/E ratios can be presented as either "trailing" or "forward looking." Based both on theoretical assumptions and data availability constraints, historical, or 12-month trailing, P/E ratios were chosen for

analytical steps. The first was to finalize the choice of which index family to use. Simulations were conducted using end-of-year (fourth quarter) and mid-year (second quarter) P/Es for each index family. Then, a choice had to be made whether to use end-of-year or mid-year P/E ratios for calculating the wealth estimates and compare it with FOF data covering the corresponding period of observation.

The examination of results using all three available index families for each of the two time periods is presented in Table 3. An analysis of each index family is conducted by comparing shaded index total-columns with a shaded FOF column for each of Table 3's two panels. Russell had the obvious advantage of being the only index with data that were available back to 1990 for mid-year analysis. The calculations for each of the two within-year dates using the other two indexes did not yield any strong evidence of better correlation between Wilshire or S&P-based computations of market capitalization and FOF numbers, especially for the 1997 benchmark year.

Once the Russell P/E ratio was chosen as a source for final analysis, a comparison was done between market capitalization totals estimated using end-of-year and mid-year ratios, and corresponding FOF data. This comparison is of the shaded Russell column in upper panel of Table 3 with a corresponding shaded column in the lower panel of the table.

these calculations. The "trailing" ratios are consistent with the actual earnings from the GPO that would be capitalized and the 12-month trailing P/E ratios data were more readily available to use for the analysis.

Table 3. Comparison of Russell, Wilshire, and S&P-based Estimated Market Capitalization of Small and Large Corporations with Federal Reserve's Flow of Funds Data, End-of-Year and Mid-Year (in billions of dollars)

Year	Russell				Wilshire				Standard & Poor's				Flow of Funds
	Small	Large	Total	Small Business Share	Small	Large	Total	Small Business Share	Small	Large	Total	Small Business Share	
1990	\$ 840	\$2,150	\$ 2,990	28.1%	n/a	n/a	n/a	n/a	n/a	\$2,165	n/a	n/a	\$ 3,237
1991	\$1,377	\$3,535	\$ 4,913	28.0%	n/a	n/a	n/a	n/a	n/a	\$3,500	n/a	n/a	\$ 4,450
1992	\$2,016	\$3,674	\$ 5,690	35.4%	n/a	n/a	n/a	n/a	n/a	\$3,691	n/a	n/a	\$ 4,977
1993	\$2,200	\$3,847	\$ 6,047	36.4%	n/a	n/a	n/a	n/a	n/a	\$3,926	n/a	n/a	\$ 5,594
1994	\$1,905	\$3,576	\$ 5,481	34.8%	\$1,846	\$ 3,397	\$ 5,243	35.2%	\$1,738	\$3,643	\$ 5,381	32.3%	\$ 5,523
1995	\$2,583	\$4,635	\$ 7,218	35.8%	\$2,504	\$ 4,742	\$ 7,245	34.6%	\$2,538	\$4,582	\$ 7,119	35.6%	\$ 7,486
1996	\$3,177	\$6,203	\$ 9,380	33.9%	\$3,177	\$ 6,203	\$ 9,380	33.9%	\$3,086	\$6,143	\$ 9,229	33.4%	\$ 9,039
1997	\$3,772	\$7,580	\$11,352	33.2%	\$3,923	\$ 6,825	\$10,748	36.5%	\$3,727	\$7,580	\$11,307	33.0%	\$11,796
1998	\$3,325	\$8,886	\$12,211	27.2%	\$3,418	\$ 9,264	\$12,682	27.0%	\$3,098	\$9,089	\$12,187	25.4%	\$13,777
1999	\$4,280	\$9,430	\$13,710	31.2%	\$4,850	\$10,276	\$15,126	32.1%	\$3,516	\$9,550	\$13,066	26.9%	\$17,196
2000	\$3,325	\$8,612	\$11,937	27.9%	\$3,576	\$ 8,645	\$12,221	29.3%	\$2,763	\$8,355	\$11,119	24.9%	\$15,396

Year	Russell				Wilshire				Standard & Poor's				Flow of Funds
	Small	Large	Total	Small Business Share	Small	Large	Total	Small Business Share	Small	Large	Total	Small Business Share	
1990	\$1,003	\$2,298	\$ 3,300	30.4%	n/a	n/a	n/a	n/a	n/a	\$2,165	n/a	n/a	\$ 3,480
1991	\$1,130	\$2,940	\$ 4,070	27.8%	n/a	n/a	n/a	n/a	n/a	\$3,500	n/a	n/a	\$ 3,716
1992	\$1,851	\$3,898	\$ 5,749	32.2%	n/a	n/a	n/a	n/a	n/a	\$3,691	n/a	n/a	\$ 4,364
1993	\$1,973	\$4,024	\$ 5,996	32.9%	n/a	n/a	n/a	n/a	n/a	\$3,926	n/a	n/a	\$ 5,195
1994	\$1,964	\$3,866	\$ 5,830	33.7%	\$1,846	\$ 3,397	\$ 5,243	35.2%	\$1,738	\$3,643	\$ 5,381	32.3%	\$ 5,275
1995	\$2,390	\$4,395	\$ 6,785	35.2%	\$2,504	\$ 4,742	\$ 7,245	34.6%	\$2,538	\$4,582	\$ 7,119	35.6%	\$ 6,488
1996	\$3,307	\$5,933	\$ 9,240	35.8%	\$3,177	\$ 6,203	\$ 9,380	33.9%	\$3,086	\$6,143	\$ 9,229	33.4%	\$ 8,156
1997	\$3,712	\$7,022	\$10,734	34.6%	\$3,923	\$ 6,825	\$10,748	36.5%	\$3,727	\$7,580	\$11,307	33.0%	\$10,484
1998	\$3,405	\$7,812	\$11,217	30.4%	\$3,418	\$ 9,264	\$12,682	27.0%	\$3,098	\$9,089	\$12,187	25.4%	\$13,474
1999	\$3,863	\$9,762	\$13,625	28.4%	\$4,850	\$10,276	\$15,126	32.1%	\$3,516	\$9,550	\$13,066	26.9%	\$15,229
2000	\$3,975	\$9,866	\$13,841	28.7%	\$3,576	\$ 8,645	\$12,221	29.3%	\$2,763	\$8,355	\$11,119	24.9%	\$17,011

Note: Mid-year P/E ratios are only available for Russell Indexes; therefore the change in shares of small and large businesses' market capitalization is evident only for Russell-based analysis.

FOF Observation Date Charts 4 and 5 show this result - the behavior of wealth estimates obtained using end-of-year and mid-year Russell P/E ratios, as compared with published FOF data. From these two charts, it is evident that for the period between benchmark GPO years of 1992 and 1997, end-of-year data showed better correlation. We did note, however, that second quarter calculations provided closer comparisons for the last three years of rapid economic expansion (1998-2000), but, again, not for the period in between benchmark years. Therefore, it was decided to finalize the analysis with end-of-year data.

Corporate Wealth Aggregation After capitalization, the next step in the process was to sum the small and large components (Table 1, Column 6) and compare the calculated total with total corporate wealth as reported in the level tables that accompany the Flow of Funds (Table 1, Column 7).²¹ That FOF total represents the market value of U.S. domestic corporate wealth. Columns 8 and 9 in Table 1 represent shares of small and large businesses of the market value of U.S. domestic corporate wealth.

²¹ Table L.213 of the Flow of Funds, “Corporate Equities” outstanding, was used. From this table, the historical series for “market value of domestic corporations” (line 20 in the table) was extracted for use in the analysis.

Chart 4. End-of-Year Comparison

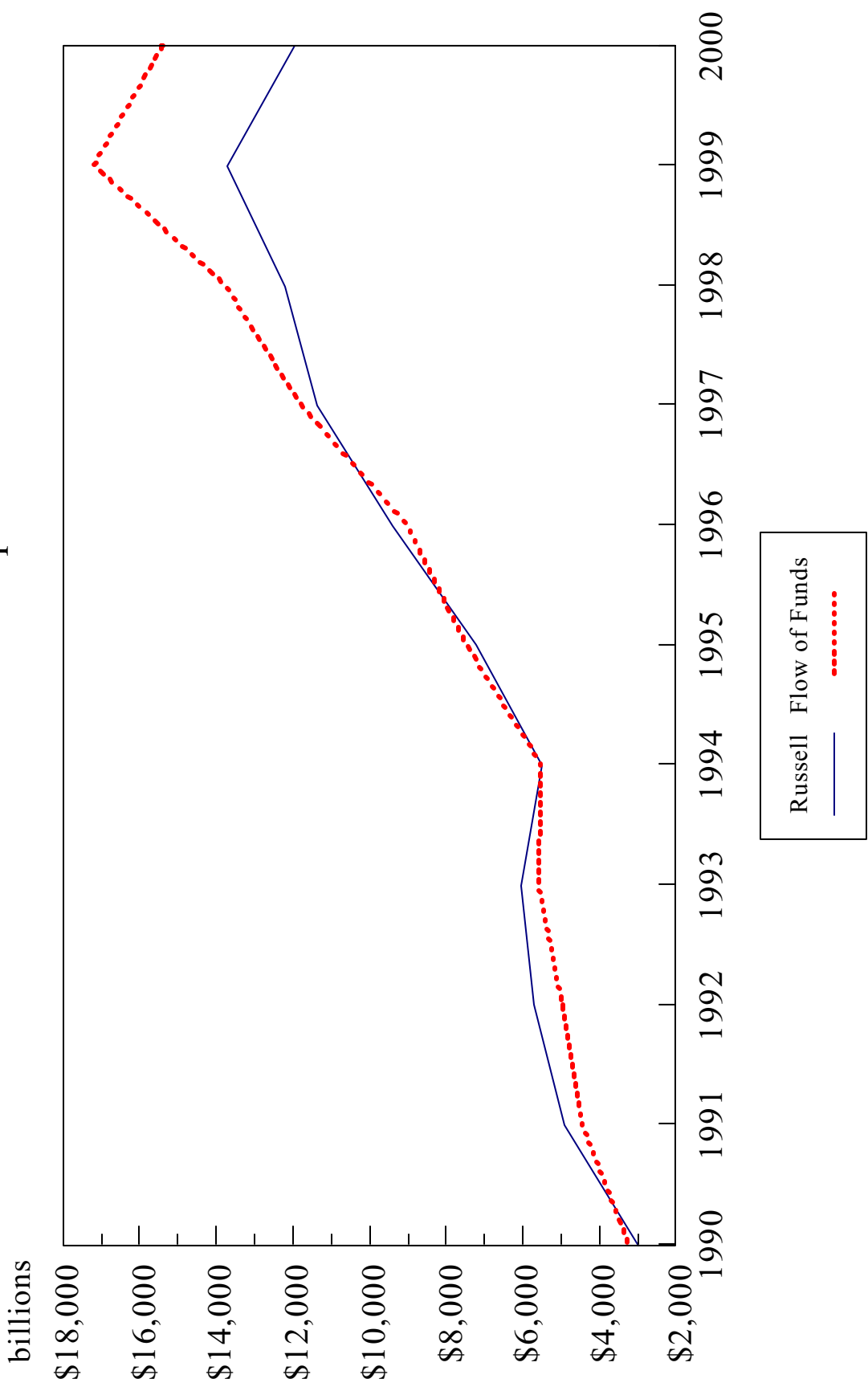


Chart 5. Mid-Year Comparison

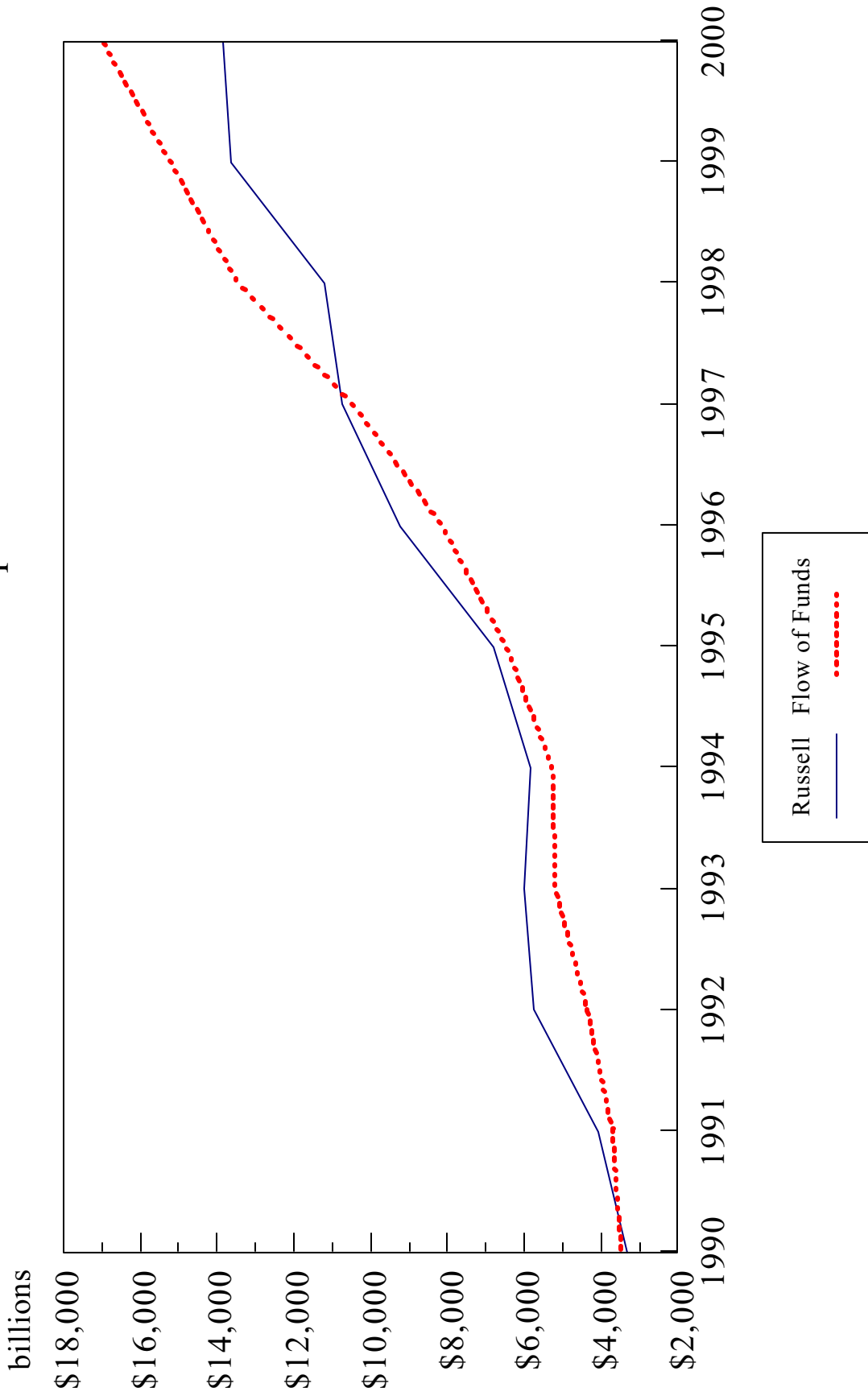


Table 4, shown below, reviews these two measures. The total calculated using our approach moves very closely in line with FOF data in the period between the GPO benchmark years of 1992 and 1997, and also in years 1990 and 1991. For years after 1997, there are somewhat larger discrepancies between the two data series.

Table 4. Comparison of Total Corporate Wealth Results (in billions of dollars)

Year	Estimated Market Capitalization	Market Value of Domestic Corporations
1990	\$ 2,990	\$ 3,237
1991	\$ 4,913	\$ 4,450
1992	\$ 5,690	\$ 4,977
1993	\$ 6,047	\$ 5,594
1994	\$ 5,481	\$ 5,523
1995	\$ 7,218	\$ 7,486
1996	\$ 9,380	\$ 9,039
1997	\$11,352	\$11,796
1998	\$12,211	\$13,777
1999	\$13,710	\$17,196
2000	\$11,937	\$15,396

Note: Estimated market capitalization is calculated by Joel Popkin and Company; 'Market Value of Domestic Corporations' is from Federal Reserve's Flow of Funds, Table L.213, Corporate Equities

There are several possible reasons for this discrepancy. This is a period for which the profit-type income used to calculate the JPC market capitalization numbers by business size has not been benchmarked. That could lead to some discrepancies with the capitalization estimates since different P/E ratios are used for small and large businesses, although one would not expect them to be large. However, a more fundamental reason may be the definitional differences between the IRS and the BEA profits that were discussed earlier. As shown in Table 5, the divergence in the wealth estimates

corresponds to a time period in which the two measures of profits were diverging as well.²²

Table 5. NIPA's versus IRS Calculated Profits

Year	NIPA's Profits	IRS Profits	Ratio of NIPA's to IRS' Profits
1990	\$401.5	\$378.8	106.0
1991	\$416.1	\$352.1	118.2
1992	\$451.6	\$415.0	108.8
1993	\$510.4	\$507.9	100.5
1994	\$573.4	\$585.1	98.0
1995	\$668.5	\$717.8	93.1
1996	\$726.3	\$797.6	91.1
1997	\$792.4	\$905.5	87.5
1998	\$721.1	\$834.5	86.4
1999	\$776.3	n/a	n/a
2000	\$845.4	n/a	n/a

Note: Ratios are calculated by dividing NIPA's Profits Before Taxes by IRS Total Receipts less Total Deductions.
Source: NIPA's tables

If this divergence continues over time, or if the adjustments that are causing the divergence could be expected to impact one business size class more than the other, these definitional differences could cause some difficulties in using this methodology in the long-run. If the levels generated by this methodology were going to be used directly, it would be necessary to study this divergence in greater detail. However, if one is to use this estimate of proportional shares only to segment FOF data, there is not as much concern. IRS profits measures are used as the primary proxy for dividing the GPO profits by firm size. Consequently, the resulting firm size shares of profits are closely aligned with the IRS definition of profits. Since it is the IRS definition of profits that is the basis of the P/E ratio calculations, the shares of wealth that are generated from those profits

²² In addition to the definitional differences mentioned earlier between the calculation of these two series, the BEA profits number is also adjusted for changes in the value of the inventories each firm is holding.

should not be biased by any definitional differences even if the levels calculated using the process are too high or too low.

Because of the close correlation between the two series during most of the time period, it would be possible to use the JPC data directly as an estimate of wealth by business size, although some adjustments would have to be made to account for the definitional issues discussed above. However, there are advantages to using the FOF as the control-total for overall corporate wealth. Consequently, it would be better to apply the business size shares calculated from the JPC data to divide the FOF total into small and large business wealth estimates. This also reduces the concerns about the definitional differences between the two profits measures.

Noncorporate Wealth Noncorporate wealth requires a different approach than the market value of equities methodology used for corporate wealth in this analysis. Since no organized market for noncorporate entities exists, there is no equivalent to the stock market based measure of wealth that is being used for corporations. But the FOF does contain estimates of noncorporate net worth. The Federal Reserve estimates them by subtracting liabilities from assets in the balance sheet of nonfarm noncorporate business in which tangible assets are valued at replacement cost. Such net assets are assumed to be totally owned by sole proprietorships, partnerships and limited liability companies. As was discussed earlier, with respect to corporations, the net worth, or liquidation, valuation of wealth is not easy to separate by firm size. However, for noncorporate entities this may not be as important as it is for corporations. There certainly are noncorporate firms that

employ more than 500 people and are, by the definitions used in this analysis, large businesses. But for the most part, the noncorporate forms of legal organization consist mostly of small businesses. Thus, one simplifying assumption that can be used is that all of noncorporate business is small business. That is what is assumed in this analysis. This is consistent with the methodology that is used when estimating GPO profit and profit-type income by firm size.

Since the goal of this analysis is to produce small and large business estimates of total business wealth, the use of the replacement value of net worth for noncorporate business wealth while using an equity market valuation of corporate business wealth needs to be evaluated. However, these two concepts should not be significantly at odds with one another. A firm's value as a single entity always varies somewhat from the net value of its assets if the firm was liquidated and each asset sold separately. But, the value of its net assets is at the core of any valuation made of the company. Consequently, in a noncorporate business it is logical that the core value of the company would be the cash in-hand after its assets are sold at market prices and its liabilities are satisfied. This is similar to assuming Tobin's q to be equal to one, a reasonable equilibrium assumption for a firm with few intangible assets. Thus, the corporate and noncorporate wealth concepts are consistent because the necessary assumptions to construct that aggregation are transparent.²³

²³ Noncorporate asset valuations can be assessed, at least to some extent, by the implied P/E ratio obtained by dividing the net worth by the profit-type income for the noncorporate sector. The ratio averaged about 6 for the 1990-2000 time period. That is, as expected, lower than the corporate P/E ratio values for small businesses. While the lack of a liquid market for noncorporate companies is one reason for expecting the implied P/E ratios to be lower than those for corporations, there is a second factor to consider as well. The profit-type income for noncorporate firms is often a mixture of return to labor and return to capital. Therefore, the denominator of the implied P/E ratio is larger than it would be if it were strictly a measure of

SECTION III - RESULTS

Once the methodology for splitting corporate wealth was proved viable, the data series for FOF's market value of domestic corporations was split using the shares obtained in the capitalization process. That enabled a final calculation of total corporate and noncorporate small business wealth, both based on Federal Reserve FOF data.

Table 6 shows the relative proportions of small and large business wealth for the corporate form and for all forms of business wealth. It shows that in the benchmark year

Table 6. Estimates of Business Wealth by Firm Size

Market Value of Corporate Wealth and of the Net Worth of Noncorporate Business

Year	Corporate		Noncorporate	Total	Small Business Share Of Corporate Wealth	Small Business Share Of Total Wealth
	Small	Large				
1990	\$ 909	\$ 2,328	\$2,478	\$ 5,716	28.1%	59.3%
1991	\$1,248	\$ 3,203	\$2,458	\$ 6,908	28.0%	53.6%
1992	\$1,764	\$ 3,214	\$2,404	\$ 7,381	35.4%	56.5%
1993	\$2,035	\$ 3,559	\$2,466	\$ 8,060	36.4%	55.8%
1994	\$1,920	\$ 3,603	\$2,625	\$ 8,148	34.8%	55.8%
1995	\$2,679	\$ 4,807	\$2,801	\$10,287	35.8%	53.3%
1996	\$3,062	\$ 5,978	\$2,957	\$11,996	33.9%	50.2%
1997	\$3,920	\$ 7,876	\$3,176	\$14,972	33.2%	47.4%
1998	\$3,751	\$10,026	\$3,508	\$17,285	27.2%	42.0%
1999	\$5,369	\$11,827	\$3,757	\$20,953	31.2%	43.6%
2000	\$4,288	\$11,108	\$4,039	\$19,434	27.9%	42.8%

Note: Net worth value of noncorporate wealth is from Flow of Funds' Table B.103, Balance Sheet of Nonfarm Noncorporate Wealth (assets minus liabilities)

the return to capital and the resulting ratio smaller than it would be otherwise. There was very little variation in the implied ratio over time, as opposed to the Russell 2000 Small Cap P/E ratio's greater variation. But, market valuations are impacted by many more factors than are net worth calculations.

1997, estimated small business wealth accounted for 47 percent of all business wealth. Looking only at corporations, the table shows the small business share to be 33 percent, reflecting the assumption made that all noncorporate wealth is held by small business. Table 6 also indicates that the share of small business wealth of all business, as well as of only corporate businesses, has been falling rather steeply over the past few years. The possible explanations for this and further study required to evaluate these estimates are discussed in the next section.

SECTION IV - IMPLICATION OF THE RESULTS FOR FURTHER RESEARCH

The methodology described above is intended to provide a starting point for measuring wealth by firm size. The results in Table 6, while interesting and thought provoking, are certainly not likely to reflect the final word in this area of study. The first and foremost question that these results provoke is the one about the concept of wealth. The methodology used in this research produces a sharp decline in the share of small business wealth between 1995 and 2000. That is mostly the result of the sharp run-up in equity prices during the late 1990s, especially, the run-up in the value of large technology firms. This caused the equity valuation of the large corporations to increase 131 percent compared with 60 percent for smaller corporations. Both increased more than the 44 percent rise in the net worth of noncorporate business.

Consequently, the former should be more volatile than latter. So, the implied ratio indicates that there is nothing untoward in the use of FOF noncorporate net worth data in this manner.

By now analysts have the benefit of hindsight to know that the large run-up in the values of publicly held companies in the U.S. was not a lasting increase in wealth. For this study it brings up the very difficult question about whether a market valuation that could possibly include the value of asset price "bubbles" should be considered the measure of wealth. Joseph Stiglitz summarized this general concern when he wrote, "[i]f asset prices do not reflect fundamentals well, and if these skewed asset prices have an important effect on resource allocations, then the confidence of economists in the efficiency of market allocations of investment resources is, to say the least, weakened."²⁴

However, there are many reasonable arguments for using the market's valuation of wealth. First, there have been many studies that show that the market is valuing much more of a corporation than is represented by the sum of the replacement values of its corporate assets. The value of its intangibles and future expectations about the earnings potential of all those assets should be counted as part of wealth. Secondly, if large run-ups in stock prices influence consumer spending or savings decisions, as many researchers have suggested, then arguably the wealth is "real" at least for the period of time that it exists.²⁵ Investment spending of businesses can also be affected by market values. High P/E ratios make it easier to raise money for such investment. The large run up in corporate debt and investment over that past few years strongly suggest that happened. Third, it is not easy to tell from the outside when a market is manifesting an

²⁴ See Stiglitz (1990)

²⁵ There has been significant research on the wealth effect of consumer's spending and saving decisions. James Proterba (2000) summarizes many of those studies. Under the permanent income hypothesis, it is reasonable to hypothesize that stock market gains, even if not realized, have some influence on the decisions that stock-holding consumers make. Other researchers have argued that consumer's choices to spend and save are being influenced by the same underlying economic fundamentals as are driving the

asset price bubble and when the increase in its value is based on economic fundamentals.²⁶ Consequently, it would never be possible to determine what part of the market valuation of a firm is based on the underlying fundamentals and what part might be caused by “irrational exuberance.” For the most part, markets work and provide valuable information; therefore, estimating wealth by firm size based on the equity market's valuation is a positive step forward in this research.

As was mentioned at the beginning of this paper, it would be ideal to be able to split the equity value of firms by business size and to determine the replacement cost of assets and liabilities by firm size. That would provide two measures of wealth by firm size, the differences in which could provide interesting insights, through Tobin's q or other approaches, into the behavior of the business sector of the U.S. So doing would also provide a choice of wealth measures by business size that could be used for different purposes. More study of these issues is clearly warranted.²⁷

increases in the valuations of the publicly held companies but that there is no direct correlation (Lantz and Sarte).

²⁶ Timothy Cogley (1999) argues that it is not possible for the monetary authorities to accurately determine when a bubble exists in the asset markets because they never have full and complete information on which to make that judgement. Therefore, the Fed is in danger of providing destabilizing monetary policy if it tries to deflate a bubble. Consequently, it seems unlikely that it will be possible to ever separate the bubble portion of the market's wealth valuation from an increase in wealth that is based on the fundamentals of the firm and the economy.

²⁷ Other areas of further study are wealth by industry by firm size and a refinement of the tax rates used in this analysis.

APPENDIX A: DATA

GPO

**Table A-1 Profits Before Taxes with IVA, by business size
(in millions of dollars)**

Year	Small Business	Large Business
1990	\$ 83,404	\$ 226,645
1991	\$ 84,851	\$ 257,686
1992	\$ 120,997	\$ 252,564
1993	\$ 134,483	\$ 290,387
1994	\$ 145,623	\$ 331,387
1995	\$ 166,279	\$ 389,232
1996	\$ 187,344	\$ 432,949
1997	\$ 215,341	\$ 468,322
1998	\$ 199,643	\$ 434,181
1999	\$ 206,158	\$ 448,349
2000	\$ 217,671	\$ 473,389

Calculated by JPC from BEA's Gross Product Originating by industry.

Flow of Funds (FOF)

**Table A-2 Flow of Funds Release, Table L.213, Line 20
(in billions of dollars)**

Year	Market Value of Domestic Corporations (mid-year)	Market Value of Domestic Corporations (end-of-year)
1990	\$ 3,480	\$ 3,237
1991	\$ 3,716	\$ 4,450
1992	\$ 4,364	\$ 4,977
1993	\$ 5,195	\$ 5,594
1994	\$ 5,275	\$ 5,523
1995	\$ 6,488	\$ 7,486
1996	\$ 8,156	\$ 9,039
1997	\$10,484	\$11,796
1998	\$13,474	\$13,777
1999	\$15,229	\$17,196
2000	\$17,011	\$15,396

Federal Reserve Board.

Tax Ratio

**Table A-3 NIPA's Table 1.14, National Income by Type of Income,
Corporate Profits with Inventory Valuation Adjustment (in billions of dollars)**

Year	Profits Before Tax	Profits After Tax	Tax Ratio
1990	401.5	260.9	0.6498
1991	416.1	282.6	0.6792
1992	451.6	308.4	0.6829
1993	510.4	345.0	0.6759
1994	573.4	386.7	0.6744
1995	668.5	457.5	0.6844
1996	726.3	502.7	0.6921
1997	792.4	555.2	0.7007
1998	721.1	482.3	0.6688
1999	776.3	523.3	0.6741
2000	845.4	573.9	0.6789

Bureau of Economic Analysis.

P/E Ratios

Table A-4 Russell Indexes

Quarter	Russell 2000 Small Cap		Russell 1000 Large Cap	
	12-month trailing	12-month forward	12-month trailing	12-month forward
2Q 1990	18.5	13.2	15.6	12.8
4Q 1990	15.5	11.5	14.6	12.2
2Q 1991	19.6	13.6	16.8	14.6
4Q 1991	23.9	15.7	20.2	16.3
2Q 1992	22.4	14.4	22.6	15.3
4Q 1992	24.4	16.5	21.3	16.1
2Q 1993	21.7	15.6	20.5	15.7
4Q 1993	24.2	16.6	19.6	15.5
2Q 1994	20.0	14.4	17.3	13.7
4Q 1994	19.4	14.2	16.0	13.0
2Q 1995	21.0	15.0	16.5	13.9
4Q 1995	22.7	16.5	17.4	15.1
2Q 1996	25.5	17.4	19.8	16.2
4Q 1996	24.5	17.8	20.7	16.9
2Q 1997	24.6	18.8	21.4	18.6
4Q 1997	25.0	19.2	23.1	19.7
2Q 1998	25.5	19.7	26.9	22.6
4Q 1998	24.9	19.5	30.6	24.3
2Q 1999	27.8	20.1	32.3	25.8
4Q 1999	30.8	22.7	31.2	26.3
2Q 2000	26.9	19.7	30.7	26.2
4Q 2000	22.5	17.4	26.8	23.0

All numbers are weighted harmonic averages; source: Frank Russell & Co., Prudential Securities.

Table A-5 Wilshire Indexes

Quarter	Wilshire Next 1750 Small Cap		Wilshire Top 750 Large Cap	
	12-month trailing	12-month forward	12-month trailing	12-month forward
2Q 1990	n/a	n/a	n/a	n/a
4Q 1990	n/a	n/a	n/a	n/a
2Q 1991	n/a	n/a	n/a	n/a
4Q 1991	n/a	n/a	n/a	n/a
2Q 1992	n/a	n/a	n/a	n/a
4Q 1992	n/a	n/a	n/a	n/a
2Q 1993	n/a	n/a	n/a	n/a
4Q 1993	n/a	n/a	n/a	n/a
2Q 1994	n/a	n/a	n/a	n/a
4Q 1994	18.8	14.5	15.2	12.7
2Q 1995	n/a	n/a	n/a	n/a
4Q 1995	22.0	19.0	17.8	16.3
2Q 1996	n/a	n/a	n/a	n/a
4Q 1996	24.5	20.0	20.7	17.9
2Q 1997	n/a	n/a	n/a	n/a
4Q 1997	26.0	17.0	20.8	16.2
2Q 1998	n/a	n/a	n/a	n/a
4Q 1998	25.6	21.0	31.9	27.4
2Q 1999	n/a	n/a	n/a	n/a
4Q 1999	34.9	26.1	34.0	27.3
2Q 2000	n/a	n/a	n/a	n/a
4Q 2000	24.2	20.6	26.9	24.9

All numbers are weighted harmonic averages; source: Prudential Securities.

Table A-6 Standard & Poor's Indexes

Quarter	S&P 600 Small Cap		S&P 100 Large Cap		S&P 500
	12-month trailing	12-month forward	12-month trailing	12-month forward	12-month trailing
2Q 1990	n/a	n/a	n/a	n/a	15.6
4Q 1990	n/a	n/a	n/a	n/a	14.7
2Q 1991	n/a	n/a	n/a	n/a	16.5
4Q 1991	n/a	n/a	n/a	n/a	20.0
2Q 1992	n/a	n/a	n/a	n/a	23.1
4Q 1992	n/a	n/a	n/a	n/a	21.4
2Q 1993	n/a	n/a	n/a	n/a	20.8
4Q 1993	n/a	n/a	n/a	n/a	20.0
2Q 1994	n/a	n/a	n/a	n/a	17.5
4Q 1994	17.7	13.9	n/a	n/a	16.3
2Q 1995	n/a	n/a	n/a	n/a	16.4
4Q 1995	22.3	19.2	n/a	n/a	17.2
2Q 1996	n/a	n/a	n/a	n/a	19.5
4Q 1996	23.8	19.3	n/a	n/a	20.5
2Q 1997	n/a	n/a	n/a	n/a	21.5
4Q 1997	24.7	16.2	n/a	n/a	23.1
2Q 1998	n/a	n/a	n/a	n/a	26.9
4Q 1998	23.2	19.9	32.5	27.4	31.3
2Q 1999	n/a	n/a	n/a	n/a	32.8
4Q 1999	25.3	20.4	35.3	31.7	31.6
2Q 2000	n/a	n/a	n/a	n/a	28.7
4Q 2000	18.7	17.0	27.1	25.4	26.0

All numbers are weighted harmonic averages; sources: Standard & Poor's, Prudential Securities.

APPENDIX B: STOCK INDEX FAMILIES' SUB-INDEXES BY BUSINESS SIZE

Russell Indexes

Russell 3000 includes the 3,000 largest U.S. companies based on total market capitalization, which represents about 98% of the investable U.S. equity market. Russell 2000 measures the performance of the 2,000 smallest companies in the Russell 3000 Index, which represents approximately 8% of the Russell 3000's market capitalization. At the latest reconstitution, the average market capitalization of a company in Russell 2000 was approximately \$530 million; the median market capitalization was approximately \$410 million. The largest company in the index had an approximate market capitalization of \$1.4 billion. Process of annual index reconstitution starts on May 31 of each year. The final results of latest annual reconstitution for both Russell 3000 and Russell 2000 took effect July 1, 2001. In order to be eligible for inclusion into Russell indexes, stocks must be of a U.S. company and trading on May 31 in a given year, at or above \$1.00, and Russell must have access to documentation verifying the company's eligibility for inclusion such as corporate description, incorporation information, shares outstanding data, among other conditions.

At the last reconstitution, 609 companies were added and 431 deleted from Russell 2000. Based on Peter Fortune's *A Primer on U.S. Stock Price Indices*, published by the Boston Fed, Russell 2000 has very similar movement characteristics as NASDAQ Composite Index. Following econometric analysis, Fortune's paper concludes that Russell 2000 and

NASDAQ indices “measure returns on stocks that, as a group, represent aggressive investments” (as opposed to Dow 30, S&P 500, and Wilshire 5000).

Wilshire Indexes

Wilshire Next 1750 Small Cap represents the 751st to 2,500th largest stocks in the Wilshire 5000 as determined by market capitalization. Wilshire 5000 measures the performance of all U.S. headquartered equity securities with readily available price data. Wilshire 1750 Small Cap follows Wilshire 5000’s membership guidelines, in which additions to the index happen at the end of each month. However, additions to the index from Wilshire 5000 are derived only once a year, at June 30. As of the end of last year, mean market value of a company included in Wilshire 1750 was \$727 million, and median market value was \$568 million. The index’s largest company’s market value was \$5,075 million.

Standard & Poor’s Indexes

The S&P 600 SmallCap index consists of 600 domestic stock chosen of market size, liquidity (bid-asked spread, ownership, share turnover and number of no-trade days), and industry group representation. It is a market-value weighted index. Current mean market value of a company included in S&P SmallCap 600 Index is \$672 million, and median market value is \$585 million. The index’s largest company’s market value is \$3,186 million. Membership guidelines for S&P SmallCap 600 are stricter than for other indices. Companies are carefully selected in order to represent a broad range of industry

segments within the U.S. economy, their financial and operating condition is rigorously analyzed, as is their trading activity.

Information collected from: www.russell.com, www.wilshire.com, and www.spglobal.com

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