The Private Equity Premium Puzzle

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Abstract

We document that investment in private equity is extremely concentrated. Yet despite the very poor diversification of entrepreneurs' portfolios, we find that the returns to private equity are similar to the returns on public equity. Given the large premium required by investors in public equity, it is puzzling why households willingly invest substantial amounts in a single privately held firm with a far worse risk-return tradeoff. We examine various explanations and conclude that private nonpecuniary benefits of control must be large and/or entrepreneurs must greatly overestimate their probability of success in order to explain the observed concentration of wealth in private equity.

Introduction

Both asset pricing and investment theory critically rely on our understanding of investors' portfolio choices. One of the most studied puzzles in financial economics is that, given the returns and volatility of publicly traded equity, investors seem to allocate too little wealth to stocks. That is, the premium demanded for holding equity appears too high given observed investment in the stock market. However, while most of the literature has focused on publicly traded equity, we analyze the holdings of households in companies that are not publicly traded and focus on the returns to equity in these privately held firms. The private equity market is as important as the public equity market in terms of size and is actually larger over most of our sample period. Thus, it is equally important to understand investment behavior and the risk-return tradeoff in this market.

We find investment in private equity to be extremely concentrated. About 77 percent of all private equity is owned by households for whom private equity constitutes at least half of their total net worth. Furthermore, households with positive private equity ownership invest on average more than 70 percent of their private holdings in a single private company in which the household has an active management interest. Despite this dramatic lack of diversification and heavy investment in private firms, this paper documents that the average annual return to all equity in privately held companies is rather unimpressive. We document that private equity returns are similar to the return on an index of publicly traded equity, using both data from the Survey of Consumer Finances over the period 1989 to 1998 as well as data from the Flow of Funds Accounts over the longer period 1953 to 1998. This is true under a variety of assumptions and adjustments for private wages and salaries taken in private firms, retained earnings in the firm, firm births and deaths, the treatment of proceeds from initial public offerings and mergers, and various tax issues including potential income underreporting and tax evasion.

We also find that an index of private equity is slightly more volatile than the public equity index and is highly correlated with public market returns. However, given that the average household holds equity in a *single* private firm, which is also highly correlated with its human capital, the diversified portfolio of public equity offers a far more attractive risk-return tradeoff. We supplement these risk calculations with an analysis of the distribution of returns to equity across privately held firms. Survival rates of private firms are less than 35 percent over the first 10 years of the firm's life. Even conditional on survival, however, entrepreneurial investment appears extremely risky, generating a wide returns distribution.

Therefore, unlike the equity premium puzzle documented in public markets, the returns to

private equity investment appear far too low given their risk. In other words, given the returns and volatility of private equity, as well as the high correlation with owners' return on human capital, it is puzzling why investors allocate so much of their wealth to private ventures. Hence, this paper uncovers an equity investment puzzle in the private market exactly opposite to that found in the public market. Given the evidence on public equity, our findings provide an additional challenge to asset pricing theory: If households require such a high expected return to take on the risk of *publicly* traded equity, why are they willing to invest substantial amounts of wealth in a single *private* company with a much worse risk-return trade-off?

In the final part of the paper, we begin to explore what motivates entrepreneurs to hold such undiversified portfolios of private equity, despite the unattractive risk-return trade-off. We begin by asking whether optimal contracting between owner-managers and other (current or potential) investors in the firm can explain why managers may have to maintain large ownership stakes. However, even if all ownership patterns were to fit the predictions of optimal contracting theory this would not explain why entrepreneurs/managers agree to hold undiversified portfolios of private equity in the first place. In the terminology of optimal contracting theory, the poor risk-return trade-off we document should lead to a violation of the participation constraints of entrepreneurs if no additional payoffs are provided. We therefore consider four possible explanations for why entrepreneurs willingly hold undiversified portfolios of private equity: high entrepreneur risk tolerance, large additional pecuniary benefits, large non-pecuniary benefits, and lastly, overoptimism and misperceived risk.

We conclude, based on the composition of the remaining part of entrepreneurs' portfolios and evidence from several additional sources, that entrepreneurs are far from risk neutral, behaving in a manner consistent with risk averse preferences. Furthermore, additional pecuniary benefits from managerial compensation packages (e.g., stock options, long-term incentive plans, bonuses, etc.) are generally only relevant for large public companies. In private companies the only additional pecuniary benefits come from taking salaries from the firm or from tax evasion, both of which are accounted for in our estimate of private equity returns, and are not sufficient to explain observed investment. That leaves two possibilities. One is that entrepreneurs enjoy large nonpecuniary benefits of control. Based on the observed concentration of wealth in the firm and our calculated low returns from private equity investment, we estimate (based on existing theoretical work) that these benefits would have to be worth the equivalent of from 5 to 20 percent in expected return per year to justify observed investment. That is, individuals would have to be willing to forego from

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5 to as much as 20 percent in average returns per year in order to own and run the firm. This translates into an average of 142 percent of annual income foregone for the median entrepreneur, when weighted across households by the size of private equity investment! This is a substantial sacrifice, although not entirely implausible. Alternatively, entrepreneurs may be overoptimistic and/or misperceive the risk of concentrating their wealth in a single private company. Independent survey evidence is consistent with this explanation. While the average return to entrepreneurship is low, the distribution of returns is highly skewed. If individuals overestimate their chances of success and believe their performance will be in the right tail of this distribution, then this could be the motivation for entrepreneurship and private equity investment. Based on estimates of the distribution of returns to private equity across surviving households, the conditional distribution of returns looks attractive compared to that of public equity. Thus, overestimating the probability of survival strongly increases the incentive to become an entrepreneur. Survey evidence confirms that entrepreneurs' perception of failure rates are grossly underestimated. For instance, Cooper, Woo, and Dunkelberg (1988) find that 68 percent of entrepreneurs think that the odds of their business succeeding are better than the odds for another business like theirs. Only 5 percent think their odds are worse. Actual failure rates of firms in the first 10 years of life are almost 66 percent.

To our knowledge the returns to all private equity have not previously been documented. While there is a small literature on the returns to venture capital, this type of private equity investment represents less than 1 percent of all private equity. Furthermore, companies who are able to obtain venture capital financing are not representative of the true population of private firms. Venture financing occurs well after the firm has already achieved much success. Despite this, we show that even the small sector of the private market that receives venture capital financing does not produce particularly attractive returns.

The concentrated holdings of private equity we document contribute to a growing list of facts documenting poor diversification of household portfolios. While theory and empirical evidence on return volatility prescribes holding a well-diversified set of assets, and asset pricing models typically assume investors hold well-diversified portfolios, there is ample evidence that investors do not behave in a manner consistent with economic theory. Several papers document that some households with public equity holdings hold very few stocks, exposing themselves to substantial diversifiable risk.[1] In addition to holding only a small number of stocks, the types of securities chosen by investors also seem to limit the diversification of their portfolios (e.g., Coval and Moskowitz

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[1]See Blume, Crockett, and Friend (1974), Blume and Friend (1978), and Avery and Elliehausen (1986).

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(1999,2000) and Huberman (2000), who document a strong preference for equity of geographically proximate firms). However, we will argue that the lack of diversification among private equity holders is far more severe than the extent of poor diversification of public equity portfolios. This underscores the importance of analyzing and understanding investment in private equity.

Finally, the equity premium literature has previously only analyzed investment and returns in the public stock market. Investors, however, hold considerable amounts of wealth in private equity, and the private equity market is at least as large as the public market. In order to understand the premium demanded for public equity, it is important to analyze the entire equity positions of investors and the return distribution of all equity holdings. In a recent paper, Heaton and Lucas (2000a) document a link between the risk of entrepreneurial investment and portfolio choice and asset prices. They suggest that the additional risk of private investment and its correlation with public equity market returns may explain why the public equity premium is so high.[2] While it is standard in the literature on nonfinancial income and asset pricing to take this income as exogenous, our findings for private equity emphasize that a complete understanding of investor portfolio choice requires that private equity holdings be endogenized. Understanding the motive for private equity investment will determine how entrepreneurial risk influences investment choices, risk sharing, and asset prices. We hope this paper begins to shed light on these issues by taking a first step in documenting the distribution of private equity returns and motivations for investment in privately held companies.

The rest of the paper is organized as follows. Section I briefly describes the data used in this study, highlighting the combination of data sources used to analyze the diversification of and returns to private equity. Section II documents the extent of household private equity ownership and compares it to ownership of publicly traded stock in the firm for which the household works. Section III conducts a detailed analysis of the returns to private equity, highlighting a series of issues in calculating these returns. Section IV then examines the risks of private equity investment. Based on the risk-return tradeoff of private equity we document, the observed concentration of wealth in private firms appears puzzling. Section V therefore evaluates various explanations for why investors willingly hold so much private equity. Finally, Section VI concludes.

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[2]Others have documented the relation between nonfinancial income and portfolio choice as well. See, for example, Guiso, Jappelli, and Terlizzese (1994), Vissing-Jørgensen (2000), and Souleles (2000).

I. Data Sources

In order to analyze private equity holdings and own company stock ownership, we use data from six sources. The first is the 1989, 1992, 1995, and 1998 *Survey of Consumer Finances* (SCF). These surveys are nationally representative samples of about 4,000 households per survey year. The respondents provide information on individual household portfolio composition, including investment in both private and publicly traded firms. Characteristics of the household are provided on net worth, employment and retirement status, hours worked per week, demographics and educational attainment, as well as on the attributes of private firms in which the household has ownership. About 30 percent of respondents report to have some ownership in a non-publicly traded firm. A second data source we employ to supplement the SCF data is the 1993 *National Survey of Small Business Finances* (NSSBF). This survey, conducted by the Federal Reserve Board, provides detailed information on a representative sample of 4,637 small private firms designed to represent about 5 million small businesses in the U.S. As an additional supplement to our private equity data, we also employ data from the Federal Reserve Board's *Flow of Funds Accounts* (FFA) over the 1953 to 1998 time period. This data source provides aggregate statistics on the value and income of corporate and non-corporate firms on an annual basis. We employ this data to generate a time-series of private and public equity magnitudes and returns. We also supplement our return calculations with adjustments for merger and acquisition activity in the private and public markets using data from the Securities Data Corporation (SDC) and making adjustments for tax evasion and tax underreporting using data from the Internal Revenue Service's Taxpayer Compliance Measurement Program (TCMP). Finally, we supplement our data with public stock return information from the Center for Research in Security Prices (CRSP).

II. Private Equity and Own Company Stock Ownership

In this section we document the extent of private equity ownership and of own company stock holdings. We analyze entrepreneurial stock ownership in privately held businesses and compare ownership patterns to those in publicly traded corporations for which a household member works or has worked. We refer to the latter as own company stock ownership.

A. Small Businesses and Privately Held Firms

Using data from the SCF, Panel A of Table I documents the poor diversification of household portfolios in private equity. The value of private equity for a given household is the self-reported

value of the household's share of net equity in the business if it were sold today. We account for entrepreneurial leverage in the firm by adding loans from the household to the business, subtracting loans from the business to the household, and adding the value of personal assets used as collateral for business loans. Summary statistics are reported for each survey year (1989, 1992, 1995, and 1998) as well as the average across years. All figures are calculated using SCF weights, and are thus representative of the population of U.S. households.[3]

The first three rows of Panel A report the percent of total private equity owned by households with various degrees of net worth devoted to private equity. These figures demonstrate that the private equity market is comprised primarily of individuals who invest heavily in private firms. For instance, in 1998, 76.5 percent of all private equity was held by households who had more than 50 percent of their personal net worth devoted to private equity. A more direct measure of the poor diversification caused by investment in private equity is captured by the next two rows of Panel A. The rows report the average percent of net worth invested in private equity across all households with some private equity holdings and positive net worth. The average household in this group invests almost 43 percent of its wealth (about 46 percent when weighting by net worth) in private equity.[4] Moreover, this investment is typically devoted to a single private firm in which the household has an active management interest. The next two rows of Panel A report the mean percent of private equity held by households in the firm for which they have the largest actively managed equity share. The average household who owns private equity has about 82 percent (73 percent when weighted by amount of private equity invested) of its private equity investment in such a firm. Moreover, around 85 percent of total private equity is held by investors with an active management role in the company. Thus, most private equity investments are in businesses managed by the household. Overall, these results suggest that not only is private equity investment substantial relative to net worth, it is also poorly diversified, and is highly concentrated in the hands of managers.

We supplement the figures from the SCF, which are representative of U.S. households, with numbers from the 1993 NSSBF, which are representative of small U.S. firms. This survey pertains to firms with less than 500 employees, more than 99 percent of which are private companies. Figure 1 plots the percentage of the private firm's equity owned by the principal shareholder (who is typically the entrepreneur) across various types of firms. Firms are sorted into deciles by number

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[3]All five SCF imputations are employed. Results do not vary substantially across imputations.

[4]This figure does not include the fraction of the household's net worth derived from labor income from the firm. Including labor income would only increase the fraction of wealth tied to the firm.

of employees, total assets, and firm age, and the average ownership share of the principal shareholder is plotted for each decile. For comparison, the ratio of the value of total firm equity to total assets is also plotted.[5] As the figure demonstrates, share ownership of the principal shareholder ranges from over 60 to close to 100 percent, indicating that the principal shareholder/entrepreneur is the majority owner of the firm. The ownership of the principal shareholder is larger for smaller firms, with fewer number of employees, but is relatively flat across firm age deciles.

Accumulating the evidence in Table I and Figure 1, the concentration of wealth in private equity is substantial. Households with private equity ownership appear to be very undiversified, investing a large fraction of their wealth in a single business which they own and manage. The question is why do they exhibit this behavior and how costly is such behavior in terms of unexploited diversification benefits?

B.   Publicly Traded Firms

For comparison to the concentration of wealth in private equity, we report the concentration of wealth in publicly traded equity of firms for which a household member is or has been employed. Since the majority of private firms never go public, and because publicly traded firms have more dispersed ownership, we suspect that the concentration of household wealth in own company stock that trades publicly will be smaller than in privately held firms.

Panel B of Table I reports that for households with own company stock holdings, these constitute the majority of the households' direct equity investment, averaging almost 75 percent (51.4 percent when weighted by amount of directly held equity). As a fraction of all equity held, both directly and indirectly through mutual funds, IRAs, pension plans, annuities and trusts, own company stock accounts for about 53 percent (35 percent when weighted by amount of total equity invested) of a household's total equity holdings. Relative to privately held firms, however, investment in own company stock for public firms is far less concentrated. As a fraction of household net worth, investment in own company stock is only 10 percent, compared to 46 percent for private firms. Furthermore, households with over 25 percent of their equity holdings in own company stock constitute only about 12.3 percent of total equity investment in public firms. Households with over 50 percent and 75 percent of their equity holdings in own company stock comprise only 8 and 4.4 percent, respectively, of total public equity investment. Hence, while the scope of own company

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[5]The deciles are calculated using NSSBF weights and firms are weighted within deciles according to the NSSBF. Since the first two deciles of number of employees is one, we treat the bottom 20 percent of firms as one category, plotting a single point on the graph. Therefore, there are only 9 employee categories, but 10 asset and firm age groups.

stock investment is significant, owners of own company stock in public companies are not as poorly diversified as owners of private equity. Bitler, Moskowitz, and Vissing-Jørgensen (2000) show that initial owners of private firms continue to hold substantial ownership shares well after the firm goes public. Hence, part of the concentration of investment in own company stock is due to original owners of the firm maintaining their holdings after the firm goes public.

The numbers shown in Table I do not include own company stock held indirectly through pension plans or employee stock ownership plans (ESOPs). However, the Department of Labor provides estimates of holdings of employer shares in pension plans and ESOPs. The pension plan estimates are based on Form 5500 filed with the Internal Revenue Service. For 1995, of the total $1,024 billion in assets of defined contribution plans with 100 or more participants, $165 billion was invested in employer stock. ESOPs with 100 or more participants account for another $100 billion of investments in employer equity. For comparison, SCF weights can be used to estimate the total dollar amount of directly held own company stock in the U.S. population. Using the 1995 SCF estimates, this is $272 billion dollars, about the same as holdings through pension plans and ESOPs combined. The total amount of direct and indirect holdings of publicly traded stock by households is $3,430 billion for 1995. Combining the numbers from the Department of Labor and the SCF leads to an estimated share of own company stock as a percent of total public equity owned by households of $\frac{165+100+272}{3430} = 15.7$ percent.[6] Thus, even taking into account indirect company stock holdings through pensions and ESOPs, public equity seems considerably less concentrated than private equity. It should be emphasized that households may hold undiversified portfolios of public equity without owning any own company stock. However, Vissing-Jørgensen (1999) shows that 91.3 percent of public equity held in the 1995 SCF is owned by households with at least 5 directly held stocks or half or more of their equity holdings in indirect form (e.g., mutual funds, retirement plans, etc.). Thus, poor diversification of public equity portfolios seems to be much less prevalent than poor diversification of private equity portfolios.

III. The Returns to Private Equity Investment

We begin with a comparison between the returns of privately held and publicly traded companies. Given observed investment in the public stock market, the premium on equity appears too high (e.g., Mehra and Prescott (1985)). Since investment in private equity is far more concentrated, we

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[6]To estimate how much of the risk of U.S. companies is borne by employees one should also add an estimate of stock options and stock performance-based compensation given to employees. This is beyond the scope of this paper however.

expect the premium on private equity to be even higher. This study represents one of the first attempts to quantify the returns to investing in private equity.

A. The Size of the Private Equity Market

We begin by comparing the size of the private and public equity markets. We employ two data sources for our estimates of the size and returns of the private equity market. The first is the 1989, 1992, 1995, and 1998 SCF. The second is the FFA.[7] Panel A of Table II reports the size of the private equity market estimated from the SCF using the household weights provided. Total market value of private equity held in billions of dollars are reported for three types of firms: proprietorships and partnerships, S and other corporations, and unknown types. In computing the total amount of private equity investment (and their returns) we deduct collateral posted by the entrepreneur for loans to the firm. This is done to be conservative so that private equity values will not be inflated by the inclusion of personal assets posted as collateral. Including personal collateral in the private equity returns calculations would bias returns downward. The 1989 survey also reports book value of equity for proprietorships and partnerships and S and other corporations, which we use to compute a market-to-book ratio for these firms (1.74 and 1.24, respectively) for later use.

As Table II shows, the market value of private equity has risen steadily from 1989 to 1998, primarily due to an increase in S and other corporations. The total dollar amount of private equity is substantial, ranging from \$3.7 trillion in 1989 to \$5.8 trillion in 1998. The SCF can also be used to estimate the market value of public equity held by households. This has similarly risen sharply over the decade covered by the four surveys (from \$1.6 trillion to \$7.2 trillion).[8] The growth in public equity value has outpaced that of private equity. The private market was 2.3 times larger than the public market in 1989, but was only 80 percent as large as the public market by the end of 1998. This suggests that the returns to public equity were larger than those of private equity over this time period. Also reported is the average price to earnings ratio (P/E) in the private market. We report the P/E ratios both with and without an adjustment for the labor component of firm profits (this will be explained in detail below). The P/E ratios, with adjustment for the entrepreneur's labor component of private company earnings, range from 4.88 to 8.17 over the survey years, and are significantly smaller than those in the public market.

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[7]For a comparison of the SCF and FFA equity numbers, as well as the numbers for many other asset categories, see Antoniewicz (2000).

[8]These numbers include estimates of households' ownership of public equity through mutual funds, defined contribution retirement plans, and trusts. Since part of public equity is owned by defined benefit retirement plans, including state and local government retirement plans, or by non-profit organizations, insurance companies, and foreigners, the SCF public equity totals will be lower than the CRSP total market value for public equity.

For comparison, we also estimate the size of the private equity market from data obtained from the Federal Reserve's Flow of Funds Account (FFA). For comparison to the SCF estimates, we employ FFA data from 1989, 1992, 1995, and 1998. The FFA numbers for noncorporate equity consist of an estimate of book equity for noncorporate firms based on tax returns, plus an estimate of the market value of one to four family rental properties. To obtain a number more comparable to the SCF, we subtract from the FFA number an estimate (based on SCF data) of the market value of these types of rental properties. Furthermore, to convert the FFA book values into market values, we employ the market-to-book ratio for proprietorships and partnerships from the SCF 1989 data in Panel A. The resulting estimates of noncorporate equity are somewhat larger than the SCF numbers in Panel A. The FFA numbers for equity in corporations refer to both equity in publicly traded corporations and equity in closely held companies (S corporations, C corporations, and other types of corporations). The FFA estimates the value of closely held companies from estate tax returns, but do not publish separate series for publicly traded corporate equity and non-public corporate equity. To obtain an estimate of non-public corporate equity, therefore, we subtract from the FFA number the estimate of the market value of public equity from CRSP given in Panel C.

The FFA estimates of corporate private equity obtained by this method are smaller than the estimates based on the SCF for 1989 and 1992 but closer for 1995 and 1998. This gap is at least partly due to the FFA including all owners of private equity. It is likely that the portfolios of old households contain less private equity than the 'average' portfolio. An estimate of S and C corporation equity based on estate tax returns would then lead to downward biased estimates of private equity. Antoniewicz (2000) has access to the actual FFA series for S and C corporation equity and provides the number for 1989, 1992, 1995, and 1998. Her numbers are even lower than the FFA numbers we imputed.[9]

In summary, the size of the private equity market is substantial, and is larger than that of the public equity market for the first part of our sample period. In addition, as Table I notes, owners of private equity are more undiversified than owners of public equity. For these reasons, documenting the returns to private equity investment is an important exercise.

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[9]We do not use Antoniewicz's numbers for these four years since we use the FFA data over a longer time period below and prefer to use the same method throughout. We hope to obtain the actual FFA series for all years at a later time.

B. Private Equity Return Estimates

In order to estimate the returns to private equity holdings, we use the household estimates of the market value and profits of the private firms being held as reported in Table II. The profits reported by households are pre-tax earnings for the year prior to the survey. Although these numbers are self-reported by households, they are anonymous and not subject to tax scrutiny. However, we will address later whether reporting biases are likely to have influenced our return calculations and how we can account for these possible distortions. For now, we begin with a baseline estimate of private equity returns, deferring robustness issues.

In order to estimate returns, we first convert pre-tax earnings into after tax profits by subtracting an estimate of the taxes due for corporations (this adjustment is already accounted for in the profit numbers shown in Table II). Both S corporations and proprietorships and partnerships are exempt from corporate taxation, so no adjustment is made for these firms. For all other firms, we assume a 30 percent corporate tax rate and therefore consider only 70 percent of pre-tax earnings as a possible cash flow to investors in calculating returns. Since earnings are reported for the year prior to each survey, and surveys occur only every three years, we report the average of the returns obtained using the current and the previous survey's earnings estimates for our calculations. For example, in calculating returns over the first survey period (1990 to 1992), we report the average of the annualized returns using 1988 earnings and 1991 earnings.

To avoid double counting earnings as both a potential dividend to investors as well as a capital gain, we must make an assumption about the fraction of (after-tax) earnings that are retained in the firm. Since the SCF does not record how much of earnings are paid out to shareholders, we assume that one half of after tax profits are retained in C corporations. This corresponds roughly to the ratio of retained earnings to after tax profits for public corporations in CRSP over the period 1989 to 1998. External financing is likely to be more costly for private firms than for larger public firms. Therefore, it is likely that private C corporations retain more in the firm than larger public firms. Increasing the retention rate will lower our subsequent return estimates, hence the 50 percent retention assumption will, if anything, bias our returns *upward*. Since S corporations, proprietorships, and partnerships are often smaller than C corporations and may have fewer growth prospects, we assume their retention is half of that of C corporations. While many firms do not make cash distributions to shareholders, assuming all proprietors, partnerships, and S corporations retain 100 percent of earnings would bias our calculated return calculations downward. Conversely, assuming that no earnings are retained implies that firms are not reinvesting or planning to grow.

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This seems unreasonable for most small private firms. However, we will report return estimates using this alternative and extreme retained earnings assumption for robustness.

Using the market value of private equity at the beginning and end of each survey period, plus the after-tax earnings of the firm, adjusted for the amount retained in the firm to avoid double counting, we compute the return on private equity over the years between each survey. Table III Panel A reports the geometric average annual return from investing in private equity over the three survey periods. From 1990 to 1992, the average return is 11.46 percent per year, from 1993 to 1995, the average return is 18.21 percent, while it is 23.45 percent from 1996 to 1998.

Panel B of Table III reports the returns to public equity over the same time period for comparison, obtained from CRSP. These returns account for stock repurchases. The geometric average annual return to public equity is 11.03, 14.57, and 24.68 percent for the 1990 to 1992, 1993 to 1995, and 1996 to 1998 periods, respectively. These returns are similar to those from the SCF (a bit lower from 1993 to 1995). However, since private firms are much smaller and riskier than large public companies, represented by the CRSP index, perhaps a better comparison is to the returns on the smallest decile of publicly traded firms. Over the three survey periods, the geometric average annual returns on the smallest decile of CRSP firms is 30.47, 20.27, and 22.00, respectively. These are considerably higher than the private equity returns for the 1990 to 1992 period and similar for the other two periods.

Our basic private equity return estimates discussed so far are likely to be biased in several ways. In the rest of this section we quantify these biases as best we can. Correcting for some of the biases leads to higher private equity returns while correcting for others leads to lower private equity returns.

B.1 Labor Adjustment: Accounting for Salaries

Included in the private equity earnings numbers is the total salary paid to self-employed managers, which we report in Table II Panel A for reference. Hence, our return calculations account for salaries withdrawn from the firm by the entrepreneur. However, the SCF earnings figures assume no salary is paid to entrepreneurs who do not report a salary to themselves. For these entrepreneurs, part of their companies' profits is payment for hours worked by the entrepreneur, rather than return on equity. Therefore, we make an adjustment to earnings for this labor component for individuals (head and/or spouse) who report being self-employed, have ownership in a private company in which they have an active management interest, but fail to report a salary taken. We assume a 50

week work year, and multiply the reported number of hours worked by these individuals per week by an estimated wage rate for similar individuals in the survey who worked in paid employment. Specifically, for respondents who reported to work in paid employment (i.e., not self-employed), we regress their hourly wage rate on a constant, their age, age squared, a dummy variable for having a high school diploma but not a college degree, a dummy for graduating college, and a dummy for their gender (= 1 if male). We run one regression for heads of households and one regression for spouses. Using the regression coefficients, we then estimate the wage rate for self-employed individuals who do not report a salary by multiplying their demographic and education characteristics by the estimated coefficients and using the predicted value as their wage rate. This procedure assumes that the relationship between the household's demographic/education characteristics and wages is the same for self-employed individuals as individuals who work in paid employment. Hamilton (2000) demonstrates that self-employed individuals would have earned higher wages than equivalently educated and similar individuals in employed occupations, suggesting that more talented individuals self select into entrepreneurial activities. This suggests that our labor adjustment for entrepreneurs, which is based on employed households, may be too low. If so, this will bias our private equity return estimates *upward*.

For self-employed households who do report a salary, this salary corresponds to between 1.4 and 1.8 times the salary our regression approach would suggest. This either confirms the selection issues emphasized by Hamilton (2000) or reflects excessive salaries reported by some entrepreneurs for tax reasons. To rule out the latter, we compare entrepreneurial salaries between C corporations and other private firms. Only for C corporations do entrepreneurs have an incentive to exaggerate salaries to save taxes. Finding no tendency for the ratio of actual to regression estimated salaries to be higher for C corporations than for other firm types, we conclude that the high salaries taken by some entrepreneurs more likely reflect higher ability rather than tax avoidance.

Using the labor adjustments for non-reporting households, we subtract the estimated annual wage from earnings and recompute returns. The labor adjusted returns are reported in the second row of Table III Panel A. As the table shows, the labor adjustment reduces the estimated returns by about 3.96 percent per year, indicating its importance in these calculations. With this adjustment, returns to private equity are considerably smaller than those for public equity.

B.2 Accounting for IPOs, Firm Births, Deaths, and Mergers and Acquisitions

The computations above are conducted assuming that the composition of firms in the SCF is the same at the beginning of each three year survey period as it is at the end. While the SCF employs the same sampling procedure and questions for each of the surveys we consider, which should generate a representative sample, there will be sample composition differences between survey years that may distort the return estimates for several reasons.

First, if a firm goes public between the two surveys, then it will no longer be contained in the end of period figures for private equity. Since IPOs are generally the most successful private companies, this may understate the returns to private equity. To take this into account, we document the value of all initial public offerings over the three years between surveys.[10] As an upper bound on the influence of IPOs, we assume that private equity holders receive the entire proceeds of all initial offerings. The effect of IPOs is rather small, increasing average returns by only about 50 basis points per year.

Another possible distortion of the composition of firms that comprise the beginning and end of period private equity values occurs when new private firms are born between the two survey years. Since end of period figures contain firms created after the previous survey, the end of period values are not fully comparable to the beginning of period numbers. To take this into account, we recompute returns by dropping firms at the end of the period that were founded (but not those that were bought/inherited) less than three years ago. This is done for the earnings estimates as well. Because we examine the end of period total market value of all private equity, accounting for new firm births will not allow firms that fail during the three years to be "replaced" by new private firms. Consequently, the returns drop by 1 to 2 percent per year, indicating the importance of accounting for this effect.

However, a distortion in the composition of beginning and end of period private equity samples that will increase returns concerns merger and acquisition activity between the survey years. Specifically, when a private firm is bought out by a public company between surveys, the value of that private firm will no longer be contained in the end of period private equity value. This will understate returns. If a private firm is purchased or merged by another private firm, however, our calculations will take it into account. Therefore, we need to determine the extent to which private firms are acquired by public companies, and add back this component to private equity values.

In order to do so, we examine the total dollar amount and number of transactions of merger and

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[10]We thank Jay Ritter for providing the IPO data.

acquisition activity in the private and public market using data from Securities Data Corporation (SDC) over the period 1989 to 1999. SDC records whether the acquirer and target is a private or public firm. Table IV reports the total dollar amount in millions and total number of transactions involving public firm acquisitions of private firms, private firm acquisitions of other private firms, public acquisitions of private firms, and the sum of these three categories. Also reported are the number of deals with available price information. Since the total value reported only pertains to those deals with price information, we also report a scaled dollar value of transaction volume by assuming the missing acquisitions transacted for the average value. This scaled value is reported for each year in Table IV. Since deals containing price information are likely to be the largest transactions, employing the average value for the missing observations will increase the impact of public acquisitions of private companies, overstating our private equity return estimates.

Table IV reports that the dollar volume of public acquisitions of private firms ranges from a high of $90 billion in 1999 to less than $8 billion in 1991. As indicated in Table IV, the fraction of missing price firms is large for these acquisitions, so the scaled values are much higher across the years. We add the scaled values of private firms acquired by public companies between survey years to the end of period total value for private equity. This assigns the return from being acquired to the initial private equity owners. As indicated in the fifth row of Panel A of Table III, accounting for mergers and acquisitions adds an additional 50 basis points per year to private equity returns over the 1990 to 1992 period, about 1 percent per year from 1993 to 1995, and almost 2.5 percent per year from 1996 to 1998. Hence, mergers and acquisitions contribute substantially to returns. However, even these adjusted returns are still substantially below the returns on public equity for the 1990 to 1992 and 1996 to 1998 periods and similar for 1993 to 1995.

B.3   Retained Earnings Sensitivity

We have thus far assumed retained earnings for S corporations, proprietorships, and partnerships are 25 percent of after tax earnings. However, this assumes that all such firms are reinvesting some portion of earnings and growing. For robustness, and as an overestimate of the returns to private equity, we assume that these firms do not retain any earnings. This is an extreme assumption since it implies that actual retained earnings for all S corporations, proprietorships, and partnerships will be double counted as both a dividend and capital gain to entrepreneurs. Nevertheless, Table III reports that private equity returns are still below those of the public market in 2 of the 3 time periods.

B.4   Tax Evasion

Another possible benefit of owning a private firm is that tax evasion may be easier. This refers to both overstated expenses and understated income of private firms, resulting in artificially low returns. If this is the case, then we should incorporate the profits from tax evasion into our calculations. Since the SCF is based on interviews and not tax returns, it is not clear whether respondents report their true profits or the profits as stated on their tax forms. If they report the latter, the profit numbers must be adjusted for tax evasion and tax underreporting in order to estimate the true profits and thus the true returns to private equity.

Little is known about the amount of tax evasion in U.S. companies. The main source of information is derived from studies performed by the IRS under the Tax Compliance Measurement Program (TCMP).[11] For our purposes we are interested in computing the true profits of proprietorships, partnerships, S corporations, and C corporations. For proprietorships we use the TCMP results for the category 'Other Sole Proprietorship' which refers to nonfarm sole proprietors with the exception of informal suppliers (baby sitters, street vendors, etc.). For partnerships and S corporations we use the same numbers as for proprietorships due to large fluctuations in tax compliance rates across surveys for these categories. Even for the proprietorships, the compliance rates vary quite substantially across TCMP years. Using IRS recommended increases in taxable proprietor income, the ratio of recommended to tax payer reported income is 1.219 for 1973, 1.229 for 1976, 1.299 for 1979, and 1.419 for 1982. We employ the 1979 value to scale up earnings since it is in the middle of the range. Not all recommended income increases hold up after appeals by tax payers, however. 'Assessed' income and tax changes take this into account. For 1979, the ratio of assessed to tax payer reported income is 1.253 for proprietorships. For large C corporations (assets greater than $10 million with no distinction between public and private C corporations), the IRS does not report the recommended and assessed changes in income, only the changes in taxes. The results based on audit yields imply recommended dollar tax increases of 21.4 percent using 1985 data. Assessed tax increases amount to 13.8 percent. With progressive taxes the underlying income changes

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[11]For each of the years 1973, 1976, 1979, and 1982 a sample of about 55,000 tax filers was subjected to extensive audits. (This program has since been discontinued.) These audits differed from regular IRS audits in that only experienced IRS examiners were used, and in that examiners reviewed each item on the return line by line. The TCMP studies include information about all components of income, including income from proprietorships and partnerships, with S corporations included in the partnership category as far as we were able to determine. These studies were supplemented by separate studies of small corporation income tax returns for 1977 and 1980. For large corporations, regular audit yields were extrapolated by the IRS based on a regression using averages of data for 1984, 1985, and 1986 to compute what audit yields would have been had all large corporations been audited. The results of all of these studies are summarized in IRS (1988).

will be smaller. Hence, a tax evasion adjustment using the tax increases for these companies will be larger than the adjustment based on income increases (had they been available).

We report private equity returns using both recommended and assessed tax increases to private firm profits in Table III. The recommended and assessed tax evasion adjustments increase returns by between 2.5 and 4 percent per year, indicating their importance (compare line 7 and 8 in Table III to line 5). In addition, the IRS employs 'multipliers' which scale up the additional income detected in TCMP audits for proprietorships, partnerships, and S corporations by various factors to account for the fact that not all unreported income can be found at an audit. These multipliers seem to be based on very little information and one may suspect that the IRS has an incentive to exaggerate the multipliers to increase the funding they receive for audits. Employing the multipliers, which increases returns by an *additional* 1 to 2 percent per year, leads to private equity returns that are higher than the public equity returns by between 0.5 and 5.3 percentage points.[12] We reiterate that it is not clear that a tax evasion adjustment needs to be made to the SCF numbers, since respondents are anonymous, their responses are not subject to tax scrutiny, and figures are not based on tax returns. Of course, there are firms set up legally as tax shelters such as real estate ventures. To the extent these firms report low earnings and the TCMP numbers do not sufficiently add back this component, the returns on these firms may be low. However, even if this is the case, these firms comprise only a small fraction of our sample. In addition, we have removed real estate firms from our calculations and found little impact on returns. This suggests such firms are not materially affecting our results.

B.5   Firm Growth

Finally, the returns to private equity we have documented pertain to all firms not held publicly. These include firms ultimately seeking a public offering or takeover (i.e., planning to grow and expand) as well as firms not seeking growth such as "mom and pop" stores, gas stations, and entities set up for tax and other purposes. Being interested in the total returns to all private equity, we did not distinguish between these. However, there may be important return differences between these two types of firms. If the low returns we document are driven primarily by gas stations, vendors, or private companies set up as tax shields, for instance, then the returns to 'true' entrepreneurial activity (as conventionally thought of) may be much higher. Therefore, to assess the motives for entrepreneurship, we attempt to distinguish between these.

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[12]The multiplier for C corporations is simply 1, resulting in a 13.8% tax adjustment, while the multiplier for proprietorships, partnerships, and S corporations results in a 47.6% adjustment.

Separating out "growing" firms from other firms is a difficult task. A distinguishing characteristics may be the industry or line of business in which the firm operates. Due to the scarcity of firms in each industry category classified by the SCF, we attempt to identify only two types of firms: growth and non-growth. Non-growth firms are broadly categorized as farms, contractors, gas stations, real estate and oil ventures, professional and entertainment services, food and liquor stores, and beauty shops. The main categories among growth firms are manufacturing, advertising, computer programming, and financial services firms. We found that growth firms do not significantly outperform non-growth firms, and neither consistently outperforms the broad index of public equity. Hence, the returns to private equity appear no higher even when focusing on particular segments of private firms.[13]

Accumulating all of the return estimates under the variety of assumptions, the returns to private equity are generally lower than those of public equity from 1990 to 1992 and 1996 to 1998 and higher from 1993 to 1995.

C. The Robustness of the Return Estimates

Before exploring the risks of private equity investment, we examine the robustness of our return estimates. We first consider possible reporting biases in the SCF and whether these could distort our return estimates. We then analyze private equity returns using another data source (the FFA). Finally, we evaluate actual reported returns from private equity funds.

C.1   Reporting Biases?

The imputations and weights in the SCF are designed to aggregate the survey figures to represent the true population of investment by households. Throughout our computations, we assume that these figures do in fact represent the aggregate wealth and investment in the U.S. economy.

Since our return estimates are derived from the SCF, which contains market values and earnings figures provided by the households themselves, one wonders whether reporting biases are affecting our results. For instance, wealthier households are less likely to respond to the survey, resulting in a possible sample selection issue. However, the SCF explicitly oversamples wealthy households and adjusts their weights and imputations in order to account for this effect. Moreover, one wonders what a household's incentive to respond to the survey is, and whether this results in reporting

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[13]An earlier attempt at computing returns by industry resulted in private equity returns that were not consistently higher than public equity returns for any of the industries. The lack of consistently extreme (positive or negative) performance among any of the industries relative to the public market indicates our return estimates are not driven by a particular industry. These results are available upon request.

biases? While it is difficult to assess respondent incentives, the SCF is considered quite accurate and relatively free of biases (see Avery, Elliehausen, and Kennickel (1988), Kennickel and Starr-McCluer (1994), Kennickel, Starr-McCluer, and Sunden (1997), and Kennickel, Starr-McCluer, and Surette (2000) for a discussion of the survey and weighting schemes, as well as the SCF codebook). In addition, we employ another data set of private equity figures from the FFA that are not obtained from household surveys and find returns lower than those of the SCF. Thus, potential reporting biases are unlikely to explain our results.

As a way of determining whether there is any general reporting bias in the SCF equity numbers, we use the SCF to construct public equity returns, and then compare them to those from CRSP. This comparison provides a test of how accurate the SCF data is, not only from a household reporting perspective, but also when aggregating data using the imputations and weights. As Panel B of Table III reports, the public equity return numbers from the SCF are 2 to 6 percent higher than the CRSP returns. Since the CRSP data implicitly takes into account IPOs and merger activity (i.e., when private firms purchase public firms), but the SCF data may not, we make an adjustment for this. This increases the return estimates further (by about 1 to 2 percentage points).[14] Comparing the SCF public equity returns with those of CRSP, the SCF numbers are consistently higher. Thus, if there is a reporting or weighting bias, it seems to run in the wrong direction to reconcile our low private equity return numbers.[15]

However, since price information is more readily available in public markets, it is possible that reporting distortions may be more prevalent in the private equity figures. In order to further evaluate potential reporting biases in the SCF we calculate the capital gain on detached single family houses using SCF data and compare it to the capital gain on such properties based on data from the Office of Federal Housing Enterprise Oversight (OFHEO). The two sets of numbers differ in that the SCF numbers are based on households' self-reported estimates of what they think they could sell their house for, whereas the OFHEO numbers are based on actual house transactions data from Freddie Mac and Fannie Mae. We focus on single family houses since we were only able to obtain capital gains data from an alternative source (OFHEO) for this category of homes. The comparison can be done for the periods 1993 to 1995 and 1996 to 1998 since the 1992, 1995, and

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[14]To the extent CRSP does not capture takeovers of public firms by private companies in their delisting file, we also report CRSP returns with a takeover adjustment as well.

[15]It should be noted that for some account types in which public equity is held, the SCF only provides categorical information about holdings, e.g. 'mostly stocks', 'mostly bonds' or 'a combination of stocks and bonds'. This by itself could lead the public equity returns calculated using the SCF to differ a bit from the CRSP returns, but should not cause a systematic bias.

1998 SCFs provide information on the type of home the respondent households live in. We use the SCF weights to calculate the total value of U.S. detached single family houses in each of these years, and calculate geometric average annual capital gains over the three year periods in between surveys. One adjustment to the SCF data is needed. The value of new homes sold in between survey years enter the current SCF calculation in the same way as new firms created between survey years affected the calculation of the return to private equity. We therefore subtract an estimate of the value of new single family houses sold between survey years from the end of period SCF value of single family houses to obtain the correct capital gain. The estimate of the value of new single family houses is obtained from the U.S. Bureau of the Census. The capital gain for the period 1993 to 1995 is thus calculated as ((SCF based 1995 total value of single family houses − U.S. Bureau of Census estimate of the value of new single family houses sold in 1993, 1994, and 1995)/(SCF based 1992 total value of single family houses))$^{(1/3)}$. Similarly for the 1996 to 1998 period.

The resulting capital gains based on the SCF are 5.28 percent per year from 1993 to 1995 and 5.73 percent per year from 1996 to 1998. This is compared to the estimates based on OFHEO data of 2.59 percent per year from 1993 to 1995 and 4.28 percent per year from 1996 to 1998. The SCF numbers are a bit higher. This is comforting for our previous calculations since it suggests that using household self-reported estimates of the market value of their assets (e.g., homes or private equity) if anything leads to higher capital gain estimates than other sources over the period in focus.[16]

Again, we are primarily concerned with reporting issues that would lead to low returns. One possibility is that households simply report the book value of their private equity holdings if they find it difficult to estimate market values. This would tend to understate returns in periods where the market to book ratio is increasing. However, in the 1989 survey, both market and book values are reported. The average market-to-book ratio for proprietorships and partnerships is 1.74 and for S and C corporations is 1.24, indicating that households are distinguishing between market and book values. Furthermore, the dispersion of household market-to-book ratios is substantial. The lower quartile of reported market-to-book ratios for proprietorships and partnerships is 0.95, while the median and upper quartile is 1.25 and 4.58, respectively. The lower quartile, median, and upper quartile for S and C corporations is 1, 1.47, and 6.41, respectively. This indicates that the majority

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[16]It is possible that the set of houses that transacted and thus enter the OFHEO calculation is a nonrandom subgroup of all single family houses. For the SCF capital gains to be a *downward* biased estimate of the capital gains on the population of (transacted and non-transacted) houses, the selection correction to the OFHEO data would need to be large. Transacted houses would need to have had substantially lower capital gains than other houses which does not seem likely.

of households are not simply reporting book values.

Another possibility is that households simply report values that would be consistent with comparable firms in the public market, by employing earnings multiples from public firms in similar lines of business to estimate market value. This may be why, for instance, the private equity returns we calculate are so close to the public equity returns, and seem to move with the public market. Of course, even if this is the case, if households view their returns to be equivalent to those in the public market, this would not explain why they willingly take on more risk by investing in private equity for essentially the same return. However, as indicated in Table II, the P/E ratios of private firms are very different than public firms. Moreover, the variation in P/E ratios across households is large as illustrated by the earnings rates (E/P) in Figure 3 (discussed below), suggesting that households are not systematically using comparable public firm multiples to estimate private firm values.

C.2 Another Data Source – the FFA

For further robustness, Table III also computes the return to private equity using data from the *Flow of Funds Account*. The FFA does not rely on survey information and is therefore free of potential household reporting issues. This provides an independent test of our return estimates. The FFA market equity estimate is calculated as described in Section III.A. Actual retained earnings of the corporations are reported in the FFA for all corporations, but not for other firms. Hence, we employ the 25 percent retained earning assumption for non-corporate firms as we did previously.

Panel B line 10 reports an average annual return of 10.22, 16.65, and 18.94 percent for the three survey periods, respectively, without any adjustments made. In addition, subtracting out the average labor adjustment from the SCF (3.96 percent per year) and using IPO data to adjust for private companies going public generates returns of 6.26, 12.69, and 14.98 percent per year, respectively. These numbers should be compared to line 3 in Panel A from the SCF. As the two panels indicate, the FFA returns are slightly lower. We believe the SCF data to be more reliable since its methodology is well-documented and not based off of estate tax returns (as are the S and C corporations in the FFA). Bearing this in mind, the lower FFA returns could also reflect an upward reporting bias in the SCF that *overstates* returns, or a possibly too generous retained earnings assumption on our part in the SCF calculations. Both of these suggest that the SCF returns may be too high, if anything. In sum, both data sets provide estimates of private equity returns that are similar to or a bit lower than the return to public equity. This result seems to be robust to a

variety of specifications and assumptions.

In addition, the FFA data is available since 1952, allowing a comparison of private and public equity returns over a longer period. The drawback is that we do not have data for firm births, mergers and acquisitions, and tax evasion going back this far (IPO data are available back to 1960). However, since the SCF calculations give an idea of the importance of adjusting for these factors, providing FFA returns for the longer period is still informative. Line 13 of Panel B shows an (arithmetic) average FFA return to private equity of 8.60 for the period 1953 to 1998.[17] The only adjustment made is the 3.96 percent salary adjustment based on our SCF estimates. This is to be compared to a public equity return over the same period of 13.77. Our SCF calculations suggest that adjusting for IPOs, firm births, mergers and acquisitions and tax evasion would increase the 8.60 percent number by about 3 percent per year to around 11.6 percent (compare line 2 and 8 of panel A). In addition, it is possible that the use of a market to book ratio of 1.76 for noncorporate equity (based on the 1989 SCF) in our FFA calculations is not representative of the longer sample period from 1953 to 1998. An overstated market to book ratio would bias downward our FFA private equity returns. To address this issue, we went back to the 1962 Survey of Financial Characteristics of Consumers (the predecessor to the SCF) to calculate an estimate of the market to book ratio for partnerships and proprietorships (including farms) for 1962. We calculate the market to book ratio for 1962 as the total market value for households reporting both market and book values of their ownership shares divided by the total book value for these, using the survey weights. The resulting market to book ratio was 1.26. Using this for the entire period increases the FFA private equity returns by an additional 2.27 percent per year (compare line 13 and 14). Adding this to the 11.6 percent implies a return to private equity of 13.9 percent, similar to the CRSP return of 13.77 percent over the same period. While we recognize the uncertainty associated with these calculations, these figures are reassuring, confirming our previous conclusion that the returns to private and public equity are similar, even over the longer sample period 1953 to 1998.

C.3 Actual Returns of Private Equity Funds

As a final robustness check, we compare our calculated returns to actual returns reported by private equity funds. Specifically, we examine actual reported returns of venture capital, buyout and mezzanine, and all private equity funds. It is important to note, however, that our earlier results represent the returns to investing in *all private equity*, not just those involving venture

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[17]Results are similar whether comparing arithmetic or geometric averages.

capital, buyouts, or mezzanine financing. Two facts are worth emphasizing. First, venture capital, buyout, and mezzanine financing is a very small percentage of all private equity. For instance, Fenn, Liang, and Prowse (1995) estimate that total venture capital in 1994 equaled 30 billion dollars. This constitutes less than 0.7 percent of our estimate of total private equity in 1995 based on the SCF. Clearly, venture capital represents a tiny fraction of the entire investment in private firms. Second, firms who obtain venture capital, mezzanine financing, or are bought out, are not representative of the population of private firms. Firms selected by venture or buyout funds are already relatively successful, and hence we would expect their returns to be higher than other private firms. In addition, venture capitalists and buyout funds can influence firm profitability (through advice, guidance, and funds), which will also increase their returns over other private equity investors. Keeping these caveats in mind, we analyze reported private equity fund returns from *Venture Economics* over the period 1980 to 1998.[18]

Venture Economics receives cash flow information from about 1,000 private equity partnerships and uses this to compute an internal rate of return (net of management fees and partnership expenses). Table V summarizes the returns from these funds over the last two decades, reporting value-weighted geometric average returns across the funds. The table shows that the returns to these funds are again similar to the return on the publicly traded equity index. Over the entire sample period (1980 to 1998), the geometric average annual return for buyout and mezzanine funds is 14.71 percent, for venture capital funds is 17.25 percent, and for all private equity funds is 16.42 percent. For comparison, the average annual return on the CRSP index is 17.26 percent. Hence, even the actual reported private equity fund returns, which are upward biased due to firm selection, influence, and perhaps survivorship bias, do not appear greater than the returns to public equity.[19] More importantly, the real venture returns are not far off from our return calculations, indicating our estimates appear to be reasonable.

In sum, the academic literature has only recently begun to examine private equity investment, focusing largely on venture capital, but generally without a focus on equity returns. Moreover, as we cite above, while there are practitioner sources that report returns to venture capital and buyout funds, these are a negligible fraction of the entire private equity market. One of the contributions of this paper, therefore, is a characterization of the returns to all private equity. We are unaware of any source that identifies these returns, yet documenting the returns and risks of

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[18]We thank Steve Kaplan for providing these data. The numbers given are geometric average returns, calculated based on annual internal rates of returns reported by these partnerships. It is not known whether survivorship bias affects these numbers.

[19]Cochrane (2000) discusses the significant sample selection issues regarding analysis of venture capital returns.

private equity investment, which constitutes the majority of many households' portfolios, is vital for understanding investment choice and equilibrium asset prices. We turn now to the risk of private equity investment.

IV.   The Risk of Private Equity

Simple economic theory suggests that concentrating investment in a single private firm is a dubious strategy from a risk-return perspective. In this section, we document explicitly the risk and volatility of private equity investment, which to our knowledge has not been previously studied. Moreover, by quantifying the risk of private equity, we can evaluate possible motives for private investment. For instance, if private equity has sufficiently low risk, this could explain why investors are willing to hold it despite facing low returns and poor diversification. As suspected, this is not the case.

We analyze the risk of private equity investment in two ways. First, we compare the risk-return trade-off of an index of equity in private proprietorships and partnerships to that of an index of publicly traded companies. In this way, we can see if the private market is riskier in the aggregate than the public market. Second, since most investors in private equity hold large stakes in a single firm, we also examine the distribution of holding period returns in private equity across households, and compare this to the return the household would have obtained by investing in an index of public companies over the same horizon.

A.   An Index of Private Equity

Both approaches are challenging given the available data. Our highest quality data source, the SCF, contains data only for four survey years, representing four cross-sectional snap shots of household portfolios. Our supplementary data source, the FFA, contains a time-series of annual data from 1952 to 1998. As discussed earlier, measurement errors are likely to be substantial for the market values of S and C corporations in the FFA. While this is unlikely to dramatically affect our calculations of average returns to private equity in the FFA, it prevents us from using the S and C corporation data to calculate standard deviations of returns. That leaves the noncorporate equity in the FFA (proprietors and partnerships) which are reported at book values. We therefore compare the standard deviations of returns to book equity for these private firms with the standard deviation of returns to book equity in public companies. For public equity we use the CRSP firms which are included in Compustat. Given the gradual improvement of Compustat coverage we focus

on the period after 1975, since the ratio of Compustat to CRSP number of firms stabilizes around 1975. We use IPO values to account for the fact that the end of year total book values of Compustat firms partly reflect the value of firms not present at the beginning of the year. The resulting book equity (arithmetic) returns and standard deviations are shown on lines 15 and 18 of Table III. Interestingly, the private equity book returns are more volatile than the public equity book returns, suggesting that private equity (at least in proprietorships and partnerships) is, if anything, more volatile than public equity.

For robustness, we also examine the distribution of returns on the actual private equity funds in Table V. The annual standard deviation of average private equity fund returns is 17.9 percent over the 1980 to 1998 period. In addition, there is a wide range of fund performance, with the average maximum return per year being 909.76 percent and the minimum -82.69 percent! Likewise, while the upper quartile exhibits a 19.98 percent return per year, the lower quartile averages -2.33 percent per year. Clearly, even an index of private equity funds has substantial risk, and appears at least as risky as an index of public equity.

To provide evidence of the correlation between private and public equity returns we use the two book equity return series from the FFA and CRSP-Compustat universe for 1975 to 1998. The series are plotted in Figure 2 and exhibit a strong correlation of 0.77. Note also that the SCF private equity returns across the periods 1990 to 1992, 1993 to 1995, and 1996 to 1998 show the same upward trend as the CRSP returns for these three periods, suggesting that even market equity returns tend to move together.

Our conclusion based on the available evidence is that the risk-return tradeoff for private equity as a whole is similar or slightly worse than for public equity. Given the fact that private equity owners have the majority of their private equity holdings in only one private company, this implies that the typical private equity owner faces a much worse risk-return tradeoff than could have been obtained by investing in an index of public equity. We attempt to further support this view by analyzing the cross-sectional distribution of returns across entrepreneurs.

B.   The Distribution of Household Returns in a Single Private Firm

Using data on individual household investment in private equity from the SCF, we calculate the distribution of household returns in a single private investment, in order to gauge the risk. Examining those private companies in which the household has the largest actively managed ownership share, the following information is available from the SCF: the year in which the firm was

founded/acquired, firm profits in the year before the survey interview, the market value of the ownership share in the interview year (estimated by the respondent), and the basis value for tax purposes of the original ownership share. We use the latter as an estimate of the initial value of the equity investment corresponding to the current ownership share. We then estimate the geometric average annual capital gain over the period since the firm was founded/acquired. Assuming the current profit to equity ratio is representative of those in previous years we also construct an estimate of the income stream to the household from the investment. These returns represent the price appreciation and income received from the initial investment date to the time of the survey. We are not able to construct estimates of the return obtained through the full period of ownership, of course, since households may keep their ownership share in the company for many years after the survey. We are also not able to construct return estimates for household investments that did not survive. Hence, we emphasize that the distribution of returns we calculate is *conditional on survival*, and does not represent the unconditional distribution of returns. Certainly, a large part of the risk associated with starting a new business is the risk of failure, as opposed to a risky distribution of returns conditional on survival. In order to gauge this we first appeal to outside evidence on firm survival rates, and then examine the distribution of returns conditional on survival based on the SCF data.

B.1 Private Firm Survival Rates

Dunne, Roberts, and Samuelson (1988) construct firm survival rates based on the 1967, 1972, 1977, and 1982 *Census of Manufacturers*. They find that on average 61.5 percent of firms exit in the five years following the first census in which they are observed. On average, 79.6 percent of firms exit within ten years. Popkin and Kirchhoff (1991) analyze survival rates by age of business from 1976 to 1986, using the *United States Establishment Longitudinal Microdata* file (USELM) based on Dun and Bradstreet's marketing file. They estimate that the two year survival rate of firms who were less than two years old in 1976 is 76.9 percent, and the ten year survival rate is 34.4 percent. Somewhat surprisingly, survival rates do not increase dramatically with initial firm age. Firms who were between 10 and 19 years old had a two year survival rate of 73.9 percent and a ten year survival rate of 48.8 percent.

It is difficult to evaluate how much business owners lose when their business is discontinued. Data provided by the *U.S. Small Business Administration* (2000) documents that the average annual number of firm bankruptcies over the 1990 to 1997 period was 59,393 (source: The Ad-

ministrative Office of the U.S. Courts). The number of bankruptcies is somewhat lower than the average number of business failures of 78,711 over this period. A business failure is defined as an enterprise that ceases operation with a loss to one or more creditors (source: Dun and Bradstreet Corporation). The average number of failures constitute 15.3 percent of the average total number of firm terminations, which was 515,273 over the same time period. Owners in failed companies do not necessarily lose all of their initial equity investment. Using Dun and Bradstreet's recovery Receivable Management Service, the estimated recovery rate of assets in failed companies is 34.82 percent. Presumably, most of this belongs to debt holders. To the extent absolute priority is violated in bankruptcy proceedings, some of this will belong to equity holders. This is likely to be a pretty small share of recovered assets. Combining the survival rates with the share of discontinued firms, the founder of a new private company faces a (1-0.344)×0.153×100=10.0 percent risk of losing her investment within the first 10 years. For the remainder of discontinued firms it is difficult to evaluate how much of the initial equity investment by owners has been lost, if any. Some firms may be discontinued with a partial equity investment loss due to poor future prospects. Others are successful, but are sold to new owners. These may provide a (potentially large) positive return on equity for these entrepreneurs. Suppose that half of the remaining (1-0.344)×(1-0.153)×100=55.6 percent of discontinued firms terminate with no loss or even a gain. Then an entrepreneur faces a 10+55.6/2=37.8 percent chance of discontinuing the business and losing part or most of her initial investment (and these calculations do not take lost wages in alternative employment into account). These calculations are only meant to be suggestive but do illustrate the substantial risk of investing in a single private company.

B.2 Household Private Equity Returns Conditional on Survival

Clearly, failure poses a great risk. But, even conditional on survival, the returns to private equity are highly volatile. Using data from the SCF (which contains only surviving households), we plot in Figure 3 the distribution of returns from private equity investment. The graphs do not take out a labor component of firm profits for households with no salary reported since we do not have retroactive information on hours worked. This will only overstate returns. Panel A graphs the distribution of household returns from the 1989 SCF and Panel B from the 1998 SCF. Each panel contains four graphs, all constructed using SCF weights. We focus on households with initial investments of at least $1,000 (1983 dollars using the CPI for all urban consumers). This implies dropping about 5 percent of the entrepreneur households.

The first graph plots the histogram of average annual capital gains accrued across households over the period since the firm was founded/acquired. For each household, we compute the geometric average annual capital gain as

$$\left(\frac{\text{Value at the time of the survey}}{\text{Value of original investment}}\right)^{1/\left(\text{Years since founded/acquired}\right)} - 1. \qquad (1)$$

The distribution of capital gains, conditional on survival, is wide.[20] Using the 1989 survey, the median of the capital gain distribution is 6.87 percent per year, while the 1st quartile is 0 and the 3rd quartile is 18.44 percent per year. Using the 1998 survey, the median is 4.31 percent per year while the first quartile is 0 and the 3rd quartile is 12.44. As for the holding periods over which these annualized capital gains have been obtained, 43 percent of households had invested in private equity for 5 years or less at the time of the survey, 47.5 percent had invested for between 5 and 25 years, and 9.5 percent had invested for more than 25 years (averaged across all four survey years).

The second graph plots the histogram of earnings rates, defined as earnings in the year before the survey divided by the total market value of the firm. There is substantial variation in earnings rates, although most households report zero or positive earnings rates. The third graph in each panel plots the histogram of household average returns if households had invested their wealth in the CRSP index of all publicly traded stocks over the same horizon as their private equity investment. For example, for an investor who held private equity in his company for 30 years at the time of the 1989 survey, we compute the geometric average annual return to investing in the CRSP index over those same 30 years (i.e., from 1959 to 1989).[21] As shown in the graph, the distribution of returns on a diversified public equity index over the same investment horizon is tight, with a minimum return of 5.57 percent per year and a maximum return of 19.89 percent per year using the 1989 survey (11.58 and 28.57 for 1998).

Combining the capital gain and income figures from private equity investment, we construct the distribution of total annualized returns to private equity, conditional on survival. To do this, we assume that the earnings rates for a household in the years before the interview year were the same as in the interview year. This will overstate volatility if earnings rates are mean-reverting. We further assume for simplicity and ease of comparison across households that 1/3 of profits are uniformly retained in the firm across all firm types. Since we wish to have uniform assumptions across firm

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[20]We plot households who lost all of their initial capital but still say they are in business at -100% in this figure. These households are not included in the subsequent graphs since it is not possible to define profit/equity for companies with zero equity.

[21]Since NASDAQ only exists after 1973 and AMEX after 1962, the CRSP index includes only NYSE and AMEX firms prior to 1973 and only NYSE firms prior to 1962.

types, and since our previous calculations employed 50 percent retention for C corporations and 25 percent for all other firm types, a 1/3 retention rate is used. We compare the resulting distribution of total returns to private equity with the returns households could have obtained by investing in the CRSP index over the same period. This essentially combines the first three plots into one – the fourth plot – which is the household distribution of the difference between the returns on private equity over what the household would have received by investing in the public equity index. Even though this distribution is conditional on survival, still around 30 percent of households would have been better off investing in the CRSP index rather than their own company (29 percent based on the 1998 survey). Moreover, there is substantial variation in the excess returns to private over public equity investment, even conditional on survival. The excess return distribution is highly skewed. While the median excess return using the 1989 data is 17.04 percent per year, the average excess return is 134.45 percent per year due to a fairly small fraction of households with very large annualized excess returns (19.73 and 78.70 percent per year using the 1998 survey).[22] These high excess returns are partially due to households with low initial investments. When households are weighted by the size of their initial investment, the median excess return is -2.66 percent per year while the mean excess return is 23.03 percent using the 1989 data (-1.12 and 20.94 percent per year using the 1998 data). These figures are similar to those from Table V regarding actual private equity fund returns. The median private equity fund earns about 1.85 percent per year, with a highly skewed and wide distribution.

Accumulating the evidence, the results in Tables III-V and Figure 3 show that investors do not seem to earn higher average returns from private equity investment despite forgoing large diversification benefits from investing in a broad public equity index. The aggregate return to private equity reflects negative returns for a large number of the discontinued businesses and a wide distribution of returns even conditional on survival. For surviving firms, the median excess return over a public equity index is negative when weighting households by the size of initial investment. However, the distribution is highly skewed and has a fat right tail; excess returns are extremely large for a small proportion of households. Hence, if the median entrepreneur believes a priori that his investment is in the right tail of this distribution, investment in private equity appears very attractive. We return to this issue when discussing the possibility that entrepreneurs overestimate their probability of success.

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[22]Subtracting an estimate of the labor component of the equity return for each household, assuming the labor component to profit ratio for the survey year is representative for all years since the formation/acquisition of the firm, makes only a small difference.

V. So Why Do Investors Hold So Much Private and Own Company Stock?

The poor risk-return tradeoff of private equity is puzzling given the observed concentration of wealth in private and own company stock. In this section, we turn to possible explanations for why private equity investors hold such concentrated and risky portfolios. First, we consider the possibility that entrepreneurs cannot diversify their holdings because it is costly to sell private equity or because they are contractually forbidden to do so. This, of course, does not explain why they would be willing to hold private shares to begin with, but may explain why they continue to hold shares.

A. Going Public and the Ability to Diversify

One possible explanation for the concentration of wealth in private equity is that because private shares can only be traded informally, at considerable cost, the ability to diversify may be limited. Since insiders are likely to have better information about firm prospects than potential investors, outsiders may only be willing to by shares at a discounted price. Bitler, Moskowitz, and Vissing-Jørgensen (2000) use data from initial public offerings to test for the importance of asymmetric information in preventing owners of private equity from diversifying. They find that a relatively small percentage of holdings are sold by most pre-IPO investors at the IPO, and that the cross-sectional patterns of sales are consistent with implications of signaling theory. (See also Pagano (1993) and Pagano, Panetta, and Zingales (1998) regarding the diversification motive for going public.)

While these findings suggest that asymmetric information may be part of the explanation for why managers retain large equity stakes in the firm (along with issues of moral hazard and agency costs), this cannot explain why individuals enter into entrepreneurship initially. In the terminology of optimal contracting theory, the poor risk-return trade-off we document should lead to a violation of the participation constraints of entrepreneurs if no additional payoffs are provided.

B. Why Are Entrepreneurs Willing to Participate in the First Place?

We consider four possible explanations for entry into entrepreneurship, despite the poor diversification and risk-return trade-off of existing entrepreneurs: high entrepreneur risk tolerance, large additional pecuniary benefits, non-pecuniary benefits, and lastly overoptimism and misperceived risk.

B.1 Risk Tolerance

We have assumed managers are risk averse, and therefore suffer large non-diversification costs from being heavily invested in private and own company stock. However, if managers, particularly very wealthy individuals, have low risk aversion, then these diversification costs may be very small. For instance, the marginal utility of an additional dollar to Bill Gates or Ted Turner may be sufficiently low that their behavior can be construed as close to risk neutral. If this is the case, then the returns to private equity need not be higher than those of public equity to explain the observed concentration of wealth.

However, several studies and anecdotal evidence suggests that managers are indeed quite risk averse. First, Carpenter (1998), and Huddart and Lang (1996) document prevalent early option exercise in employee stock option compensation plans that is consistent with risk averse behavior. Even for the top executives, American options on low or non-dividend paying stocks are often exercised early when the underlying shares are non-transferable or tradable. Furthermore, exercise is shown to depend on recent price movements, moneyness, and volatility, consistent with risk averse behavior (see Huddart (1994)). Second, a recent article in the Wall Street Journal[23] cites the rising popularity of hedging strategies offered by investment firms to reduce exposure to own company stock performance for top executives. The motivation for the use of these strategies is that executives typically are restricted from selling many of their shares (yet, curiously are not restricted from engaging in these hedging strategies on the side). It is estimated that as many as a couple thousand such strategies are executed each year. This suggests that executives do care about the volatility of their own company stock holdings, and take steps to reduce their exposure to the firm. Hence, their behavior appears far from risk neutral. In fact, one of the more notable participants in these strategies is Ted Turner, despite his more than $9 billion wealth. Thus, even the wealthiest managers seem to care about the volatility of their holdings and recognize the benefits of diversification.[24]

To address this issue more directly for our sample of entrepreneurs, Table VI reports the re-maining composition of entrepreneur portfolios from the 1989 (Panel A) and 1998 (Panel B) SCF. Portfolios of households who own and run their own business are compared to those who do not. As the table demonstrates, apart from a sizeable 40 percent investment in private equity, the rest of their portfolios are quite similar. The main difference between the two groups is that entrepreneurs

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[23] "Your Money Matters. Hedging a Single Stock Has Ups, Downs", by Ruth Simon, February 2, 2000.

[24] These hedging strategies are typically not available for private equity. Hence, investors are not able to diversify their private holdings as easily.

invest a smaller percentage in their primary residence. Aside from private equity and the primary residence, private business owners hold a portfolio quite similar to other households.

B.2 Other Pecuniary Benefits

Even though we document a poor risk-return trade-off for private equity, alternative forms of compensation derived by managers and entrepreneurs may explain their desire to own and run the firm. For instance, if holding a large stake in the firm generates other benefits to the manager (e.g., high salaries and bonuses or perquisite taking) then this may motivate the large fraction of private and own company equity holdings.

Own company stock holdings in publicly traded firms are often part of a compensation package given to managers of the firm. While this may help explain own company stock holding by managers in publicly traded firms, salaries derived from private companies are already accounted for in our returns calculations in Section III. Hence, these cannot explain why ownership stakes are so large for private equity investors. Furthermore, Hamilton (2000) finds that both initial earnings and earnings growth are lower for entrepreneurs than in paid employment for similar individuals, and that these findings are not driven by self-selection of low ability managers into self-employment. In addition, we showed that additional benefits from tax evasion and tax underreporting are not sufficiently large to explain investment.

Finally, there may be other pecuniary benefits derived from perquisite taking that we cannot account for. We can derive how large these benefits would have to be to induce private investment and determine how reasonable this is. In a recent paper, Heaton and Lucas (2000b), accounting for entrepreneur leverage and collateral in the firm, bankruptcy/failure rates, and the correlation of entrepreneurial wealth and human capital with firm prospects, estimate that the added return premium above the market needed to explain observed investment in private firms ranges from 5 to as much as 20 percent per year (across a variety of assumptions about risk aversion). Since the actual returns to private equity are similar to public market returns, this implies that additional pecuniary benefits would have to provide at least 5 to 20 percent higher average returns per year. As a percentage of private equity investment, a modest 10 percent additional pecuniary benefit amounts to 143 percent of total annual income for the median entrepreneur (focusing on entrepreneurs with at least $5,000 of private equity holdings), weighting households by the size of their private equity holdings in the 1998 SCF. This translates into a median $460,000 of perquisite taking annually, which seems high. On the other hand, not weighting by the size of private equity holdings leads

to a median of \$8,000 or 12.5 percent of income in annual perquisite taking based on a similar calculation.

B.3   Nonpecuniary Benefits

Since the pecuniary benefits from private equity and own company stock holdings do not appear adequate to offset the costs of non-diversification, perhaps nonpecuniary benefits can explain these holdings. One of the most often cited motivations for starting a business is the utility derived from being one's own boss. For instance, over 21 percent of survey respondents in the 1992 *Economic Census Characteristics of Business Owners* stated being their own boss as the *main* reason for starting the firm, rather than as a primary or secondary source of income.[25] Other studies have also identified the flexibility and autonomy of self-employment as a major nonpecuniary benefit. Blanchflower and Oswald (1992) find that the self-employed have higher job satisfaction than employees. Duncan (1976) and Duncan and Stafford (1980) report positive compensating differentials for paid jobs offering greater "freedom in controlling hours worked" and "opportunities to choose an individual or flexible work schedule and an individual work pace." Furthermore, the reputation and status of running your own firm may provide an additional incentive to choose self-employment despite lower wages and returns.

Hamilton (2000) documents that individuals choose self-employment despite facing a median stream of future earnings significantly less than that available as a paid employee. Even though a small fraction of "star" entrepreneurs earn substantial returns (consistent with the superstar theory of Rosen (1981)), most entrepreneurs do not, yet they continue to enter and remain in business. For individuals who have been in business for 10 years, Hamilton (2000) documents a 35 percent median (but not mean) wage discount from being self-employed, as well as showing that the cross-sectional standard deviation of self-employed earnings is substantially larger than that of wages from paid employment. Hamilton interprets these results as evidence that large nonpecuniary benefits to self-employment exist.

In addition to the study by Heaton and Lucas (2000b), several earlier papers consider the utility loss from poor diversification. Brennan and Torous (1999) estimate the certainty equivalent loss of investing in a single publicly traded security as opposed to a broad market index. Through simulations they estimate that the loss over a ten year period for a modestly risk tolerant individual (i.e., relative risk aversion of 2) is over 64 percent per dollar of initial investment! This is about

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[25]This figure may be understated as well, since survey respondents included part-time business owners who likely cited "a secondary source of income" as their primary motivation for starting the firm.

a 5 percent certainty equivalent loss per year (geometric average). Moreover, their analysis is conducted on publicly traded equity and does not assume the individual is employed at the firm. The certainty equivalent loss would be more severe for privately held equity when factoring in the correlation of the return to human capital with the prospects of the firm and the larger probability of the firm being discontinued.

Benartzi (2000) finds that a return premium of 20 percent is needed for a household to be indifferent between investing 45 percent of its portfolio in a single publicly traded stock versus T-bills. In other words, private benefits of control would have to be large enough for investors to forego as much as 20 percentage points additional expected return per year. This is a substantial sacrifice. As stated previously, for the median entrepreneur, a 10 percent (of private equity investment) non-pecuniary benefit would amount to 143 percent of total annual income. While a substantial amount, this may not be unreasonable. Certainly, many financial economists willingly give up substantially more wealth than this by choosing to remain in academia rather than work on Wall Street or industry. The academic lifestyle could certainly be considered a non-pecuniary benefit.

B.4 Overoptimism and Misperceived Risk

An alternative to the previous theories is that entrepreneurs and insiders may behave in a manner that is not perfectly rational. For instance, they may be overly optimistic about the firm's prospects or they may irrationally believe it is safe to invest in the familiar. This implies that they may be willing to hold a large share of the firm. Russo and Schoemaker (1992) find that managers are dramatically overconfident. Huberman (2000) and Benartzi (2000) document that investment portfolios are overweighted toward familiar assets, the most familiar of which being the employer's stock. These two effects will result in insiders retaining a large stake in the firm.

Given the observed holdings of private and own company stock, and the private equity return and risk calculations from Section III, we can get a rough idea of how overconfident managers must be to explain their investment choices. As mentioned above, Heaton and Lucas (2000b) document that the return premium needed to explain investment in private businesses is 5 to as much as 20 percent per year above the market return. We calculated in Section IV that the average return, conditional on survival, from private equity is about 20 percent greater than the public market return. Hence, if entrepreneurs believed their probability of survival was 100 percent, then the distribution of future returns looks attractive. Thus, either the entrepreneur believes his performance is in the right tail of the distribution, or believes the probability of his firm failing

is close to zero. If this is the case, entrepreneurship and private equity investment would appear attractive, despite the severe lack of diversification.

Skewed perceptions are borne out in survey evidence of entrepreneurs. Cooper, Woo, and Dunkelberg (1988) find that 68 percent of entrepreneurs think that the odds of their business succeeding is better than the odds for another business like theirs; only 5 percent think their odds are worse. In addition, a third of entrepreneurs believe their probability of success (e.g., surviving) is 100 percent, and 72 percent of entrepreneurs think their probability of success is at least 80 percent.[26] Thus, misperceptions of success, by either being overly optimistic about returns or underestimating the risks, could explain why people start their own businesses and hold so much of their wealth in their firm.

VI.   Concluding Remarks

We find that the majority of household investment in private companies is concentrated in a single, risky, privately held firm in which the household has an active management interest. Despite the risks these investors face and diversification benefits foregone, the returns to private company investment are surprisingly low. Given the large equity premium demanded by investors in public markets, it is puzzling why individuals are willing to invest so heavily in a undiversified portfolio of private equity which offers a much worse risk-return tradeoff.

We evaluate a variety of explanations for why concentrated private equity investment is so prevalent despite its poor risk-return trade-off. We conclude there are two possibilities most consistent with observed investment. The first is that entrepreneurs enjoy large nonpecuniary benefits of control. A simple calculation suggests individuals are willing to forego as much as 20 percent per year in expected returns to "be their own boss." A second possibility, however, is that entrepreneurs greatly overestimate their probabilities of success and returns, and underestimate the risks. Although the unconditional mean and median return to entrepreneurship is below the public market, the distribution of entrepreneurial returns is highly skewed. If the median or average entrepreneur believes his performance is in the right tail of this distribution, this may explain why starting and investing in a business appears to be attractive. Based on our return calculations across self-employed households, the returns to private equity conditional on survival of the firm are attractive. If the average entrepreneur erroneously believes the probability of failure is close to zero, this would also be consistent with observed behavior. Since the failure rate in the first

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[26]Bernardo and Welch (1998) argue why individuals remain overconfident in an entrepreneurial setting.

ten years is about 66 percent, the underestimation of risk would have to be substantial. However, survey evidence suggests this may not be unrealistic.

Distinguishing between private benefits of control and misperceptions of success may have profound implications for entrepreneurship and the macroeconomy. From a social welfare perspective, if private benefits of control motivate entrepreneurship, then the observed concentration of wealth in the firm and extent of private equity ownership may be efficient. On the other hand, if individuals systematically overestimate the expected returns and underestimate the risks of private business ownership, then the observed level of entrepreneurship and private equity investment may be inefficient. Resolving which of these effects is more important could help dictate public policy which in the latter case should be less 'pro small business' than in the former case.

In addition to macroeconomic growth and investment, understanding the motivations for entrepreneurship and private equity investment may have important asset pricing implications. As several papers have shown, entrepreneurial income risk has a significant influence on portfolio choice and asset prices. Certainly the influence of entrepreneurial risk will depend on the motivation behind entrepreneurial investment. We leave these issues for future research.

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Principal Equity Ownership in Privately Held Firms

Using the *1993 National Survey of Small Business Finances* from the Federal Reserve, the fraction of equity owned by the principal shareholder in privately held firms is plotted for various types of firms. The average fraction of principal ownership is plotted for deciles of firms sorted by number of employees, total asset value, and firm age. Also plotted is the ratio of firm total equity to total assets across the deciles. The deciles are calculated using NSSBF weights and firms are weighted within deciles according to the NSSBF weights. Since the first two deciles of numbers of employees is one, we treat the bottom 20 percent of firms as one category, plotting a single point on the graph. Therefore, there are only 9 number of employees categories, but there are 10 asset and firm age groups.

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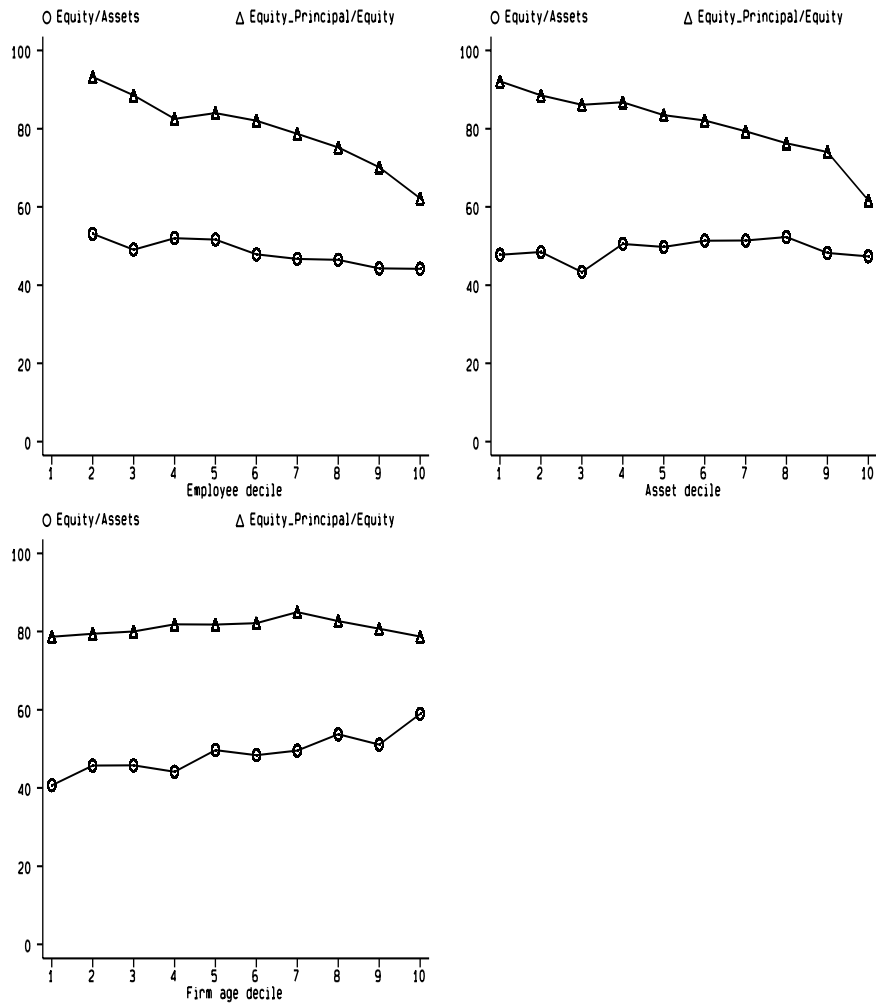
Figure 2:

The Returns to Private and Public Equity (1975 to 1998)

The annual returns to book equity in private (proprietors and partnerships only) and public corporations are plotted below over the period 1975 to 1998, estimated from the Federal Reserve's Flow of Funds Account and CRSP-Compustat, respectively.
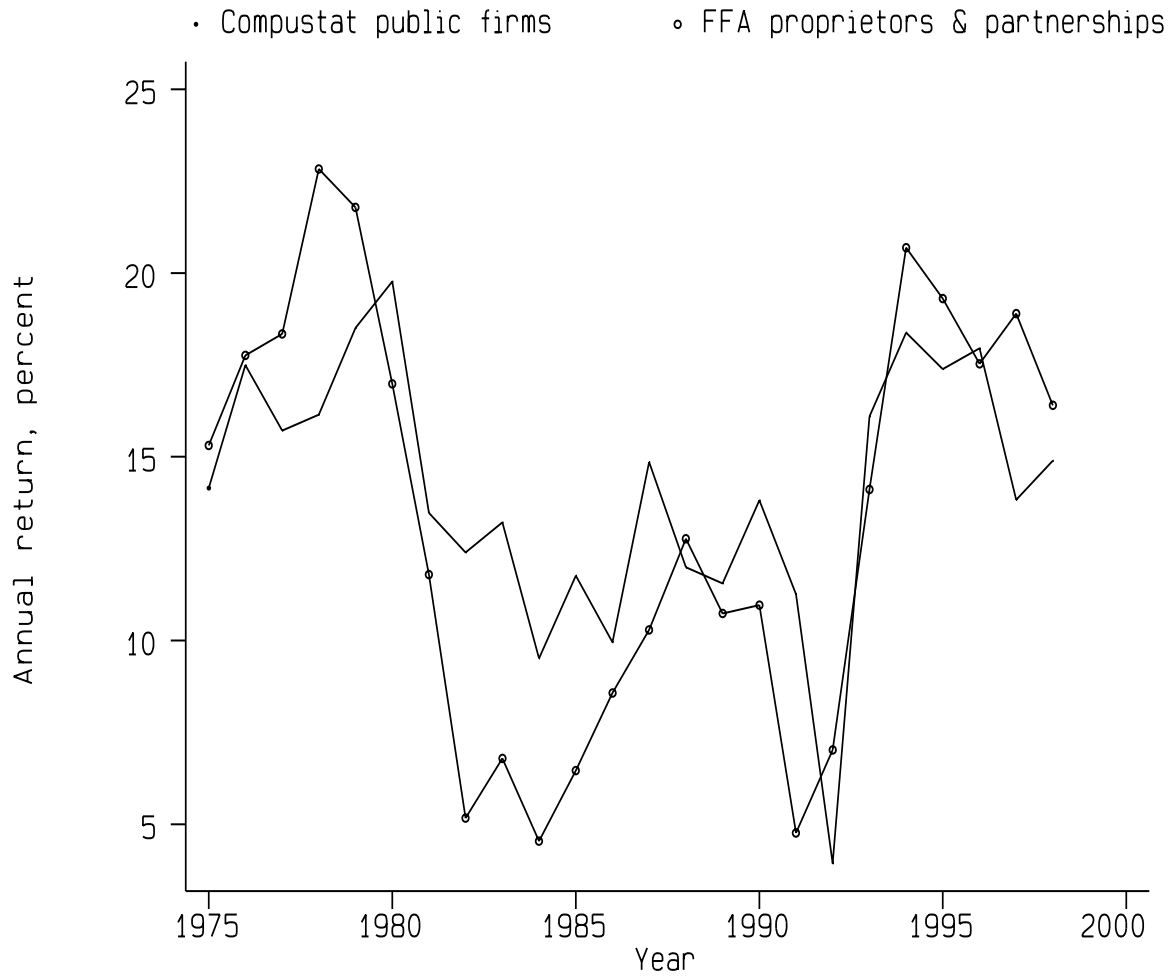
Figure 3:

The Conditional Distribution of Returns to Private Equity Across Households

Household data from the 1989 SCF are used in Panel A and from the 1998 SCF in Panel B. The first plot in each panel computes the histogram of geometric average annual capital gains accrued across households, defined as the ratio of value today divided by original investment, raised to one over the number of years the investment was held, minus one. The second plot computes the histogram of earnings rates (earnings divided by market value of equity) accrued across households over their investment horizon. Earnings are assumed to have been constant over time for a given household. The third plot computes the histogram across households of the average return on investment if households had invested their wealth in the CRSP index of all publicly traded stocks (i.e., value-weighted index of all NYSE, AMEX, and NASDAQ stocks) over the same horizon as their private equity investment. The fourth plot is the histogram across households of the total average return (capital gain plus earnings, where 1/3 of earnings are assumed to be retained in the firm) on private equity in excess of the CRSP index return over the same horizon for each household.

Panel A: 1989 SCF Household Data

Panel B: 1998 SCF Household Data

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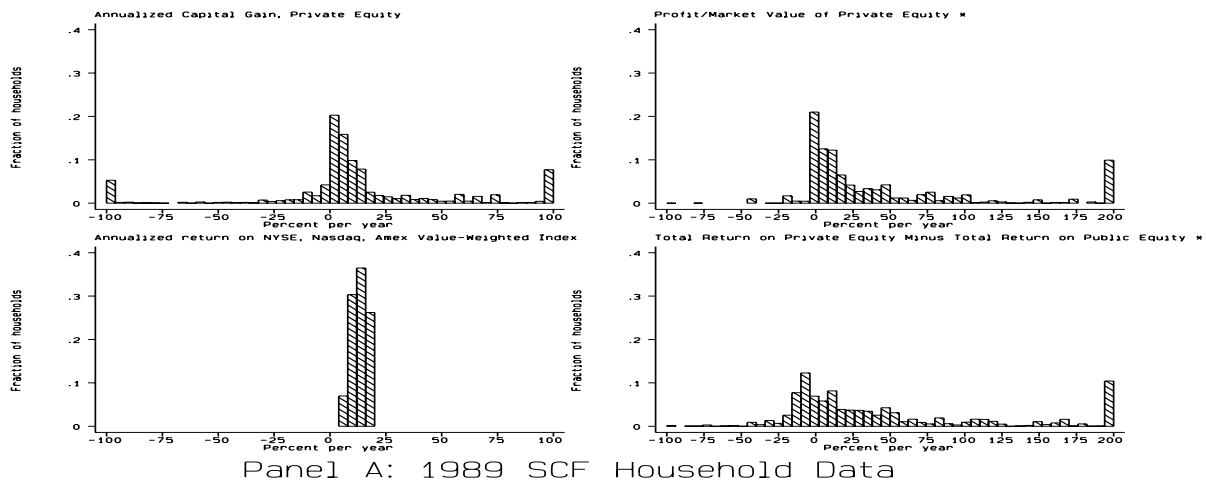
Table I:
Private Equity and Own Company Stock Ownership

Summary statistics for households are reported from the 1989, 1992, 1995, and 1998 *Survey of Consumer Finances*, as well as the average across all four survey years. Panel A contains summary statistics on private equity ownership and Panel B contains information on own company stock holdings, defined as ownership in a firm for which a household member is or has been employed, for publicly traded firms. All statistics reported are averages of all five SCF imputations.

Panel A: Private Equity Ownership					
	1989	1992[†]	1995	1998	Average
% of Total Private Equity[‡] Owned By Households with					
$\geq 25\%$ net worth in private equity	92.9	92.9	93.7	92.0	92.9
$\geq 50\%$ net worth in private equity	76.9	75.1	78.1	76.5	76.7
$\geq 75\%$ net worth in private equity	45.4	49.0	50.9	48.7	48.5
Mean % of Net Worth Invested in Private Equity					
for Households with Positive Private Equity and Net Worth					
SCF weights only	43.8	48.1	38.0	40.7	42.7
Weighted by net worth	47.0	46.7	46.7	44.9	46.3
Mean % of Private Equity Held in One Actively Managed Firm					
for Households with Positive Private Equity					
SCF weights only	77.8	83.0	82.5	84.9	82.1
Weighted by amount of private equity	72.4	70.8	74.0	73.6	72.7

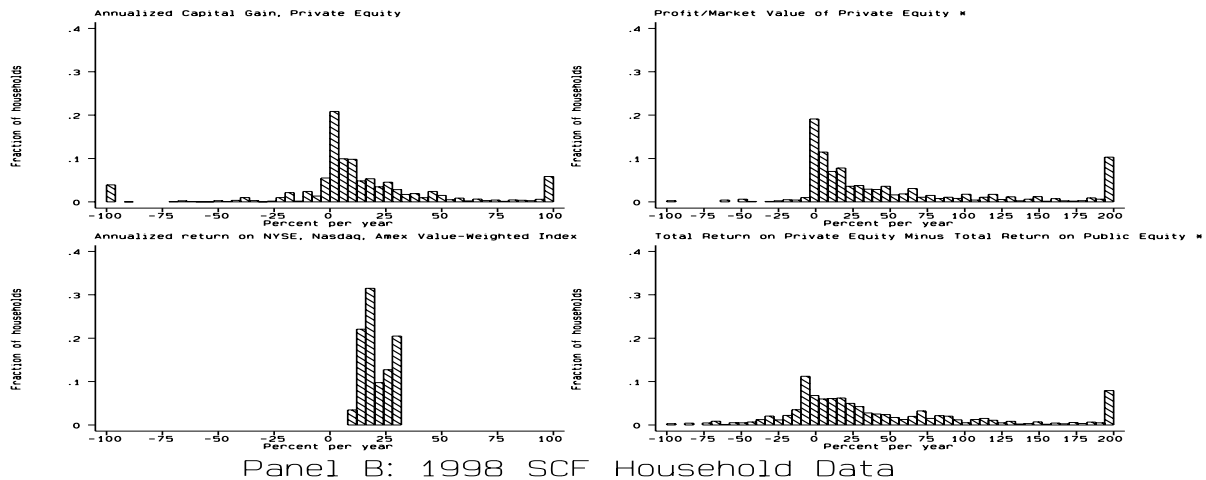| **Panel B: Own Company Stock Ownership in Public Firms**					
	1989	1992	1995	1998	Average
% of Total Public Equity Owned By Households with					
$\geq 25\%$ of their equity holdings in own company	13.4	12.2	10.9	12.7	12.3
$\geq 50\%$ of their equity holdings in own company	10.4	8.7	6.7	6.1	8.0
$\geq 75\%$ of their equity holdings in own company	5.6	4.8	3.7	3.6	4.4
Mean % of Net Worth Invested in Own Company Stock					
for Households with Positive Own Company Stock and Net Worth					
SCF weights only	8.8	7.0	11.0	10.5	9.3
Weighted by net worth	7.8	9.2	10.5	12.9	10.1
Mean % of Directly Held Equity in Own Company Stock					
for Households with Positive Own Company Stock					
SCF weights only	77.9	81.3	69.1	71.5	74.9
Weighted by amount of directly held equity	55.2	53.4	47.8	49.3	51.4
Mean % of Directly and Indirectly Held Equity in Own Company Stock					
for Households with Positive Own Company Stock					
SCF weights only	67.2	57.0	47.0	40.5	52.9
Weighted by total equity held	44.0	34.9	30.8	30.50	35.1

[‡] Ownership by households with negative net worth included in total private equity numbers.

[†] For 1992, data for two households with very large outliers for one of the imputations were deleted to get sensible results. Data for one household reporting inconsistent own company stock data in 1992 were also dropped.

Table II:
The Size of Private and Public Equity Markets

The market values of private and public equity are reported below. Estimates of the size of privately held equity and the components used to compute returns to investing in private equity are obtained from two sources. Panel A contains data from the 1989, 1992, 1995, and 1998 Survey of Consumer Finances. All SCF numbers are calculated by averaging over all 5 imputations. Panel B contains data from the Federal Reserve's Flow of Funds Account (FFA). The numbers are reported for 1989, 1992, 1995, and 1998 for comparison to the SCF data. Panel C contains data on publicly traded equity from the Center for Research in Security Prices (CRSP).

	1989	1992	1995	1998
Panel A: Private Equity ($ billion), Survey of Consumer Finances				
Proprietors and Partnerships (1989 market-to-book =1.74)	2,023	1,979	1,994	2,528
S and Other Corporations (1989 market-to-book =1.24)	1,536	1,710	2,128	3,062
Type unknown	124	71	175	218
Total Private Equity (Market Value)	**3,683**	**3,760**	**4,297**	**5,808**
Public equity (Market Value)	**1,586**	**2,089**	**3,430**	**7,221**
Ratio: Private/Public Equity	**2.32**	**1.80**	**1.25**	**0.80**
Profits ($ billion)				
Proprietors and Partnerships	333	429	760	532
S and Other Corporations[†]	205	280	325	448
Type unknown	88	11	23	71
(Hours worked)×(estimated wage rate)[‡]				
for entrepreneurs with no self-employment salary	175	192	228	228
Total salary paid to self-employed managers	176	253	236	410
Price-to-Earnings ratio	5.88	5.22	3.88	5.53
Price-to-Earnings ratio w/ salary adj.	8.17	7.12	4.88	7.06
Panel B: Private Equity ($ billion), Flow of Funds Account				
Equity in Noncorporate Business	3,193.73	3,150.11	3,672.18	4,387.18
−Value of 1 − 4 Family Rental Properties (from SCF)	885.00	969.00	1,055.00	1,320.00
=Private Equity, Proprietors and Partnerships (Book Value)	2,308.73	2,181.11	2,617.18	3,067.18
× 1.74 (SCF market-to-book ratio)	4,017.19	3,795.13	4,553.89	5,336.89
All S and C Corporations (Market Value)	3,831.64	5,458.25	8,331.34	15,437.70
−Public Equity (Market Value from CRSP)	3,222.35	4,275.97	6,594.45	12,396.82
=Private Equity, S and C Corporations (Market Value)	609.29	1,182.28	1,736.89	3,040.88
Total Private Equity (Market Value)	**4,626.48**	**4,977.41**	**6,290.78**	**8,377.77**
Ratio: Private/Public Equity	**1.44**	**1.16**	**0.95**	**0.68**
Income and Dividends 3-Year Total ($ billion)		1990-92	1993-95	1996-98
Proprietors' Income		1,199.55	1,436.12	1,729.48
Dividends, S and C Corporations		529.55	692.25	980.03
Panel C: Public Equity ($ billion), Center for Research in Security Prices				
Market Value	**3222.35**	**4275.97**	**6594.45**	**12396.82**
Market-to-Book ratio[*]	1.41	1.68	1.82	2.61
Price-to-Earnings ratio[*]	12.84	19.84	15.43	24.79
Stock Issues and Dividends 3-Year Total ($ billion)		1990-92	1993-95	1996-98
Dividends and repurchases[**]		328.28	399.21	524.79
New Issues[***]		42.42	76.20	109.99

[†] Earnings are after tax, assuming a 30 percent corporate tax rate which only applies to C corporations.

[‡] Hours worked by head or spouse for self-employed persons with positive equity in a business in which they have an active management role and who did not report salary received. Estimated wage rates are determined by first regressing wage rates of employed household members on educational and demographic attributes, and then using the regression equation to predict wage rates of self-employed household members with no salary reported.

* Market-to-Book ratios and Price-to-Earnings ratios are based on CRSP firms who can be matched to Compustat.

** Dividends and repurchases calculated based on CRSP income returns and market values.

*** Data for new issues (IPOs) generously provided by Jay Ritter.

Table III:
The Returns of Private Equity

Panel A reports the returns to all private equity based on estimates of the size of privately held equity and their earnings from Table II. The return estimates primarily pertain to data from our main source, the 1989, 1992, 1995, and 1998 Survey of Consumer Finances. All SCF numbers are calculated by averaging over all 5 imputations. Returns are calculated using various assumptions about retained earnings, salaries earned, IPO proceeds, sample composition changes due to new firm births and merger activity, and tax evasion. In addition, private equity return estimates are calculated using data from the Federal Reserve's Flow of Funds Account (FFA) for comparison. Panel B reports returns to publicly traded equity over the same time period from the SCF and the Center for Research in Security Prices (CRSP) for comparison to the private equity numbers. All returns are nominal.

	Panel A: Private Equity Returns									
	Adjustments for							**Annual Returns**		
	Retained Earnings				Firm	Mergers	Tax	(percent per year)		
	C Corp.	P,P,S	Salary†	IPOs	Births	& Acquis.‡	Evasion*	1990-92	1993-95	1996-98
Data from the SCF										
1.	50%	25%	–	–	–	–	–	11.46	18.21	23.45
2.	50%	25%	Yes	–	–	–	–	7.30	14.07	19.87
3.	50%	25%	Yes	Yes	–	–	–	7.63	14.59	20.46
4.	50%	25%	Yes	Yes	Yes	–	–	6.80	13.46	18.21
5.	50%	25%	Yes	Yes	Yes	Yes	–	7.38	14.52	20.65
6.	50%	0%	Yes	Yes	Yes	Yes	–	10.02	18.10	24.04
7.	50%	25%	Yes	Yes	Yes	Yes	recomm.	10.39	18.22	24.09
8.	50%	25%	Yes	Yes	Yes	Yes	assessed	**9.81**	**17.57**	**23.49**
9.	50%	25%	Yes	Yes	Yes	Yes	multiplier	11.51	19.87	25.68
Data from the FFA										
10.	actual	25%	–	–	–	–	–	10.22	16.65	18.94
11.	actual	25%	Yes	–	–	–	–	6.26	12.69	14.98
12.	actual	25%	Yes	Yes	–	–	–	6.66	13.26	15.64

	Retained Earnings				**Annual Returns**	
					1953 – 1998	
	C&S Corp.	P&P	Salary†	M/B P&P	Arith.	Geom.
13.	actual	25%	Yes	1.76	8.60	8.47
14.	actual	25%	Yes	1.26	10.87	10.69
15.	P&P, Book Equity return, w/salary adj., **1975-98**, arith. avg. (std.)				**13.32 (5.77)**	

	Panel B: Public Equity Returns						
		Annual Returns			**Annual Returns**		
		(1953-1998)			(percent per year)		
		Arith.	Geom.	Stdev.	1990-92	1993-95	1996-98
16.	CRSP Data	**13.77**	**12.45**	**17.14**	**11.03**	**14.57**	**24.68**
17.	CRSP Data, with Takeover Adjustment				11.41	15.08	25.32
18.	CRSP Data, Book Equity return, 1975-98, arith. avg. (std.)		**14.08 (3.55)**				
19.	CRSP Data, Smallest Decile	24.19	18.20	41.13	30.47	20.27	22.00
20.	SCF Data				13.05	20.81	29.90
21.	SCF Data, with IPO and Takeover Adjustment**				14.36	22.55	32.11

† When salaries are not reported for self-employed households, the salary adjustment is the hours worked by head or spouse for self-employed persons times the estimated hourly wage rate for the person. Estimated wage rates are determined by first regressing wage rates of employed household members on educational and demographic attributes, and then using the regression equation to predict wage rates of self-employed household members with no salary reported.

‡ Obtained from Securities Data Corporation for each year over the survey period.

* Obtained from the IRS's Taxpayer Compliance Measurement Program for 1979. The assessed tax adjustment for C corporations (proprietorships, partnerships, and S corporations) is 13.8% (25.3%), the recommended tax adjustment is 21.4% (29.9%), and the multiplier tax adjustment is 13.8% (47.6%).

** IPO, and takeover adjustments assume households own 70 percent of all public equity. This corresponds approximately to the share of corporate equity owned by households (directly and indirectly) in the FFA for this period.

Table IV:
Merger and Acquisition Activity in Private and Public Firms

The total dollar amount and number of transactions of merger and acquisition activity in the private and public equity markets are reported below over the period January, 1989 to December, 1999. The data are obtained from Securities Data Corporation (SDC), who records the volume of merger and acquisition activity for both public and privately held firms. Reported for each year are the total dollar amount (in $ millions) and number of transactions (in parentheses) involving public firm acquisitions of private firms, private firm acquisitions of other private firms, private firm acquisitions of public firms, and the sum of these three categories. Both the total number of transactions and number with available price information are reported. Since dollar amounts only reflect those transactions with price information, we also report the scaled value of deals by assuming the acquisitions with missing price information transacted at the average value.

	$ Millions			
Target:	Private	Private	Public	Sum of
Acquirer:	Public	Private	Private	Columns 2-4
1989	10,528.80	5,670.50	84,358.20	100,557.50
(# Deals, w/price)	(793, 322)	(470, 87)	(542, 482)	(1805, 891)
Scaled Value	25,929.62	30,633.74	94,859.22	203,710.76
1990	10,889.60	3,796.10	27,551.20	42,236.90
(# Deals, w/price)	(990, 377)	(446, 74)	(433, 372)	(1869, 823)
Scaled Value	28,596.03	22,879.20	32,069.00	95,918.31
1991	7,769.90	2,840.60	6,594.40	17,204.90
(# Deals, w/price)	(894, 396)	(359, 79)	(391, 329)	(1644, 804)
Scaled Value	17,541.14	12,908.55	7,837.11	35,180.17
1992	12,904.90	4,633.90	4,078.00	21,616.80
(# Deals, w/price)	(1211, 572)	(375, 115)	(388, 319)	(1974, 1006)
Scaled Value	27,321.39	15,110.54	4,960.08	42,417.06
1993	14,736.70	4,473.20	11,352.50	30,562.40
(# Deals, w/price)	(1445, 758)	(331, 111)	(413, 346)	(2189, 1215)
Scaled Value	28,093.05	13,339.00	13,550.82	55,062.63
1994	28,951.30	5,181.70	12,688.10	46,821.10
(# Deals, w/price)	(1922, 1036)	(407, 101)	(609, 532)	(2938, 1669)
Scaled Value	53,710.81	20,880.71	14,524.54	82,420.85
1995	36,382.20	5,317.50	48,134.30	89,834.00
(# Deals, w/price)	(2148, 1073)	(734, 154)	(768, 635)	(3650, 1862)
Scaled Value	72,832.21	25,344.45	58,215.97	176,097.80
1996	55,954.50	13,914.00	30,217.10	100,085.60
(# Deals, w/price)	(2533, 1226)	(722, 170)	(850, 714)	(4105, 2110)
Scaled Value	115,605.83	59,093.58	35,972.74	194,716.30
1997	70,881.90	11,672.80	30,267.50	112,822.20
(# Deals, w/price)	(3403, 1746)	(734, 186)	(491, 386)	(4628, 2318)
Scaled Value	138,150.69	46,063.63	38,500.89	225,255.02
1998	88,004.20	16,912.50	82,386.50	187,303.20
(# Deals, w/price)	(4011, 1819)	(915, 202)	(399, 264)	(5325, 2285)
Scaled Value	194,054.34	76,608.60	124,515.96	436,494.33
1999	90,396.60	16,376.60	32,265.70	139,038.90
(# Deals, w/price)	(3410, 1416)	(967, 243)	(289, 209)	(4666, 1868)
Scaled Value	217,692.38	65,169.43	44,616.21	347,299.52

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Table V:
Actual Reported Returns from Private Equity Funds

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Reported internal rates of returns from various private equity funds are reported below from 1980 to 1998, obtained from *Venture Economics*. The value-weighted mean as well as the maximum, minimum, median, and 25th and 75th percentiles are reported for all buyout and mezzanine funds, venture capital funds, and all private equity funds covered by *Venture Economics*. These returns are based on cash flow estimates reported to *Venture Economics* by the funds themselves. All returns are geometric averages and are reported over five year subperiods along with their standard deviations. For comparison, the last column reports returns for the CRSP value-weighted index of all publicly traded equities over the same period.

Years	# Funds	Mean	Max	75th %	Median	25th %	Min	Time-Series Stdev.	CRSP Index
Buyout and Mezzanine Funds									
1980-1984	17	4.60	22.30	3.86	0.34	-1.38	-5.56	8.37	15.12
1985-1989	114	21.46	527.34	28.16	2.10	0.00	-81.26	26.12	19.00
1990-1994	213	16.28	590.24	17.06	3.50	-0.94	-95.44	16.25	9.50
1995-1998	328	16.93	1310.58	27.85	5.08	-3.13	-97.38	6.47	27.48
1980-1998		14.71	575.88	18.78	2.63	-1.27	-68.46	16.60	17.26
Venture Capital Funds									
1980-1984	212	21.38	411.82	33.12	8.80	-1.50	-88.98	16.86	15.12
1985-1989	468	7.12	479.92	8.94	0.18	-6.04	-74.40	23.11	19.00
1990-1994	592	12.12	771.22	18.94	1.24	-6.28	-87.84	16.21	9.50
1995-1998	679	31.18	1191.65	34.98	5.23	-4.13	-97.03	14.94	27.48
1980-1998		17.25	688.49	23.42	3.79	-4.51	-86.54	17.90	17.26
All Private Equity Funds									
1980-1984	229	20.22	731.68	22.22	1.58	-0.20	-49.30	16.03	15.12
1985-1989	582	14.66	595.48	9.56	0.10	-1.14	-87.58	23.11	19.00
1990-1994	805	14.80	950.46	18.18	1.72	-4.76	-97.62	16.21	9.50
1995-1998	1,007	21.65	1474.33	32.48	4.53	-3.43	-99.65	6.51	27.48
1980-1998		16.42	909.76	19.98	1.85	-2.33	-82.69	17.90	17.26

Source: *Venture Economics*, 2000. www.ventureeconomics.com.

What Else Do Entrepreneurs Hold in Their Portfolios?

Reported below are the portfolio shares of households in various asset classes as a percentage of total assets held. Panel A reports data from the 1989 *Survey of Consumer Finances* (SCF) and Panel B from the 1998 SCF. Total assets are defined as the sum of cash, bonds, bills, stocks, life insurance, vehicles, housing and other real estate, and private equity. Debt/Assets is the ratio of total debt outstanding to total assets. The mean and median (in parentheses) portfolio shares are reported for households with greater than $1,000 in assets and greater than $100,000 in assets. Portfolio shares are also reported separately for households with no proprietary business ownership and for those who own a business. Statistics are reported using both SCF weights only and weighting households by both SCF weights and total asset value.

	Households with > $1,000 in Assets				Households with > $100,000 in Assets			
	No Business		Own Business		No Business		Own Business	
weight:	SCF only	SCF+Assets	SCF only	SCF+Assets	SCF only	SCF+Assets	SCF only	SCF+Assets
Panel A: 1989 Survey of Consumer Finances								
Financial Wealth (% Assets)								
Cash	8.65 (2.61)	5.98 (1.89)	3.83 (1.45)	2.55 (0.66)	5.85 (2.30)	5.98 (1.89)	3.13 (1.40)	2.54 (0.66)
Bonds	9.28 (3.25)	14.62 (5.82)	7.37 (1.14)	7.99 (2.46)	12.05 (4.71)	15.71 (6.72)	7.37 (1.90)	8.00 (2.52)
Public Equity	4.16 (0.00)	10.32 (2.40)	3.50 (0.00)	6.42 (1.44)	6.88 (0.68)	11.52 (3.80)	3.97 (2.45)	6.46 (1.44)
Life Insurance	3.36 (0.00)	2.26 (0.00)	2.13 (0.00)	1.26 (0.22)	2.46 (0.00)	2.12 (0.00)	2.04 (0.27)	1.24 (0.23)
Other	1.81 (0.00)	1.79 (0.00)	1.59 (0.00)	1.62 (0.00)	1.17 (0.00)	1.81 (0.00)	1.67 (0.00)	1.63 (0.00)
Non-Financial Wealth (% Assets)								
Vehicles	21.01 (7.81)	5.23 (2.54)	7.99 (3.28)	1.95 (0.91)	5.44 (3.76)	3.65 (2.26)	3.97 (2.63)	1.81 (0.90)
Primary Residence	43.81 (48.84)	43.94 (41.14)	26.65 (19.43)	15.01 (8.66)	55.15 (57.14)	41.91 (38.00)	27.97 (21.90)	14.89 (8.66)
Other Real Estate	6.36 (0.00)	14.17 (0.00)	9.65 (0.00)	20.02 (8.49)	9.75 (0.00)	15.59 (0.74)	11.38 (0.00)	20.17 (8.59)
Private Equity	0.00 (0.00)	0.00 (0.00)	35.61 (29.12)	41.24 (38.55)	0.00 (0.00)	0.00 (0.00)	36.87 (31.04)	41.32 (38.76)
Other	15.58 (0.00)	1.69 (0.00)	1.68 (0.00)	1.95 (0.00)	1.24 (0.00)	1.71 (0.00)	1.62 (0.00)	1.94 (0.00)
Debt/Assets	0.407 (0.163)	0.174 (0.067)	0.177 (0.105)	0.128 (0.065)	0.201 (0.120)	0.150 (0.057)	0.162 (0.106)	0.127 (0.065)
Panel B: 1998 Survey of Consumer Finances								
Financial Wealth (% Assets)								
Cash	8.02 (2.38)	4.60 (1.51)	3.68 (1.44)	2.14 (0.49)	5.07 (2.02)	4.43 (1.49)	3.05 (1.36)	2.13 (0.49)
Bonds	8.09 (0.19)	11.46 (3.87)	4.68 (0.42)	6.71 (1.77)	9.60 (2.72)	11.79 (4.30)	5.08 (0.77)	6.73 (1.79)
Public Equity	10.39 (0.00)	24.02 (16.68)	10.21 (2.73)	18.24 (9.18)	14.03 (5.25)	25.27 (18.72)	11.28 (3.88)	18.33 (9.34)
Life Insurance	4.07 (0.00)	3.78 (0.00)	2.29 (0.00)	1.68 (0.13)	3.66 (0.00)	3.78 (0.00)	2.48 (0.00)	1.69 (0.13)
Other	1.02 (0.00)	0.77 (0.00)	1.05 (0.00)	1.08 (0.00)	0.73 (0.00)	0.76 (0.00)	0.88 (0.00)	1.07 (0.00)
Non-Financial Wealth (% Assets)								
Vehicles	20.62 (7.71)	5.30 (2.78)	7.08 (3.73)	1.87 (0.69)	6.85 (5.06)	4.29 (2.53)	4.79 (3.23)	1.78 (0.68)
Primary Residence	40.85 (42.47)	37.33 (32.59)	31.18 (28.22)	15.32 (8.66)	51.23 (52.65)	36.46 (32.06)	32.81 (29.59)	15.23 (8.70)
Other Real Estate	4.59 (0.00)	9.90 (0.00)	7.63 (0.00)	10.26 (3.07)	6.59 (0.00)	10.36 (0.00)	8.26 (0.00)	10.30 (3.08)
Private Equity	0.00 (0.00)	0.00 (0.00)	30.19 (23.04)	41.03 (37.07)	0.00 (0.00)	0.00 (0.00)	29.63 (22.62)	41.09 (37.18)
Other	0.96 (0.00)	1.05 (0.00)	1.33 (0.00)	1.08 (0.00)	0.70 (0.00)	1.04 (0.00)	1.16 (0.00)	1.07 (0.00)
Debt/Assets	0.417 (0.186)	0.186 (0.076)	0.220 (0.155)	0.087 (0.036)	0.266 (0.176)	0.172 (0.071)	0.202 (0.150)	0.085 (0.035)