The Private Equity Premium Puzzle Revisited

by Katya Kartashova

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Canadian Economic Analysis Department
Bank of Canada
Ottawa, Ontario, Canada K1A 0G9
kkartashova@bankofcanada.ca

Acknowledgements

Abstract

In this paper, I extend the results of Moskowitz and Vissing-Jørgensen (2002) on the returns to entrepreneurial investments in the United States. First, following the authors' methodology I replicate the original findings from the Survey of Consumer Finances (SCF) for the period 1989–1998 and show that the returns to private and public equity are similar. I then extend the period under consideration using data from subsequently released waves of SCF 2001, 2004, and 2007 and assess the robustness of their results to this extension. I find that the "private equity premium puzzle" is not a robust feature of the data and does not survive beyond the period of high public equity returns in the 1990s. In particular, returns to entrepreneurial equity remain largely unaffected when public equity returns plunge to near zero values between 1999 and 2001. The average return to private equity exceeds public equity return in 1999-2007 and for the period 1989-2007 as a whole. To validate the results, I provide alternative measures of private equity returns in the data.

JEL classification: G11, G12, G24, G31, G32
Bank classification: Financial markets; Recent economic and financial developments;
Interest rates

Résumé

L'auteure applique à une plus longue période la méthode qu'utilisent Moskowitz et Vissing-Jørgensen (2002) pour calculer le rendement des investissements des entrepreneurs américains. En premier lieu, en suivant la même approche qu'eux, elle reproduit les résultats initiaux obtenus à partir de l'enquête sur les finances des consommateurs pour les années 1989 à 1998 et montre que les entreprises à capitaux privés et les sociétés cotées en bourse offraient alors des rendements similaires. L'auteure prolonge ensuite la période étudiée en exploitant les données publiées des éditions 2001, 2004 et 2007 de l'enquête, puis évalue si les résultats de Moskowitz et Vissing-Jørgensen tiennent toujours. L'énigme que posait la trop faible prime de risque sur les capitaux privés ne constitue plus un trait caractéristique des données une fois disparus les forts rendements boursiers des années 1990. En particulier, les rendements des capitaux des entrepreneurs restent largement inchangés lorsque les rendements en bourse dégringolent pour devenir quasi nuls entre 1999 et 2001. Le rendement moyen des capitaux privés dépasse celui des placements boursiers de 1999 à 2007 et durant toute la période 1989-2007. Pour valider les résultats, l'auteure fournit d'autres mesures statistiques des rendements produits par les capitaux privés.

Classification JEL : G11, G12, G24, G31, G32
Classification de la Banque : Marchés financiers; Évolution économique et financière
récente; Taux d'intérêt

1   Introduction

In this paper, I extend the results of Moskowitz and Vissing-Jørgensen (2002) on the returns to entrepreneurial investments in the United States. First, I replicate the set of findings in Moskowitz and Vissing-Jørgensen (2002) (also referred to as MVJ) using the authors' methodology and data from the four Surveys of Consumer Finances (SCF) available for the period from 1989 to 1998. Then I incorporate into my analysis subsequently released waves of SCF 2001, 2004, and 2007 and assess the robustness of their original findings to this extension of the period under consideration.

I find that the "private equity premium puzzle" documented by Moskowitz and Vissing-Jørgensen (2002) is not a robust feature of the data and does not survive beyond the 1990s, a period of extraordinarily high public equity returns. In the new sample period, entrepreneurial portfolios remain poorly diversified,[1] but entrepreneurial equity significantly outperforms public equity. In particular, in 1999–2001 the average annualized public equity returns fall to near zero values, while returns to entrepreneurial equity remain largely unaffected. Public equity returns also remain substantially below their private equity counterparts in the period 2002 to 2004. This is in sharp contrast to the original finding of Moskowitz and Vissing-Jørgensen (2002) that private equity returns are no higher than returns to public equity over the period 1989–1998.

This relative performance across the two sample periods mirrors the behavior of public and private equity values, as they mechanically account for the largest part of the returns. The two equities grow at a similar rate throughout the 1990s and so their average returns are very close over the period 1989–1998. In the new sample period, the growth rate of public equity falls due to large negative capital gains in the early 2000s. At the same time, private equity continued to increase in value steadily earning higher average return relative to public equity for the period 1998-2007, and 1989-2007 as a whole. As a robustness check for my findings, I consider alternative measures of private equity returns — in particular, the private equity industry returns.

The paper is organized as follows. Section 2.1 reports on the extended series for the returns to public and private equity for the period 1989 to 2007, with particular focus on the aftermath of the 1990s. Section 2.2 includes a brief discussion of the post 2007 events and data issues involved. Section 3 discusses one of the approaches to validate reported results, and Section 4 concludes.

2   Performance of Private and Public Equity Beyond 1989–1998

Private equity refers to *non-traded* owner's capital and shareholders' equity. This is the equity held both in non-traded *unincorporated* businesses such proprietorships and partnerships,[2] and in *incorporated businesses* such as subchapter S and C corporations. In turn, public equity refers to direct and indirect share holdings in publicly traded companies. In this section, I report the extended series for the returns to public and private equity and the underlying aggregate statistics, focusing on the period beyond 1998.

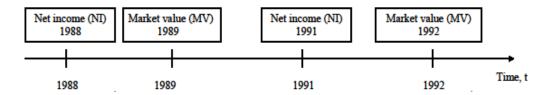## 2.1   Aggregate Returns to Private and Public Equity

I follow the methodology of Moskowitz and Vissing-Jørgensen (2002) to replicate returns to an index of private equity for the period 1989–1998 and to extend the series to 2007. Regular SCFs are cross-sectional surveys and are carried out triennially. Figure 1 shows data used in the construction of average annualized returns[3] over these three-year intervals; for conceretenss I use the example of two consecutive SCF surveys in 1989 and 1992. The market value of equity is reported for the year of the survey, and the value of profits (net income) refers to the year preceding it.

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[1] See Table 5 for a comparison of statistics on the concentration of entrepreneurial investments in their firms and public equity ownership concentration for SCF 1995, 2004, and 2007. Table 6 also provides summary statistics on entrepreneurs from the SCF 1995 and 2007.

[2] More specifically, unincorporated businesses include such legal forms of organizations as general partnerships, limited partnerships, including limited liability and limited liability limited partnerships, and limited liability companies, etc.

[3] The same formula applies to both raw and adjusted returns, with appropriate changes to market value of equity and net income used in the calculation.

FIGURE 1: Computing Returns to an Index of Private Equity

Using data in Figure 1, the average annualized return R over the period 1989–1992 is computed as the geometric average of returns R_1 and R_2 as follows:

$$R_1 = \left(\frac{\text{MV}_{1992} + 3 \cdot \text{NI}_{1988}}{\text{MV}_{1989}}\right)^{\frac{1}{3}} \tag{1}$$

$$R_2 = \left(\frac{\text{MV}_{1992} + 3 \cdot \text{NI}_{1991}}{\text{MV}_{1989}}\right)^{\frac{1}{3}} \tag{2}$$

$$R = (\sqrt{R_1 \cdot R_2} - 1) \cdot 100\% \tag{3}$$

The values of market equity and net income depend on an index of private equity, for which returns are being constructed, for example, an index of corporate, non-corporate or total private equity. The underlying statistics for the computation of the returns are reported in Table 1 (additional details on these statistics in SCF and other sources of aggregate data are included in Appendix A).

Table 2 summarizes the returns to public and private equity for the period 1989-2007. Reported in lines 1-3 of the table are the raw returns to an index of all private equity, and to indices of corporate and noncorporate private equity constructed using (1)–(3) above. In the remainder of the table, I report raw returns with adjustments in stages for (*i*) the profit tax; (*ii*) retained earnings; (*iii*) labor income of entrepreneurs managing their own businesses;[4] (*iv*) firm birth and new equity investment; and (*v*) the turnover of firms through IPO, mergers and acquisitions, and liquidation. These adjustments apply both to the market value of equity (MV) and to net income (NI) in (1)–(2). Lines 7–24 provide a comparison for the period 1989–1998 of replicated returns and returns reported in MVJ after each stage of adjustment. The MVJ returns are reported in parentheses, and replicated returns to all private equity and corporate/noncorporate equity mirror them very closely.[5] The final returns to all private equity are reported in lines 25 and 26 (the MVJ returns) of Table 2.[6] For the benchmark comparison with public equity returns, I use the CRSP market index return reported in line 30 of Table 2. This is a value-weighted portfolio return for all available stocks in the trading period.[7] The number reported for each three-year period is the geometric average of the annual returns aggregated from the monthly returns in CRSP. Appendix B discusses alternative measures of public equity returns.

In the original period 1989–1998, returns to indices of private and public equity appear to co-move closely. The returns to an index of all private equity are also no higher than the returns to public equity. However, with the extension of the period under consideration into the 2000s, the close co-movement of the returns weakens, so that private equity displays a substantial premium over public equity, in particular, due to its low returns in 1999–2001. Over this period, the average annualized public equity returns plunge to

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[4] Appendix D discusses the assumptions underlying the labor income adjustment in MVJ and possible alternatives.

[5] Replicating these results exactly would be impossible, since the SCF is edited periodically and the old versions of the survey data are replaced by the new ones. For a list of all changes to the data, see http://www.federalreserve.gov/PUBS/oss/oss2/changes.html.

[6] While in lines 7–24 the replicates and the original returns are quite close to each other, the difference between the two is more sizeable in lines 25 and 26, which take into account the mergers and acquisitions adjustment. The sources of this discrepancy are discussed in detail in Appendix C. Over the period 1989–2007 the contribution of the mergers and acquisitions adjustment to private equity returns has always been positive, leading to an increase in private equity returns. However, the main result of the paper remains unchanged when instead public equity returns are compared to returns in line 24 before the final adjustment for mergers and acquisitions, which are lower.

[7] The weights applied to the individual stock returns are given by the market value of the individual stock, outstanding at the end of the previous trading period, in the total market value of all stocks.

near zero values, whereas the returns to private equity remain largely unaffected.[8] Overall, this relative performance across the two sample periods mirrors the behavior of public and private equity values, as they mechanically account for the largest part of the returns. More specifically, the two equities grow at a similar rate throughout the 1990s and so their average returns are very close over the period 1989–1998. In the new sample period, however, the growth rate of public equity falls due to large negative capital gains in the early 2000s as reported in line 1 of Table 3. At the same time, private equity continues to grow at a fairly constant rate, earning a higher average return than public equity for the period 1999-2007, and 1989-2007 as a whole.

I check the robustness of my findings using the private equity industry returns as an alternative to private equity returns in the SCF. The details for this robustness exercise are included in Section 3.

2.2   The Current Recession and Equity Returns

This paper extends the results of Moskowitz and Vissing-Jørgensen (2002) through the end of 2007, the year of the latest publicly available Survey of Consumer Finances. While the start of the current economic crisis also dates back to late 2007, its main developments associated with the decline in the stock market and the economic activity in the real sector did not take place until 2008-2009. Therefore, the aggregate public and private equity returns reported in Tables 2 and 3 for 2004–2007 do not reflect these later adverse developments.[9]

What is the effect of the current crisis on the relative performance of public and private equities? While data on public equity returns from CRSP show that they fell sharply to significantly negative values after 2007 before rebounding in 2010, similar data required for construction of private equity returns in SCF are not readily available. In July 2009 the Federal Reserve Board launched a follow-up survey of the respondents interviewed in the 2007 SCF to document the effects of the crisis on households and their finances. At the same time, the regularly scheduled SCF survey was conducted in 2010. While the data from the 2010 SCF will be published in summary form in early 2012, it is not yet certain that it will be possible to release to the public a version of the panel micro data from 2007-2009 SCF. Thus, it is not possible to obtain an estimate of the return to private equity from SCF for the same period. As shown in the previous section, private equity substantially outperforms public equity over the period 1999–2001, which also includes the recessionary year of 2001. The nature of this recession has been quite different, however, and any comparisons with earlier recessionary episodes should be drawn with caution.

3   Alternative Measures of Private Equity Returns: the Private Equity Industry

The private equity industry is represented by venture capital and buyout funds, organized as partnerships and involving cooperation between entrepreneurs, financial organizers, and investors. The financial organizers and investors serve as general and limited partners in these partnerships, with entrepreneurs in their role as scientists and executives. The general partners and entrepreneurs primarily supply human capital, and receive a return on their human capital investment,[10] while the limited partners provide financial capital and earn financial returns. Thus, to validate the estimates of private equity returns reported earlier, the appropriate comparison is between the return to private equity net of labor income adjustment in SCF and returns of limited partners in the private equity funds.

Thomson Reuters' database VentureXpert produces the estimate of the limited partners' pooled internal

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[8] As reported in line 2 of Table 3, two of the three public equity returns in 1999-2001 are highly negative with the average net return for the period close to zero. Negative returns in 2002 also contribute to relatively low average return for the period 2002-2004.

[9] Appendix A provides a more detailed discussion of the aggregate statistics for private and public equity in SCF 2007 and their comparison with the aggregates in FFA/NIPA.

[10] The human capital here refers to the present discounted value of the labor input — time adjusted for effort. For entrepreneurs and general partners, the financial investment constitutes only a small part of their total investment and is taken into account.

rate of return (IRR)[11] as a standard measure of the industry's performance.[12] This return is constructed by pooling together private equity funds similar to the index of all private equity in Moskowitz and Vissing-Jørgensen (2002). The IRR is calculated as an annualized effective compounded rate of return using net cash flows (to and from investors) and the residual value of the pooled fund.[13] Prior to exit events these values are determined according to traditional valuation practices in the industry. In particular, as venture capital financing usually takes place in rounds, investments are valued as of the most recent round of financing.[14] In turn, the values for non-venture or buyout funds are set at the purchase of portfolio companies. When portfolio companies exit through IPOs, mergers and acquisitions, and liquidations, the actual market values are used. Line 3 of Table 4 reports pooled IRR as a measure of private equity industry performance. These series co-move closely with the return series from SCF in line 25 of Table 2, and yield the same qualitative comparison to public equity returns.

4 Conclusions

In this paper, I establish that the so-called private equity premium puzzle, orriginally identified in MVJ (2002), is not a robust feature of the data as it does not survive beyond the period of high public equity returns in the 1990s. In particular, the returns to the entrepreneurial equity index remain largely unaffected when public equity returns plunge between 1999 and 2001. This result is validated using an IRR measure of the private equity industry returns. At the same time, necessary data are not yet available to compare the performance of public and private equity in the most recent recession. As SCF public use micro data are released in 2012, the sign and size of the private equity premium can be accurately determined and incorporated into the discussion. More generally, the findings presented here may be suggestive of the role of private equity as a hedge against public equity, which is also a subject of future research.

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[11] The internal rate of return is defined as the return at which the net present value of investment becomes 0.

[12] In particular, the returns from VentureXpert have been used by Kaplan and Schoar (2005) as the aggregate measures of private equity industry performance in the 1980s and 1990s. Hall and Woodward (2007) do not use venture index returns produced by VentureXpert, but compute their own measures with data from Sandhill Econometrics using two methods. Venture index returns are obtained using two methods. First, they construct returns using company-level flows and the share of ownership of the limited investors, adjusting for preferences, dilution and GP charges. Second, they calculate returns using the net amounts directly received by limited partners. They find that the two measures move "reasonably close" to each other, and to the VentureXpert reported returns. The findings in Hall and Woodward (2007) and previous studies justify using readily available index returns from VentureXpert. I use the VentureXpert supplied return to an index of all private equity, including both venture and buyout funds, and for the two types of private equity separately.

[13] This residual value is treated as a terminal cash flow to investors.

[14] Hall and Woodward (forthcoming) discuss the endogeneity of these financing events, and propose a correction to the returns of investors that would take this endogeneity into account. They propose using linear interpolation to impute values in between rounds of financing over the regular valuation intervals.

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Appendix A. Aggregate Statistics on Public and Private Equity: Comparison of SCF, NIPA/FFA, and CRSP

In Table 1, I compare aggregate statistics for private and public equity using alternative sources of data. For public equity, the benchmark results in the paper use values from the Center for Research in Security Prices (CRSP). The apparent discrepancy between SCF and CRSP arises mainly from the fact that public equity values in SCF exclude some categories of indirect shareholdings in CRSP, leading to a systematic downward bias.[15] An additional source of discrepancy comes from the reporting of indirectly held equities in pooled investment funds and tax-deferred retirement accounts.[16] These are often invested jointly in bonds and stocks, and the split reported in SCF may not be entirely accurate.

In terms of the time series behavior, unlike in the 1990s, in the period from 1998[17] to 2004 the series of public equity values in SCF appear to diverge substantially from their CRSP counterpart.[18] More specifically, the value of public equity in CRSP increased slightly between 1998 and 2001, and then more dramatically between 2001 and 2004. In SCF, on the contrary, the value of public equity experienced significant growth between 1998 and 2001, and then declined somewhat between 2001 and 2004. Given these differences in the behavior of aggregate public equity values in the two sources and the fact that CRSP is the most accurate source of public equity values, I include in Table 1 the alternative series for public equity values from SCF, which uses information on the behavior of total public equity from CRSP. These series use the weighted average of equity values in 1998 and 2004 SCFs in place of the 2001 value, with the weights reflecting the fraction of the total increase in CRSP value of equity between 1998 and 2004 that occurred from 1998 to 2001.[19] These alternative series are used in the computation of revised public equity returns from SCF, reported for reference in line 35 Table 2.

For private equity, I compare statistics from SCF and NIPA/FFA. The series of equity values for the corporate and non-corporate sectors track each other reasonably well in the two sources for the period 1989-2004. However, from 2004 to 2007 there is a large increase in the total value of private equity in SCF, largely due to an almost two-fold increase in the value of unincorporated equity.[20] Noncorporate profits experienced similarly large growth in this period. More generally, comparison across the two sources reveals lower values of equity and profits for the noncorporate sector in NIPA/FFA. Among others, two main reasons might be contributing to this difference. On the one hand, FFA reports values outstanding as of end of year, and SCF interviews its respondents much earlier in the year. While not significant in other years, in 2007 these differences in valuation dates can be important with the start of the economic crisis dating back to Fall 2007. On the other hand, there is an issue with the valuation of equity in FFA/NIPA. It includes both market and non-market components. Using standard balance sheet accounting it is the sum of tangible assets (real estate at estimated market value, equipment, software, and inventories all at replacement / current) and financial assets less liabilities. At the same time, it excludes the value of intangible assets, in particular, financed with "sweat and equity investments," reported as part of the business owners'[21] equity in SCF. Despite these differences, however, the returns from NIPA/FFA and SCF in Table 2 are largely comparable.

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[15] Excluded from SCF are public equities owned by defined benefit retirement plans, including state and local government retirement plans, or by nonprofit organizations, insurance companies, etc., which constitute indirect holdings of the households. More systematically, comparison of SCF with other sources of aggregate statistics in terms of their coverage is addressed in Antoniewicz (2000).

[16] These include combination, stock, and other mutual funds in the pooled investment funds, and IRAs, Keogh, and certain employer-sponsored accounts in the tax-deferred retirement accounts.

[17] Given the procedure for construction of private equity returns, year 1998 is included in both periods - from 1989 to 1998 and from 1998 to 2007.

[18] The series in CRSP referred to here are also those reported over the three-year intervals.

[19] This is similar to the approach used by MVJ with respect to the 1995 value of profits of proprietorships and partnerships, which was very sensitive to the presence of a single observation.

[20] This category includes sole proprietorships, general partnerships, limited partnerships, and limited liability companies, with the LPs and LLCs responsible for the largest part of the increase. The limited liability companies and limited liability partnerships are grouped together for the public dataset. The LLC legal form of organization combines the limited liability for all owners characteristic of corporations with the pass-through tax treatment of partnerships, and offers more organizational flexibility than S-corporations. This classification is based on the incorporation status of the business at its establishment. Thus, unincorporated equity also includes the value of businesses that have elected to be treated as corporations for tax purposes.

[21] See McGrattan and Prescott (2005) for definitions of expensed and sweat equity investments and for the discussion of accounting issues related to these investments in NIPA/FFA.

Appendix B. Alternative Measures of Returns to Public Equity

Alternative measures of public equity performance used for comparison include the CRSP S&P holding return and Shiller's S&P 500 index return as reported in Table 2 in lines 32[22] and 33, respectively. They deliver a qualitatively similar comparison with private equity returns. I also use public equity returns from SCF in line 35 of the same table, constructed in the same way as their private equity counterparts. In particular, in their construction, the "equity" variable from the SCF public extract is used for the value of household public equity holdings,[23] and the "dividend income" variable from the full dataset is used for the value of income derived from these equity holdings.[24] The aggregate values for public equity and the dividend distributions are obtained by summing up the values of equity and dividend income for each household multiplied by the SCF non-response adjusted sample weights. As in the case of private equity, I report the geometric average of the two returns ($R1$ and $R2$) computed using two alternative values of aggregate dividend income. The returns to public equity based on the revised equity series in SCF are somewhat higher than the returns obtained in CRSP, but display a large negative premium relative to private equity returns in 1999–2001 and 2002–2004.

Appendix C. Mergers and Acquisitions

Moskowitz and Vissing-Jørgensen (2002) report their most accurate estimates of private equity returns with the mergers and acquisitions adjustment. In addition to firm births and deaths through liquidations and bankruptcies, this is an important channel for changes in the aggregate value of private equity. Returns with M&A adjustment are reported in Table 2 in lines 25 and 26, respectively. The data for this adjustment come from the SDC Platinum database of Thomson Reuters, which is the same database used by MVJ. They report that about 50% of the transactions they include in the adjustment have missing deal values in the database, and use imputation regression method to address this issue. Since the publication of their paper, however, a large number of these missing value transactions were updated to include the actual deal values.[25] Thus, the difference in returns mentioned earlier may reflect the systematic downward bias created by the imputation procedure. It can also be associated with the classification of transactions by the source of financing. For the purpose of this adjustment, it is important to distinguish between debt (including internal funds) and equity financing of the mergers and acquisition. While some transactions are classified as debt or equity financed only, others use both, and so their total values have to be divided accordingly. The different numbers of transactions with debt and equity financing reported in Table 5 of Moskowitz and Vissing-Jørgensen (2002) and in Table 7 of this paper suggest that in mixed financing cases, the deal value may have been assigned to either the debt or the equity category instead of both. While these two sources would explain most of the difference between the results reported in lines 25 and 26, pure input errors may have also played a role.[26] With higher private equity returns for the period 1989–1998 due to M&A adjustment, the nature of their comparison with the public equity returns over the same period remains unchanged.[27] At the same time, mergers and acquisitions produce an upward adjustment to the total private equity returns for the period 1999 to 2007 and contribute positively to the premium of private over public equity.

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[22] As well as in line 3 of Table 3.

[23] As mentioned previously, the household public equity holdings include direct holdings of stocks, mutual funds, defined contribution retirement plans, trusts, and annuities.

[24] The question corresponding to this variable in SCF is: "In total, what was your (family's) annual income from dividends in ... (year), before deductions for taxes and anything else?"

[25] SDC Platinum is a commercial use database which gets updated as additional information for past transactions becomes available, in particular, for missing deal values. The database contains a special variable that records the date when the transaction was last updated. Many transactions continue to be updated many years after their effective date and the date of the original posting in the database. In particular, heavily edited fields include the total value of the deal, the sources of financing (debt or equity or both), and their values. Thomson Reuters, which owns the database, collects its data from many different sources, including prospectuses, newspapers, experts, etc., so the information may become available in parts and find its way into the database over time.

[26] For example, some of the acquirors/targets in SDC have been mistakenly coded as both private and public. These discrepancies and inaccuracies were corrected with the help of Thomson's Helpdesk.

[27] The private equity returns are no higher than the public equity returns.

Appendix D. Robustness Checks: Labor Income Adjustment

The labor income adjustment removes the component of raw private equity returns that should be correctly attributed to the human capital investment of entrepreneurs, e.g., as they provide managerial and other labor services to their businesses but fail to report compensation at market rates. Sole proprietors and partners, in particular, are outrightly prohibited from expensing their own labor in their businesses, with many reporting in SCF no or zero labor compensation. In these cases, Moskowitz and Vissing-Jørgensen (2002) reduce their reported net income by the amount of imputed wages to arrive at the measure of net income used in the construction of returns. At the same time, if sole proprietors and partners do report positive labor compensation, it is assumed to be already excluded from their reported net income. There are two objections to this differential treatment of net income with non-zero labor compensation. First, for the question of net income of the business, the SCF codebook contains references to IRS income tax forms. The net income of sole proprietors and partners on these forms refers to the total net income and thus must include labour compensation. Second, in NIPA/FFA, capital and labor incomes of proprietors and partners are usually determined by dividing their total net income according to production function factor shares, which also implies that it is inclusive of labor compensation. This suggests two alternatives to the procedure in MVJ (2002) for labor income adjustment. The results for this alternative labor adjustment to the net income of proprietors and partners using (i) the total of reported and imputed unreported wages and (ii) the time-invariant labor share are reported in lines 2 and 3 of Table 8, respectively. The main result of the paper remains unchanged when these returns are compared to CRSP public equity returns in line 4 of the table.

TABLE 1: The Aggregate Statistics of Private and Public Equity (1989–2007), $ billion

Survey year	1989	1992	1995	1998	2001	2004	2007
STATISTICS FROM SCF							
PRIVATE EQUITY VALUES							
Total equity [1]	3,680	3,740	4,290	5,710	7,830	9,650	14,700
s.e.	(525)	(298)	(277)	(427)	(484)	(521)	(859)
Equity in PP	2,020	1,980	1,990	2,510	3,570	4,310	8,260
s.e.	(397)	(143)	(174)	(208)	(272)	(299)	(626)
Equity in SC	1,660	1,770	2,300	3,200	4,260	5,350	6,460
s.e.	(242)	(223)	(241)	(348)	(358)	(411)	(560)
PUBLIC EQUITY VALUES							
Original series	1,770	2,230	3,640	7,430	11,400	10,800	13,700
Revised series [2]	1,770	2,230	3,640	7,430	8,010	10,800	13,700
Equities ratio (private/public)	2.08	1.67	1.18	0.77	0.98	0.89	1.08
PROFITS							
Pretax profits PP	335	433	460	543	787	842	1,480
After tax profits SC	266	287	341	489	677	696	863
Profits - RE PP [3]	268	347	368	434	629	673	1,180
After tax profits - RE SC	175	194	246	351	479	530	641
LABOR INCOME							
Paid wages, total	141	191	246	292	331	336	419
PP	65.4	79.5	110	133	124	147	204
SC	75.5	112	136	159	212	193	224
Unpaid wages, total	179	184	205	225	268	301	387
PP	152	148	181	172	214	245	334
SC	27	36	24	53	54	56	53
Profits – RE – unpaid wages							
PP	116	199	187	262	415	427	846
SC	148	158	222	298	425	474	588
STATISTICS FROM CRSP							
EQUITY STATISTICS							
Total Public Equity	3,306	4,396	6,785	13,288	13,829	16,458	19,851
[4,5]	(3,292)	(4,376)	(6,734)	(13,217)			
Public equity x 0.7 [6]	2,314	3,078	4,750	9,301	9,681	11,521	13,896

TABLE 1: The Aggregate Statistics of Private and Public Equity (1989–2007), $ bln. (continued)

Survey year	1989	1992	1995	1998	2001	2004	2007
STATISTICS FROM CRSP							
DIVIDEND INCOME OF public corporations [7]	66.4	69.2	100.0	98.3	108.0	107.0	148.0
STATISTICS FROM FFA/NIPA							
PRIVATE EQUITY VALUES							
Equity in noncorporate business [8]	2,966	2,980	3,487	4,121	4,821	6,359	8,347
Minus value of 1–4 family rental properties [9]	916	982	1,109	1,235	1,441	1,756	1,991
Equals market value of proprietorships and partnerships	2,050	1,998	2,377	2,886	3,380	4,602	6,356
S and C corporations, market value							
With estate multiplier = 2 [10]	1,412	1,662	1,921	2,540	2,098	2,535	–
With estate multiplier = 3	2,117	2,433	2,887	3,811	3,147	3,803	–
INCOME AND DIVIDENDS							
Proprietors' income [11]	363.3	427.6	492.1	627.8	771.9	911.6	1056.2
Adjusted proprietors' income							
Minus retained earnings [12, 13]	187.7	216.3	283.3	514.6	514.7	557.3	678.1
Dividends, S and C private corporations [14]	165.2	177.2	249.0	387.6	406.4	466.0	–

PUBLIC equity statistics on new issues and takeovers		1992	1995	1998	2001	2004	2007
SDC M & A equity adj. [15]		284	442	846	1,162	1,061	1,941
New issues of public equity [16]		40	75	108	164	63	94

Note 1: For private equity statistics, s.e. refers to standard errors.
Note 2: This revision is as described in the text.
Note 3: RE refers to retained earnings.
Note 4: The market values for CRSP are obtained from the WRDS version of the CRSP Monthly Stock Market indices database and correpond to the variable "Total Market Value." The variable refers to the monthly total market value for a given market for all non-ADR securities with valid prices. The values reported are those for the end of the calendar year.
Note 5: The values in brackets are those originally reported in Moskowitz and Vissing-Jørgensen (2002). The small discrepancy can be atributed to infrequent minor revisions of CRSP.
Note 6: This is the CRSP value of public equity held by the household sector.
Note 7. Dividend distributions of publicly traded corporations include only distributions from current net income and do not include liquidating and other distributions.

Note 8: These numbers refer to net worth of noncorporate business and owners' equity in farm business, and unincorporated security brokers and dealers, as reported in the FFA balance sheets of households and nonprofit organizations.

Note 9: These values come from the BEA Detailed Data for Fixed Assets and Consumer Durables "Residential Detailed Estimates" files. They represent values of net stocks in 1–4 family rental properties of households, sole proprietors and partnerships, and nonprofit organizations, net of depreciation.

Note 10: These numbers are constructed using SOI files "Estate Tax Returns Filed for "Year" Decedents: Gross Estate by Type of Property." Multipliers 2 and 3 are applied to values of closely held stock at date of death (value times 2 or 3, accordingly). Moskowitz and Vissing-Jørgensen's (2002) original numbers come from tax files by year of filing not year of death. The values for 2007 are left blank as the SOI tax files for this year have not yet been posted.

Note 11: These numbers correspond to the series "Proprietors' income incl. inventory valuation (IVA) and capital consumption (CCAdj.) adjustments" as reported in NIPA Table 1.13, line 14 or Table 1.12, line 9.

Note 12: Adjusted proprietors' income refers to proprietors' income adjusted for a constant annual percentage of tax misreporting as in Moskowitz and Vissing-Jørgensen (2002). It assumes that every $1 of profits reported to the IRS corresponds to $1.75 of "true" profits. This adjustment is available only for nonfarm proprietors' income as reported in NIPA Table 7.14, line 1 (BEA does not provide raw data from the IRS for the noncorporate farm sector), so for noncorporate farm income I use reported NIPA income instead.

The tax misreporting adjustment applies to income without IVA and CCAdj. I add back IVA adjustment, but not CCAdj. to get a measure of the actual profit flow to proprietors. Then the total adjusted proprietors' income is the sum of the NIPA farm income with IVA adjustment (Table 1.12, line 32), and nonfarm income constructed as above.

Note 13: As in Moskowitz and Vissing-Jørgensen (2002), retained earnings adjustment is given by the sum of capital expenditures, net acquisition of financial assets less net increase in financial liabilities, and proprietors' net investment.

Note 14: These are obtained as a difference between NIPA/FFA total corporate dividends and CRSP dividends of publicly traded corporations. The value for 2007 cannot be constructed as the total dividends from NIPA/FFA for this year are unavailable.

Note 15: Values of M&A adjustment are aggregated for the three-year periods 1990–92, 1993–95, 1996–98, 1999–2001, 2002–04, 2005–07. These values reflect movements in and out of public equity between the survey years.

Note 16: As MVJ, in construction of private equity returns with IPO adjustment, I use statistics from Ritter published on his web-site: reported by Jay Ritter on his web-site: http://bear.cba.ufl.edu/ritter/Moneybyyear.pdf. As in the case of M&A adjustment, values are aggregated over the three-year intervals.

	90–92	93–95	96–98	99–01	02–04	05–07	Line
Total Private Equity in SCF							
UNADJUSTED RETURNS							
ALL	17.4	21.9	26.4	27.7	22.7	29.0	1
PP	15.7	19.0	26.3	30.3	23.7	39.5	2
SC	19.5	25.0	26.5	25.5	21.8	19.1	3
INCOME TAXES							
ALL	15.8	20.7	25.4	26.5	21.8	28.5	4
PP	15.7	19.0	26.3	30.3	23.7	39.5	5
SC	16.0	22.5	24.5	23.4	20.2	18.1	6
RETAINED EARNINGS							
ALL	12.3	17.2	22.1	23.1	18.9	25.8	7
	(12.3)	(17.0)	(22.2)				8
PP	12.8	15.7	23.1	27.1	20.6	36.7	9
	(12.6)	(15.6)	(23.0)				10
SC	11.7	18.7	21.1	19.8	17.2	15.4	11
	(12.0)	(18.5)	(21.4)				12
LABOR INCOME							
ALL	8.2	13.3	18.6	20.2	16.2	23.5	13
	(8.2)	(12.7)	(18.4)				14
PP	6.5	9.2	16.9	22.1	16.0	33.0	15
	(6.4)	(9.4)	(15.9)				16
SC	10.2	17.5	20.0	18.6	16.3	14.6	17
	(10.9)	(16.9)	(20.6)				18
FIRM BIRTH							
ALL	7.0	11.8	16.1	18.2	14.5	17.4	19
	(7.5)	(11.6)	(16.4)				20
PP	5.3	7.5	13.8	20.4	13.9	26.3	21
SC	9.2	16.3	18.0	16.4	15.0	9.0	22
IPO [1]							
ALL	7.4	12.3	16.7	18.8	14.7	17.6	23
	(7.8)	(12.1)	(17.0)				24

	90–92	93–95	96–98	99–01	02–04	05–07	Line
Total Private Equity in SCF							
M&A							
ALL	9.6	15.4	21.4	23.5	18.0	22.3	25
	(8.2)	(13.0)	(19.4)				26
Non-actively Managed Private Equity in SCF [2]							
ALL OWNERS	37.5	10.5	26.8	15.1	15.4	22.7	27
NON-ACTIVE OWNERS	36.0	21.7	40.2	13.3	5.5	36.8	28
Private Equity in FFA/NIPA							
PP	5.4	13.2	17.3	16.9	19.6	19.5	29
Public Equity in CRSP							
CRSP VALUE-WGTD INDEX UPDATED [3]	11.0	14.5	24.5	-0.4	6.0	10.2	30
	(11.0)	(14.6)	(24.7)				31
CRSP S&P INDEX HOLDING RETURN	7.2	11.2	25.9	-2.3	1.8	6.6	32
S&P INDEX, SHILLER	7.9	12.1	26.1	-4.2	0.1	5.5	33
Public Equity in SCF							
RETURN	11.2	20.4	28.5	16.4	-0.8	9.2	34
RETURN REVISED	11.2	20.4	28.5	3.8	11.5	9.2	35

Note 1: IPO adjustment uses Jay Ritter's data.

Note 2: Category "all owners" refers to entrepreneurs with both actively and passively managed businesses; "non-active owners" refers to entrepreneurs with passive management role only.

Note 3: For the CRSP value-weighted index, returns in brackets are those originally reported in Moskowitz and Vissing-Jørgensen (2002).

TABLE 3: Public Equity Market Values and Returns (1998–2007)

Year	1998	1999	2000	2001	2002	Line
CRSP MARKET VALUE, BLN. $	13,288	17,009	15,575	13,829	11,034	1
CRSP INDEX RETURN, %	22.3	25.3	-11.1	-11.3	-20.8	2
CRSP S&P RETURN, %	26.7	19.5	-10.1	-13.0	-23.4	3

Year	2003	2004	2005	2006	2007	Line
CRSP MARKET VALUE, BLN. $	14,585	16,458	17,384	19,548	19,851	1
CRSP INDEX RETURN, %	33.1	13.0	7.3	16.2	7.3	2
CRSP S&P RETURN, %	26.4	9.0	3.0	13.6	3.5	3

TABLE 4: Private Equity Industry Characteristics and Returns (1989–2007)

Year	90–92	93–95	96–98	99–01	02–04	05–07	Line
Aggregates, mln. $							
Total resources	61,841	137,174	362,162	802,647	446,440	1,390,315	1
Total investments	13,461	22,789	67,812	287,907	120,923	165,859	2
Returns, %							
ALL PRIVATE EQUITY							
Pooled IRR	13.6	14.9	16.7	18.0	14.2	14.1	3
1-yr horizon IRR	9.3	23.6	25.4	14.7	6.9	13.0	4
VENTURE CAPITAL							
Pooled IRR	9.8	12.0	14.9	19.2	16.4	15.9	5
BUYOUT FUNDS							
Pooled IRR	21.3	19.6	19.8	17.3	12.5	13.3	6

TABLE 5: Private Equity (PE) and Own-Company Public Stock Ownership

MEASURE	1995	2004	2007
Private Equity (PE) Ownership			
% OF TOTAL PE OWNED BY HOUSEHOLDS WITH:			
more than 25% of net worth in PE	93.3	92.4	93.5
more than 50% of net worth in PE	77.1	73.7	79.0
more than 75% of net worth in PE	50.6	41.9	51.4
MEAN % OF NET WORTH INVESTED IN PE FOR HOUSEHOLDS WITH POSITIVE PRIVATE EQUITY AND NET WORTH:			
SCF weights only	36.9	37.5	37.6
Net worth weights	45.7	41.4	46.0
MEAN % OF PE HELD IN ONE ACTIVELY MANAGED FIRM FOR HOUSEHOLDS WITH POSITIVE PE:			
SCF weights only	82.5	85.4	85.3
Private equity weights	73.9	73.8	72.2
Own Company Stock Ownership in Public Firms			
% OF TOTAL PUBLIC EQUITY OWNED BY HOUSEHOLDS WITH:			
more than 25% of public equity in own company	11.0	9.9	12.6
more than 50% of public equity in own company	6.5	4.6	6.7
more than 75% of public equity in own company	3.1	1.2	2.7
MEAN % OF NET WORTH INVESTED IN OWN-COMPANY STOCK FOR HOUSEHOLDS WITH POSITIVE OWN-COMPANY STOCK AND NET WORTH:			
SCF weights only	11.1	9.0	8.9
Net worth weights	10.4	8.3	11.4
MEAN % OF DIRECTLY HELD PUBLIC EQUITY IN OWN-COMPANY STOCK FOR HOUSEHOLDS WITH POSITIVE OWN-COMPANY STOCK:			
SCF weights only	70.1	69.7	73.3
Directly held public equity weights	48.4	47.0	57.4
MEAN % OF TOTAL PUBLIC EQUITY HELD IN OWN-COMPANY STOCK FOR HOUSEHOLDS WITH POSITIVE OWN-COMPANY STOCK:			
SCF weights only	44.2	32.2	35.3
Total public equity held weights	29.4	20.9	29.1

Note: This table is an analogue of Table 2 in Moskowitz and Vissing-Jørgensen (2002) (p. 751).

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TABLE 6: Summary Statistics on Entrepreneurs from the Survey of Consumer Finances

Section A			Percentile				
CHARACTERISTIC	Mean	Std. dev.	10th	25th	50th	75th	90th
SCF1995							
Entrepreneur age	46.5	12.6	31	37	45	54	65
Firm age	11.9	11.6	2	4	8	16	26
Private equity value, $ ths.	289.3	1,664.9	0	5.0	30.0	129.0	481.0
Sales, $ ths.	6,994.7	217,000	0	4.2	30.0	130.0	700.0
Profits, $ ths.	94.2	1,646.7	0	0.5	6.5	29.0	80.0
Net worth, $ ths.	774.5	3,365.7	32.0	80.6	182.0	489.6	1,337.7
Share of firm, % [1]	86.5	26.4	100	1000	100	100	100
Employees [2]	12.1	123.8	1	1	2	4	12
SCF 2007							
Entrepreneur age	49.4	11.9	34	41	49	58	65
Firm age	12.7	10.6	2	4	10	18	28
Private equity value, $ ths.	751.9	4,592.4	0	11.0	80.0	350.0	1,200.0
Sales, $ ths.	6,521.6	101,000.0	1.2	15.0	70.0	373.0	1,500.0
Profits, $ ths.	147.2	994.5	0	3.0	20.0	75.0	200.0
Net worth, $ ths.	2,067.0	8,291.6	64.0	178.3	515.8	1,519.0	4,647.8
Share of firm, %	82.9	29.2	33	50	100	100	100
Employees	28.5	272.9	1	1	2	6	15

TABLE 6: Summary Statistics on Entrepreneurs from the Survey of Consumer Finances

Section B SCF 2007	
INDUSTRY	% PE
Agriculture [3]	10.2
Construction/mining [4]	17.5
Manufacturing	6.5
Retail, wholesale [5]	13.7
FIRE/communications [6]	14.7
Services [7]	37.4

Note 1: The ownership share refers to the first (main) actively managed business of
the household.
Note 2: The number of employees includes entrepreneurs working in the business.
Note 3: This category includes: agriculture, forestry, fishing, hunting, and veterinary and
landscaping services.
Note 4: Oil and gas extraction, coal mining, quarrying, and supporting services for mining
and construction.
Note 5: Wholesale and retail trade, restaurants, and food services.
Note 6: Finance and insurance, real estate (FIRE), automotive rental and leasing, software
publishing, data processing, automotive repair and maintenance.
Note 7: Commercial, industrial, and other intangible asset rental and leasing;
employment and business support services; broadcasting and telecommunications;
other administrative and support services; health, education, and social services; arts
and entertainment services; recreation, accommodation, and food services;
personal services, etc.

TABLE 7: Merger and Acquisition Activity in Private and Public Firms (1989–2007), $ billion

Survey year	1990–1992			1993–1995			1996–1998		
Acquiror (acq.):	Pub	Priv	Priv	Pub	Priv	Priv	Pub	Priv	Priv
Target:	Priv	Priv	Pub	Priv	Priv	Pub	Priv	Priv	Pub
All acquirors, all targets									
Value	220.6	192.9	69.7	363.8	84.4	247.2	756.5	219.9	446.1
Number of deals	4,715	3,701	528	7,746	626	4,911	11,794	1,026	7,093
All acquirors, dom. targets									
Value	94.3			201.4			424.9		
Number of deals	2,209			4,313			6,417		
Dom. acq., dom. targets debt of cash funded									
Value		69.9			101.9			157.1	
Number of deals		1,208			1,615			2,107	
Foreign acq., dom. targets									
Value		13			9.3			16	
Number of deals		143			95			167	
Dom. acq., foreign targets equity funded									
Value		0.7			0.6			2.1	
Number of deals		5			12			14	
Dom. acq., all targets equity funded									
Value			2.7			6.9			24.8
Number of deals			21			12			37
Total change		284.5			441.7			846.2	

Note 1: Dom. refers to domestic, and for. refers to foreign.

TABLE 7: Merger and Acquisition Activity in Private and Public Firms (1989–2007), $ bln. (continued)

Survey year	1999–2001			2002–2004			2005–2007		
Acquiror:	Pub	Priv	Priv	Pub	Priv	Priv	Pub	Priv	Priv
Target:	Priv	Priv	Pub	Priv	Priv	Pub	Priv	Priv	Pub
All acq., all targets									
Value	1,126	400.9	635.4	723.6	287.3	470	1,241	1,327	1,488
Number of deals	11,588	1,590	8,133	9,025	1,253	7,592	12,765	1,606	9,670
All acq., dom. targets									
Value	534.1			330.1			497.4		
Number of deals	4,670			3,056			3,866		
Dom. acq., dom. targets									
debt of cash funded									
Value		181			230.8			457.7	
Number of deals		1,966			1,959			2,308	
For. acq., dom. targets									
Value		22.4			18.7			82.2	
Number of deals		222			150			265	
Dom. acq., for. targets									
equity funded									
Value		0.4			2.8			2	
Number of deals		19			11			8	
Dom. acq., all targets									
equity funded									
Value			7.9			9.3			45.1
Number of deals			33			14			10
Total change		1,162			1,061			1,941	

TABLE 8: Robustness Checks

	90–92	93–95	96–98	99–01	02–04	05–07	Line
Total Private Equity in SCF							
MVJ ASSUMPTIONS							
ALL EQUITY	9.6	15.4	21.4	23.5	18.0	22.3	1
ALTERNATIVE ASSUMPTIONS							
Noncorporate labor income [1]							
ALL EQUITY	8.7	14.5	20.4	22.6	17.5	21.7	2
Production function income shares for noncorporate income and [1], [2]							
ALL EQUITY	8.3	13.9	19.9	21.6	16.2	20.0	3
PUBLIC EQUITY RETURNS							
CRSP [3]	11.0	14.5	24.5	-0.4	6.0	10.2	4

Note 1: With this adjustment, both reported and unreported imputed wages for proprietors and partners are subtracted from net income to construct their returns.

Note 2: This adjustment is the same as [1] above but uses the time-invariant share of labor income in total net income for the labor adjustment.

Note 3: Public equity returns are included in the table to confirm that the main result of the paper remains unchanged with alternative assumptions on labor adjustment.