# Wall Street and Main Street: What Contributes to the Rise in the Highest Incomes?

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We study how much of the top end of the income distribution is represented by four sectors—non-financial-firm top executives (Main Street); investment bankers and hedge, private equity, and mutual fund investors (Wall Street); corporate lawyers; and athletes and celebrities. Wall Street individuals comprise a higher percentage of the top income brackets than nonfinancial executives of public companies. While top executives' representation in the top brackets has increased from 1994 to 2004, Wall Street's representation has likely increased even more. We discuss the implications of our findings for different explanations for the increased skewness at the highest income levels. (*JEL* D31, G34, J33, M52)

It is well known that the personal income distribution in the United States has become increasingly unequal over the last several decades.[1] The sources of this increased inequality, however, are not completely understood, particularly at the very top end of the distribution. In this article, we consider in detail how much of the inequality today at the very top end of the income distribution can be attributed to four different sectors of the economy: top executives of nonfinancial firms (Main Street); financial service sector employees from investment banks, hedge funds, private equity (PE) funds, and mutual funds (Wall Street); lawyers; and professional athletes and celebrities.[2]

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[1] See Piketty and Saez (2003, 2006a, 2006b); Autor, Katz, and Kearney (2006, 2008); Dew-Becker and Gordon (2005); and Gordon and Dew-Becker (2007).

[2] We are interested in the very top end of the distribution, i.e., the 99th percentile and above. Other studies focus on inequality between the 90th and 50th and between the 50th and 10th percentiles.

When possible, we estimate how those contributions vary over time. It is well documented that top executive pay has increased substantially over the last twenty-five years (Hall and Liebman 1998; Hall and Murphy 2003; Jensen, Murphy, and Wruck 2004; Bebchuk and Fried 2004, 2005). Those increases have generated a great deal of controversy and attention. At the same time, the financial and legal sectors also have experienced substantial growth over the last twenty-five years, both in number and the pay of those employees. As a result, those sectors also include many high-income individuals. Unlike data on the top executives of public companies, however, compensation on investment bankers, hedge fund employees, PE partners, and law firm partners is not disclosed systematically.

We begin with the data on pay for top executives of public firms in the ExecuComp database. We use two measures of pay. First, we consider realized or actual compensation that includes options exercised during the year. While realized compensation estimates the compensation on an executive's income tax return for one year, it may represent option grants from more or less than one year. Since income from stock options is taxed upon exercise, this provides a measure of the employment-related compensation the executive actually reports to the IRS that year. Second, we consider ex ante compensation that uses the estimated value of options granted that year rather than the value of options exercised. This measures the pay the board expected to give the CEO and represents just one year of pay.

We extrapolate the data on those companies to also include non-ExecuComp companies. We estimate the contribution of all top executives from nonfinancial and financial firms to the top ends of the distributions of adjusted gross income (AGI) from the IRS, both recently and for 1994.

In 2004, using realized compensation, nonfinancial executives represent 5.37% of the top 0.01% bracket of AGI; using ex ante compensation, they represent only 3.98% of the top 0.01% bracket. In both cases, top executives explain only a modest fraction of the top 0.01% bracket. The results are similar for the top 0.001% and 0.0001% brackets. In 1994, nonfinancial executives represent 3.91% of the top 0.01% bracket of AGI using realized compensation, and 3.66% using ex ante compensation. Nonfinancial executives, therefore, represent a modestly larger fraction of the very top brackets using realized compensation, and virtually the same fraction using ex ante compensation in 1994 and 2004 despite the large increase in pay over this period.

We then use the financial statements of publicly traded investment banking firms (e.g., Goldman Sachs and Morgan Stanley), and assumptions of the pay distribution within these firms to estimate the pay of the most highly compensated people (whom we refer to as managing directors or MDs) at those firms. We estimate that MDs of the top investment banking firms comprise a larger percentage of the top 0.01% (but a smaller percentage of the top 0.001%) than top executives of nonfinancial public companies.

Next, we estimate incomes for individuals in the asset management business. We look at hedge fund, venture capital (VC) fund, and PE or buyout fund investors. The data here are very coarse, and we make a number of assumptions to obtain estimates of income. A large number of professionals in these areas are highly compensated. We estimate that the professionals in hedge, VC, and PE funds include roughly the same number of individuals in the top 0.1% of the AGI income distribution as the top nonfinancial executives. While we do not estimate precise distributional changes over time for this sector, we show that these industries are significantly larger today than ten and twenty years ago and, therefore, that their employees must represent a larger fraction of the top brackets than before.

We also find that hedge fund investors and other "Wall Street" type individuals comprise a larger fraction of the very highest end of the AGI distribution (the top 0.0001%) than CEOs and top executives. In 2004, nine times as many Wall Street investors earned in excess of $100 million as public company CEOs. In fact, the top twenty-five hedge fund managers combined appear to have earned more than all five hundred S&P 500 CEOs combined (both realized and ex ante). This trend accelerated after 2004. In 2007, it is likely that the top five hedge fund managers earned more than all five hundred S&P 500 CEOs combined.

We then examine lawyers using profit per partner for the top law firms in the United States. The average profit per partner in 2004 in the top one hundred firms is $1.0 million, representing almost eighteen thousand partners. This compares to an average profit per partner of $0.45 million for thirteen thousand partners in 1994. Profits per partner, therefore, have increased by almost 2.2 times, while the number of partners has increased by more than 40%. Consistent with these increases, we estimate that the fraction of lawyers in the 0.1% (and top 0.5%) AGI brackets rose substantially from 1994 to 2004.

Finally, we consider professional athletes in basketball, baseball, and football. These athletes represent a similar percentage of the top 0.1% AGI bracket in 2004 as in 1995 (0.8% for both years), but a larger percentage of the top 0.01% AGI bracket (1.5% versus 1.0%). Data on celebrities are not as complete as data on professional athletes but suggest that celebrities comprise a substantially smaller share of the top brackets.

Overall, we estimate that the groups we study represent 15–26.5% of the individuals who comprise the AGI brackets at and above the top 0.1%. Among those groups, nonfinancial public company CEOs and top executives are estimated relatively precisely and represent 2.0–6.4% of the very top brackets. In every top AGI bracket, we estimate that Wall Street-related individuals comprise a greater percentage of the top AGI brackets than nonfinancial executives of public companies.

While our estimates represent a substantial portion of the top income groups, they clearly miss a large number of high-earning individuals. We suspect that some of the missing individuals are trial lawyers, successful entrepreneurs,

owners and executives of privately held companies, highly paid doctors, and independently wealthy individuals who have a high AGI. While some of the missing individuals may also be non-top-five executives of publicly traded companies, the pay of the fifth highest paid executives suggests that this number is negligible for the top 0.01% and above.

From 1994 to 2004, the representation of top executives of nonfinancial firms in the top brackets increased using realized pay, but was virtually the same using ex ante pay. The contribution of lawyers, hedge fund managers, PE, and VC professionals to the top brackets unequivocally increased over this period, and almost certainly to a greater extent than top executives. This pattern is likely to have continued from 2004 to 2007, as the ex ante pay of public company CEOs remained roughly constant in real terms while the pay of the other groups likely continued to increase.

We conclude by considering how our results inform different explanations for the increased skewness at the top end of the distribution. These explanations include trade or globalization theories (Hecksher 1931; Ohlin 1933; Stolper and Samuelson 1941), increasing returns to generalists rather than specialists (Murphy and Zabojnik 2004; Frydman 2007), theories of managerial power (Bebchuk and Fried 2004), social norms (Piketty and Saez 2006a; Levy and Temin 2007), greater scale (Gabaix and Landier 2008), skill-biased technological change (Katz and Murphy 1992; Garicano and Rossi-Hansberg 2006; Garicano and Hubbard 2007), and superstars (Rosen 1981).

We argue that the evidence is more consistent with theories of skill-biased technological change, superstars, greater scale, and their interaction than with the other theories. With the large improvements in information technology and the substantial increase in value of the securities markets over the last twenty-five years, asset managers, investment bankers, lawyers, and top executives now apply their talent to much larger pools of assets.

Our analysis is most closely related to the second half of Dew-Becker and Gordon (2005). They consider two possible sources of increasing income inequality—the pay of top executives and the pay of entertainment and sports superstars. Based on average pay statistics, they claim that those two groups account for most of the income earned in the very top quantiles of the income distribution. There are several ways in which our analysis is different from theirs. First, Dew-Becker and Gordon interpret the mean statistics from Bebchuk and Grinstein (2005) rather than analyze the distribution of pay we do. Second, they do not consider non-ExecuComp firms. Finally, they do not measure Wall Street-type professionals or lawyers at all.

The article proceeds as follows. Section 1 analyzes data on the incomes of top executives in nonfinancial and financial firms and their contribution to the income distribution. Section 2 focuses on other employees in the financial services and investment sector. Section 3 reports our results on lawyers. Section 4 reports our results on professional athletes. In Section 5, we use the results in the previous sections to see how much of the top end of the income

distribution those groups explain. Section 6 discusses the extent to which the different groups are paid for performance. In Section 7, we summarize our findings and discuss their implications for different theories of increased income inequality.

## 1. Top Executives (Main Street)

In this section, we consider the contribution of top executives of U.S. public companies to the top end of the income distribution. We begin with the top executives in the ExecuComp database. ExecuComp covers the compensation of top executives of companies in the S&P 500, the S&P Midcap 400, and the S&P Smallcap 600, plus some companies that were in those indices in previous years. We focus on 1994 because it is the first year that ExecuComp has full coverage of the index companies and on 2004 because it was the most recent year for which complete data were available and for which we could extrapolate AGI brackets.[3] For 1994, ExecuComp covered 1747 companies and 8426 executives, and for 2004 it covered 1722 companies and 8430 executives.

ExecuComp reports two summary measures of pay, TDC1 and TDC2. TDC2 estimates the value of total compensation realized by the executive in a given year. This is the sum of salary, bonus, the value of restricted stock granted, the net value of stock options exercised, and the value of long-term incentive payouts. (TDC2 also reflects any benefit that an executive may have received from backdating options.) Because executives typically exercise options granted in previous years, TDC2 may represent pay from more or less than one year.

TDC1 estimates the value of total compensation awarded (but not necessarily realized) to the executive that year. This equals TDC2 but replaces the net value of stock options exercised with the estimated or ex ante value of stock options granted, using a Black-Scholes calculation. TDC1 does not reflect option backdating because it assumes that the stock price on the issue date was the same as the exercise price. Backdating is unlikely to affect our results on TDC1 because Heron and Lie (2007) suggest that backdating was uncommon by 2004 and also was likely uncommon in 1994.

Reported taxable income may differ from TDC2 because some restricted stock grants are not taxable until they vest. In any given year, an executive's true taxable income will reflect the restricted stock grants that vested that year, which will include some current year, as well as past year grants.

Reported AGI also differs from TDC2 to the extent that executives earn income from other sources, such as interest, dividends, and capital gains. To control for this, we repeat our analyses excluding investment income from the AGI brackets. When we do so, we obtain qualitatively similar results. Other deferred compensation, such as pension benefits, also will not appear in TDC2

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[3] Subsequent to writing the first draft of this article, we have repeated our analyses using 2005 ExecuComp data. We obtain qualitatively similar results, which we discuss below when appropriate.

or TDC1, nor would they appear in AGI.[4] An additional caveat when looking at AGI comparisons is that AGI is calculated at the level of the tax-filing unit, whereas we consider individuals. In other words, we assume that none of the individuals examined in our article are married to other high earners.

To summarize, TDC2 will be closer to an executive's true AGI while TDC1 will more closely approximate the compensation a company's board expected to pay the executive.

We also assume that all top executives are U.S. citizens and report all of their income to U.S. tax authorities. Because some top executives are not U.S. citizens or are taxed elsewhere, our results overstate the number of executives that actually appear in the relevant tax brackets.

For 1994 and 2004, we report the number of top executives in each AGI income bracket based on TDC2 and TDC1. We restrict our sample in two additional ways. First, we include only the top five most highly compensated executives per firm. ExecuComp typically includes all executives in the disclosure statements, which sometimes exceed the legally required five. The average number of unique executives per firm-year in ExecuComp was 6.7 in 1994 and 5.9 in 2004. To ensure that our results are not affected by changing coverage, we keep only the largest five TDC2 observations for each firm-year. Second, for executives who appear in the top five at multiple firms in a given year (because they changed firms during the year), we sum the pay they earned at each firm to convert multiple observations into one.

While most ExecuComp companies are nonfinancial companies, some, like Goldman Sachs, are financial services companies, such as banks and investment banks. Accordingly, we divide the ExecuComp executives into nonfinancial and financial executives. Financial executives are executives of firms that have an SIC Code from 6000 to 6299. We consider firms with SIC Codes at 6300 and above to be nonfinancials; these firms include insurance companies and real estate agents and operators. We classify them as nonfinancials because they are generally not "Wall Street" type firms. Financial firms comprised less than 10% of the S&P 500, S&P Midcap 400, and S&P Smallcap 600 in 1994 and 2004.

Table 1 reports the number of nonfinancial and financial ExecuComp executives in each AGI bracket. The top fractile AGI cutoffs in 1994 are calculated using the detailed IRS Statistics of Income files for U.S. individuals, held at the NBER. The cutoffs for the top fractiles of AGI income in 2004 are calculated based on the 2002 distribution (the latest years for which the detailed files were available) and the relation between the 2002 and 2004 fractiles documented in Piketty and Saez (2003, 2006b).

Table 1 shows that from 1994 to 2004, CEO and top executive compensation increased substantially. For the top five nonfinancial ExecuComp executives,

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[4] Sundaram and Yermack (2007) estimate the average change in pension value is 10% of total compensation (TDC1) for Fortune 500 CEOs from 1996 to 2002.

**Table 1**
**AGI thresholds and top executive compensation, ExecuComp executives**

| | | | | Realized pay including options exercised (TDC2) | | | | Ex ante pay including options granted (TDC1) | | | |
| | | | | ExecuComp nonfinancial | | ExecuComp financial | | ExecuComp nonfinancial | | ExecuComp financial | |
| Bottom of bracket | Top of bracket | Number of returns | Bracket | Number of executives | Share of bracket and above | Number of executives | Share of bracket and above | Number of executives | Share of bracket and above | Number of executives | Share of bracket and above |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2004** | | | | | | | | | | | |
| $0 | $309,160 | 131,061,150 | ≤99 | 621 | 0.01% | 45 | 0.00% | 675 | 0.01% | 65 | 0.00% |
| $309,160 | $479,177 | 661,925 | >99 | 972 | 0.57% | 65 | 0.05% | 675 | 0.57% | 72 | 0.05% |
| $479,177 | $1,400,370 | 529,540 | >99.5 | 3033 | 0.99% | 226 | 0.09% | 3081 | 1.03% | 222 | 0.09% |
| $1,400,370 | $7,189,506 | 119,146 | >99.9 | 2937 | 2.68% | 265 | 0.28% | 3265 | 2.82% | 263 | 0.26% |
| $7,189,506 | $31,178,805 | 11,915 | >99.99 | 539 | 4.59% | 93 | 0.82% | 451 | 3.58% | 83 | 0.66% |
| $31,178,805 | | 1,324 | >99.999 | 68 | 5.14% | 15 | 1.13% | 23 | 1.74% | 4 | 0.30% |
| | | | Mean ($M) | $2.77 | | $4.24 | | $2.39 | | $3.44 | |
| | | | Median ($M) | $1.16 | | $1.51 | | $1.25 | | $1.36 | |
| | | | Total dollars ($M) | $22,665 | | $3004 | | $19,514 | | $2441 | |
| | | | Number of executives | 8170 | | 709 | | 8170 | | 709 | |
| **1994** | | | | | | | | | | | |
| $0 | $194,200 | 114,783,570 | ≤99 | 807 | 0.01% | 18 | 0.00% | 946 | 0.01% | 41 | 0.00% |
| $194,200 | $286,290 | 579,715 | >99 | 1124 | 0.59% | 67 | 0.06% | 779 | 0.58% | 50 | 0.06% |
| $286,290 | $733,602 | 463,772 | >99.5 | 3210 | 0.99% | 275 | 0.11% | 2853 | 1.03% | 243 | 0.11% |
| $733,602 | $3,179,134 | 104,349 | >99.9 | 2261 | 2.21% | 310 | 0.32% | 2697 | 2.69% | 302 | 0.34% |
| $3,179,134 | $13,444,936 | 10,435 | >99.99 | 275 | 2.56% | 52 | 0.51% | 395 | 3.66% | 87 | 0.80% |
| $13,444,936 | | 1,159 | >99.999 | 22 | 1.90% | 7 | 0.60% | 29 | 2.50% | 6 | 0.52% |
| | | | Mean ($M) | $0.90 | | $1.32 | | $1.04 | | $1.53 | |
| | | | Median ($M) | $0.49 | | $0.74 | | $0.57 | | $0.82 | |
| | | | Total dollars ($M) | $6942 | | $960 | | $8039 | | $1117 | |
| | | | Number of executives | 7699 | | 729 | | 7699 | | 729 | |

This table shows the distribution of total compensation for executives in ExecuComp relative to the distribution of adjusted gross income (AGI). Only the top five executives are counted for each ExecuComp company. Financial firms are defined as firms that have an SIC Code between 6000 and 6299, which includes depository institutions, nondepository credit institutions, and securities and commodities brokers. Percentiles are shown relative to the number of tax filers. The cutoffs for the top fractiles of AGI in 1994 are calculated based on the detailed IRS Statistics of Income files for US individuals, held at the NBER. The cutoffs for the top fractiles of AGI in 2004 are calculated based on the 2002 distribution (the latest years for which the detailed files were available) and the relation between the 2002 and 2004 fractiles documented in the tabulations of Piketty and Saez (2003, 2006b).

the average nominal realized compensation (TDC2) increased from $0.90 million in 1994 to $2.77 million in 2004. For financial executives, the increase was from $1.32 million to $4.24 million.

Using realized compensation, nonfinancial ExecuComp executives represent a somewhat larger fraction of the top AGI brackets in 2004 than they did in 1994. The increase is small in the top 0.1%, but larger in the brackets above. Nonfinancial ExecuComp executives represented 2.21% of the top 0.1% in 1994 and 2.68% in 2004. At the same time, for the top 0.01%, they represented 2.56% in 1994, but 4.59% in 2004; for the top 0.001%, 1.90% in 1994, and 5.14% in 2004. While their share of the very top brackets has increased, the top executives comprise a modest fraction of those brackets. Although not reported in the table, we find that the representation of nonfinancial executives in the top brackets declined somewhat in 2005 to 4.05% for the top 0.01% and 3.80% for the top 0.001%.

Using ex ante or estimated compensation, the picture is different. Table 1 shows that nonfinancial ExecuComp executives occupy roughly the same fraction of the top brackets in 2004 as in 1994 except for the very top where their share declines. Nonfinancial ExecuComp executives represent 3.66% of the top 0.01% in 1994 and 3.58% in 2004. At the same time, they represent 2.50% of the top 0.001% in 1994, but only 1.74% in 2004. Although not reported in the table, in 2005, nonfinancial executives' representation in the top brackets also declined to 2.81% for the top 0.01% and 1.19% for the top 0.001%.

Table 1 also shows that the fraction of financial executives in the top brackets increases using realized pay, but remains roughly the same using ex ante pay.

As noted earlier, we believe it is appropriate to separate the nonfinancial and financial executives. However, if the two groups are combined, using realized pay, we find that top executives comprised 5.41% and 6.27% of the top 0.01% and top 0.001% brackets in 2004 and 3.07% and 2.50% in 1994. Using ex ante pay, top executives comprised 4.24% and 2.04% of the top 0.01% and top 0.001% brackets in 2004 and 4.46% and 3.02% in 1994. These patterns are qualitatively identical to the patterns for the nonfinancial executives alone.

For comparison with other studies, we also considered the distributions for CEOs only and obtained qualitatively similar results to those for all top executives. CEOs have maintained or increased their share of the top brackets using realized pay, and have maintained their share using ex ante pay.

While the ExecuComp data cover over sixteen hundred publicly traded firms, a total of 8060 publicly traded firms in 2004 have equity market values available in Compustat. Accordingly, we estimate the pay of top executives in the non-ExecuComp firms. We sample proxy statements to measure pay for up to fifty non-ExecuComp firms in each of three size brackets. We do this because the non-ExecuComp firms are small relative to those in ExecuComp and compensation tends to be lower in smaller firms.

We use three size brackets that are analogous to those in the ExecuComp data. We assume that if a firm's equity market value exceeds the maximum

equity market value for S&P 400 midcap firms, it is like an S&P 500 firm. We identify fewer than fifty such firms. The second group includes firms with equity market values above $1 billion but below the maximum for S&P 400 midcap firms. The third group includes firms with equity market values below $1 billion, but above the minimum equity market value for the S&P 600 smallcap firms. We exclude firms with market values below the minimum for the S&P 600 smallcap, assuming that these companies have virtually no very high paid executives. We assume that top executive compensation in the non-ExecuComp firms in each size class mirrors the top executive compensation of the firms that we sample in each size class.

Table 2 indicates that there are relatively few very highly paid executives in non-ExecuComp firms. Top executives in nonfinancial non-ExecuComp firms comprise a lower fraction of the top 0.01% of AGI brackets in 2004 than they do in 1994—0.79% versus 1.34%—but a higher fraction of the top 0.001–1.34% versus 0—using realized pay. The top executives occupy a higher fraction of the very top brackets using ex ante compensation. In all cases, however, the magnitudes are quite modest, never exceeding 1.36% of any bracket using realized pay and 0.86% of any bracket using ex ante pay.

Table 2 also combines the estimates for ExecuComp and non-ExecuComp executives. Using realized pay, nonfinancial executives overall occupy 5.37% of the top 0.01% and 6.48% of the top 0.001% in 2004, compared to 3.91% and 1.90%, respectively, in 1994. Using ex ante pay, nonfinancial executives overall occupied 3.98% of the top 0.01% and 1.92% of the top 0.001% in 2004 compared to 3.66% and 2.50% in 1994. These results are summarized graphically in Figure 1A and B.

In unreported analyses, we use AGI brackets that exclude investment income (including dividends, interest, rentals, farm income, IRA distributions, income from estates and trusts, pension and annuity distributions, long-term capital gains, and Form 4797 income). This increases the percentage of the brackets occupied by the top executives. Using realized pay, top executives of all nonfinancial firms comprise 8.55% of the top 0.01% in 2004 versus 6.07% in 1994. For the top 0.001%, the top executives comprise 11.87% in 2004 versus 3.97% in 1994. Using ex ante pay, top executives of all nonfinancial firms comprise 7.28% of the top 0.01% in 2004 versus 6.18% in 1994. For the top 0.001%, the top executives comprise 5.90% in 2004 versus 5.35% in 1994. Our results also are qualitatively similar if we combine nonfinancial and financial executives.

Overall, the analyses show two main patterns. First, using ex ante pay, the nonfinancial top executives' share of the very top AGI brackets is small and has remained roughly the same or declined since 1994. Second, using realized pay, the share of nonfinancial top executives in the very top brackets is also small in an absolute sense. The share of the top 0.01% has increased modestly, while the share of the very top—the top 0.001%—has increased by more.

One possible criticism of these results is that we leave out a large number of high earners by restricting the sample to the top five executives. To assess this,

**Table 2.**
**AGI thresholds and compensation of top five executives of non-ExecuComp firms**

| | Non-ExecuComp nonfinancial | | | | ExecuComp and non-ExecuComp nonfinancial | | | |
|---|---|---|---|---|---|---|---|---|
| | Realized pay including options exercised (TDC2) | | Ex ante pay including options granted (TDC1) | | Realized pay including options exercised (TDC2) | | Ex ante pay including options granted (TDC1) | |
| Bracket | Number of executives | Share of bracket and above | Number of executives | Share of bracket and above | Number of executives | Share of bracket and above | Number of executives | Share of bracket and above |
| **2004** | | | | | | | | |
| ≤99 | 4111 | 0.01% | 6059 | 0.01% | 4732 | 0.02% | 6734 | 0.02% |
| >99 | 3292 | 0.77% | 4137 | 0.62% | 4264 | 1.34% | 4812 | 1.19% |
| >99.5 | 5259 | 1.04% | 3340 | 0.62% | 8292 | 2.03% | 6421 | 1.65% |
| >99.9 | 1518 | 1.23% | 695 | 0.56% | 4455 | 3.90% | 3960 | 3.39% |
| >99.99 | 86 | 0.79% | 50 | 0.39% | 625 | 5.37% | 501 | 3.98% |
| >99.999 | 18 | 1.34% | 2 | 0.18% | 86 | 6.48% | 25 | 1.92% |
| Mean ($M) | $0.84 | | $0.56 | | $1.54 | | $1.23 | |
| Median ($M) | $0.50 | | $0.38 | | $0.74 | | $0.70 | |
| Total dollars ($M) | $12,000 | | $8022 | | $34,665 | | $27,536 | |
| **1994** | | | | | | | | |
| ≤99 | 2801 | 0.01% | 3780 | 0.01% | 3608 | 0.02% | 4726 | 0.02% |
| >99 | 1933 | 0.60% | 2112 | 0.51% | 3057 | 1.19% | 2891 | 1.10% |
| >99.5 | 3410 | 0.86% | 2856 | 0.66% | 6620 | 1.85% | 5709 | 1.69% |
| >99.9 | 1418 | 1.36% | 995 | 0.86% | 3679 | 3.56% | 3692 | 3.55% |
| >99.99 | 156 | 1.34% | 0 | 0.00% | 431 | 3.91% | 395 | 3.66% |
| >99.999 | 0 | 0.00% | 0 | 0.00% | 22 | 1.90% | 29 | 2.50% |
| Mean ($M) | $0.38 | | $0.55 | | $0.61 | | $0.77 | |
| Median ($M) | $0.27 | | $0.37 | | $0.37 | | $0.46 | |
| Total dollars ($M) | $3712 | | $5329 | | $10,654 | | $13,368 | |

This table shows the estimated distribution of total compensation for top five executives of companies not in the ExecuComp database, relative to the distribution of AGI. Non-ExecuComp counts were obtained by sampling the disclosure documents of non-ExecuComp firms in 1994 and 2004, and then scaling to the number of non-ExecuComp firms in the universe. See note to Table 1 for details on the computation of the income fractile thresholds and the definition of financial versus nonfinancial firms.

**A: Non-financial executives in top AGI brackets using ex-ante pay including options granted (TDC1)**



**B: Non-financial executives in top AGI brackets using realized pay including options exercised (TDC2)**
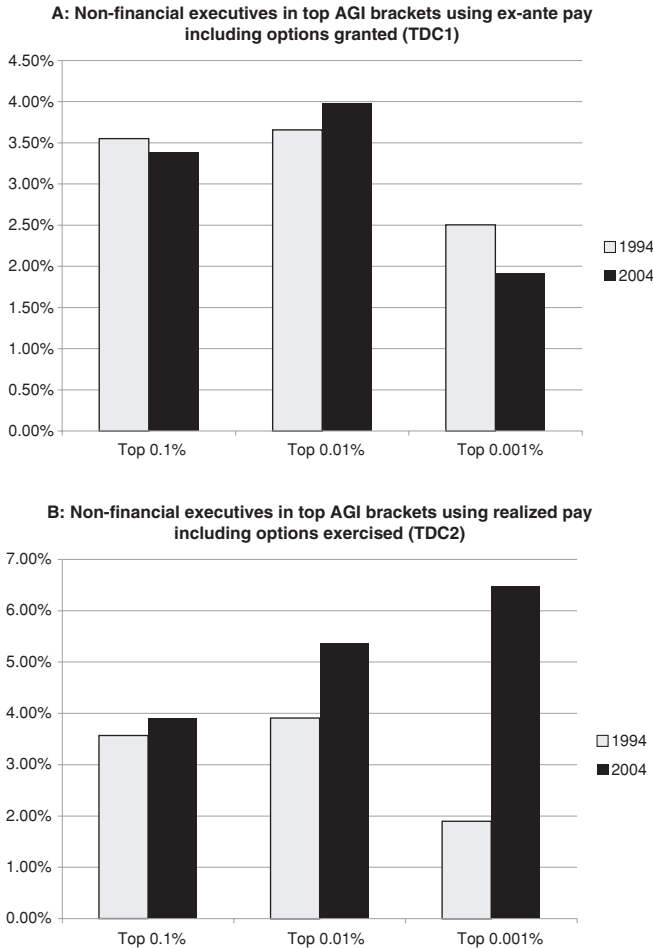


**Figure 1**
**Share of public company executives in adjusted gross income (AGI) bracket and above in 1994 and 2004, including both ExecuComp and estimated non-ExecuComp executives**
(A) Income is defined excluding options exercised and including options granted (known as TDC1). (B) Income is defined including options exercised and excluding options granted (known as TDC2).

we look at the pay of the fifth highest paid executive. In 2004, only seven of the fifth highest paid nonfinancial ExecuComp executives are in the top 0.01% bracket using realized pay and only thirteen are in that bracket using ex ante pay. The corresponding numbers in 1994 are five and eighteen. These represent at most 0.16% of their respective brackets. These results suggest that including executives below the five highest paid is unlikely to affect our basic results about the changes in the fraction of executives in the very highest brackets and about the absolute fraction of executives in those brackets (the top 0.01% and above).

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In 2004, 296 of the fifth highest paid nonfinancial ExecuComp executives (or 0.23% of the bracket) are in the top 0.1% bracket using realized pay and 454 (or 0.35%) are in that bracket using ex ante pay. The corresponding numbers in 1994 are 177 (or 0.16%) and 293 (0.27%). Again, this suggests that including executives below the five highest paid is unlikely to affect our basic results about the changes in the fraction of executives in the top 0.1%.

It is more difficult to say how including non-top-five executives would affect the absolute number of executives in the top 0.1% (and top 0.5%) brackets. Of the 296 fifth highest paid executives with realized pay in the top 0.1% (above $1.4 million) in 2004, 122 had pay between $1.4 million and $2 million; 103, between $2 and $3 million; and 73, over $3 million. We do not know how many executives below the top five earn over $1.4 million in those 296 companies. We do know, however, that the fifth highest paid executive earns 78% of the fourth highest paid executive (on average), and the fourth highest paid executive earns 79% of the third highest paid executive. If these relationships hold for the sixth, seventh, and eighth highest paid executives, then, at most one additional executive would be in the top 0.1% from the first group (of 122) and at most three additional executives from the second group (of 103) for a total of 431 executives. Similar calculations imply a total of, at most, an additional 375 from the most highly paid group of seventy-three firms. Combining the calculations, this implies a maximum increase of 806 nonfinancial executives (just over 0.6% of the bracket) in the top 0.1%. Again, under these assumptions, our basic conclusions are unchanged.

## 2. Wall Street

### 2.1 Investment banking

It is well known that investment banking and other financial services firms have a large number of highly compensated individuals. Investment banks typically report only a small amount of information about employee compensation, generally limited to total global employee compensation plus the usual figures for compensation of the top five corporate executives. These disclosures likely obscure the fact that there are many highly paid professionals at most investment banks who are not among the top corporate executives. Indeed, according to conversations with industry insiders, the typical MD at a top Wall Street firm rarely earns less than $500,000 a year in total pay.

In this section, we estimate the number of highly paid professionals at Wall Street firms, as well as their distribution of pay, and examine how this number and distribution compare to the statistics on executives of publicly traded companies. We use publicly available compensation information from top publicly traded investment banks. Based on these data and discussions with industry insiders, we create a distribution of income for these firms. We then extrapolate from that information to other firms.

**2.1.1  Counting the managing directors.**    We use the title managing director or MD to describe the top echelon of employees in securities firms. We begin by studying ten of the top eleven securities firms taken from the top one hundred securities firms listed by *Institutional Investor* (2004). *Institutional Investor* organizes this list by total consolidated capital of the firms' securities units; the ten we study comprise roughly 90% of the total consolidated capital of the top one hundred. The firms are listed in Table 3. We exclude Bank of America Securities from our top ten because of data availability issues, and instead include number 11, J. P. Morgan Securities.

There are several complications that we attempt to address. First, several of the top ten are divisions of conglomerates that include both investment and commercial banks. We focus on only the securities businesses of these firms, including asset and wealth management but excluding commercial banking. While some firms report disaggregated segment level information on total number of employees, many do not. Where necessary, we use the ratio of segment net revenue to total net revenue to estimate segment employees. Second, not all securities firms report the number of MDs. In these cases, we either rely on industry estimates or estimate the number of global MDs as a fraction of global employees. We typically estimate that MDs represent between 3% and 4% of total employees, based on published information and information from industry insiders. Third, while some firms report U.S. separately from global information, in many cases we needed to estimate the number of U.S. employees. Where necessary, we use the ratio of U.S. to global net revenues to estimate. Finally, we generally assume that the ratio of U.S. to global employees equals the ratio of U.S. to global revenues.

Table 3 presents our assessment of the likely number of U.S. MDs at these ten firms. Nonitalicized figures are numbers taken directly from company financial reports or calculated as ratios of figures taken directly from the reports. Italicized figures represent our estimates, in which we have attempted to be conservative.

We use straightforward calculations to estimate MDs at Goldman Sachs Group, Bear Stearns Companies, and Lehman Brothers. The 2004 Goldman Sachs annual report lists 1181 MDs. The annual report also lists 20,722 global employees with 13,278 or 64% based in the United States. We estimate that U.S. MDs represent 64% or 757 of total MDs. For Bear Stearns, although the company does not list its MDs, industry insiders estimated 850 global MDs. Furthermore, while this firm does not detail the U.S. versus non-U.S. employee breakdown, 91% of Bear Stearns revenues originate in the United States. We estimate that Bear Stearns had 770 (91% of 850) U.S.-based MDs. Both Goldman Sachs and Bear Stearns are essentially pure securities firms, so there are no complications involved with deriving segment-level estimates. Lehman Brothers' annual report lists 19,600 global employees with 14,100 based in the United States. Based on conversations with industry insiders, we assume there are 564 U.S.-based MDs, a conservative 4% (compared to the implied 6% for Goldman Sachs and 8% for Bear Stearns) of U.S. employees.

**Table 3**
**Estimated numbers of managing directors or equivalents at top securities firms in 2004**

| | Currency | Net revenue (millions) | | | Employees | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Global | U.S. | Ratio of U.S. to global | Global | Global managing director (MD) ratio | Global MDs or equivalents | U.S. to global employee ratio | U.S. employees | U.S. MDs or equivalents in securities industries |
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Goldman Sachs Group | US$ | 20,550 | 12,932 | 63% | 20,722 | 6% | 1181 | 64% | 13,278 | 757 |
| Bear Stearns Companies | US$ | 6,813 | 6,172 | 91% | 10,961 | 8% | 850 | 91% | 9,930 | 770 |
| Lehman Brothers | US$ | 11,576 | 8,225 | 71% | 19,600 | 4% | 784 | 72% | 14,100 | 564 |
| Morgan Stanley | US$ | 23,708 | 17,365 | 73% | 53,284 | 2% | 1071 | 73% | 39,028 | |
| Institutional Securities | US$ | 13,113 | 9,572 | 73% | 29,472 | 3% | 884 | 73% | 21,514 | 645 |
| Asset Management | US$ | 2,738 | 1,999 | 73% | 6,154 | 3% | 185 | 73% | 4,492 | 135 |
| J.P. Morgan Chase and Co. | US$ | 43,097 | 32,972 | 77% | 160,968 | – | – | 77% | 123,151 | |
| Investment Bank | US$ | 12,605 | 9,644 | 77% | 17,478 | 4% | 699 | 77% | 13,372 | 535 |
| Treasury & Securities Services | US$ | 4,857 | 3,716 | 77% | 22,612 | 2% | 452 | 77% | 17,300 | 346 |
| Assets and Wealth Management | US$ | 4,179 | 3,197 | 77% | 12,287 | 2% | 246 | 77% | 9,400 | 188 |
| Credit Suisse First Boston | CHF | 55,139 | 12,267 | 22% | 19,479 | 3% | 584 | 22% | 4,334 | 130 |
| Deutsche Bank | EUR | 21,546 | | | 65,417 | – | – | 18% | 11,954 | |
| Corporate and Investment Bank | EUR | 13,414 | | | 14,130 | 4% | 565 | 18% | 2,582 | 103 |
| Corporate Investments (Private Equity) | EUR | 621 | | | 65 | 4% | 3 | 18% | 12 | 0 |
| UBS | CHF | 50,975 | | | 67,424 | – | – | 39% | 26,232 | |
| Investment Banking and Securities | CHF | 17,600 | | | 16,970 | 4% | 679 | 39% | 6,602 | 264 |
| Wealth Management (U.S.) | CHF | 5,158 | | | 16,969 | 2% | 339 | 100% | 16,969 | 339 |
| Asset Management | CHF | 2,487 | | | 2,665 | 2% | 53 | 100% | 2,665 | 53 |
| Merrill Lynch | US$ | 22,023 | 15,878 | 72% | 50,600 | – | – | 79.4% | 40,200 | |
| Global Markets and Investment Banking | US$ | 11,022 | 7,947 | 72% | 12,000 | 4% | 480 | 79.4% | 9,534 | 381 |
| Investment Management | US$ | 1,581 | 1,140 | 72% | 2,500 | 4% | 100 | 79.4% | 1,986 | 79 |
| Citigroup Global Market Holdings | US$ | 39,340 | 18,490 | 47% | 38,000 | 4% | 1520 | 47% | 17,860 | 714 |
| | | | | | | | | Total U.S. MDs | | 6006 |

This table presents an assessment of the likely number of U.S. managing directors in the securities business (including asset management but excluding commercial and retail banking) at top ten investment banking firms in 2004. Nonitalicized figures are numbers taken directly from the financial reports of the companies in question or calculated as ratios of figures taken directly from the reports. Italicized figures represent inputed figures, which we describe in detail in the text.

Although it may be obvious, it is worth pointing out that we wrote this article well before the failure of Bear Stearns in early 2008. Interestingly, it is not obvious that this would affect our estimates. In a July 2008 article, the *Deal Magazine* (Wu 2008) tracked the one hundred or so most senior people at Bear Stearns. Less than four months after Bear Stearns' demise, the article reported that "most of the people have been able to find something of a comparable level and salary too."

Morgan Stanley is a firm that engages in non-securities-related activities, including credit cards and retail brokerage. Its annual report provides the number of total employees and the number of MDs. We estimate the employees in each segment by applying the ratio of segment to total net revenues to the number of global employees. For example, we estimate the institutional securities division has 29,472 employees, 53,284 times the ratio of $13,313 to $23,708. We assume that all MDs come from the institutional securities and asset management divisions. This implies that 3% of the employees in those divisions are MDs, still low relative to Lehman Brothers, Goldman Sachs, and Bear Stearns. We estimate U.S. employees as the ratio of U.S. to total net revenue. These calculations yield 780 MDs at Morgan Stanley.

Proceeding in this way, we count 6006 U.S.-based MDs in these ten firms. We believe that this understates the number of MDs and other highly paid professionals. Private conversations with industry participants and readers of previous versions of this article suggest that we understate the number of highly paid investment bankers at these firms. We also estimate that adding the rest of the U.S. investment banking sector would raise this figure by a large, but unknown amount. In our analysis, we report the income distribution per ten thousand MDs. We believe this is a reasonable guess of the total number of MDs or employees receiving MD-type pay. In any investment bank, there also will be many highly paid employees who are not yet MDs. If one wanted to be conservative, seven thousand MDs would be a minimum.

**2.1.2  Estimating the distribution of pay.**    According to industry sources, it was rare for a top Wall Street MD to receive compensation of less than $500,000 during the period we study. Furthermore, we understand that at least one quarter of MDs earned in excess of $2.5 million per year.[5] Based on this information, we consider two possible pay distributions. The first is a Pareto distribution with a minimum value of $500,000, which we truncate at $35 million, as this is roughly the top value publicly reported for any investment banking employee.

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[5] Our estimates are based on conversations with industry sources. For confirmation, see Lisa Kasenaar, *The International Herald Tribune*, 6 February 2006, who reports that the Options Group, an executive-search company, estimated that "managing directors may get an average bonus of about $2.25 million in coming weeks" in 2005; as well as Duff McDonald's "Please, Sir, I Want Some More. How Goldman Sachs is carving up its $11 billion money pie," in *New York Magazine*, 5 December 2005.

The cumulative distribution function of the Pareto distribution takes the form

$$P(X > x) = \left(\frac{x}{x_{\mathrm{m}}}\right)^{-k},\tag{1}$$

where $x_{\mathrm{m}}$ is the minimum value of \$500,000 and we estimate $k = 0.8613$ based on the restriction that 25% of the distribution earns more than \$2.5 million. This distribution yields estimates that are more conservative at the bottom of the distribution than would be accepted by most industry insiders, with almost half of the MDs earning less than \$1 million.

The second distribution is an exponential distribution, which we censor below at \$500,000. The cumulative distribution function of the exponential distribution takes the form

$$P(X > x) = 1 - e^{-\beta x},\tag{2}$$

where we estimate $\beta = 0.00055$ based on the restriction that 25% of the distribution earns more than \$2.5 million. This distribution is more liberal at the upper end of the distribution than the truncated Pareto, though it is more conservative at the very top. The censored exponential distribution allows only 0.1% of MDs to earn more than \$20 million, compared to 0.3% as given by the truncated Pareto distribution.

It is our understanding that most of the pay estimated here will show up in AGI for the MDs. Most of the investment banks are public companies and C corporations. The MDs of these firms will receive wage income. MDs of private firms may receive $K - 1$ or partnership income. It is our understanding that the majority of income and bonus that MDs receive is in the form of cash. This will appear in AGI in the year it is received. For many investment banks, MDs receive some fraction of compensation as restricted stock and options or defer some compensation. For this compensation, there will be a timing difference between our estimates and actual AGI. For example, restricted stock will appear as income when it vests and option gains will appear when the options are exercised.

Table 4 reports the estimated distributions of pay for ten thousand MDs alongside the AGI brackets. The first vertical panel presents the percentage of MDs in each AGI bracket. The Pareto distribution implies that 60% of MDs earn less than \$1.4 million (the top 0.1% threshold) while the exponential implies that number is 31%. The average MD earns \$1.9 million (Pareto) and \$2.8 million (exponential). Based on conversations with industry insiders, we believe the exponential distribution is more realistic.

The second vertical panel presents the number of individuals earning at least the minimum bracket amount for every ten thousand MDs. As noted above, we believe that ten thousand MDs is a reasonable estimate for Wall Street as a whole. If anything, they may be too low. Consistent with this, we received an

**Table 4**
**Income distribution and Wall Street managing directors in 2004**

| Income above | Bracket | Distribution of compensation for managing directors at top investment banks | | Percent of category bracket explained per 10,000 managing directors | | Percent of category and above explained per 10,000 managing directors | | Number in category and above explained per 10,000 managing directors | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pareto | Exponential | Pareto | Exponential | Pareto | Exponential | Pareto | Exponential |
| $479,177 | > 99.5 | 60.4% | 31.0% | 1.1% | 0.6% | 1.5% | 1.5% | 10,000 | 10,000 |
| $1,400,370 | > 99.9 | 32.0% | 54.2% | 2.7% | 4.5% | 3.0% | 5.2% | 3,964 | 6,900 |
| $7,189,506 | > 99.99 | 7.4% | 14.7% | 6.2% | 12.3% | 5.8% | 11.2% | 767 | 1,482 |
| $31,178,805 | > 99.999 | 0.3% | 0.1% | 2.0% | 1.0% | 2.0% | 1.0% | 26 | 13 |
| | Mean ($M) | $1.90 | $2.84 | | | | | | |
| | Median ($M) | $1.10 | $2.60 | | | | | | |
| | Total dollars ($M) | $19,013 | $28,410 | | | | | | |

This table reports the estimated distributions of pay for ten thousand managing directors alongside AGI brackets. Based on industry information, the figures assume that essentially no managing director of a top ten investment bank earned less than $500,000 in 2004. Two possible distributions of pay are considered. The first is a Pareto distribution with a minimum value of $500,000, estimated so that 25% of managing directors earn more than $2.5 million and truncated at $35 million, the highest payout observed for an investment banking employee in 2004. The second distribution is an exponential distribution, which we censor below at $500,000 and calibrate so that only one employee earns more than $25 million. The right-most pair of columns presents the number of individuals earning at least the minimum bracket amount for every ten thousand managing directors.

e-mail about a previous draft of this article from a former Secretary of the U.S. Treasury who is active on Wall Street. He thought our estimates for investment bankers were understated.

Using our assumptions, we estimate that the ten thousand MDs at investment banks generate enough AGI to explain at least 5.8% (Pareto) or 11.2% (exponential) of the top 0.01% of the AGI distribution. These are at least as large as our estimates for all top nonfinancial executives of 5.25% using realized and 3.93% using ex ante compensation. The MDs explain a lower fraction of the top 0.001%.

To see whether these distributions are plausible, we compared our estimation procedure for the MDs with the actual pay reported for the top five executives at the investment banks. This is not an apples-to-apples comparison because many of the highest paid MDs are traders who produce large profits, while some of the top five executives are general counsels and chief financial officers who do not produce profits directly. Nevertheless, the results are encouraging, particularly for the exponential distribution. The exponential distribution generates top five pay of $35, $25, $22, $21, and $20 million. The actual top five pay reported by the seven (U.S.) reporting firms of the top ten investment banks averaged $33, $26, $19, $15, and $13 million. Given the likelihood that each firm had some well-compensated traders, these results are consistent with our assumptions.

Overall, we estimate that the MDs earn a total of $19 billion (Pareto) to $28 billion (exponential). This represents 20–30% of the global total compensation in 2004 at the ten firms in Table 3. Although MD and total compensation are not exactly comparable, the orders of magnitude for MD pay seem plausible, if not low. The $19–28 billion estimated total pay to MDs is slightly lower, but the same order of magnitude as our estimate of $34 billion (realized) and $27 billion (ex ante) for all top nonfinancial executives.

Overall, then, investment bankers appear to explain roughly the same amount of the top end of the income distribution as top executives of nonfinancial firms.

**2.1.3 Historical Wall Street.**    It seems likely that the number of MDs on Wall Street and their compensation have increased substantially in the last twenty or thirty years. Unfortunately, data availability concerns make it difficult if not impossible to repeat our 2004 analysis for earlier periods. We can, however, get a sense of the growth in Wall Street by comparing the number of employees and capital employed at Wall Street firms over time. The Securities Industry Association (SIA) provides a list of the top fifty securities firms each year. We collected the 2004 list, as well as the 1987 list (the furthest back we could find). We also obtained the list of the top fifty securities firms in 1972 taken from the Investment Banker-Broker Almanac.

Table 5 reports the total number of global employees and the total global capital employed at the top fifty U.S. securities firms in 1972, 1987, and 2004. Employment increased by 170% from 1972 to 1987, and by 79% from 1987 to 2004. Capital employed by those employees increased exponentially by more

**Table 5**
**Securities industry capital and employees over time**

|  | SIA 2004 | SIA 1987 | IB-BA 1972 |
|---|---|---|---|
| Total number of employees in top 50 firms | 389,181 | 217,813 | 80,784 |
| Total amount of capital in top 50 firms ($ million) | $696,087 | $29,636 | $2768 |
| Capital per employee | 1.789 | 0.136 | 0.034 |
| Capital per employee (2004 dollars) | 1.789 | 0.203 | 0.124 |

The table reports the total number of global employees and the total global capital employed at the top fifty U.S. securities firms in 1972, 1987, and 2004. SIA information is from *Securities Industry Association Handbook* for 1987 and 2004. IB-BA is Investment Banker-Broker Almanac.

than ten times from 1972 to 1987, and by more than twenty times from 1987 to 2004. Capital per employee, therefore, increased substantially as well, from $34,000 ($124,000 in 2004 dollars) in 1972 to $136,000 ($203,000) in 1994 to $1,789,000 in 2004. This represents a remarkable increase in capital per employee, particularly since 1994.

Similarly, Morrison and Wilhelm (2008) present evidence concerning investment banks in the 1960s and 1970s. In 1970, their tabulations indicate that the top twenty-three investment banks have a total of fewer than sixteen hundred partners and average capital per partner of less than $0.75 million. This would represent $3 million of capital per partner in 2004 dollars. Assuming that the firms in Table 5 have ten thousand MDs, Table 5 implies almost $70 million of capital per MD, a twenty-three-fold increase relative to 1970.

## 2.2 Alternative assets

Over the last twenty-five years, the amount of money allocated by institutional investors and wealthy individuals to alternative asset classes has increased markedly. The most prominent members of the alternative asset classes are hedge funds, VC funds, and PE or buyout funds. These funds are of interest for compensation and the income distribution because the hedge fund, VC, and PE fund investors potentially receive substantial compensation.

The fees typically paid to the alternative asset fund—whether hedge, VC, or PE fund—consists of a management fee that equals a percentage of total or committed capital and a profit share or carried interest of the profits of the fund (after paying the management fees). The typical compensation for hedge funds today is 2/20, i.e., 2% management fee and 20% of the profits on total capital although the top performing hedge funds charge more. This also is typical for VC and PE funds based on committed capital. It is typical for the larger PE funds to reduce the management fee to 1.5% of committed capital, while smaller VC funds increase the management fee to 2.5%.[6] In this section, we attempt to estimate the amount of fees paid to the managers of alternative assets, how those fees have increased over time, and the effect of those fees on the income distribution.

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[6] See Gompers and Lerner (1999) and Metrick and Yasuda (2007).

**Table 6**
**Assets under management and estimated fees for hedge funds**

| Year | Money under management Hedge fund Hennessee | # Funds Hedge fund Hennessee | Money under management Hedge fund Hennessee | Hedge fund returns Hennessee | Fees hedge funds 2/20 Average returns | Fees hedge funds 2/20 Expected 11%volatility |
|---|---|---|---|---|---|---|
| 1980 | | | | | | |
| 1981 | | | | | | |
| 1982 | | | | | | |
| 1983 | | | | | | |
| 1984 | | | | | | |
| 1985 | | | | | | |
| 1986 | $20 | 100 | $20 | | | |
| 1987 | | | | 11.99 | $1.00 | $0.68 |
| 1988 | | | | 20.16 | | |
| 1989 | | | | 24.58 | | |
| 1990 | | | | 11.97 | | |
| 1991 | $35 | 880 | $35 | 25.83 | | |
| 1992 | $50 | 1100 | $50 | 15.57 | $2.06 | $1.12 |
| 1993 | $99 | 1640 | $99 | 25.69 | $4.21 | $1.60 |
| 1994 | $76 | 2080 | $76 | 0.17 | $2.02 | $3.17 |
| 1995 | $97 | 2800 | $97 | 17.70 | $4.88 | $2.43 |
| 1996 | $130 | 3000 | $130 | 19.07 | $6.56 | $3.10 |
| 1997 | $210 | 3200 | $210 | 18.18 | $8.51 | $4.16 |
| 1998 | $221 | 3500 | $221 | 1.43 | $4.95 | $6.72 |
| 1999 | $324 | 4000 | $324 | 30.77 | $21.42 | $7.07 |
| 2000 | $408 | 4800 | $408 | 8.16 | $13.09 | $10.37 |
| 2001 | $564 | 5500 | $564 | 4.35 | $12.60 | $13.06 |
| 2002 | $592 | 5700 | $592 | −2.89 | $11.28 | $18.05 |
| 2003 | $795 | 7000 | $795 | 18.78 | $39.63 | $18.94 |
| 2004 | $934 | 8050 | $934 | 8.25 | $32.30 | $25.44 |
| 2005 | | | | 7.85 | $37.01 | $29.89 |

This table reports assets under management at hedge funds and number of hedge funds over time as reported by the Hennessee Group, Hedge Fund Research, and TASS. Hedge fund fees are calculated in two ways, assuming annual management fees of 2% and profit share of 20% using Hennessee Group assets under management. First, hedge fund fees are calculated using the average returns for the year and assuming that all funds earn the average return. Second, hedge fund fees are calculated assuming that fees equal 2% management fee and that the profit share leads to fees of 1.2% per year based on a Black-Scholes calculation with expected volatility of 11% and a risk-free rate of 3%.

**2.2.1 Hedge funds.** It is well known that hedge funds have experienced a large increase in assets under management in the last twenty years. Table 6 provides time series of hedge fund assets from the Hennessee Group.[7] The table confirms the large increase in hedge fund assets from less than $50 billion in 1990 to roughly $1 trillion by the end of 2005.

Table 6 uses the Hennessee Group series to provide two estimates of hedge fund fees. First, we use realized (net) hedge fund returns and the typical compensation of 2/20 to estimate hedge fund managers' fees. We estimate management fees by multiplying start of year assets under management by 2%. We estimate the profit share or carry by multiplying the average return for the year if it is positive by start of year assets under management to get net profit. Because net profit is after carry, we gross up the net profit by dividing by 80% to get the year's gross profit. We estimate the profit share as 20% of gross profit. Total

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[7] We find similar patterns in two other hedge fund databases—Hedge Fund Research and TASS.
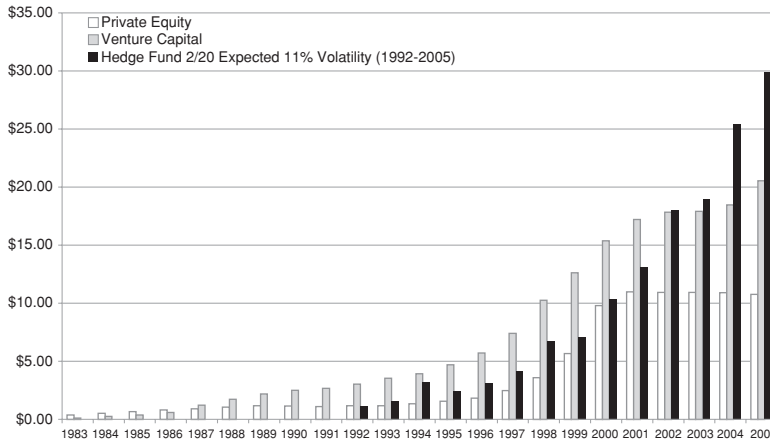
**Figure 2**
**Estimates of private equity, venture capital, and hedge fund fees taken from Table 7**.

fees are the sum of management fees and profit share. Table 6 estimates that hedge fund fees have increased from $1 billion in 1987 to $2 billion in 1994 to $32 billion in 2004. On average, the fees represent roughly 4.4% of assets under management.

This calculation likely understates fees because it assumes that all hedge funds earn the average annual return. Because the 20% profit share is applied only to positive returns, any dispersion across funds such that some funds earn negative returns implies that the actual profit share exceeds the estimates above. In other words, the profit share acts like a call option.

The second method to calculate hedge fund fees is presented in the last column of Table 6. This method estimates the value of the carried interest as a call option on 20% of the overall fund. Malkiel and Saha (2005) report a standard deviation of 11% on the Van Global Hedge Fund index. Chan et al. (2007) report a standard deviation of 8.25% on the CSFB/Tremont hedge fund index. They report mean annualized standard deviations across a sample of over four thousand individual hedge funds that exceeds 14%. If we conservatively assume a standard deviation of 11% and risk-free rate of 3%, a one-year call option is worth almost 6% (with a 14% standard deviation, roughly 7%) using Black-Scholes. The 20% profit share is 20% of a call option on an entire fund. This implies that the profit share has an expected annual cost of 1.2% with an 11% standard deviation. Under this assumption, the expected fees on a 2/20 hedge fund are roughly 3.2%. The last column of Table 6 calculates fees on this basis, and Figure 2 depicts the results graphically. Using this second methodology, estimated fees for 2004 are $25.4 billion, the same order of magnitude as the $32 billion using the first method. The $25 and $32 billion

estimates are the same order of magnitude as the total pay to nonfinancial top executives and to investment banking MDs.

Our estimates of hedge fund fees are in line with those in French (2008). Although he reports that the hedge funds he studies charge somewhat less than 2/20, he estimates fees for hedge funds that invest in U.S. equities to average 3.67% of assets from 1996 to 2007. This is in between our estimated hedge fund fees of 3.2% and 4.4% of assets under management, respectively, using expected fees and fees estimated using realized returns.

It also is likely that French's (2008) estimates are understated. He bases his calculations on hedge funds that report fees and returns. It is well known that some of the larger (and historically better performing) hedge funds are not represented in the hedge fund databases. French does not count these funds, and it is likely they charge higher than average fees.

Our estimates (and those of French 2008) also are below those in Brooks, Clare, and Motson (2007), who study the funds in the TASS hedge fund database and estimate fees on realized returns at 5.15%.

To be conservative (and to account for the non-wage-operating expenses we describe below), we estimate compensation and bracket representation using the assumption that hedge fund fees are 3.2% of assets under management.

It is clear from Table 6 and Figure 2 that fees going to hedge funds have increased markedly. There is no doubt that much of this increase shows up as compensation to hedge fund owners and the people they hire.[8] While it is difficult to know exactly how much, we provide some rough estimates below.

We begin with the list of the top one hundred hedge fund firms in *Institutional Investor* (*II*) in 2005, which measures assets at the end of 2004. According to *II*, these hedge funds managed $568 billion. Of the one hundred firms, seventy-nine are listed as U.S. firms with $459 billion under management. We searched the SEC Investment Advisor Public Disclosure database for information on these funds. Forty-six provided information to the SEC. These funds are listed by *II* as having $268 billion of hedge fund money under management.

SEC reporting funds must list a range of the total number of employees and the total number of investment advisory employees. On average, the forty-six funds list a minimum of eighty-nine and a maximum of 255 employees; they list a minimum of twenty-six and a maximum of 109 investment advisory employees. This translates into an average of $36–160 million per employee. Similarly, this implies $159–550 million per investment advisory employee. The averages of the minimum and maximum ranges are $98 million per employee and $305 million per investment advisory employee.

Another way of looking at this is to divide total hedge fund assets at these firms by the total number of employees. On this basis, the firms have $23 million

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[8] Hedge funds may be organized as partnerships in which some of the carried interest is taxed as capital gains. Thus, carried interest would appear as part of AGI, but would be taxed at lower rates. In addition, there is some evidence that hedge fund managers defer the realization of ordinary income into the future (Fleischer 2007).

per maximum number of employees and $65 million per minimum number of employees. Similarly, this works out to $54 million to $220 million per investment advisory employee. The averages of the minimum and maximum are $44 million per employee and $137 million per investment advisory employee.

Most of the investment advisory employees are highly paid. The non-investment advisory employees include some highly paid, but also clerical and non-highly paid employees. In what follows, we assume that the average highly paid employee controls or is paid from $100 million of assets. Under the assumption of total fees of 3.2% of assets, this implies $3.2 million in fees per highly compensated employee. If we then apply this to $900 billion of hedge fund assets, we obtain nine thousand highly compensated employees with average fees of $3.2 million.

Obviously, this is a rough estimate. The assumption of fees equal to 3.2% of assets is almost certainly too low. On the other hand, the fee estimates overstate total pay to employees because hedge funds pay non-wage-operating expenses from these fees. Operating margins in the asset management business, however, are high. Before paying top executives and marketing expenses (which hedge fund firms do not pay), it is common for publicly traded mutual fund firms to report operating margins above 70%.[9] The financial statements of Och-Ziff, a U.S.-based hedge fund that recently went public, also are consistent with very high operating margins. For Och-Ziff, we distinguish between revenue going to employees, either as compensation or as profit, from revenue going to pay nonprofit or noncompensation expense. Nonemployee expenses were roughly 10% of total revenues, suggesting an operating margin on the order of 90%. Given that nonemployee expenses are a small percentage and that our fee estimates for hedge funds are likely understated, nonwage expenses are unlikely to affect our basic analysis and conclusions.

It is likely that many of the big hedge fund payments will appear as ordinary partnership income on the $K - 1$'s of the owners or partners of the hedge funds. Some unknown number of the most highly compensated employees who are not partners will receive $W - 2$ income.

Given the huge increase in hedge fund assets, it is virtually certain that the number of highly compensated employees at hedge funds has increased substantially over time. In 1984, when there were almost no hedge funds, there would have been few such employees. In 1994, when hedge funds had less than $80 billion in assets under management, we estimate hedge fund fees were roughly 10% of the fees in 2004. At the same fee per employee ratio, this implies a ten-fold increase in the number of highly paid employees. To the extent that the money managed per individual has increased, the number of highly paid employees will have increased less, but compensation of each individual will have increased more.

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[9] See, for example, 2005 10-Ks for Calamos Asset Management, Eaton Vance, and Janus Capital.

**2.2.2 Venture capital and private equity funds.** The capital committed to VC and buyout or PE funds also has increased substantially over time. The first three columns of Table 7 present the capital committed to U.S. VC funds, the number of funds raised each year, and capital per fund from 1980 to 2005 according to Thomson Financial's Venture Economics database. The next three columns do the same for PE funds. When a VC or PE firm raises a fund, its investors (limited partners) commit to provide a certain amount of money over the investing life of the fund (usually five years). The investments are harvested over the subsequent five to ten years, giving a total commitment period or investment life of ten to fifteen years. The commitments, therefore, represent money committed, but not necessarily invested in a given year.

Table 7 shows that combined annual commitments to VC and PE funds have grown from less than $2.5 billion combined in 1982 to less than $35 billion in 1994 to over $80 billion in 2004 (and to over $150 billion in 2005). Both the number of funds and the size of the average fund have increased.

To calculate fees, columns 7 and 8 of Table 7 estimate the total money under management in VC and PE funds at any one time as the sum of capital commitments over the previous seven years (including the current year). This assumes that the VC and PE firms earn management fees on committed capital for seven years. Most funds earn management fees for ten years, but the management fee typically declines after the five-year investment period. Metrick and Yasuda (2007) report median management fees of 2% and median profit shares of 20% for a large sample of VC and PE funds raised from 2000 to 2005.

The last four columns of Table 7 estimate fees paid to VC and PE funds using the two methodologies we used for hedge funds. First, we estimate management fees by multiplying assets under management at the start of the year by 2%. We estimate the profit share by multiplying the average return for the year from Venture Economics (if it is positive) by start of year assets under management to get net profit. We gross up the net profit by dividing by 80% to get the gross profit for the year. We then take 20% of the gross profit as the estimate of the profit share. Total fees are the sum of management fees and carried interest.

Table 7 shows that VC and PE fees also have increased substantially over time. Under these assumptions, the combined fees to VC and PE funds have increased from less than $0.25 billion in 1984 to roughly $8 billion in 1994 to over $43 billion in 2004 and 2005.

As with the hedge funds, the simple calculation above likely understates compensation because it assumes that all VC and PE funds earned the average return for the year. In fact, returns are volatile around the average and the 20% profit share acts like a call option, increasing in value with volatility. It also is likely the case that VC and PE fund returns are more volatile than hedge fund returns because they are calculated based on performance over the life of the fund rather than annually. This calculation also understates total fees for PE funds because it does not include any deal or monitoring fees.

**Table 7**
**Assets under management and estimated fees for VC and PE funds**

| Year | Capital committed Venture ($B) | # Funds VC | Capital per fund ($ M) | Capital committed Private equity ($B) | # Funds PE | per fund ($ M) | Money under management VC Seven year ($B) | Money under management PE Seven year ($B) | VC VC returns | VC Estimated fees 2/20 Actual returns | VC Estimated fees 2/20 Expected 22% volatility | PE returns | PE Estimated fees 2/20 Actual returns | PE Estimated fees 2/20 Expected 22% volatility |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | $2.1 | 54 | $38 | $0.2 | 4 | $46 | $2.1 | $0.2 | | | | | | |
| 1981 | $1.5 | 75 | $20 | $0.4 | 7 | $50 | $3.6 | $0.5 | 20.10 | $0.15 | $0.14 | | | |
| 1982 | $1.7 | 89 | $20 | $0.6 | 13 | $47 | $5.3 | $1.1 | 30.50 | $0.34 | $0.21 | | | |
| 1983 | $4.0 | 143 | $28 | $1.5 | 18 | $86 | $9.3 | $2.7 | 54.90 | $0.84 | $0.37 | 52.50 | $0.17 | $0.11 |
| 1984 | $3.2 | 120 | $26 | $3.5 | 24 | $148 | $12.4 | $6.2 | −5.80 | $0.19 | $0.50 | −4.40 | $0.05 | $0.25 |
| 1985 | $4.0 | 120 | $33 | $3.0 | 22 | $136 | $16.4 | $9.2 | −0.90 | $0.25 | $0.66 | 2.90 | $0.17 | $0.37 |
| 1986 | $3.8 | 103 | $37 | $5.0 | 34 | $147 | $20.2 | $14.2 | 4.40 | $0.51 | $0.81 | 11.70 | $0.45 | $0.57 |
| 1987 | $4.5 | 119 | $38 | $16.1 | 48 | $335 | $22.6 | $30.1 | 6.40 | $0.73 | $0.91 | 10.00 | $0.64 | $1.20 |
| 1988 | $4.5 | 105 | $43 | $12.9 | 62 | $209 | $25.7 | $42.7 | 2.60 | $0.60 | $1.03 | 17.70 | $1.93 | $1.71 |
| 1989 | $5.1 | 105 | $48 | $12.2 | 83 | $146 | $29.0 | $54.2 | 5.20 | $0.85 | $1.16 | 13.70 | $2.32 | $2.17 |
| 1990 | $3.5 | 89 | $39 | $9.6 | 72 | $134 | $28.5 | $62.3 | 3.00 | $0.80 | $1.14 | −4.30 | $1.08 | $2.49 |
| 1991 | $2.0 | 42 | $48 | $7.5 | 34 | $219 | $27.4 | $66.2 | 22.80 | $2.20 | $1.10 | 22.20 | $4.70 | $2.65 |
| 1992 | $5.3 | 82 | $65 | $12.3 | 64 | $193 | $28.7 | $75.6 | 14.90 | $1.57 | $1.15 | 11.50 | $3.23 | $3.02 |
| 1993 | $4.0 | 91 | $44 | $17.8 | 88 | $202 | $29.0 | $88.4 | 19.40 | $1.97 | $1.16 | 18.70 | $5.04 | $3.54 |
| 1994 | $8.9 | 137 | $65 | $25.5 | 117 | $218 | $33.3 | $97.8 | 15.90 | $1.73 | $1.33 | 20.70 | $6.34 | $3.91 |
| 1995 | $10.1 | 173 | $59 | $32.1 | 124 | $259 | $38.9 | $116.9 | 49.30 | $4.77 | $1.56 | 32.20 | $9.83 | $4.68 |
| 1996 | $11.5 | 161 | $72 | $37.8 | 128 | $295 | $45.4 | $142.5 | 42.70 | $4.93 | $1.81 | 34.80 | $12.51 | $5.70 |
| 1997 | $19.6 | 242 | $81 | $51.7 | 154 | $336 | $61.5 | $184.7 | 33.10 | $4.66 | $2.46 | 26.80 | $12.40 | $7.39 |
| 1998 | $30.0 | 289 | $104 | $79.1 | 206 | $384 | $89.5 | $256.3 | 18.90 | $4.14 | $3.58 | 15.60 | $10.89 | $10.25 |
| 1999 | $57.2 | 450 | $127 | $71.1 | 188 | $378 | $141.5 | $315.0 | 188.80 | $44.06 | $5.66 | 71.30 | $50.81 | $12.60 |
| 2000 | $107.4 | 639 | $168 | $86.8 | 193 | $450 | $244.9 | $384.0 | 24.30 | $11.42 | $9.79 | 10.60 | $14.65 | $15.36 |
| 2001 | $38.0 | 310 | $123 | $71.2 | 169 | $421 | $274.0 | $429.7 | −34.30 | $4.90 | $10.96 | −20.60 | $7.68 | $17.19 |
| 2002 | $9.2 | 198 | $47 | $47.7 | 166 | $288 | $273.0 | $445.4 | −29.50 | $5.48 | $10.92 | −13.10 | $8.59 | $17.82 |
| 2003 | $11.6 | 155 | $75 | $40.0 | 138 | $290 | $273.1 | $447.6 | 6.80 | $10.10 | $10.92 | 18.20 | $29.17 | $17.91 |
| 2004 | $18.8 | 206 | $91 | $65.3 | 177 | $369 | $272.3 | $461.2 | 15.40 | $15.98 | $10.89 | 17.20 | $28.20 | $18.45 |
| 2005 | $26.4 | 200 | $132 | $130.9 | 228 | $574 | $268.7 | $513.0 | 14.10 | $15.04 | $10.75 | 21.40 | $33.90 | $20.52 |

This table reports annual capital commitments to, number of funds raised in, and average annual returns of Venture Capital (VC) and Private Equity (PE) from 1980 to 2005 using Thomson Financial's Venture Economics database. Money under management is calculated as the sum of capital commitments over the last seven years including the current year. Estimated fees are calculated using the money under management at the beginning of the year, average returns for the year, and assuming that all funds earn the average return.

Second, we calculate total fees using the call option methodology we used for hedge funds. Kaplan and Schoar (2005) report that the historical standard deviation of returns on VC funds is between 19% and 34%; on PE funds, between 19% and 27%.[10] If we assume a standard deviation of 22%, risk-free rate of 3%, the 20% profit share, and a 2% management fee, the expected annual fees for VC and PE firms equal 4% of assets under management. As depicted in Table 7 and Figure 2, this equals a total for VC and PE firms of roughly $30 billion in 2004 and 2005 versus just over $5 billion in 1994.

The $30–43 billion estimates for VC and PE fund investors in 2004 are of the same order of magnitude as total pay for each of the groups we analyzed earlier—nonfinancial top executives, investment banking MDs, and hedge fund investors.

As with the hedge funds, our fee estimates may overstate compensation because they do not subtract non-wage-operating expenses from these fees. As with hedge funds, this is unlikely to affect our estimates because non-wage-operating expenses are quite low. For PE funds, we considered the $S - 1$ financial statements of KKR and Blackstone, two PE firms that recently filed to go public. As in the case of Och-Ziff, nonemployee expenses were roughly only 10% of total revenues.

How do these fees translate into compensation? In their sample of VC and PE funds, Metrick and Yasuda (2007) report that the typical VC and PE fund has six partners (median of 5 and average of 6.4). Over the last five years, the Venture Economics figures indicate over one thousand VC funds and almost nine hundred PE funds have been raised. This implies more than eleven thousand highly compensated partners, a large increase over the number twenty-five years ago.

At $30 billion in fees, this represents roughly $1.8 million per VC partner and $3.4 million per PE partner; at $43 billion in fees, $2.6 million per VC partner and $5.2 million per PE partner. These are consistent with Metrick and Yasuda (2007), who estimate that the average VC partner can expect to receive $13 million in present value over the life of a fund; the average PE partner, $18 million in present value. Assuming a fund lasts for ten years, this works out to fees of $1.3 million and $1.8 million per VC and PE partner per year in present value. However, successful firms invest their funds in five years or less, at which point they raise another fund. As a result, the net present value may effectively reflect five years of fees, not ten. Assuming five years, this would put the present value of average annual fees received per partner at VC and PE firms equal to $2.6 million and $3.6 million, respectively.

Our calculations and those of Metrick and Yasuda (2007), then, give us a range of fees per partner of $1.8–2.6 million per VC partner and $3.4–5.2 million per PE partner. As with hedge funds, the fees do not equal compensation

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[10] The standard deviations depend on whether funds are value- or equal-weighted and whether returns are calculated by Venture Economics or Kaplan and Schoar.

received by the partners. VC and PE firms must pay operating expenses out of the fees. It is difficult to know exactly what fraction of fees these expenses represent. However, as we mentioned above, operating margins are very high in the money management business.

PE and VC investors are likely taxed similarly to hedge fund investors in that most of the income will appear as partnership income on the $K-1$'s of the owners or partners of the funds. The one difference is that a larger fraction of the PE and VC income will be in the form of long-term capital gains. The reason for this is that most of the investments will have a term of greater than one year and the 20% profit shares on those investments will appear as capital gains (see Fleischer 2007).

In summary, there is no doubt that VC and PE partners have contributed to the increase in the top end of the income distribution. It seems likely that almost all of the eleven thousand (or more) VC and PE partners earn in excess of the $0.48 million necessary to put them in the top 0.5% of the income distribution.

As estimated fees increased by more than ten times from 1984 to 1994, and, again, by a factor of five or six times from 1994 to 2004, this undoubtedly represents a large increase in the number of such individuals since 1984 and 1994. In 1984, roughly five hundred VC and PE funds were raised over the previous five years. These funds had capital under management of $19 billion. At 4% total fees, this translates into $0.76 billion of fees. With six partners per fund, this translates into three thousand partners and $0.25 million in fees per partner or $0.41 million per partner in $2005. So, the number of partners has more than tripled and the fees per partner have increased by more than a factor of five times over this period.

### 2.2.3 Contributions to the top end of the income distribution.

In the previous subsection, we estimate average fees per highly compensated individual or partner in hedge fund, VC, and PE firms. We are unable to estimate the contributions of such firms to the very high end of the distribution. In this section, we use other data sources to attempt to do so.

Table 8 presents *II*'s estimates of the incomes of the top twenty-five most compensated hedge fund managers based in the United States from 2003 to 2005. The table confirms that the top hedge fund investors are very highly paid. The 20th most highly paid hedge fund manager earned $92, $110, and $150 million, respectively, in those three years. This compares to three nonfinancial ExecuComp U.S. executives and our estimate of four total nonfinancial U.S. executives who earned more than $100 million in 2004.

It is also striking that the top twenty-five individual hedge fund managers earned a combined total of $5.2 billion, $6.3 billion, and almost $9 billion, respectively, in 2003, 2004, and 2005. The $6.3 billion in 2004 for these twenty-five exceeds the aggregate earnings—both using estimated and realized pay—of all five hundred CEOs of the S&P 500 companies in 2004.

**Table 8**
**Top hedge fund incomes in millions of dollars**

| Rank | Alpha top hedge fund managers (U.S. only) | | |
| --- | --- | --- | --- |
| | 2003 | 2004 | 2005 |
| 1 | 750 | 1020 | 1500 |
| 2 | 510 | 670 | 1400 |
| 3 | 500 | 550 | 840 |
| 4 | 420 | 450 | 550 |
| 5 | 350 | 420 | 500 |
| 6 | 350 | 305 | 425 |
| 7 | 300 | 300 | 400 |
| 8 | 230 | 240 | 400 |
| 9 | 150 | 225 | 340 |
| 10 | 146 | 205 | 275 |
| 11 | 135 | 195 | 230 |
| 12 | 128 | 180 | 215 |
| 13 | 125 | 153 | 210 |
| 14 | 120 | 125 | 200 |
| 15 | 110 | 125 | 200 |
| 16 | 110 | 125 | 200 |
| 17 | 100 | 120 | 190 |
| 18 | 95 | 115 | 175 |
| 19 | 95 | 115 | 160 |
| 20 | 92 | 110 | 150 |
| 21 | 80 | 110 | 150 |
| 22 | 80 | 110 | 145 |
| 23 | 75 | 102 | – |
| 24 | 70 | 100 | – |
| 25 | 65 | 100 | – |
| Total | 5186 | 6270 | 8855 |

Source: Institutional Investor's estimates of the incomes of the top twenty-five most highly compensated hedge fund managers from 2003 to 2005, including only those hedge fund managers listed as based in the United States.

The pay of hedge fund managers relative to CEOs has increased since 2004. In 2005, the pay of the top twenty hedge fund managers exceeded the pay of all five hundred S&P 500 CEOs. Although we do not report this in the table, in 2007, *II* estimated that the top five hedge fund investors earned a total of $12.6 billion. While the 2007 ExecuComp data are not yet available, the pay of the top five hedge fund investors is very likely to exceed the pay of all five hundred S&P 500 CEOs in 2007 (both estimated and realized).

Table 9 presents estimated earnings of top earners in the financial industry more broadly. The first four columns present *Financial World* rankings for 1988 and 1995. *Financial World* includes all financial industry individuals including investment bankers and hedge fund and PE investors. The last three columns combine the rankings from *Trader Monthly* and *II Alpha* for 2003–2005.

Trader Monthly ranks the top traders and hedge fund investors only. *Trader Monthly* and *II Alpha* do not include PE and VC investors and, therefore, understate such incomes relative to the *Financial World* rankings. The Blackstone and KKR $S - 1$ filings indicate that some PE investors earn sums comparable to those of hedge fund investors. KKR's filings imply that Henry Kravis

**Table 9**
**Top financial industry incomes in millions of dollars**

| Rank | | *Financial World* | | | *Alpha and Trader Monthly (US only)* | | |
|------|------|------|------|------|------|------|------|
| | 1988 | 1988 in 2004 dollars | 1995 | 1995 in 2004 dollars | 2003 | 2004 | 2005 |
| 1 | 190 | 283 | 1500 | 1777 | 750 | 1020 | 1500 |
| 2 | 120 | 179 | 350 | 415 | 510 | 670 | 1400 |
| 3 | 110 | 164 | 150 | 178 | 500 | 550 | 840 |
| 4 | 110 | 164 | 115 | 136 | 420 | 450 | 550 |
| 5 | 100 | 149 | 95 | 113 | 350 | 420 | 550 |
| 6 | 88 | 130 | 90 | 107 | 350 | 305 | 500 |
| 7 | 80 | 119 | 76 | 90 | 300 | 300 | 425 |
| 8 | 65 | 97 | 76 | 90 | 275 | 240 | 400 |
| 9 | 55 | 82 | 75 | 89 | 230 | 225 | 400 |
| 10 | 55 | 82 | 70 | 83 | 225 | 205 | 340 |
| 20 | 30 | 45 | 40 | 47 | 100 | 120 | 190 |
| 30 | 25 | 37 | 30 | 36 | 63 | 88 | 125 |
| 40 | 20 | 30 | 25 | 30 | 35 | 63 | 68 |
| 50 | 15 | 22 | 20 | 24 | 25 | 35 | 45 |
| 60 | 15 | 22 | 17 | 20 | 13 | 28 | 35 |
| 70 | 10 | 15 | 14 | 17 | 8 | 23 | 23 |
| 80 | 9 | 13 | 13 | 15 | 8 | 13 | 13 |
| 90 | 8 | 12 | 10 | 12 | 8 | 13 | 13 |
| 100 | 8 | 12 | 9 | 11 | NA | NA | NA |

*Financial World* rankings include all financial industry individuals and employees, including private equity and hedge funds. Trader Monthly rankings include traders and hedge fund professionals only, and Alpha rankings are for hedge fund professionals only. Alpha figures are released later and for this reason when there is conflicting information about a given individual's earnings, Alpha numbers are used. Inflation adjustments for the counts of 1988 in 2004 dollars and 1995 in 2004 dollars are performed using the GDP deflator.

and George Roberts (each owning 37.5% of KKR) earned roughly $300 and $350 million in 2004 and 2005. The 29.8% of Blackstone owned by Stephen Schwartzman implies income of $447 and $388 million in 2004 and 2005.

Although we do not include PE investor incomes in 2004 (because *Financial World* ceased publishing its rankings), Tables 8 and 9 suggest some conclusions. There is little change in the top end of the distribution from 1988 to 1995. In both 1988 and 1995, forty individuals earned more than $30 million in 2004 dollars and ten individuals earned more than $82 million in 2004 dollars. There appears to have been a large increase in the very top end since then. In 2004 and 2005, among only traders and hedge fund investors, at least fifty-seven individuals earned more than $30 million and at least thirty-seven earned more than $82 million. Again, this indicates a large increase in the very top end of the income distribution.

We also considered the possibility that managers of hedge funds, VC firms, and PE firms may not be exactly the right comparison group for top public company executives because some of the annual compensation in fund management rewards entrepreneurial initiative or ownership in the same way that equity ownership rewards executives in public companies. Some of this income, therefore, may be analogous to investment income from the sale of founder stock for public company executives.

While we agree this is possible, we believe that our comparisons are appropriate for several reasons. First, a large amount of hedge fund and some PE and VC income is taxed as ordinary income, suggesting it has a substantial labor income component. And there has been an active debate in Congress in 2007 about increasing the fraction that is so taxed.

Second, fees paid to hedge funds, VC firms, and buyout firms are flow measures. In other words, these fees are the compensation realized that year by firm owners and employees. Like public company executives, the owners also potentially earn more from the appreciation of firm value. Our treatment of public company founders who still run their firms is similar in that we measure their flow compensation, not the appreciation in the value of their companies. This is particularly true of ex ante compensation.

Third, if we exclude investment income from AGI (which eliminates founder stock sales), we obtain similar results with respect to Wall Street versus Main Street. This is not surprising because as Piketty and Saez (2003, 2006b) show, the share of salary income in AGI at the very top has increased.

## 2.3 Mutual funds

At the same time that alternative assets under management and their fees have grown substantially, so have institutionally managed assets, particularly mutual funds. In this section, we document the increase in assets under management and fees paid to mutual funds.

According to the 2006 Investment Company Institute Handbook, total assets under management at mutual funds increased from $135 billion in 1980 to $2.16 trillion in 1994 to $8.9 trillion in 2005, with more than half of the assets in 2005 residing in equity mutual funds. The number of funds grew from fewer than one thousand to almost eight thousand. Table 10 uses data from the 2006 Investment Company Institute Handbook to report the fees including sales loads paid on these mutual funds.

Asset-weighted percentage fees have declined over time, driven by the increase in index funds and by the decrease in the use of sales loads. While the percentage fees have declined, the huge increase in assets under management has led to a substantial increase in fee dollars. Fees increased from $1.3 billion in 1980 to $31.1 billion in 1995 to $67.9 billion in 2004.[11]

Unfortunately, it is difficult to measure the number of people involved in the mutual fund industry and their pay distribution. The fees are paid to investment managers, as well as to brokers and intermediaries who sell or distribute the mutual funds. Some of these individuals work for the top securities firms and are already counted in the investment banking section. Rather than provide inaccurate estimates, we simply conclude that there are likely many highly compensated individuals in the mutual fund industry and that number has grown substantially since 1980.

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[11] Bogle (2005) makes a similar point.

**Table 10**
**Fees at mutual funds**

| Year | $ Billions Total assets | Preferred common | Fees Asset weighted % funds | Fees Asset weighted % funds | Fees $ Billions Stock funds | Fees $ Billions Bond funds | Fees $ Billions Total Billions Total | Fees $ Billions in $2005 Stock funds | Fees $ Billions in $2005 Bond funds | Fees $ Billions in $2005 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | | | 2.32% | 2.05% | $1.0 | $0.3 | $1.3 | $2.1 | $0.6 | $2.7 |
| 1981 | | | | | | | | | | |
| 1982 | | | | | | | | | | |
| 1983 | | | | | | | | | | |
| 1984 | $137 | $83 | | | | | | | | |
| 1985 | $252 | $114 | 2.19% | 1.91% | $2.4 | $2.7 | $5.1 | $3.9 | $4.3 | $8.2 |
| 1986 | $424 | $161 | | | | | | | | |
| 1987 | $453 | $182 | | | | | | | | |
| 1988 | $471 | $179 | | | | | | | | |
| 1989 | $553 | $245 | | | | | | | | |
| 1990 | $567 | $216 | 1.98% | 1.89% | $4.7 | $6.2 | $10.9 | $6.5 | $8.5 | $15.0 |
| 1991 | $851 | $381 | | | | | | | | |
| 1992 | $1096 | $485 | | | | | | | | |
| 1993 | $1505 | $712 | | | | | | | | |
| 1994 | $1544 | $824 | | | | | | | | |
| 1995 | $2058 | $1215 | 1.55% | 1.45% | $19.4 | $11.7 | $31.1 | $23.6 | $14.3 | $37.9 |
| 1996 | $2624 | $1718 | | | | | | | | |
| 1997 | $3409 | $2358 | | | | | | | | |
| 1998 | $4174 | $3004 | | | | | | | | |
| 1999 | $5233 | $4060 | | | | | | | | |
| 2000 | $5119 | $3910 | 1.28% | 1.03% | $50.7 | $11.9 | $62.6 | $56.9 | $13.4 | $70.2 |
| 2001 | $4690 | $3424 | 1.24% | 0.97% | $42.4 | $12.3 | $54.7 | $46.4 | $13.5 | $59.9 |
| 2002 | $4118 | $2688 | 1.24% | 0.93% | $33.0 | $13.5 | $46.6 | $35.5 | $14.6 | $50.1 |
| 2003 | $5362 | $3760 | 1.22% | 0.94% | $44.9 | $15.8 | $60.7 | $47.4 | $16.6 | $64.1 |
| 2004 | $6194 | $4490 | 1.17% | 0.92% | $51.3 | $16.6 | $67.9 | $52.7 | $17.1 | $69.8 |
| 2005 | $6865 | $5054 | 1.13% | 0.90% | $55.8 | $17.3 | $73.1 | $55.8 | $17.3 | $73.1 |

This table reports fees as a percentage of assets under management, dollars of fees, and dollars of fees in 2004 dollars using the GDP implicit price deflator for bond and equity mutual funds from 1980 to 2005. Fees include loads and sales charges. The source is the 2006 Investment Company Institute Handbook.

**Table 11**
**Statistics for lawyers at top firms**

| | Top 50 in 1984 | Top 50 in 1994 | Top 50 in 2004 | 1984 top 50 still in top 100 in 2004 | Top 100 in 1994 | Top 100 in 2004 | Top 200 in 2004 |
|---|---|---|---|---|---|---|---|
| Revenues ($ millions) per firm | $66.4 | $209.5 | $644.6 | $611.9 | $153.1 | $460.4 | $297.6 |
| | $61.5 | $174.0 | $573.0 | $503.5 | $124.5 | $398.5 | $199.5 |
| Revenues ($ millions) per firm in 2004$ | $106.8 | $251.2 | $644.6 | $611.9 | $183.6 | $460.4 | $297.6 |
| | $99.0 | $208.6 | $573.0 | $503.5 | $149.3 | $398.5 | $199.5 |
| Lawyers per firm | 258 | 469 | 889 | 830 | 371 | 682 | 471 |
| | 230 | 401 | 808 | 661 | 330 | 597 | 361 |
| Total number of lawyers all firms | 13,150 | 23,463 | 44,473 | 37,329 | 37,098 | 68,186 | 94,214 |
| Equity partners per firm | 90 | 155 | 221 | 203 | 130 | 179 | 134 |
| | 75 | 136 | 205 | 168 | 112 | 152 | 116 |
| Total number of equity partners all firms | 4603 | 7774 | 11,034 | 9144 | 12,961 | 17,861 | 26,755 |
| Profits per equity partner ($ millions) | $0.309 | $0.531 | $1.260 | $1.339 | $0.450 | $1.014 | $0.828 |
| | $0.265 | $0.460 | $1.075 | $1.116 | $0.398 | $0.855 | $0.665 |
| Top 0.5% in AGI | $0.160 | $0.286 | $0.479 | $0.479 | $0.286 | $0.479 | $0.479 |
| Top 0.1% in AGI | $0.418 | $0.733 | $1.400 | $1.400 | $0.733 | $1.400 | $1.400 |
| Profits per equity partner in 2004 $($ millions) | $0.498 | $0.636 | $1.260 | $1.339 | $0.540 | $1.014 | $0.828 |
| | $0.427 | $0.552 | $1.075 | $1.116 | $0.477 | $0.855 | $0.665 |
| Number of firms | 51 | 50 | 50 | 45 | 100 | 100 | 200 |

This table reports revenues, lawyers, equity partners, and profits per partner for law firms from *American Lawyer Magazine*, Am Law top law firms for calendar years 1984, 1994, and 2004. In each cell, average is reported above medians. When converted, 1984 and 1994 dollars are converted into 2004 dollars using the GDP Implicit Price Deflator. In 1984, we assume that all partners are equity partners, so profit per equity partner equals profit per partner. In 1994, firms began to appoint nonequity partners. The median firm had no nonequity partners. For 1994, we report the number of equity partners and profits per all partners. This slightly understates true profits per equity partner. In 2004, ALM distinguished between profits per equity and total partners.

## 3. Lawyers

We next look at the pay of top corporate lawyers, relying on *American Lawyer Magazine*'s annual surveys of law firm revenues and compensation. In 1985, Am Law covered the top fifty firms; in 1995, the top one hundred firms; and, in 2005, the top two hundred firms, all ranked by revenue. The Am Law surveys are released mid-year and, therefore, reflect results for the previous calendar year. Table 11, therefore, summarizes the Am Law results for calendar years 1984, 1994, and 2004.

The current Am Law surveys report the average profit per equity partner at each of the top law firms. Because law firms are usually structured as flow-through entities for tax purposes, the profit an equity partner earns should appear as ordinary income in the partner's AGI. As a result, average profit per equity partner likely provides a lower bound on the AGI of the average equity partner because it does not include non-law-firm income.

In our analysis, we prefer to use profit per equity partner because those partners are the key partners in the firms. According to the Am Law survey, equity partners are those who file a Schedule $K - 1$ tax form and receive no more than half their compensation on a fixed-income basis. Nonequity partners receive more than half of their compensation on a fixed-income basis. They are lawyers whom the firm wants to retain, but who do not receive the same voting rights, decision rights, and compensation.

By 2004, most law firms distinguished between equity and nonequity partners, with the median Am Law 100 firm having roughly one nonequity partner for each three equity partners. The 2004 Am Law numbers report profits per equity partner. For the 1984 Am Law 50, we use total partners and profits per all partners. At that time, few firms, if any, had gone to the model of nonequity partners, so these calculations represent primarily equity partners. In 1994, some firms had begun to appoint nonequity partners. As a result, the Am Law 100 reports the number of equity and nonequity partners. The median Am Law 100 firm had no nonequity partners. Unfortunately, the Am Law 100 only reports profit per (all) partner, not profits per equity partner. In our analysis, we report the number of equity partners and profits per (all) partner for 1994. This slightly understates true profits per equity partner, but likely not more than 10%. When we estimate profits per partner for the fifty-six firms that do not have any nonequity partners, we obtain average (median) profits per partner that are 9.4% (5.7%) greater than the profits per partner for all one hundred firms.

Table 11 summarizes the data from the 1984, 1994, and 2004 Am Law surveys. The data exhibit two strong patterns. First, a large number of law partners are in the top 0.5% and top 0.1% of the income distribution in 2004. Second, both the compensation of law partners and the number of highly compensated law partners have grown substantially over time.

Table 11 shows that the average profits per partner in the top fifty, one hundred, and two hundred U.S. law firms in 2004, respectively, were $1.26, $1.01, and $0.83 million. These averages are the averages of the average profit per partner for each firm. The medians of the averages are lower, at $1.08, $0.86, and $0.67 million. These profits accrued to, respectively, 11,034, 17,861, and 26,755 partners. Average profits per partner exceed $2 million for nine firms; they are at least $0.5 million for ninety-three of the top one hundred, and 152 of the top two hundred.

It is impossible to know exactly how the payouts to individual partners are distributed around the average profits per partner because the law firms do not make this information publicly available. Conversations with law partners at three top firms and with several law school professors suggest that the distribution is not so skewed as the distribution of CEO and investment banker MD pay. Based on these conversations, we assume that 1/3 of the partners earn more than the average while 2/3 of the partners make less. We assume that the most highly paid partner earns twice the average while the

least highly paid partner earns half the average. In practice, the distribution is less skewed for some firms, more skewed for others. Our sense is that these assumptions capture the distribution on average. The bottom line of our results would not be appreciably different if we assumed a more or less skewed distribution.

Based on these distributions, we estimate that 14,351 of the 17,861 partners in the Am Law 100 earned more than $0.48 million in 2004. Table 12 indicates that these partners represent more than 2% of the returns with AGIs in the top 0.5% and top 0.1%.

If we extend the analysis to the Am Law 200, we estimate that another 4246 lawyers earn more than $0.48 million, bringing the total to over eighteen thousand, and another 312 earn more than $1.4 million, bringing the total to 3477.[12] These figures imply that when the Am Law 200 firms are included, equity partners comprise more than 2.6% of the AGI distribution above the top 0.5% and top 0.1%. When we exclude investment income, Am Law 200 partners comprise more than 4% of the top 0.1%.

The 26,000 plus equity partners at Am Law 200 firms earn a total of roughly $22 billion (at $0.83 million per partner). This is the same order of magnitude as the total pay to nonfinancial top executives, investment banking MDs, hedge fund investors, and PE and VC investors.

Table 11 also indicates that lawyers have experienced a large real increase in pay over the last ten and twenty years. In 1984, the average profit per partner at the top fifty firms was $0.309 or $0.498 million in 2004 dollars. By 1994, the average profit per partner had increased to $0.531 million or $0.636 million in 2004 dollars. And by 2004, the average profit per partner at the top fifty firms had increased to $1.260 million.

These increases translate into a greater representation of lawyers in the top 0.5% and top 0.1% AGI brackets. Table 12 shows that in 2004, AGI of $0.48 and $1.40 million, respectively, were the cutoffs for the top 0.5% and top 0.1% AGI brackets. In 1994, the analogous figures were $0.29 and $0.73 million; in 1984, $0.16 and $0.42 million. At the same time pay has increased, Table 11 indicates that the number of partners has increased substantially, going from an average of 90 in 1984 to 155 in 1994, and to 221 in 2004 at the top fifty. In the top one hundred firms, the number of equity partners increased from an average of 130 in 1994 to 179 in 2004.

Table 12 shows the effect of the increase in equity partners and compensation per partner by comparing the contribution of the equity partners to the top AGI brackets in the different years. The table indicates that the equity partners at top law firms have markedly increased their presence in the top income brackets. In 1984, Am Law 50 partners represented 0.50% of the top 0.5% and 1.06% of the top 0.1%. These increased to 0.90% and 0.97%, respectively, in 1994, and

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[12] Because some of the partners of these law firms are based overseas, this overstates the true number of partners in these brackets. It is impossible to know how large this effect is, both absolutely and compared to the overstatement for top executives.

**Table 12**
**Top law firm equity partners and AGI**

| | Bottom of bracket | Top of bracket | Number in bracket and above | Bracket | Estimated Am Law 100 | | Estimated Am Law 200 | | Estimated Am Law 50 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Number of equity partners | Share of bracket and above | Number of executives | Share of bracket and above | Number of equity partners | Share of bracket and above |
| 2004 | | | | | | | | | | |
| | $479,177 | $1,400,370 | 661,925 | >99.5 | 14,351 | 2.17% | 18,597 | 2.81% | 9915 | 1.50% |
| | $1,400,370 | | 132,385 | >99.9 | 3,165 | 2.39% | 3,477 | 2.63% | 2708 | 2.05% |
| 1994 | | | | | | | | | | |
| | $286,290 | $733,602 | 579,715 | >99.5 | 8,465 | 1.46% | | | 5233 | 0.90% |
| | $733,602 | | 115,943 | >99.9 | 1,509 | 1.30% | | | 1130 | 0.97% |
| 1984 | | | | | | | | | | |
| | $159,958 | $417,846 | 534,355 | >99.5 | | | | | 2671 | 0.50% |
| | $417,846 | | 106,871 | >99.9 | | | | | 1132 | 1.06% |

This table estimates the number of equity partners at the Am Law top law firms in the top 0.5% and 0.1% AGI brackets in 1984, 1994, and 2004. For each law firm, the estimates assume that 1/3 of the partners earn more than the average while 2/3 of the partners earn less than the average. The estimates assume that the most highly paid partner earns twice the average, while the least highly paid partner earns half the average.

to 1.50% and 2.05% in 2004. Am Law 100 partners comprised 1.46% of the top 0.5% and 1.30% of the top 0.1% AGI brackets in 1994. This increased to 2.17% and 2.39%, respectively, in 2004.

Overall, then, the representation of top corporate lawyers in the top 0.5% and top 0.1% AGI brackets has increased substantially over time.

## 4. Professional Athletes

In this section, we look at the pay of professional athletes. To do this, we collect compensation information on professional baseball, football, and basketball players in the United States. These three sports are among the most popular in the United States and include a relatively large number of athletes.

We obtain baseball compensation information for 1984–2005 from the "Business of Baseball" website (http://roadsidephotos.sabr.org/baseball/data.htm) and from *USA Today* for 2005. We obtain basketball and football compensation information from Professor Rodney Fort of Washington State University (http://www.rodneyfort.com/PHSportsEcon/Common/OtherData/DataDirectory.html). Fort credits sports statistician Patricia Bender for the basketball information from 1991 to 2000, and the *USA Today* website for information from 2001 to the present. He obtained the football information from *USA Today* and *Sports Illustrated*. These figures understate AGI because they only include income earned from the athlete's team and, therefore, do not include any income from endorsements and other sources.

Table 13 describes the extent to which those professional athletes are represented in the top end of AGI distributions for 1995 and 2004. The level of pay has increased substantially with the average athlete earning $1.85 million in 2004 versus $0.78 million in 1995. The table also indicates that the athletes represent roughly the same percentage of the top 0.1%, but a larger percentage of the top 0.01% AGI bracket in 2004 than they did in 1995. In 1995 and 2004, the athletes in baseball, football, and basketball represented 0.8% of the returns in the top 0.1%. At the same time, the athletes represented 1.0% of the returns in the top 0.01% in 1995, but 1.5% of the returns in the top 0.01% in 2004.

Table 13 also shows that in total, the 3400 plus athletes earned just over $6.3 billion in 2004. This sum is substantially smaller than the sums going to the other groups we have analyzed.

Over this period, then, professional athletes increased their pay substantially, maintained or increased their share of the top brackets, but represented a small fraction of those very top brackets.

## 5. Contributions to the Top End of the Income Distribution

In this section, we aggregate the results from the previous section to see how many individuals we can identify at the very top end of the income distribution.

**Table 13**
**Professional athletes and AGI**

| Percentiles | Baseball | Football | Basketball | All | Share of bracket | Share of bracket and above |
|---|---|---|---|---|---|---|
| **2004** | | | | | | |
| ≤99 | 122 | 616 | 0 | 738 | 0.0% | 0.0% |
| >99 | 204 | 417 | 30 | 651 | 0.1% | 0.2% |
| >99.5 | 173 | 633 | 134 | 940 | 0.2% | 0.3% |
| >99.9 | 243 | 434 | 197 | 874 | 0.7% | 0.8% |
| >99.99 | 84 | 57 | 62 | 203 | 1.7% | 1.5% |
| >99.999 | 0 | 1 | 0 | 1 | 0.1% | 0.1% |
| Mean ($M) | $2.48 | $1.24 | $3.74 | $1.85 | | |
| Median ($M) | $0.76 | $0.54 | $2.21 | $0.64 | | |
| Total dollars ($M) | $2051 | $2681 | $1580 | $6312 | | |
| **1995** | | | | | | |
| ≤99 | 481 | 743 | 59 | 1283 | 0.0% | 0.0% |
| >99 | 95 | 221 | 19 | 335 | 0.1% | 0.2% |
| >99.5 | 155 | 473 | 68 | 696 | 0.1% | 0.3% |
| >99.9 | 163 | 401 | 214 | 778 | 0.7% | 0.8% |
| >99.99 | 91 | 5 | 18 | 114 | 1.1% | 1.0% |
| >99.999 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| Mean ($M) | $0.96 | $0.55 | $1.42 | $0.78 | | |
| Median ($M) | $0.22 | $0.28 | $1.11 | $0.30 | | |
| Total dollars ($M) | $950 | $1022 | $535 | $2508 | | |

This table estimates the contribution of professional athletes to the top AGI brackets for professional athletes. See the text for details of data and sample construction.

To summarize, we have estimated the number of high-income individuals who are top executives at public companies, highly compensated investment bankers, hedge fund investors, VC investors, PE investors, lawyers, and professional athletes. Table 14 presents a summary of the individuals that we count in each category for the top fractiles—from top 0.5% to top 0.0001%—of the earnings distribution in 2004. Table 14 also includes the estimated earnings of the individuals in the Forbes Celebrity 100 in 2004, but does not include estimates of the number of highly paid individuals at mutual funds and other institutional money managers. As a result, we believe that the estimates in these tables understate the individuals in our Wall Street groups that are in the top brackets.

In Table 14, we use the ExecuComp data on realized pay and our estimates for the non-ExecuComp executives to populate the top brackets for nonfinancial and financial executives. We use the exponential-based estimates of the distribution of investment banker income. For hedge funds, we use average compensation of 3.2% of assets under management and estimate an average of $3.2 million in compensation per nine thousand highly paid employees. We assume all nine thousand have AGIs above $0.48 million (top 0.5%) and 1/3 or three thousand have AGIs above $1.4 million (top 0.1%). We use *Trader Monthly* and *II Alpha* for the very top of the hedge fund distribution. We underestimate hedge fund investors in the top 0.01% ($7.2 million) because *Trader Monthly* and *II Alpha* do not report enough hedge fund investor incomes to go below $12 million. For VC investors, we assume an average compensation of

**Table 14**
**Top AGI income quantiles and earnings of top individuals in different categories in 2004**

| | In top 0.5% | In top 0.1% | In top 0.01% | In top 0.001% | In top 0.0001% |
|---|---|---|---|---|---|
| Total tax units in 2004 | 661,925 | 132,385 | 13,239 | 1324 | 132 |
| AGI threshold | $479,177 | $1,400,370 | $7,189,506 | $31,178,805 | $101,000,000 |
| Nonfinancial top executives in ExecuComp | 6577 | 3544 | 607 | 68 | 3 |
| Nonfinancial top executives non-ExecuComp (estimated) | 6880 | 1622 | 104 | 18 | 0 |
| Total main street | 13,457 | 5166 | 711 | 86 | 3 |
| Total main street as % of bracket | 2.03% | 3.90% | 5.37% | 6.48% | 2.27% |
| Financial top executives total (estimated) | 599 | 373 | 108 | 15 | 0 |
| Investment bankers | 10,000 | 6900 | 1482 | 13 | 0 |
| Hedge fund investors | 9000 | 3000 | >100 | 60 | 26 |
| VC investors | 6000 | 1200 | | | |
| PE investors | 5400 | 2160 | >5 | >5 | >3 |
| Total Wall Street | 30,999 | 13,633 | | | |
| Am Law 100 law partners | 14,351 | 3165 | | | |
| Total Wall Street + law partners | 45,350 | 16,797 | | | |
| Professional athletes | 2018 | 1078 | 204 | 1 | 0 |
| Top celebrities | >100 | 100 | 64 | 22 | 3 |
| Total estimated in our sample | 60,925 | 23,141 | 2674 | 202 | 35 |
| Total in our sample as % of bracket | 9.20% | 17.48% | 20.20% | 15.25% | 26.44% |

This table uses the ExecuComp data and our estimates of the non-ExecuComp companies to populate the top brackets for executives of nonfinancial and financial companies. It uses estimated 2004 brackets for the top 0.5%, 0.1%, 0.01%, and 0.001%, and it uses the 2001 AGI cutoff for the top 0.0001% bracket due to data availability. It assumes the exponential-based estimates of the distribution of investment banker income. For hedge fund investors, the figures in the table assume an average compensation of 3.2% of assets under management; that all nine thousand have AGI above $0.5 million (top 0.5%); and that 1/3 or three thousand have AGI above $1.4 million (top 0.1%). For the very top end of the hedge fund distribution, the figures rely on the numbers in Tables 8 and 9, which are based on Trader Monthly and the II Alpha 25. For VC investors, we assume an average compensation of 4.0% of assets under management; that all six thousand partners have AGI above $0.5 million; and that 1/5 or twelve hundred have AGI above $1.4 million. For PE investors, under the same 4.0% assumption, we assume that all fifty-four hundred have AGI above $0.5 million and 2/5 or 2160 have AGI above $1.4 million. For VC and PE, we do not try to make any assumptions for incomes above the top 0.01%. We use the distributions calculated earlier for law partners and professional athletes.

4.0% of assets under management and estimate an average of $1.8 million (the bottom of the $1.8–2.6 million range) in compensation per six thousand partners. We assume that all six thousand partners have AGIs above $0.48 million and 1/5 or twelve hundred have AGIs above $1.4 million. For PE investors, using the 4.0% assumption, we estimate an average of $3.4 million in pay per fifty-four hundred partners (the bottom of the $3.4 to $5.2 million range). We assume that all fifty-four hundred have AGIs above $0.48 million and 2/5 or 2160 have AGIs above $1.4 million. For VC and PE, we do not make any assumptions for incomes above the top 0.01%. We recognize that at least three PE investors—Kravis, Roberts, and Schwarzman—earned at least $101 million and were in the top 0.0001% bracket. We use the distributions calculated earlier for law partners and athletes.

**Table 15**
**Dollars earned over time by various sectors (in $billions)**

| | 2004 | 1994 In 2004 dollars | 1984 In 2004 dollars | 1994 | 1984 |
|---|---|---|---|---|---|
| *Group 1: Main street* | | | | | |
| AGI of nonfinancial top executives in ExecuComp | $22.7 | $8.4 | | $6.9 | |
| AGI of nonfinancial top executives, not in ExecuComp | $12.0 | $4.5 | | $3.7 | |
| Total main street | $34.7 | $12.9 | | $10.7 | |
| *Group 2: Wall Street, including lawyers* | | | | | |
| AGI of financial top executives in ExecuComp | $3.0 | $1.2 | | $1.0 | |
| AGI investment bankers (10,000 on exponential distribution) | $28.4 | | | | |
| Fees to hedge fund investors | $25.4 | $3.8 | $1.1 | $3.2 | $0.7 |
| Fees to VC investors | $10.9 | $1.6 | $0.8 | $1.3 | $0.5 |
| Fees to PE investors | $18.4 | $4.7 | $0.4 | $3.9 | $0.2 |
| Profits to Am Law 100 law partners | $18.1 | $7.1 | $4.6 | $5.8 | $2.8 |
| Fees to mutual fund investors | $69.8 | $36.8 | $8.0 | $31.1 | $5.1 |
| Total Wall Street, including lawyers | $174.1 | | | | |
| *Group 3: Other public figures* | | | | | |
| AGI to professional athletes | $6.3 | $3.0 | | $2.5 | |
| AGI to celebrities | $2.5 | | | | |
| Total other public figures | $8.8 | | | | |

The table summarizes the dollar amounts of AGI and fees of the various groups and how they have changed over time. 1984 hedge funds use 1986 estimates. 1994 professional athletes use 1995 estimates. 1994 and 1984 mutual funds use 1995 and 1985 estimates. 1984 Am Law 100 is estimated as two times 1984 Am Law 50 Partners. AGI to investment bankers for 2004 comes from the assumptions in Table 4; for 1984, we scale the 2004 value down by the ratio of 1987 capital per employee to 2004 capital per employee.

Table 14 indicates that our groups comprise at least 17% of the top 0.1% AGI bracket, about 20% of the top 0.01% bracket, and over 26% of those in the very top 0.0001% bracket.

Including financial top executives, investment bankers, hedge funds, VC investors, and PE investors, we count more than twice as many Wall Street individuals as Main Street individuals (nonfinancial top executives) in the top 0.5% and 0.1% of the AGI distribution.

We also estimate that financial top executives, investment bankers, and hedge fund investors comprise a greater fraction of the top 0.01%, a similar fraction of the top 0.001% and a substantially greater fraction of the top 0.0001% than the top Main Street individuals. Including VC investors, PE investors, mutual fund investors, and measuring hedge fund investors more accurately would almost certainly tip the fraction in favor of Wall Street for the top 0.001% as well.

When we estimate AGI brackets excluding investment income, our groups explain a larger fraction of the top groups, particularly the top 0.01%. Our groups comprise over 22% of the top 0.1%, almost 33% of the top 0.01%, and more than 26% of the top 0.001%. We are unable to do this calculation for the top 0.0001%.

Table 15 takes an alternative look at our different groups. It summarizes the dollar amounts of AGI and fees of our various groups. The AGI of nonfinancial

executives in ExecuComp in 2004 is $35 billion. This increased in real terms by almost 2.7 times from $12.9 billion ($10.7 billion nominal) in 1994.

Using the exponential distribution, we estimate that investment bankers earned a total of $28.4 billion in 2004. Because of data availability issues, we are unable to estimate total compensation in 1994.

Fees to hedge funds totaled $25.4 billion in 2004, an increase in real terms of over seven times relative to 1994. Fees to PE funds and VC funds totaled $18.4 and $10.9 billion in 2004. These represent increases in real terms of 3.9 and 6.8 times, respectively, relative to 1994. Estimated fees to mutual funds increased by 1.9 times in real terms from 1995 to 2004; they increased by 4.6 times from 1985 to 1995.

Am Law 100 law partners earned a total of $18.1 billion in 2004, representing an increase in real profits of 2.6 times relative to 1994, virtually identical to the increase to top nonfinancial executives.

While it is not possible to map all of these results into changes in the income distribution, these results strongly suggest that Wall Street and legal professionals have contributed more than top executives of nonfinancial public companies to the widening of the income distribution.

A cursory look at the individuals in the 2007 Forbes 400 provides strong corroborating data. Each year, Forbes attempts to identify the 400 Americans with the greatest wealth using both public and private sources. While this is a stock measure, rather than a flow measure, many of the individuals in the Forbes 400 will have earned a great deal in order to amass such wealth. In 2007, a net worth of $1.3 billion was required to make the Forbes 400. At the same time that the Forbes list is not definitive, it is surely suggestive of the sources of great wealth.

We attempted to classify the source of wealth for the four hundred members of the Forbes 400. Only nine individuals were nonfounder employees (including CEOs) of public companies. And only four of those nine were hired after the company went public. In other words, there are only four public company CEOs who accumulated their wealth as public company CEOs in the Forbes 400.

In contrast, conservatively, we identify twenty-seven hedge fund investors and thirty-three PE investors in the Forbes 400. We also identify twenty-nine real estate investors. As with our income measures, we find that Wall Street-related individuals are substantially more likely to be represented in the Forbes 400 than public company executives.

The other group that comprises the largest fraction of the Forbes 400 is entrepreneurs. We identify 136 entrepreneurs in the Forbes 400. Interestingly, seventy-seven of the 136 founded their firms after 1970.

## 6. Pay-for-Performance

Some critics of top executive pay point not only to the high levels of pay, but also argue that those executives are not paid for performance. For example,
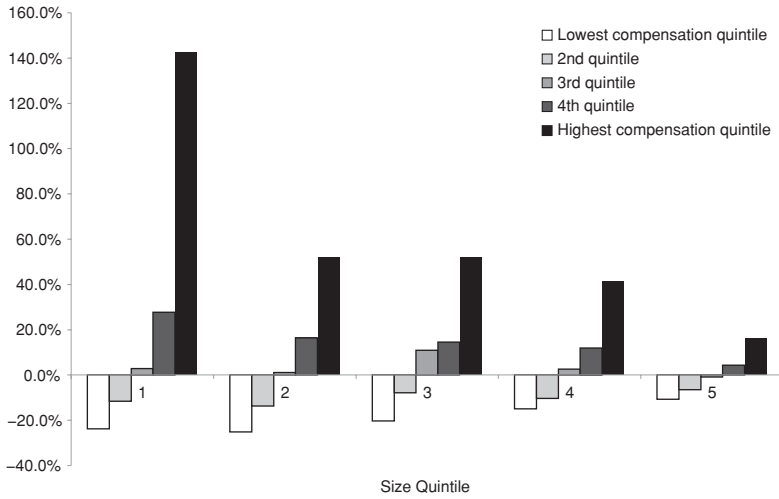
**Figure 3**
**ExecuComp firms are sorted into five groups based on size (as measured by beginning of year book assets)**
Within each size group, the CEOs are sorted into five groups based on realized compensation from lowest to highest. For each firm, we measure performance as the total return to the firm's stock less the value-weighted performance of the firm's industry (using Fama-French industry returns) over three-year periods.

Bebchuk and Fried (2004) argue that CEO pay schemes "weaken managers' incentives to increase firm value and even create incentives to take actions that reduce long-term firm value." They and others have led some to conclude that there is no link between CEO pay and firm performance. CEO pay is often contrasted with that of hedge fund, VC, and PE investors, who are supposedly highly paid for performance.

In this section, we provide evidence on the relation between firm performance and CEO pay. We also discuss the extent to which hedge fund, VC, and PE investors are paid for performance.

First, we use the ExecuComp database to compare the amount of compensation the CEOs actually receive—realized compensation or TDC2—to the company performance over the previous one, three, and five years. Each year from 1999 to 2004, we sort the ExecuComp firms into five groups based on beginning of year book assets. We do this because it is well known that compensation varies with firm size (see Gabaix and Landier 2008). Within each size group, we sort the CEOs into five groups based on realized compensation from lowest to highest. For each firm-year, we measure performance as the total return to the firm's stock less the value-weighted performance of the firm's industry (using Fama-French 1997 industry returns). We compare performance across the different compensation-size groups.

Figure 3 reports the results graphically for the three previous years of stock performance. Within each size quintile, actual compensation is highly related to performance, i.e., there is strong pay-for-performance. Firms with CEOs in the

top 20% of compensation outperform their industries by 61% on average. Firms with CEOs in the bottom 20% of compensation underperform their industries by 19% on average. The results are qualitatively identical for one year and five years of stock performance.

We suspect some of the confusion over pay is that critics focus on ex ante or estimated pay rather than realized pay. Because much of realized pay reflects the exercise of in-the-money options, CEOs will tend to receive large payoffs when their firms' stock has increased substantially. It is not surprising that most large payoffs result from strong stock performance. Estimates in Bebchuk and Grinstein (2005) imply that at least 1/2 of the expected value of CEO compensation has been equity-based since 1996.

CEO turnover also has increased over time as has the relation of CEO turnover to poor performance (see Kaplan and Minton 2008). Those results suggest that boards do hold CEOs accountable for poor performance, providing CEOs additional incentives to perform.

We also can compare top executive compensation to that of hedge fund, VC, and PE investors. As mentioned earlier, all three types of investors are paid with a combination of a fixed annual fee and a variable share of profits, usually 20%. These payoffs imply that compensation of hedge fund, VC, and PE investors is strongly related to performance if the performance is positive, but is unrelated to performance if the performance is poor. In other words, hedge fund, VC, and PE fund investors can earn a lot of money even with mediocre or poor performance. Estimates in Metrick and Yasuda (2007) suggest that the performance-based component—the profit share or carried interest—of VCs and PE investors represents less than 40% of the expected present value of compensation.

Although the compensation of these different groups is not directly comparable, it is not obvious that CEO pay is any less related to performance than that of hedge fund, VC, and PE investors.

## 7. Summary and Implications

We have estimated how much of the inequality at the top end of the income distribution can be attributed to top executives of nonfinancial firms (Main Street); financial service sector employees from investment banks, hedge funds, VC funds, PE funds, and mutual funds (Wall Street); lawyers; and professional athletes. And we have estimated how those contributions have varied over time.

Studying these groups, we identify at least 15–26.5% of the individuals who comprise the AGI categories at and above the top 0.1%. We estimate that CEOs and top executives of nonfinancial public companies comprise fewer than half of these individuals and do not comprise more than 6.4% of any of the top AGI brackets. Individuals that we classify as Wall Street professionals comprise a greater fraction of the top end of the distribution than the top five executives of "Main Street" public companies.

We believe our assumptions are conservative for Wall Street and, therefore, these groups may represent a larger fraction of the very top than we report. While our estimates represent a substantial portion of the top income groups, they clearly miss a large number of high-earning individuals. We suspect that some of the missing individuals are trial lawyers, owners, and executives of privately held companies, public company founders, and independently wealthy individuals who have a high AGI.

We also find that the representation of the top public company executives in the top AGI brackets has increased only modestly from 1994 to 2004, particularly using ex ante compensation. Using realized compensation, top executives comprise roughly the same fraction of the top 0.1% of the AGI distribution in 2004 as they did in 1994 and a somewhat higher fraction of the top 0.01%. Using ex ante pay, top executives comprise a slightly lower fraction of the top 0.1% and a slightly higher fraction of the top 0.01% in 2004 than they did in 1994. In contrast, the contributions of hedge fund managers, PE investors, VC investors, and corporate lawyers have clearly increased substantially over the past ten and twenty years, likely by a greater amount than the top executives.

These results inform some of the different explanations for the increased skewness at the top end of the income distribution. As mentioned earlier, these explanations include trade or globalization theories (Hecksher 1931; Ohlin 1933; Stolper and Samuelson 1941), skill-biased technological change (Katz and Murphy 1992), increasing returns to generalists rather than specialists (Murphy and Zabojnik 2004; Frydman 2007), managerial power (Bebchuk and Fried 2004), social norms (Piketty and Saez 2006a; Levy and Temin 2007), greater scale (Gabaix and Landier 2008), and the economics of superstars (Rosen 1981), which posits technological advance as a possible explanation for greater scale.

The globalization theories predict that the increase in inequality will be greater among individuals or groups in industries that are most affected by globalization. We believe it unlikely that such theories can account for the increase in inequality at the top levels, given the breadth of the phenomenon across the occupations we study. In particular, it seems difficult for globalization to explain the increase in the top end of VC investors, PE investors, hedge fund investors, and professional athletes.

The theory of increasing returns to generalists predicts an increased return to those with generalist skills, and has been offered as an explanation for the increase in CEO and top executive pay. We think the types of occupations responsible for some of the increase in the top end of the income distribution are not consistent with this theory. In particular, we do not believe that lawyers, hedge fund investors, investment bankers, or professional athletes have become less specialized/more general over time. In fact, the opposite seems more likely to be true.

The managerial power theory argues that corporate governance deteriorated in the last ten years to such an extent that CEOs and top executives have been

able to increase their compensation substantially through managerial power. CEOs (and top executives) are the only group we study who some argue can influence or set their own pay (by dominating their boards) without competitive negotiation. For at least four reasons, our evidence suggests that powerful CEOs or poor corporate governance cannot possibly be more than a small part of the picture of increasing income inequality, even at the very upper end of the distribution. First, other groups without such influence have experienced equal or larger increases in their contribution to the top AGI brackets. Second, top executives occupy roughly the same part of the top AGI brackets in 2004 as they did in 1994 using ex ante compensation—the amount that boards of directors expect to pay. Third, top executives represent less than 6.4% of any top AGI bracket (using realized pay) and CEOs represent less than 5% of any top bracket. Fourth, realized top executive pay (as measured by TDC2) is strongly related to a company's stock performance. We acknowledge that this does not rule out the possibility that poor corporate governance affects CEO pay.

Our evidence also is not obviously consistent with the arguments in Piketty and Saez (2006a) and Levy and Temin (2007), who suggest that the increase in pay at the top is driven by a recent removal of social norms regarding pay inequality. Piketty and Saez suggest that "impediments to free markets due to labor market regulations, unions, or social norms regarding pay inequality can keep executive pay below market. Such impediments have been largely removed in the United States, but still exist in Europe and Japan." Levy and Temin emphasize the importance of federal government policies toward unions, income taxation, and the minimum wage. We do not think our evidence is favorable toward a central role for social norms at the very top. While top executive pay has increased, so has the pay of other groups, particularly Wall Street groups, who are and were less subject to disclosure and, arguably, less subject to social norms. Compensation arrangements at hedge funds, VC funds, and PE funds of a 2% management fee and 20% profit share have not changed much, if at all, in the last twenty-five years (see Sahlman 1990; Gompers and Lerner 1999; Metrick and Yasuda 2007). It also is not clear how greater unionization would have suppressed the pay of those on Wall Street. In other words, there is no evidence of a change in social norms on Wall Street in the last twenty-five years. What has changed is the amount of money managed and the concomitant amount of pay. Consistent with this, French (2008) finds that the total basis point fees for U.S. equities have remained relatively constant since 1980, while the value of those equities has increased dramatically.

We believe that our evidence remains more favorable toward the theories of skill-biased technological change, greater scale, and their interaction.

Skill-biased technological change predicts that inequality will increase if technological progress raises the productivity of skilled workers relative to unskilled workers and/or raises the price of goods made by skilled workers relative to those made by unskilled workers. For example, computers and advances in information technology may complement skilled labor and substitute

for unskilled labor. This seems likely to provide part of the explanation for the increase in pay of professional athletes (technology increases their marginal product by allowing them to reach more consumers) and Wall Street investors (technology allows them to acquire information and trade large amounts more easily). The results in French (2008) also are consistent with this.

Gabaix and Landier (2008) argue that the wage differential between the best and next best CEO will reflect the talent differential between the two multiplied by firm size. In equilibrium, CEOs will be paid more as their firms and other firms they can work for become larger. Larger size increases the returns to hiring the more productive people. As long as other firms are also large, competition for talent will drive wages up. Gabaix and Landier attribute the large increase in CEO pay in U.S. public companies to the large growth of those companies over time—the typical large U.S. firm increased in market value by four to seven times in real terms from 1980 to 2003. Our results are arguably consistent with Gabaix and Landier (2008). In our analysis, we find that financial services firms, VC funds, PE funds, hedge funds, and law firms all have grown larger, in many instances by orders of magnitude.

As Frydman and Saks (2007) point out, however, while the increase in CEO pay since 1980 is consistent with the scale argument, the increase in CEO pay from 1940 to 1970 is not because CEO pay was roughly flat (in real terms) while company values increased substantially.

We think the most plausible explanation of our findings is the interaction of scale and technological change. That is precisely the argument made in Rosen (1981), who argues that technological change, particularly in information and communications, can increase the relative productivity of superstars or talented individuals. Rosen's theory can be viewed as a combination of the previous two explanations in that the individuals and firms who benefit from the technological change are likely to get larger. It is worth noting that Gabaix and Landier (2008) do not explain why firms (and funds) have been able to become so much larger over time. The same technological change that is biased toward skills may have helped firms and funds to become larger during our sample period. This also provides an explanation for the different relations between pay and scale over different time periods.

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