The Changing Preferences of Institutional Investors
for Common Stocks

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Abstract

We document that institutional investors, and particularly hedge funds, increased their holdings of smaller stocks from 1980 to 2010 and decreased their holdings of larger stocks. As of 1990 institutions began to underweight, relative to market weights, those stocks that make up the largest 40 percent of the value of the market, and as of 2006 began to overweight the stocks that make up the smallest 20 percent of the market. The contrary findings in the literature are due to a statistical misspecification. We propose that changes in the institutional investing environment since the 1970s are the source of these changing preferences.

1. Introduction

We address recent changes in institutional preferences for common stocks. An extensive academic literature documents the overall growth in institutional equity ownership as well as the changing composition of the types of stocks in which they invest. Using the Thomson 13F/CDA institutional holdings file available through WRDS, we analyze trends in institutional stock ownership over the period 1980 through 2010, thereby extending the evidence by thirteen years. We examine institutional portfolio allocations across deciles of equal market capitalization, a feature that distinguishes our paper from much of the other academic literature.[1] We find that institutional investors since 1980 have decreased their holdings in larger stocks and have increased their holdings in smaller stocks. Over the last three decades, institutions as a whole gradually increased their portfolio allocations to the stocks that make up the smallest ten percent of the value of the market – from 3.5 percent in 1980 to 10.2 percent in 2010 – and now *overweight* these smallest stocks relative to market weights. Further, institutions as a whole have decreased over time their portfolio allocations to the largest stocks: Since 1990 they have *underweighted*, relative to market weights, those stocks that make up the largest 40 percent of the value of the market. We also show that even though these trends apply to institutions of all sizes, they are most pronounced for smaller institutions. In addition, for the period 1997 - 2010, we find that hedge funds had larger allocations to smaller stocks than non-hedge institutions of comparable size and correspondingly smaller allocations to the larger remaining stocks.

Our results contrast with previous research that concludes either: (1) that institutional investors hold portfolios concentrated in large-cap stocks (e.g., Gompers and Metrick (2001), Del Guercia (1996), Falkenstein (1996)); or (2) that institutions hold portfolios concentrated in large-cap stocks, but the degree of concentration has declined over time (e.g., Bennett, Sias and Starks (2003)). We demonstrate that the conclusion from previous research that institutional investors overweight larger stocks relative to their market weights is due to an improper

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[1] Each equal-cap decile contains approximately ten percent of the total value of the stock market. In contrast, the market values in the equal-number deciles, which the academic literature typically uses, are skewed with about 80 percent of the market value of all stocks in the largest decile and the remaining 20 percent in the other nine deciles. It is important to note that our findings are not dependent on how the deciles of equal market capitalization are constructed – our results using deciles of equal market capitalization are consistent with those using equal-number deciles. However, the results using equal-value deciles reveal significant differences in changes in institutional holdings among the largest stocks, which make up the bulk of the market; these changes are not discernible with equal-number deciles, which group these largest stocks into one decile. The Appendix presents an analysis of the differences among various decile classification schemes.

empirical specification. We illustrate this misspecification with an analysis of Gompers and Metrick (2001). Gompers and Metrick assume a linear relation between the proportion of the shares outstanding that institutions own and the logarithm of the market value of that stock. We show that the actual relation is non-linear, and a non-linear specification leads to the opposite conclusion. We argue that our findings are consistent with changes in the institutional investment environment over the last several decades that include (1) a better understanding of the risk of a security in the context of a portfolio that enabled investments in smaller stocks, and (2) the identification of the small stock premium that focused the attention of institutional investors on these smaller stocks.

The paper is organized as follows. In Section 2, we describe our data. In Section 3, we document trends in institutional ownership of common stocks over the period 1980 to 2010 by the market values of their holdings for the entire market and then separately for their holdings in NYSE-listed stock and in NASDAQ-listed stocks. In Section 4, we reconcile our results with previous literature, particularly Gompers and Metrick (2001). In Section 5, we examine ownership patterns across institutions of different size, and also between hedge funds and non-hedge institutions of the same size. In Section 6, we attempt to understand the reasons for these changes in institutional holdings and suggest factors that might play a role. In Section 7, we conclude the paper.

2. Data

Any financial institution exercising discretionary management of investment portfolios over $100 million in qualified securities is required to report those holdings quarterly to the SEC using Form 13F. Qualified securities include stocks listed for trading in the US, among other securities. These filings, compiled quarterly by Thomson/CDA and available through Wharton Research Data Services (WRDS), are the source of the stock holdings used in this study for the period 1980 to 2010.[2] It is important to note that the holdings reported in Forms 13F are not the holdings of an individual portfolio but are the aggregate of the holdings in what could be a large number of portfolios, each managed in different styles. Further, some small institutions may engage a larger institution to report its holdings as part of those of the larger institution. One might expect that the number of aggregated portfolios will be greater for large institutions. The

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[2] On occasion, an institution will report its holding late, so that the report date and filing date in the Thomson data are not the same. As these holdings are not current, we delete them from our analysis.

reports of smaller institutions are more likely to contain a limited number of separately managed portfolios—perhaps following the same style. Thus, the holdings for large institutions as reported on Form 13F may not be as useful in understanding the investment behavior of a single portfolio manager as those for smaller institutions. As documented in Blume and Keim (2014), Thomson/CDA made two errors in transcribing the original 13F filings to its file. The analysis in this paper uses corrected data[3].

To examine the holdings and investment performance of hedge funds separately, we used several sources to compile a list of hedge funds, as described in detail in Section 5.1. A major advantage of using holdings data is that it avoids the self-reporting biases that occur in hedge fund return databases when a fund chooses not to report poor returns (see Griffin and Xu (2009) for a discussion of these issues, and for a list of references.) In anticipation of the results presented below, the identified hedge funds are almost always associated with smaller institutions, as it is not possible to separate the hedge funds of, say, Goldman Sachs from their other non-hedge fund portfolios as reported to the SEC.

We merge the holdings data with accounting and market data from Compustat and the CRSP monthly file, both available through WRDS, using the concurrent CUSIP number. Our analysis includes all common stocks and Real Estate Investment Trusts (REITs) listed on US markets, as determined by the CRSP share codes 10, 11, 12, 18, 48, and 72. We exclude American Depository Receipts (ADRs), Exchange Traded Funds (ETFs), and closed-end investment companies. ETFs and closed-end investment companies can be viewed as pass-through vehicles of liquid assets including common stock and are similar to mutual funds; including these companies would distort our analysis of institutional ownership. Because the focus of this study is investments in US stocks by institutional investors, we exclude ADRs as they represent investments in foreign companies.

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[3] The two errors occur in the data for September 30, 1999, and June 30, 2000. The errors were of two types: the incorrect substitution of the prices in these two months with prices from the end of the subsequent quarter and an incorrect adjustment of institutional holdings for stock splits and stock dividends. The effect was to substantially overstate the quarterly returns for the aggregate portfolio of all institutions for the fourth quarter of 1999 and the third quarter of 2000. For the fourth quarter of 1999, the quarterly return in excess of the market calculated using the uncorrected data is 9.76 percent, while the excess return using the corrected data is -0.28 percent. The corresponding excess returns for the third quarter of 2000 are 7.51 percent and 1.12 percent.

3. Trends in Institutional Stock Ownership

The proportion of equities managed by institutional investors hovered around five percent from 1900 to 1945. But after World War II, institutional ownership started to increase, reaching 67 percent by the end of 2010. An extensive literature documents this growth in their assets as well as the changing composition of the types of stocks in which they invest. For example, the Institutional Study Report of the Security and Exchange Commission (1971) finds that institutional equity holdings "tend to be concentrated in the shares of the larger, publicly traded corporations." (Appendix vol 1, p. ix). The more recent analyses of Del Guercia (1996), using data from 1988 through 1991, and Falkenstein (1996), using data from 1991 through 1992, reach similar conclusions. In an often-cited paper, Gompers and Metrick (2001) also find that, relative to individuals, institutions prefer "larger, more liquid stocks," and these preferences have remained stable over the years 1980 through 1996. Based on this finding, combined with the increasing institutional share of stock ownership mentioned above, Gompers and Metrick conclude that there was increasing demand for large stocks during their sample period and argue that this increased demand contributed to the demise of the small-stock premium. Bennett, Sias and Starks (2003) also find that institutions overweighted large-cap stocks throughout the period 1983 to 1997 but decreased this overweight over time. As to smaller stocks, they find that institutions, while underweighting the smaller stock through this time period, have decreased their underweighting over time.

In conformity with these studies, the profession appears to have accepted as a stylized fact that institutions prefer larger, more liquid stocks, and that this preference has resulted in an increased demand for large stocks over time. (See, for example, the recent study by Campbell, Ramadorai and Schwartz (2009), p. 67). As shown below, this stylized fact is currently not accurate and has not been accurate since the third quarter of 1990, when institutions began to underweight these larger stocks.

This section updates previous research on institutional preferences for common stocks, extending the evidence by thirteen years to the end of 2010, a period of considerable change in equity markets. We begin with an analysis of the aggregate holdings of all institutions by market value and, like other studies, find an increase in institutional stock ownership. In contrast to most previous research, however, we find that institutions have gradually increased their holdings of smaller stocks and decreased their holdings of larger stocks relative to market weights. Beginning in 1990, institutions began to underweight the largest stocks relative to

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market weights and by 2006 began to overweight the very smallest stocks. We also find that, over time, changes in both aggregate and institutional holdings were more pronounced for NASDAQ stocks than for NYSE stocks.

3.1. Trends in Stock Ownership: All Stocks

We begin by partitioning US equities into deciles of equal market capitalization (hereafter equal-cap deciles) where the first decile contains the largest stocks. Specifically, for each quarter during the period 1980 to 2010, we rank all US equities in our sample by their quarter-end market values and assign to the first decile the largest stocks whose combined market value is less than or equal to ten percent of the total market value of all stocks. Because of the granularity of market values, the combined market value of the stocks in our top decile is very likely to be less than ten percent of the total market value of all equities. To compensate for this possibility, we assign to the second decile the next largest equities whose total market value combined with those in the first decile is less than or equal to twenty percent of the total market value. We then repeat this process for the remaining eight deciles. This approach differs substantially from that used by most researchers when constructing market-cap deciles and by CRSP when constructing its US Market Cap-Based Portfolios. Those alternative approaches focus on the number of securities in each decile, rather than the market value of the stocks in each decile. As shown in the Appendix, the stratification that we use highlights more clearly deviations from market portfolio weights for the larger stocks, which of course account for a substantial portion of the total market value of all stocks.

In Table 1, we present summary statistics for the distribution of stocks by equal-cap deciles at year-end 1980 and year-end 2010 for all stocks and for all institutional holdings. Of the total market value of US common stocks of $1.4 trillion in 1980, institutions held $473 billion, or 34 percent. By 2010, the total market value of common stocks had increased to $17.1 trillion, and institutions had increased their holdings to $11.5 trillion, or 67 percent of all stocks. This increase in institutional ownership of common stocks continues the trend following World War II that prior studies have documented.

The market value of stocks is highly concentrated. In 1980, there were 4844 stocks in our sample (Table 1, Panel A). The largest four accounted for 10 percent of the total market value of these stocks, and the largest 68 accounted for 40 percent of the total market value. The smallest

3,753 stocks accounted for just 10 percent of the total market value. The results for 2010 are similar (Table 1, Panel B).

Institutional allocations across the equal-cap deciles, relative to market weights, have changed over time, as illustrated in Table 1. In 1980, institutions underweighted each of the smallest three equal-cap deciles, while they overweighted each of the seven larger equal-cap deciles. Their underweight of the smallest equal-cap decile was extreme: The stocks in this decile constituted just 3.5 percent of the value of institutional holdings in comparison to the ten percent representation in the entire market—an underweight of 65 percent.[4] Although institutions overweighted all of the seven larger equal-cap deciles in 1980, they particularly overweighted the third and fourth deciles—an overweight of 36.2 percent and 21.9 percent, respectively. By the end of 2010, however, institutions were underweighting the stocks in each of the largest five deciles, and overweighting the stocks in the smallest five deciles.[5] Indeed, the percentage of individual stocks in the smallest equal-cap decile that were *not* held in institutional portfolios declined from 37 percent in 1980 to less than three percent at the end of 2010 (Figure 1).

The time trend in institutional allocations provides further insights. In Figure 2, we plot the annual under- and overweights for all institutions for four market-cap groups: large-cap stocks (equal-cap deciles 1 to 4), mid-cap (deciles 5 to 8), small-cap (decile 9), and micro-cap (decile 10). We picked these groupings to correspond roughly to the broad trends discussed in the last paragraph and at the same time to simplify the figure. There is little change in institutional allocations to mid-cap stocks during our sample period, but there is a steady increase in allocation to small-cap and micro-cap stocks and a steady decrease in the allocation to large-cap stocks. On the basis of more detailed data than shown in Figure 2, institutions that had overweighted large-cap stocks in 1980 began to underweight these stocks by the third quarter of 1990.[6] In contrast, institutions, which underweighted the micro-cap stocks by 66 percent in 1980, gradually increased their allocation to these stocks and by the first quarter of 2006 were

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[4] We compute over- and under-weights as the ratio of institutional ownership percentages to the total market percentages less one and expressed as a percent.

[5] We broke up the smallest equal-cap decile into five groups of successively smaller market proportions (largest 8% of the decile value, the next 1%, next 0.5%, next 0.25%, and smallest 0.25%) to see whether institutions were uniformly overweighting the entire smallest decile at the end of 2010. We found that only the smallest 2% of the stocks was underweighted by institutions relative to market weights. The largest 8% of the smallest decile was overweighted by institutions by 8.9%.

[6] Institutions began underweighting the very largest stocks much earlier: they underweighted the stocks in equal-cap decile one after the fourth quarter of 1980 (with the exception of three quarters in 1984.)

overweighting them. Similarly, institutions began to overweight the small-cap stock by the second quarter of 1996.[7] In sum, institutions have gradually shifted their holdings from larger to smaller stocks over the years 1980 through 2010 and now underweight large-cap stocks and overweight small-cap and micro-cap stocks relative to market weights.[8]

3.2 Trends in Stock Ownership: NYSE versus NASDAQ stocks

As many studies of institutional ownership have confined their analyses to NYSE stocks, it is possible that our conclusions in Section 3.1 about the trends in stockownership as a function of market capitalization are due to our inclusion of NASDAQ stocks. To examine this possibility, we now analyze the trends in institutional ownership separately for NYSE and NASDAQ stocks. Although we find substantial differences in the distribution of institutional ownership across equal-cap deciles between NYSE and NASDAQ stocks, the analysis of only NYSE stocks leads to the same conclusion as in Section 3.1. Note that in the following analysis we use the same equal-cap decile cutoffs used in Section 3.1, with the result that market weights for an exchange within the cap-weighted deciles no longer approximate ten percent.

In 1980, the bulk of the $125 billion market value of NASDAQ stocks was tilted towards smaller stocks: 82 percent of this value was in the two smallest equal-cap deciles and none in the four largest equal-cap deciles (Table 2, Panel A). In contrast, at year-end 1980 NYSE stocks were underweighted in the two smallest deciles and overweighted in the largest seven deciles. By 2010, the distribution of NASDAQ stocks was bimodal with close to market weights in the largest three deciles, substantial underweight in the fourth and fifth decile, close to market weights in the sixth through ninth deciles, and substantial overweight in the smallest decile

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[7] Another way to illustrate the shift in institutional ownership is to compute the percentage of the value of a decile owned by institutions. Although the institutional ownership share grew across all the equal-cap deciles, the growth in the institutional ownership share of the large-cap stocks is much smaller than the growth in their shares of the small-cap and micro-cap stocks over our sample period. For example, the percentage of the large-cap stocks owned by institutions grew from 40.3% in 1980 to 60.0% in 2010. In contrast, the percentage of the micro-cap stocks owned by institutions grew from 11.9% in 1980 to 68.2% in 2010. And even though institutions underweighted the smallest 2% of stocks in 2010 relative to market weights (see footnote 3), the institutional ownership percentage of this tail of the distribution increased dramatically between 1980 and 2010 (from 3.75% to 45.7%). Thus, although institutions were steadily displacing individual investors across *all* strata of the market-cap spectrum, the displacement was largest for the micro-cap stocks.
[8] These results are based on deciles having equal total market values. Results using the more traditional equal-number deciles formed from market value rankings convey a similar message. In terms of equal-number deciles, institutional ownership in the largest decile declined from a 12.8 percent overweight in Dec 1980 to a 2.5 percent underweight in 2010, while institutional allocations to stocks in each of the nine other deciles increased over the same years. As shown below in Section 5.1, these differences can be reconciled by comparing the composition of our equal-cap deciles with the composition of the equal-number deciles

(although considerably less overweight than in 1980 (Table 2, Panel B)). The changes in the distribution of NYSE stocks were less dramatic between 1980 and 2010 with the most noticeable changes being a reduction in NYSE market value in the largest three deciles and an increase in the two smallest deciles.

Substantial differences in institutional holdings exist between NYSE and NASDAQ stocks. In 1980 institutions held a greater proportion of the market value of NYSE stocks in comparison to NASDAQ stocks (37.5 percent for NYSE and 17.2 percent for NASDAQ), but by 2010, this relationship had reversed (66.2 percent for NYSE and 71.6 percent for NASDAQ) (derived from Table 2). Consistent with overall trends, institutions increased their ownership of micro-cap stocks and decreased their ownership of large-cap stocks for both NYSE and NASDAQ stocks (Figure 3). For mid-cap stocks, institutions reduced their overweighting of NASDAQ stocks over the sample period, while institutions maintained a small, and mostly unchanged, overweight of NYSE stocks.

Thus, there are significant and important differences in the patterns of institutional allocations to NYSE and NASDAQ stocks over time. But the conclusion that institutions now and in recent years underweight the large stocks and overweight the smaller stocks holds for stocks overall and for NYSE stocks alone.

3.3 Some Issues Regarding SEC Reporting Requirements

It is possible that unique characteristics of the 13F data may in part be responsible for the relative increase in institutional holdings in small-cap and micro-cap stocks. As mentioned above, only institutions with more than $100 million of qualified securities are required to file Form 13F. This cutoff has not changed during our sample period even though the annual return on the equity market, as measured by the value-weighted CRSP index, averaged 12.9 percent from 1980 through 2010. This increase in market value could result in a relatively greater number of smaller institutions in the sample over time. If smaller institutions invest more heavily in small- and micro-cap stocks, as the shown in Section 5, an increase in the number of smaller institutions might over time increase the ownership percentage in small stocks from those reported above. To examine this possibility, we adjust the 1980 cutoff of $100 million dollars annually by the return on the CRSP value-weighted market index, and identify institutions that were required to file but would have fallen below this adjusted cutoff. The number of institutions falling below the adjusted cutoff increases to a high of 2567 in 2010,

while the number above the cutoff shows only a small increase from 511 in 1980 to 580 in 2010. Over most of our sample period, the institutions that fall below the adjusted cutoff underweighted the stocks in the largest seven equal-cap deciles and overweighted the stocks in the smallest three deciles. Even though the number of institutions falling below the cutoff is large, their market value in total is small due to the small size of each institution: for example, in 2010 these institutions represented only 6.1 percent of total institutional holdings. Eliminating them from the sample does not change our conclusions as to the trends in institutional ownership.[9]

Another issue arises from the way in which institutions report their holdings when they have lent these holdings to other investors. When an institution lends a security, it technically no longer owns the security and carries it as a receivable. Yet, the SEC requires that such an institution report the security as if it owned it on the rationale that the institution is still exposed to the risk of that security even if it does not have legal title. This is a reasonable rationale for the purpose of analyzing individual portfolios. For the purpose of analyzing trends in aggregate holdings, though, this SEC reporting requirement can result in a double-counting of the same security, which will occur if both the institution that lent the security and the one that ultimately holds the security are required to file a form 13F. Indeed, we find that the ratio of institutional ownership to the total market value of an individual security sometimes exceeds one, and a likely explanation of this observation is the double-counting associated with lending for 13F filers.[10]

There are numerous reasons to borrow and lend securities (e.g., short selling, dividend-recapture programs, and corporate voting schemes.) Although it would be desirable to adjust for all of these types of lending, the only publicly available data on security lending at the security level are short sales data. If the lender in a short sale transaction and the ultimate holder are both 13F filers, analysis of the 13F data overstates institutional ownership. If most lending of securities involves short sales and involves 13F filers, we can make a rough adjustment to institutional holdings by reducing the total 13F holdings in each security by the short interest in that security.

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[9] Gompers and Metrick (2001) also examined this bias and found that during their sample period (1980–1996) institutions were sufficiently concentrated above this breakpoint that any resulting bias is minimal.

[10] We find numerous instances where the market value of the holdings for a stock from the Thomson data exceeds the outstanding market value of the stock as reported in CRSP. (Most of these violations were concentrated in the smallest three equal-cap deciles, with no violations in the largest four deciles.) For these observations, we reduced the institutional holdings to the outstanding market value.

To adjust for this double-counting, we use the short interest at the end of each quarter from Compustat Xpressfeed from 2007 to 2010. Prior to 2007 and going to back to 2003, we approximate the short interest at the end of the quarter by the mid-month short interest of the last month in each quarter by mid-month short interest, as month-end data are not available. We find that this adjustment reduces the percentage of stock held by institutions in the four largest and two smallest deciles, but has a negligible effect on their allocations to stocks in deciles five through eight. Even with this adjustment, it is still the case that institutions decreased allocations to the largest stocks during the period and underweighted them by the end of 2010, and increased their allocations to the two smallest deciles during the period. Unlike our earlier conclusions, though, the adjusted holdings indicate that institutions slightly underweighted the stocks in the smallest decile relative to market weights at the end of 2010. As short interest data are available only after 2002 and the adjustment for short interest does not materially affect our findings, the analysis in the rest of the paper relies on the unadjusted holdings data.

4. Institutional Ownership Results: Comparison with Previous Literature

As discussed in Section 3, previous researchers, with the notable exception of Bennett, et al. (2003), conclude that the relative allocation of institutional portfolios as between large and small stocks in recent decades has remained largely unchanged. Our conclusions differ in that institutions over time decreased the relative allocation of their portfolios to large-cap stocks and increased their allocations to small- and micro-cap stocks. Whether the relative institutional allocation to large stocks has been stable or not is economically important, as Gompers and Metrick (2001) (hereafter GM) argue that a stable institutional allocation contributed to increased aggregate demand for large-cap stocks and, thereby, "can explain part of the disappearance of the historical small stock premium."

In an attempt to reconcile the differences, we take a closer look at the results in GM. They base their conclusion of an increasing demand for larger stocks over time on two observations. First, the institutional ownership percentage of common stocks has increased over time: this is consistent with our results. Second, there is an institutional preference for larger stocks that has been stable over recent decades; this observation differs from our results. Specifically, GM find a positive correlation between institutional ownership (measured by the ratio of shares owned by institutions to shares outstanding) and the logarithm of the market value

of the shares outstanding.[11] From the first quarter of 1980 through the last quarter of 1996, they report an average cross-sectional correlation of 0.625 (computed every quarter, across individual securities), and assume this relation is stable over their sample period.   We replicated their analysis for the 124 quarters from the first quarter of 1980 through 2010 and find that the correlations varied from a low of 0.58 to a high of 0.68. These correlations are consistent with theirs and on the surface suggest a stable relation.

To help resolve this paradox, we focus first on 1980 and plot in Figure 4A the linear regression of the percent of institutional ownership in each stock on the logarithm of its market value, treating the market value variable as an exogenous variable as they do. We also plot the unweighted means of these two variables for each equal-cap decile and center upon each point a disk whose area is proportional to the number of stocks in the decile used in the regression. As a measure of specification, we also indicate the average residual for each decile.   The regression overestimates institutional holdings in the two largest equal-cap deciles by large amounts, slightly overestimates institutional holdings in the smallest decile, and underestimates institutional holdings in the middle deciles.   This pattern of over and underestimates suggests that the linear specification is inappropriate – the expected residual conditional on the independent variable are not zero – and that a non-linear function would better fit the data. Further, the large number of observations in the two smallest equal-cap deciles relative to the small number in the larger equal-cap deciles, coupled with the differences in institutional holding in the smaller equal-cap deciles, may be driving the positive slope. As a rough test of this conjecture, we set the ratio of institutional holdings to zero for each stock in the four largest equal-cap deciles.   The re-estimated average correlation coefficient over our sample is 0.23, still positive.

These diagnostics suggest that the data better conform to a non-linear specification. As reported in Table 1, institutions in 1980 underweighted the largest equal-cap decile and the three smallest equal-cap deciles, with substantial underweights in the smallest decile. They

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[11] GM also illustrate this result in a multiple regression in which the institutional ownership ratio is regressed on a number of stock characteristics, including log of market capitalization. Bennett, Sias and Starks (2003) report a regression result similar to GM using the same institutional ownership ratio. Campbell, Ramadorai and Schwartz (2009) find that institutions decreased their allocations to small-cap and increased their allocation to large-cap stocks. CRS compute the ratio of the quarterly change in number of shares held by institutions to total shares outstanding for each stock, and find that the average of the ratio is negative in the smallest equal-number size quintile and positive in the four largest quintiles (see their Table 1). However, their ratio measures the change in the number of shares held and not the change in value of shares held, and thus does not tell us much about changes in institutional portfolio allocations.

overweighted the middle equal-cap deciles. Over time, we find that institutions gradually reduced their relative holdings in the four largest equal-cap deciles while increasing their relative holdings in the smaller equal-cap deciles.   To analyze the effects of these changes on the linear regression specification, we produced a plot like Figure 4A for 1996, the last year of the GM study, and report it in Figure 4B. Like the 1980 analysis, the large number of stocks in the smallest equal-cap deciles appears to be driving a positive relation between institutional holdings and log of market capitalization – and now the estimated linear model for 1996 overestimates institutional holdings for the seven largest equal-cap deciles. The diagnostics again suggest a non-linear relationship, but one that has changed dramatically from that in 1980.

In sum, GM's conclusion of increased demand for large-cap stocks rests on a model whose specification is inconsistent with the data. As shown above in Section 3, institutions over time actually have reduced their relative allocations to large stocks and increased their relative allocations to small stocks.

5. The Distribution of Stock Ownership by Type of Institution

In actively managing a portfolio, the strategy used by an investment manager might limit the number of securities that a portfolio can contain. As one example, some managers will only invest in companies whose headquarters they have personally visited, and clearly time considerations will limit such visits. Similarly, some managers review in detail companies' filings with the SEC, and again there is a limit on the number of companies that can be followed. And some institutional investors are legally limited with regard to the percentage of an individual company's stock they can own, and others may perceive that federal and state diversification requirements require similar limitations.[12] Thus, one might conjecture that those larger active institutions that face practical limits on the number of securities they can hold *will limit their investments in small- and micro-cap companies.* If they were to invest in smaller companies, there may not be enough stock outstanding to satisfy their investment needs and even if there were, they would necessarily have to take large positions that likely would entail large transactions costs.[13] SEC reporting requirements for holdings in excess of five percent, and

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[12]On the other hand, some managers use quantitative screens and presumably even the largest quantitative manager faces few limitations on the number of securities in which they invest, provided the allocations are approximately proportional to the market value of each stock (e.g., an enhanced index fund.)
[13] See, e.g., Chan and Lakonishok (1995) and Keim and Madhavan (1997) for evidence on the magnitudes of price impacts and trading costs associated with common stock trades of institutional investors.

possibly violations of statutory limits on investment in individual companies are further constraints. Such constraints, however, are not as binding on smaller institutions, *thus enabling them to include in their portfolios small- and mid-cap stocks*.

5.1 Large versus Small Institutions

To explore these conjectures, we break our sample each year into four quartiles of institution size from the largest to the smallest, where each quartile has approximately the same total market value in the same manner as the equal-cap deciles. Thus, the largest quartile contains many fewer institutions than the smallest quartile. As an example, at the end of 2010 the largest quartile contained six institutions and the smallest contained 2991 institutions. And these smaller institutions manage substantially smaller portfolios than the larger institutions, enabling them to include in their portfolios toward small- and micro-cap stocks. The average market value of the assets reported by the smallest institutions is 1.1 billion dollars and the median is 0.29 billion dollars, while the average market value of the assets reported by the largest institutions is 488.7 billion dollars and the median is 532.52 billion dollars. The maximum value of assets under management is $13.70 billion.

We then cross-classify the holdings of the institutions by both manager-size quartiles and the equal-cap deciles described earlier. To conserve space, we limit this discussion to the quartile of largest institutions and the quartile of smallest institutions. As conjectured, the largest institutions overweight large- and mid-cap stocks relative to market weights, and underweight the small- and micro-cap stocks for most of the sample from 1980 through 2007 (Figure 5, Panel A). Over time, however, the largest institutions gradually shifted their holdings of large-cap stocks into small- and micro-cap stocks: the change in the average overweight of the large-cap stocks between the first and second halves of our sample period is -7.26% (t = -4.69); in contrast, the change in the average underweight of the small-cap and micro-cap stocks between the first and second halves is 15.88% (t = 4.60) and 16.53% (t = 3.26) respectively. By December 2010, the largest institutions had virtually eliminated their overweight of the large- and mid-cap stocks, and dramatically reduced their underweight of small- and micro-cap stocks; in fact, the largest institutions had a slight overweight in small-cap stocks after 2007. This shift towards smaller stocks is consistent with a growth in more quantitatively-oriented portfolio strategies among the large institutions, where portfolio weights are now close to market weights.

We noted above that the smallest institutions report substantially smaller assets on Form 13f than larger institutions and conjectured that the smallest institutions have correspondingly greater flexibility to invest in smaller stocks. Panel B of Figure 5 confirms this conjecture – the smallest institutions did indeed increase their small- and micro-cap tilts to a much larger extent than did the larger institutions over the sample period. The smallest institutions overweighted small-cap stocks for the entire period, increasing their overweight from five percent in 1980 to 52 percent in 2010. And their allocations to micro-cap stocks exhibited a more dramatic increase over the period, beginning with a 39 percent *underweight* in 1980 and ending with a 51 percent *overweight* in 2010. The increase in the average overweights between the first and second halves of our sample period is 25.60% (t = 8.13) for the small-cap stocks and 61.82% (t= 10.58) for the micro-cap stocks. In contrast, the underweight by the smallest institutions of large-cap stocks became more pronounced throughout the period, ending 2010 with an underweight of about 29 percent. The decrease in the average underweight of the large-cap stocks between the first and second halves is −17.40% (t = −8.60).[14]

5.1 Hedge Funds versus Non-Hedge Funds

In this section we explore the extent to which the proliferation of hedge funds in recent years contributed to the increased institutional holdings of small-cap and micro-cap stocks. Our first task is to develop a list of hedge funds (HFs), and we begin with the annual list of the largest 100 HFs from *Institutional Investor Magazine* for each year-end from 1997 to 2010.[15] To these we add funds from a list of the 100 largest HFs in the Goldman Sachs database (Kostin, et.al (2009)). Finally, following Brunnermeier and Nagel (2004) and Griffin and Xu (2009), we consult *Nelson's Directory* and the ADV forms on the SEC Website and identify additional HFs (ranging from 27 in 1998 to 48 in 2006), requiring each fund to have over half of its assets listed as "other pooled investment vehicles (e.g., hedge funds)" or over half of its clients to be "high

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[14] Although not reported here, more detailed analysis of the growth in stock ownership by the four institutional size categories in large-cap, mid-cap, small-cap, and micro-cap stocks presents an interesting alternative perspective. We make three observations: (1) ownership of large-cap stocks by the smallest institutions remained largely unchanged over the period, in contrast to (similar) positive growth in ownership of these stocks by all three larger institutional categories; (2) the growth in ownership of mid-cap stocks is almost the same across the four institutional size quartiles; (3) there was substantial growth in small- and micro-cap ownership across all institutional categories throughout the sample period, but the smallest institutions consistently owned almost twice the amount of small-cap and micro-cap stocks than did any of the other individual manager size quartiles. For example, at December 2012, the smallest institutions owned $428.9 of the micro-cap stocks, representing 36.3 percent of all institutional holdings of those stocks.

[15] We thank Chris Geczy for providing this list for the earlier years in our sample.

net worth individuals." We manually match our list of HF names with the parent institution names in the 13F file and identify the Thompson "mgrno" codes, thereby allowing us to obtain holdings data for them. The HFs in our sample fall in the fourth (208 funds in Dec 2010) and third (8 funds in Dec 2010) quartiles of institution size as defined in the previous section.

Since most of the HFs in our sample fall in the smallest (fourth) quartile of institutions in most years, we restrict our comparisons to just those institutions in the fourth quartile. Our resulting HF sample at year-end 2010 consisted of 208 funds with equity holdings of $689 billion, or 4.03 percent of all stocks outstanding (Table 3).[16] We contrast the hedge fund and non-hedge fund ownership allocations in Figure 5C. Panel C differs from Panel B in that we report in Panel C the percentage over- and under-weighting separately for hedge funds and non-hedge funds for the years 1997 to 2010. Panel C clearly shows that relative to the other institutions in the smallest quartile HFs had on average a significantly larger overweight of small-cap stocks (difference = 44.12%, t = 12.04) and micro-cap stocks (difference = 38.06%, t = 6.13) over our sample period. After the financial crisis in 2007-2008, however, HFs significantly reduced their allocations to micro-cap stocks, and during 2009 and 2010 the HF overweights of micro-cap stocks were similar to those of the other small institutions. Throughout the entire 1997-2010 period, HFs also had a significantly larger underweight in large-cap stocks relative to the other smallest quartile institutions (difference is 27.08%, t=16.41).

The results in Figure 5 show that HFs had significantly larger portfolio tilts to small- and micro-cap stocks than comparable small non-HF institutions. In addition, the HF share of the smallest institutional quartile's holdings of the small-cap (micro-cap) sector grew from 5.2% (9.4%) at December 1997 to 19.8% (15.9%) at December 2010.

6. Changing Investment Strategies, Laws, and Regulations

The results in this paper raise the question of why institutions as a group gradually shifted their equity holdings from larger-cap to smaller-cap stocks. There are at least two factors that might have contributed to this shift. First, institutional investors, regulators, and lawmakers

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[16] How does our HF sample compare to samples used by other researchers? In their Table 1, for example, Griffin and Xu (2009) report that their sample covering the years 2000 through 2004 contained approximately 200 HFs with average equity holdings of $2.105 billion, or a total of $421 billion in equity holdings. From our Table 3, the average values for the same period are 126 funds with total equity holdings of approximately $224 billion, a little more than half the size of theirs. On the other hand, our sample contains more HFs with a larger total market value than the sample in Brunnermeier and Nagel (2004), which includes about 40-45 hedge funds in the period 1998 to 2000 with an aggregate value of about $45 billion. The corresponding averages for our sample are 82 HFs with total holdings of just under $130 billion

became more knowledgeable about how diversification reduces idiosyncratic risk, and the legal and regulatory environment evolved, albeit very slowly, to accommodate diversification into riskier smaller-cap stocks. Second, the identification by Banz (1981) of a small stock premium led to increased institutional interest in these previously-ignored stocks, particularly among active managers who might find it easier to add value with investments in smaller stocks than larger stocks.

6.1 Evolution of the Institutional Investment Environment

To address the first factor, and to put into perspective the slow pace of change in investment philosophy over the years, we begin with some history. According to the comprehensive summary of fiduciary responsibility in the twentieth century by Shattuck (1951), partially summarized in this paragraph, the emphasis in institutional investing at the beginning of the century was the preservation of principal. The majority of states had "legal" lists of allowable investments for personal trusts, which almost always excluded equities.[17] Most other states utilized the "prudent man standard," as set forth in *Harvard College v. Amory*. Although the prudent man standard allowed somewhat more flexibility in choosing investments, subsequent court cases made clear that safety of principal of each investment was paramount. Any fiduciary who invested in an asset not included in the legal list or deemed imprudent could be surcharged on the loss on that asset, even if the entire portfolio turned a profit. The legal focus was on the total risk of the individual security, which includes idiosyncratic risk, not on the contribution of that security to the risk of the portfolio. This resulted in very conservative institutional portfolios. Nevertheless, Shattuck observed that institutions gradually increased their allocations to equities over the first half of the 1900s. Data in the Institutional Investor Study (1971) confirms this observation.[18]

The emphasis on the total risk of the individual security began to shift in 1952 with the publication of Harry Markowitz's seminal work on portfolio diversification. Institutional investors that had shied away from small stocks because of the perception that they were too risky now had the tools to properly evaluate their risk in the context of a portfolio. But

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[17] The laws and regulations for personal trusts are important in understanding the investment practices of that time as personal trusts held 60.3 percent of institutionally held stock. Investment companies and private pension were much less important, holding only 20.6 percent; insurance companies and banks held the remaining stock. These percentages were derived from Table 2-19 of the Supplementary Volume I of the Institutional Investor Study (1972).
[18] As further evidence, New York had increased its allowable percentage in equities for personal trusts from zero percent in 1900 to thirty five percent in 1950.

acceptance of Markowitz's portfolio theory by the investment community, as well as those providing oversight, would take years. It was not until 1974 that Congress enacted the Employee Retirement Investment Security Act (ERISA), which states a security's risk should be evaluated in the context of a portfolio. Unfortunately, initial language from the Department of Labor clarifying the Act muddied this intent, resulting in confusion regarding interpretation and compliance with the law, thereby slowing institutional adoption.[19] Note that ERISA covered only private pension funds; other institutional funds such as personal trusts were still subject to the old rules.

In 1992 the American Law Institute and the Uniform Law Commission drafted the Restatement (Third) of Trusts, which stated that for personal trusts the risk of a security should be judged within the context of the portfolio; and in 1994, these organizations drafted similar language in the Uniform Prudent Investor Act (UPIA).[20] These two organizations draft pro forma language for new laws that individual states have the option of adopting verbatim or with modifications.[21] This adoption process takes time – not all states enact the proposed law at the same time, and some never do. Schanzenbach and Sitkoff (2009) report that by 2009 only 41 states had adopted some variant of UPIA. Exploiting this slow adoption, they conduct an event study of the state-by-state adoption of UPIA and show that after a state adopts some variant of UPIA, bank trusts increase their percentage allocations to equities. This finding indicates that these changes in state laws relaxed the binding constraints on desired investment allocations. However, Schanzenbach and Sitkoff were not able to document the actual changes in the composition of the equity portfolios held by bank-administered trusts. Our analysis complements their study by showing that institutions shifted their equity investments to small- and micro-cap stocks.

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[19] Schanzenbach and Sitkoff (2009) explain that the explanatory material that accompanied ERISA indicated that a security's risk should be evaluated in the context of a portfolio, but the total risk of the individual security is also relevant. The resulting confusion highlighted that the ultimately-accepted interpretation of a law is not always immediately apparent, and it may take years for legislators, regulators, and the courts to give precise meaning. An institution's interpretation of the new rules and corresponding investment decisions may turn out to be inconsistent with the ultimate interpretation of the law, resulting in litigation. This risk of litigation slows the adoption of the new laws. Further, the practices of investment managers trained in the old rules might also take years change.
[20] In 2006, the National Conference of Commissions on Uniform State Laws proposed the Uniform Prudent Management of Institutional Funds Act (UPMIFA), which extended the provisions of UPIA to charitable entities organized as corporations. As of this writing all states but Pennsylvania have adopted some variant of this proposed Act.
[21] Of note, the National Conference of Commissioners on Uniform State Laws proposed in 1972 for adoption by the states the Uniform Prudent Management of Institutional Funds Act (UMIFA). This Act is important as it allowed charities organized as corporations to focus on the total return of the investments, facilitating the investment in smaller stocks, which often pay low or no dividends. UPIA also focuses on total return.

6.2 The Relative Returns of Small- and Large-Cap Stocks

The question is why institutions, while generally increasing their portfolio allocations to equities, also shifted from large to smaller stocks. This brings us to the second factor mentioned above – the well-known premium of small-cap stocks relative to large-cap stocks. Although the average returns of small stocks exceed the average returns of large stocks over long periods, it is worth pointing out that the magnitude and sign of this return difference varies over time. For example, the average monthly small-stock premium as measured by SmB, the size factor from Fama French (1993), was 0.46% (standard error = 0.22%) over the 1963-1979 period preceding Banz's study. In contrast, the average monthly value of SmB is 0.01% (0.17%) for the period 1980-1996. Gompers and Metrick (2001) relied on the reduction in the small-stock premium during this period to claim that the small stock premium had "disappeared," inaccurately attributing it's disappearance to stable institutional demand for large-cap stocks. For 2001-2010, covering the period after publication of Gompers Metrick to the end of our sample period, the average value of SmB is 0.58% (0.25%). Based on this significant size premium in the most recent subperiod, as well as the significant average SmB value of 0.19% (0.10%) over the entire 1927-2012 period, it is safe to conclude that institutions might be attracted to the opportunities associated with investing in small-cap stocks.[22]

A low-cost way to capture the returns of small-cap stocks is by passive or indexed methods, but this turns out to represent a small percentage of the total small-cap institutional universe. For example, the Micro-Cap Fund (formerly the 9-10 Fund) of Dimensional Fund Advisors, one of the premier passive small-cap managers, had $4.0 billion in AUM at the end of 2010, only 0.23% of the total value of the $1.708 trillion in our tenth decile at year-end 2010 (derived from Table 1). And based on the Evestment Alliance database of U.S. asset managers at year-end 2010, only 22.6% of the $246.2 billion benchmarked to the Russell 2000 represented passive management, 77.4% represented active strategies. Thus, a significant portion of the institutional investor growth in the small-cap area documented in this paper likely represents actively-managed portfolios. The growth of the hedge fund industry and our findings of hedge fund over-weights in smaller stocks (figure 5C) are consistent with active management. Because active management relies on the identification of mispriced securities, a possible reason for the

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[22] Given that this observed variation in the small-cap premium coincided with steadily increasing institutional allocations to small-cap stocks (as documented in section 3), it is unlikely that the small-cap premium was influenced by patterns in institutional investor behavior as suggested by Gompers and Metrick.

increased focus of institutional investors on smaller-cap stocks is that mispricing is more likely for smaller stocks than for larger stocks.

The literature documents that there are fewer analysts and investors examining the fundamentals of smaller companies than larger companies (e.g., Arbel and Strebel (1983), Beard and Sias (1997) and many others), so there will be more random noise in the pricing of smaller stocks than larger stocks. If investment managers can filter fundamental signals from this noise via security analysis, it will be easier for an investment manager to add value by investing in smaller stocks than in larger stocks. To test this conjecture we ask whether the variability of individual security alphas (i.e., mispricing) is greater for small stocks than for large stocks.

We begin by computing weekly returns for each stock in the CRSP daily returns file, eliminating those weekly returns for which the stock did not trade on each eligible trading day during the week. We then estimate alphas relative to the three-factor model for each stock in every year in which it had fifty weekly returns.[23] For each of our four size groups (as defined in section 3.1) for each year, we calculate the cross-sectional standard deviation of the individual security alpha estimates. As the variability of the alphas within a group of stocks increases, the reward for successful security analysis could increase. In Figure 6, there is a clear inverse relation between these standard deviations and size groups that prevails throughout our sample period. On the basis of the Kendall Coefficient of Concordance (see, e.g., Siegel (1956), pages 229-237), the null hypothesis that the ranking of the estimated standard deviations across the cap deciles within a year are independent of other years is rejected at the one percent level. Also of interest is the lack of obvious time trends in these standard deviations within any size group; this indicates the increasing institutional ownership trends documented in sections 3 and 5 are not associated with any increase in the informational efficiency in the pricing of individual stocks.

7. Conclusion

In this paper we document trends in the growth of institutional ownership of common stock using 13F holdings data. Since 1980 institutional investors have gradually shifted their portfolio allocations from larger stocks to smaller stocks; as of 2010 institutions underweight larger stocks, and overweight the smallest stocks, in comparison to market weights. We also show that although these trends apply to institutions of all sizes, they are most pronounced for smaller institutions. And for the shorter fourteen-year period from 1997 through 2010, we find

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[23] Weekly factor returns are from Ken French's Website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

that of these smallest institutions, hedge fund portfolios exhibited the greatest shift towards smaller stocks.

Why did institutions gradually shift their equity holdings from larger-cap to smaller-cap stocks? We propose two changes in the institutional investment environment that might have contributed to this shift. First, institutional investors, regulators, and lawmakers became more knowledgeable about how diversification reduces idiosyncratic risk, and the institutional investment environment evolved to accommodate diversification into riskier smaller-cap stocks. Second, the identification of the small stock premium led to increased institutional interest in these previously-ignored stocks, particularly among active managers who might find it easier to add value with investments in smaller stocks than larger stocks.

Appendix

In this appendix we compare our equal-cap decile weighting scheme to other weighting methods. As described in Section 3, each equal-cap decile contains approximately ten percent of the market value of all stocks. As a result, the number of stocks per decile varies dramatically. These characteristics are evident under the columns labeled "Equal Cap" in Table A1 where we report the market value and number of securities in each decile at year-end 1980 and 2010. For example, at year-end 2010, the smallest decile contains 77.8 percent of all the securities in our sample while the largest decile contains only 0.2 percent.

An alternative is equal-number deciles in which each decile contains an equal number of stocks. As a result, the market values of the deciles vary dramatically. The characteristics of the deciles in this scheme are reported under the columns "Equal Number" in Table A1. Looking again at December 2010, the stocks comprising the largest equal-number decile have a market value that represents almost 77.3 percent of the entire market, while the smallest equal-number decile has a market value less than 0.1 percent of the total market.

The composition of our deciles is also very different from that of the U.S. market-cap-based portfolios published by CRSP. In its procedure, CRSP first ranks NYSE-listed US stocks by market value and assigns an *equal number* of stocks to each decile. It then uses the resulting market-value breakpoints to assign NASDAQ and AMEX stocks to the deciles. Although this approach falls between the equal market value and the equal number approaches, it is closer to the equal-number method. For example, by applying the CRSP algorithm to the stocks used in this study for year-end 2010, we find that the market value of the stocks in the largest decile makes up 60.5 percent of the market value of all stocks and the stocks in the smallest decile makes up 1.1 percent.[24]

The stratification we use in this paper better highlights deviations from market portfolio weights, especially for larger stocks, than other commonly used stratification methods. If the objective is to understand market-wide relations, such as the investment performance of institutions relative to the market, the equal-number scheme has less power than the equal-cap scheme because cross-sectional variation in relative weights for up to 77 percent of the market is obscured by combining all this value into one decile. On the other hand, if one is testing

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[24] Note that CRSP uses all stocks in its indexes, whereas we exclude ADRs, ETFs, and closed-end investment companies.

hypotheses about individual securities independent of their market value, equal-number (or CRSP) deciles will have more power than our equal-cap deciles.

References

Arbel, A., P. Strebel, 1983. Pay attention to neglected firms! Journal of Portfolio Management, 37-42.

Banz, R.W. 1981. The relationship between return and market value of common stocks, Journal of Financial Economics 9, 3-18.

Beard, C. G., R. W. Sias. 1997. Is there a neglected firm effect. Financial Analysts Journal, 19-23.

Bennett, J. A., R. W. Sias, and L. T. Starks, 2003. Greener pastures and the impact of dynamic institutional preferences. The Review of Financial Studies 16, 1203-1238.

Blume, M.E., and D.B. Keim. 2014. Data errors and inferences about average stock returns: A Note on Errors in Thomson 13f Data. Working Paper.

Brunnermeier, M., S. Nagel, 2004. Hedge funds and the technology bubble. Journal of Finance 59, 2013-2040.

Campbell, J. Y., T. Ramadorai, A. Schwartz, 2009. Caught on tape: institutional trading, stock returns, and earnings announcements. Journal of Financial Economics 92, 66-91.

Chan, L. K. C., J. Lakonishok, 1995. The behavior of stock prices around institutional trades. Journal of Finance 50, 1147-1174.

Del Guercia, D., 1996, The distorting effect of prudent-man laws on institutional equity investments. Journal of Financial Economics 40, 41-62.

Gompers, P. A., A. Metrick, 2001. Institutional investors and equity prices. The Quarterly Journal of Economics, 229-359.

Griffin, J. M., J. Xu, 2009. How smart are the smart guys? a unique view from hedge fund stock holdings. Review of Financial Studies 22, 2531-2570.

Falkenstein, E., 1996. Preferences for stock characteristics as revealed by mutual fund portfolio holdings. Journal of Finance 52, 111-136

Fama, E. F., K. R. French, 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33, 3-56.

Keim, D. B., A. Madhavan, 1997. Transaction costs and investment style: An interexchange analysis of institutional equity trades. Journal of Financial Economics 46, 265-292.

Kostin, D., N. Fox, C. Maasry and A. Sneider, 2009. Hedge Fund Trend Monitor. (various dates, The Goldman Sachs Group).

Markowitz, H., 1952, Portfolio Diversification, Journal of Finance 7, 77-91.

Schanzenbach, M. M., and R. H. Sitkoff, 2009, The Prudent Investor Rule and Trust Asset Allocation: An Empirical Analysis, ACTEC Journal 35, 314-330.

Securities and Exchange Commission, Institutional Investor Study Report. (Washington: U. S. Government Printing Office, 1971)

Shattuck, M. A., 1951, The Development of the Prudent Man Rule for Fiduciary Investment in the United States in the Twentieth Century, Ohio State Law Journal 12, 491-521.

Siegel, S., 1956, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill)

Table 1
Percentage Distribution of Stock Ownership by Market Cap Deciles: All Stocks, all Institutions
Year-end 1980 and 2010

This table presents the percentage distribution of stock analyzed in this study by market cap-deciles, where the largest decile contains the largest stocks whose total market value equal to or less than 10 percent of the total market value of all stocks. The second decile contains the next largest stocks whose total market value combined with the stocks in the largest cap-decile is less than 20 percent of the total market value of all stocks, and so on for the remaining deciles. Also presented are the upper bound values for each decile, and total numbers of stocks in each decile along with the corresponding cumulative number. Market values are in billions of dollars.

	Market Cap Decile										Total Value
	Largest	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**	**9th**	**Smallest**	**Total Value**
A. 1980											
All Stocks	9.74	10.25	9.92	9.91	10.10	10.07	9.96	10.04	10.01	10.01	1,375.93
All Institutions	9.99	11.02	13.51	12.07	10.99	11.67	10.47	9.69	7.12	3.47	473.26
Memo: All Stocks											
Number	4	9	20	35	59	87	133	230	514	3,753	
Cumulative	4	13	33	68	127	214	347	577	1,091	4,844	
Upper Bound of Decile	39.63	22.35	9.83	5.03	2.87	1.95	1.29	0.81	0.43	0.17	
B. 2010											
All Stocks	9.68	10.07	10.02	10.17	9.93	10.09	10.04	9.98	10.02	10.01	17,084.33
All Institutions	7.75	9.50	9.38	9.06	9.77	10.82	10.74	11.39	11.42	10.18	11,471.06
Memo: All Stocks											
Number	7	11	18	32	48	74	123	214	483	3,545	
Cumulative	7	18	36	68	116	190	313	527	1,010	4,555	
Upper Bound of Decile	368.71	180.07	115.90	72.69	43.78	29.15	18.76	10.96	5.64	2.28	

Table 2

Distribution of Institutional Holdings, Separately for NYSE and Nasdaq Stocks (Year End 1980 and 2010)

This table presents the percentage distribution of stock analyzed in this study by market cap-deciles, where the largest decile contains the largest stocks whose total market value equal to or less than 10 percent of the total market value of all stocks. The second decile contains the next largest stocks whose total market value combined with the stocks in the largest cap-decile is less than 20 percent of the total market value of all stocks, and so on for the remaining deciles. Also presented are the upper bound values for each decile, and total numbers of stocks in each decile along with the corresponding cumulative number. Total market values are in billions of dollars.

		Market Cap Decile										Total Value
		Largest	2nd	3rd	4th	5th	6th	7th	8th	9th	Smallest	($ Billion)
A. 1980												
NYSE:	Market Weights	11.34	11.95	11.56	10.56	11.34	10.58	11.02	9.99	7.98	3.68	1180.9
	Institutional Weights	10.67	11.77	14.43	12.70	11.49	11.92	10.68	9.18	5.59	1.56	443.2
NASDAQ:	Market Weights	0.00	0.00	0.00	0.00	2.28	4.32	2.83	8.71	24.78	57.08	124.9
	Institutional Weights	0.00	0.00	0.00	0.00	4.93	5.57	6.79	18.45	29.54	34.72	21.4
B. 2010												
NYSE:	Market Weights	8.56	10.81	10.08	12.52	11.69	10.47	10.70	9.81	9.41	5.96	13109.1
	Institutional Weights	6.25	10.13	9.41	11.11	11.74	11.06	11.52	11.12	11.02	6.63	8673.1
NASDAQ:	Market Weights	13.78	7.85	10.11	2.51	3.37	9.10	8.09	10.87	12.02	22.29	3856.6
	Institutional Weights	12.54	7.61	9.41	2.75	3.51	10.21	8.43	12.39	12.51	20.65	2763.2

Table 3

**Total Hedge Fund assets and # of Funds
for HFs in Manager Size Quartile 4**

	Tot Value of HF Stock Holdings		
year	($ millions)	% of Total Mkt	# Funds
1997	46,454	0.44%	36
1998	99,714	0.76%	76
1999	148,995	0.88%	79
2000	138,643	0.90%	91
2001	211,568	1.55%	121
2002	193,962	1.80%	130
2003	249,717	1.76%	140
2004	327,670	2.05%	148
2005	402,415	2.40%	139
2006	611,636	3.25%	174
2007	650,309	3.38%	180
2008	318,636	2.80%	178
2009	564,933	3.84%	199
2010	688,768	4.03%	208

Table A1

This table reports the market value of, and the number of securities in, each decile under three alternative methods for creating deciles: (1) the equal-cap approach used in this paper; (2) the equal-number approach commonly used in much academic research; and (3) the CRSP approach (CRSP first ranks NYSE-listed US stocks by market value and assigns an equal number of stocks to each decile. It then uses the resulting market-value breakpoints to assign NASDAQ and AMEX stocks to the deciles.) Year-end results are reported for 1980 and 2010.

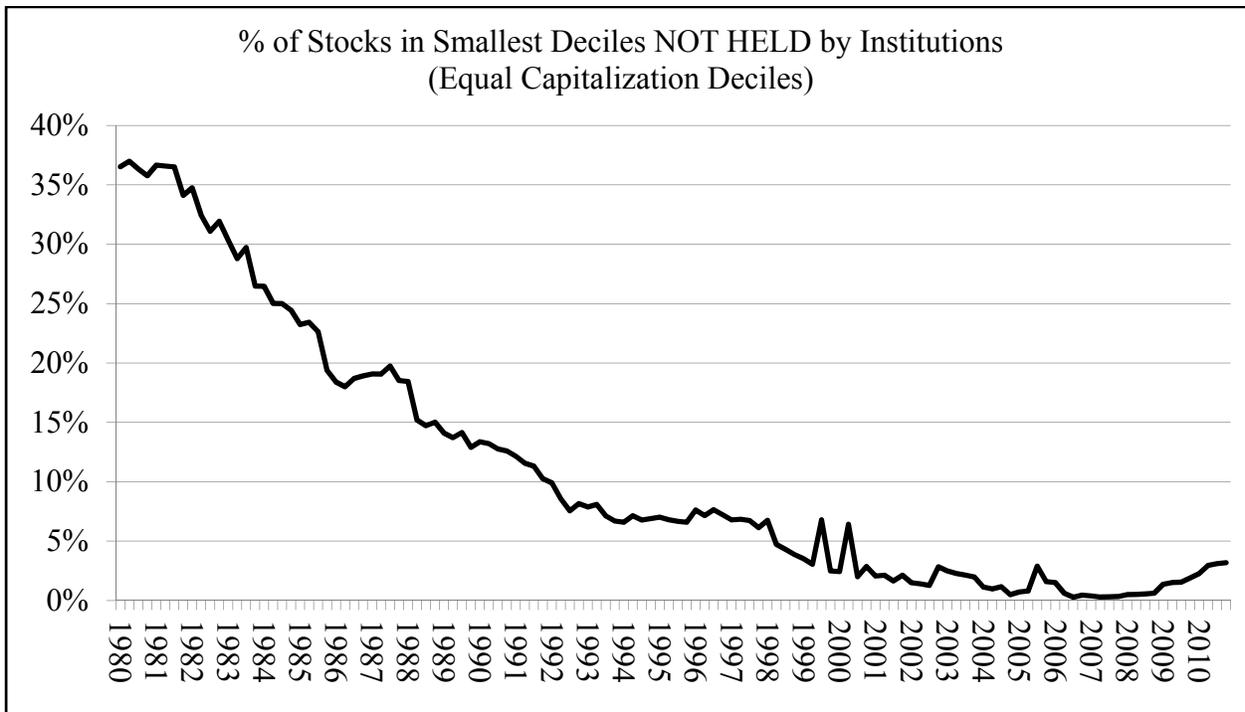| | Basic Data | | | | | | Percentage by Decile | | | | | |
| | Market Value of Decile ($ Billion) | | | Number of Securities in Decile | | | Market Value of Decile | | | Number of Securities in Decile | | |
Equal Cap Decile	Equal Cap	CRSP Approach	Equal Number	Equal Cap	CRSP Approach	Equal Number	Equal Cap	CRSP Approach	Equal Number	Equal Cap	CRSP Approach	Equal Number
A. December 1980												
Largest	133,952	743,327	1,055,611	4	158	484	9.7	54.0	76.7	0.1	3.3	10.0
2	141,085	189,805	160,178	9	155	484	10.3	13.8	11.6	0.2	3.2	10.0
3	136,457	122,479	69,227	20	171	485	9.9	8.9	5.0	0.4	3.5	10.0
4	136,286	80,740	36,898	35	185	484	9.9	5.9	2.7	0.7	3.8	10.0
5	138,971	60,975	22,000	59	214	484	10.1	4.4	1.6	1.2	4.4	10.0
6	138,536	46,056	13,797	87	240	485	10.1	3.3	1.0	1.8	5.0	10.0
7	137,076	44,307	8,741	133	357	484	10.0	3.2	0.6	2.7	7.4	10.0
8	138,156	30,218	5,290	230	390	485	10.0	2.2	0.4	4.7	8.1	10.0
9	137,710	28,505	3,026	514	625	484	10.0	2.1	0.2	10.6	12.9	10.0
Smallest	137,695	29,512	1,155	3753	2349	485	10.0	2.1	0.1	77.5	48.5	10.0
Sum	1,375,925	1,375,925	1,375,925	4,844	4,844	4,844	100.0	100.0	100.0	100.0	100.0	100.0
B. December 2010												
Largest	1,653,265	10,334,799	13,206,528	7	195	455	9.7	60.5	77.3	0.2	4.3	10.0
2	1,719,803	2,459,517	1,921,056	11	206	455	10.1	14.4	11.2	0.2	4.5	10.0
3	1,711,935	1,389,530	887,913	18	231	456	10.0	8.1	5.2	0.4	5.1	10.0
4	1,737,578	782,715	469,565	32	220	455	10.2	4.6	2.7	0.7	4.8	10.0
5	1,697,281	559,528	271,807	48	228	456	9.9	3.3	1.6	1.1	5.0	10.0
6	1,723,359	477,137	156,041	74	277	455	10.1	2.8	0.9	1.6	6.1	10.0
7	1,715,088	390,352	91,718	123	353	456	10.0	2.3	0.5	2.7	7.7	10.0
8	1,704,620	284,453	49,021	214	407	455	10.0	1.7	0.3	4.7	8.9	10.0
9	1,711,049	217,478	23,007	483	551	456	10.0	1.3	0.1	10.6	12.1	10.0
Smallest	1,710,356	188,824	7,677	3545	1887	456	10.0	1.1	0.0	77.8	41.4	10.0
Sum	17,084,332	17,084,332	17,084,332	4,555	4,555	4,555	100.0	100.0	100.0	100.0	100.0	100.0

Fig. 1. The percentage of stocks in the smallest equal-cap decile that were *not* held in institutional portfolios, 1980 to 2010. Holdings data are for all institutions in the Thomson/IDC 13F database.
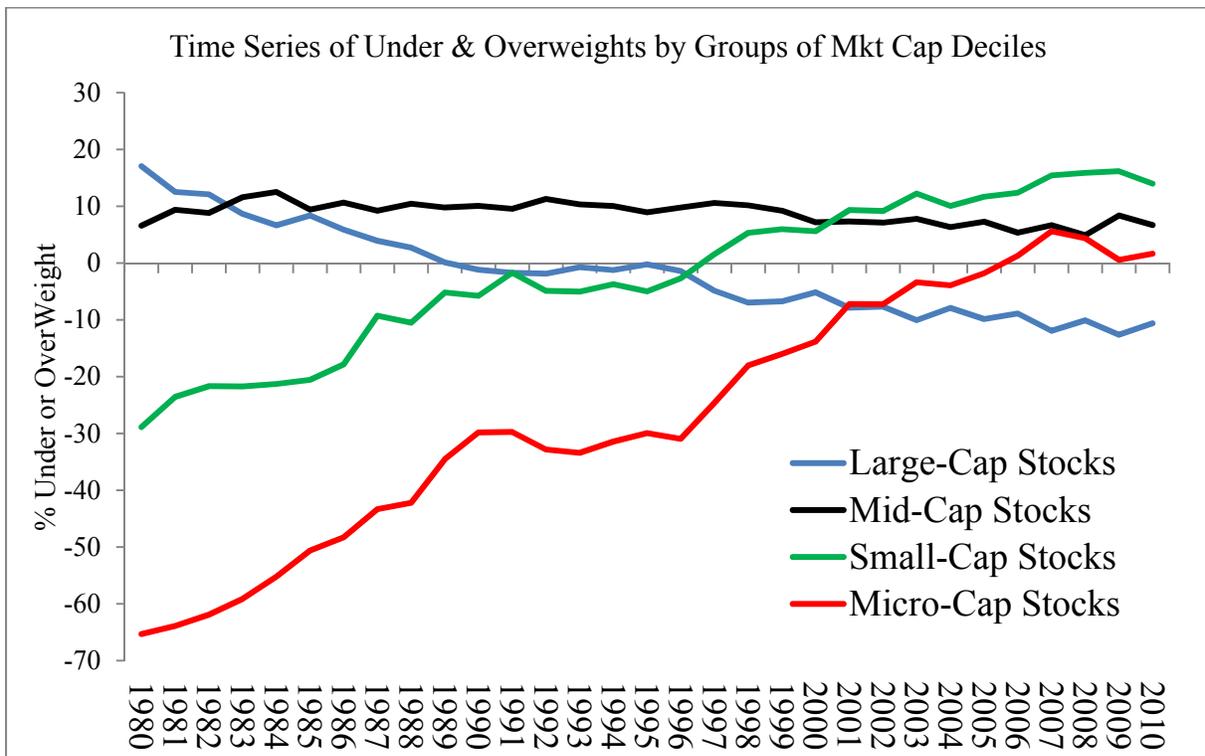

Fig. 2. Under- and over-weights relative to market weights for four equal-cap-based groupings of stocks across all institutions, reported for year-end 1980 to year-end 2010. Holdings data are for all institutions in the Thomson/IDC 13F database.
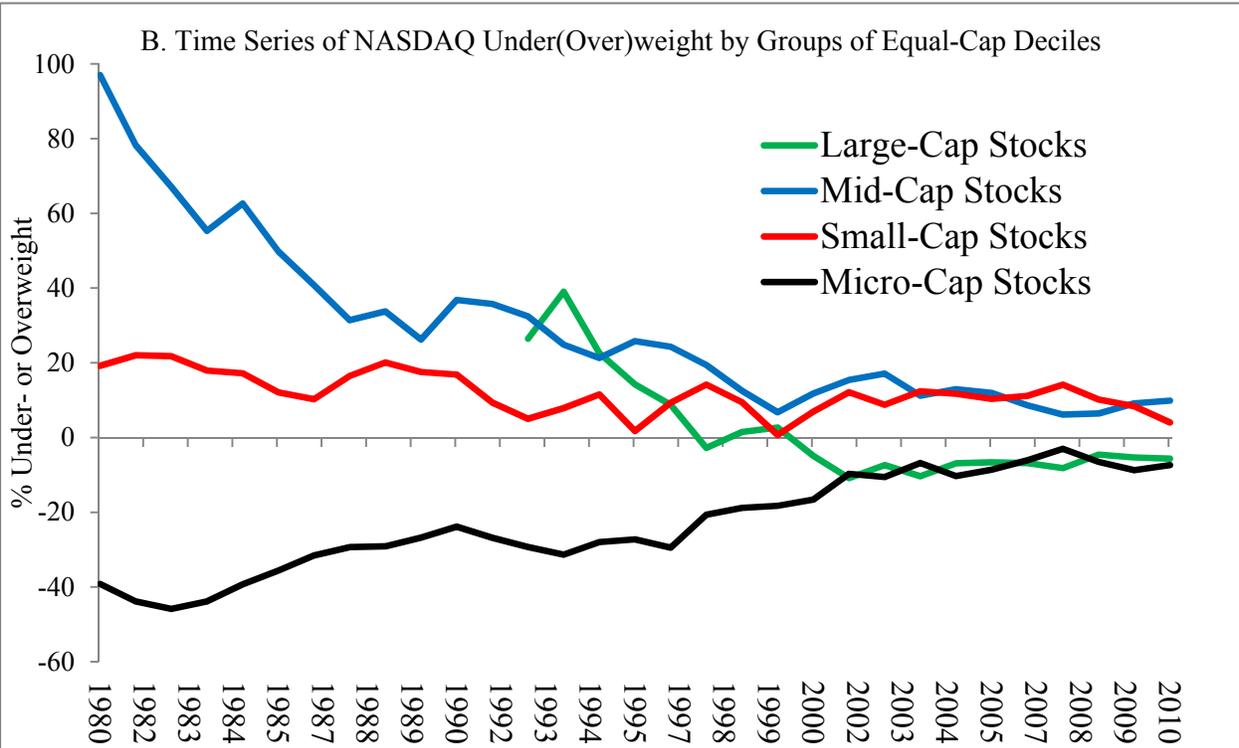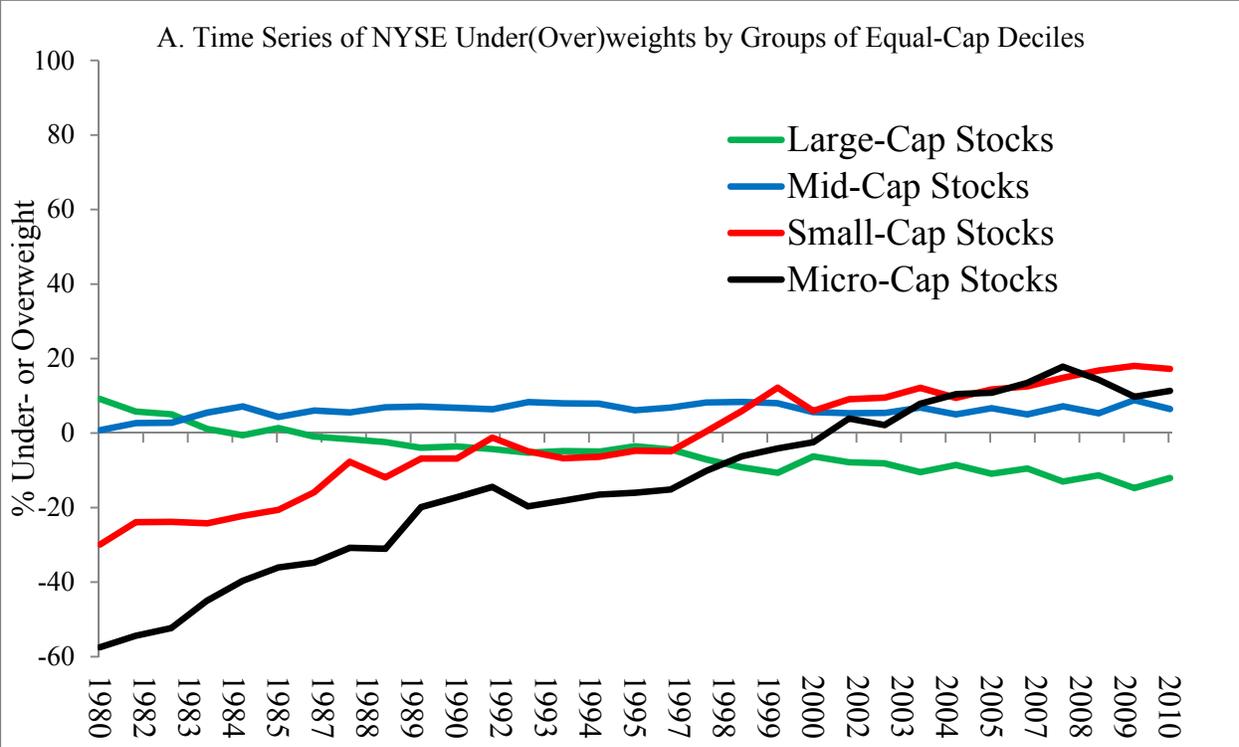
Fig. 3. Under- and over-weights relative to market weights for four equal-cap-based groupings of stocks, separately for NYSE and NASDAQ stocks and reported for year-end 1980 to year-end 2010. Holdings data are for all institutions in the Thomson/IDC 13F database.
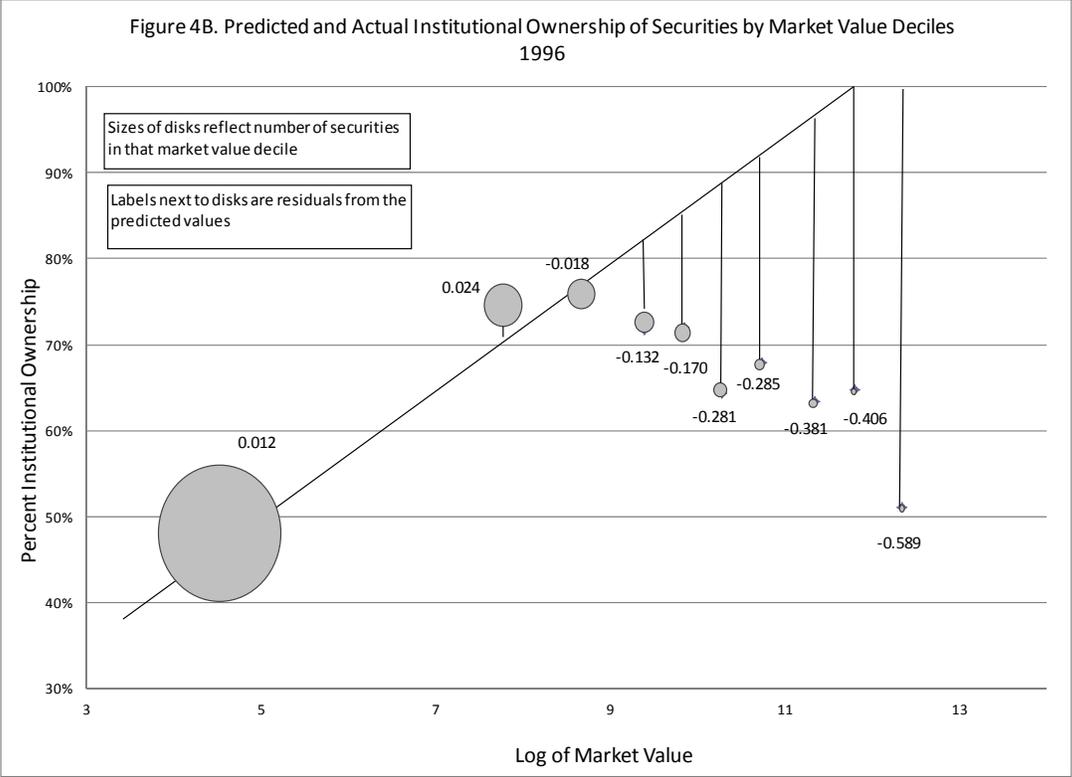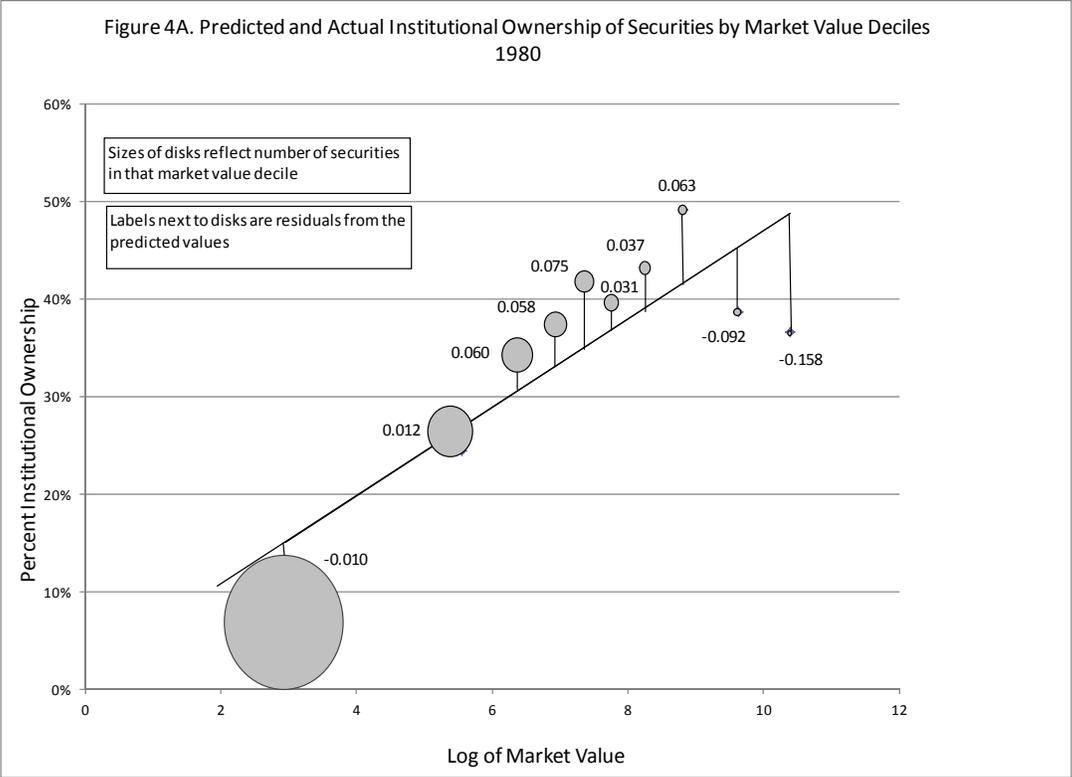
Figure 4A. Predicted and Actual Institutional Ownership of Securities by Market Value Deciles 1980

Figure 4B. Predicted and Actual Institutional Ownership of Securities by Market Value Deciles 1996

Fig. 4. These figures plot the linear regression of the percent of institutional ownership in each stock on the logarithm of its market value. We also plot the unweighted means of these two variables for each equal-cap decile and center upon each point a disk whose area is proportional to the number of stocks in the decile used in the regression. As a measure of specification, we also indicate the average residual for each decile.
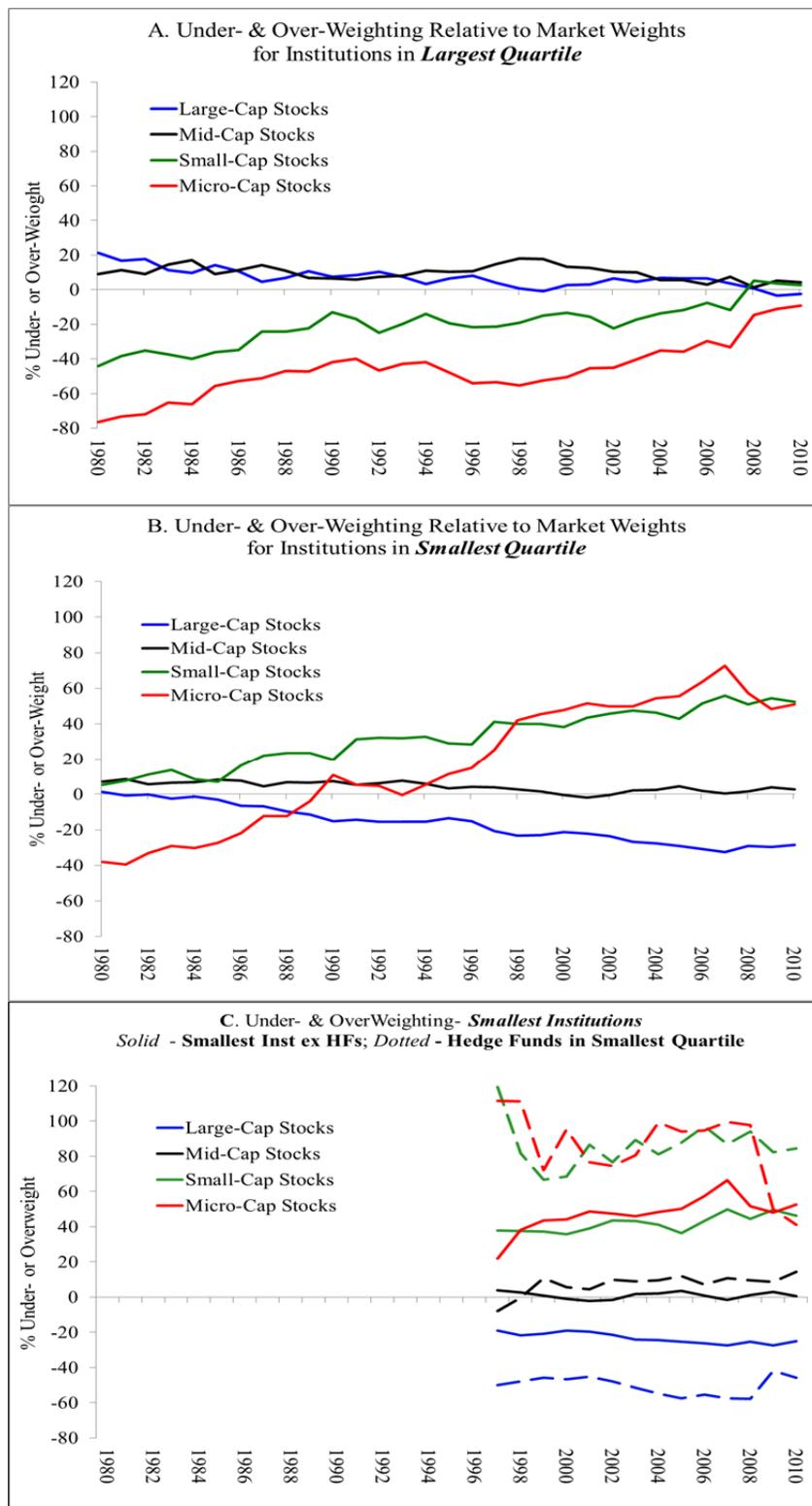
2

Fig. 5. Under- and overweights relative to market weights for the four quartiles of institutions. The quartiles are constructed each year by breaking our 13F sample into four equal-market-value quartiles of institutions. Thus, the largest quartile contains far fewer institutions (e.g., six in Dec 2010) than does the smallest quartile (e.g. 2991 in Dec 2010). Results are reported for year-end 1980 to year-end 2010.
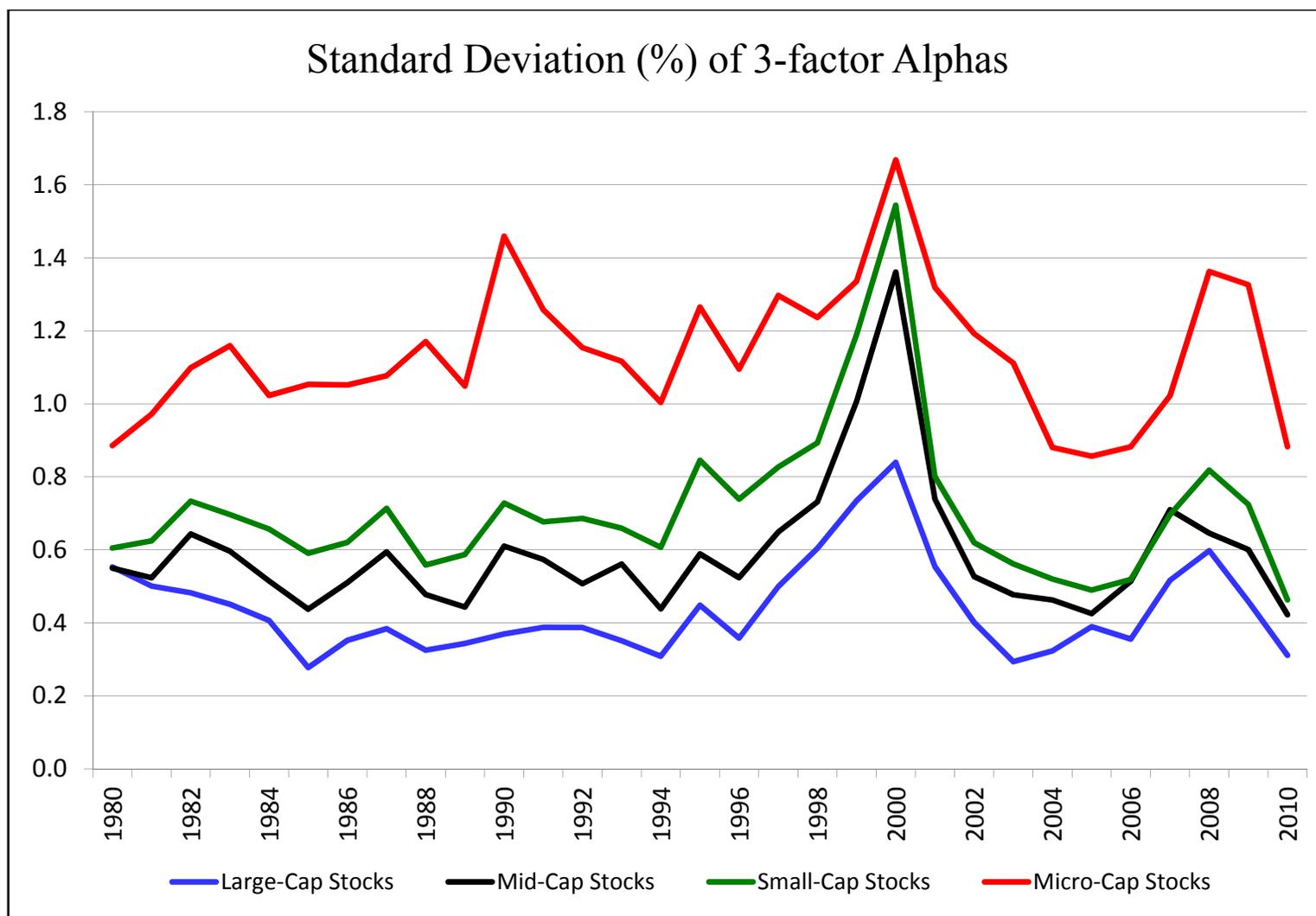
3

Fig. 6. This figure plots cross-sectional standard deviations of individual security alphas within each of our four size groups (as defined in section 3.1) for each year. Individual security alphas are estimated every year relative to the three-factor model of Fama and French (1993) using weekly returns; the individual regressions require a minimum of 50 weekly observations. We compute weekly returns for each stock in the CRSP daily returns file, eliminating those weekly returns for which the stock did not trade on each eligible trading day during the week.