

Do Financial Experts Make Better Investment Decisions?

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Abstract

We provide direct evidence on the effect of financial expertise on investment. We analyze private portfolios of mutual fund managers and their less financially astute peers. We find no evidence that financial experts are making better investment decisions: they do not outperform, do not diversify their risks better, and do not exhibit lower behavioral biases. Managers do much better in stocks they share with their mutual funds; however, only about 22% of them have any mutual fund-related positions. Interestingly, managers – particularly more experienced ones – seem to be aware about the limitations to their investment skills as they increase their holdings of mutual fund related stocks following bad performance of their portfolio. Our results demonstrate that day-to-day knowledge of finance does not improve investment decisions for investors with high level of general intelligence.

JEL Classification:

Keywords: individual investors, investor sophistication, financial expertise, mutual fund managers

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Poor investment decisions of individual investors are often being blamed on their lack of financial sophistication, defined as the ability to avoid making investment mistakes (Calvet, Campbell, and Sodini, 2009). Indeed, a number of studies relates investor sophistication to higher stock market participation (Mankiw and Zeldes, 1991, Halliassos and Bertaut, 1995, Vissing-Joergensen, 2003, Christiansen, Schroter-Joense, and Rangvid, 2007, Grinblatt, Keloharju, and Linnainmaa, 2011a), portfolio diversification (Goetzman and Kumar, 2008, Calvet et al, 2007), better performance (Seru, Shumway, and Stoffman, 2009, Grinblatt et al., 2011b), and lower behavioral biases (Feng and Seasholes, 2005, Calvet et al., 2009).

Investors may avoid mistakes either by being smart or by having knowledge of financial markets. While one does not preclude another, proxies used in the literature to identify more financially sophisticated investors appear to be good at capturing investors' general intelligence, but do not seem to measure person's expertise of financial markets well.¹

Consider for, example, labor income. According to the U.S. Bureau of Labor Statistics, financial managers' average yearly pay is well above population average (roughly 115 thousand dollars); however, they rank lower on annual compensation than lawyers, architecture and engineering managers, and doctors.² So while higher level of intelligence is strongly related to higher labor income (Taubman and Wales, 1974), it is difficult to argue that lawyers and doctors have higher financial expertise than finance professionals. Similarly, trading of complex financial instruments, e.g. derivatives, does not indicate investors' awareness about the risk and return characteristics of the security (Bauer, Cosemans, and Eichholtz, 2008).³ These suggest that existing measures of financial sophistication – and, henceforth, available evidence of its effect on investment outcomes – relate more to cognitive abilities of investors rather than to their knowledge of financial markets. This raises a natural question: does *financial expertise* matter (beyond intelligence)?

This study provides *direct* evidence on the effect of financial expertise on investment. We identify a group of individual investors which have both finance expertise and day-to-day experience with financial markets: mutual fund managers – and compare their investment decisions to the decisions made by less financially astute investors. For a large group of mutual fund (MF) managers in Sweden we observe their

¹ List of proxies of financial sophistication used in the literature includes (disposable) income and wealth (Dhar and Zhu, 2002, Vissing-Joergensen, 2003, Calvet et. al, 2007, 2009), portfolio diversification (Goetzman and Kumar, 2008, Grinblatt and Keloharju, 2001), prior investment experience (Goetzman and Kumar, 2008, Nicolosi, Peng, and Zhu, 2008, Seru, Shumway, and Stoffman, 2009), educational attainment (Christiansen et al, 2007, Calvet et. al, 2007, 2009), investment in more complex financial instruments (Genesove and Mayer, 2001, Goetzman and Kumar, 2008), and IQ (Grinblatt et. al. 2011a, 2011b).

² http://www.bls.gov/oes/current/oes_nat.htm#00-0000

³ Bauer et al. (2008) report that only a small subset of investors uses option Greeks when trading options.

own portfolios as well as portfolios of their mutual funds and peer individual investors. In addition, we have information on their real estate, total wealth, and personal characteristics.

We find that financial experts do not exhibit superior security picking ability in their own portfolios. Private investments of fund managers perform on par with investors similar to them in terms of age, gender, education level, income, and wealth. Moreover, after dissecting managers' portfolios by positions which are also held by the mutual fund of the manager (MF-related) and those which are not (non-MF-related) we find that non-MF-related investments significantly underperform MF-related investments indicating that some part of managerial performance should also be credited to access to fund's resources.

Financial experts also do not appear to be better than their peers at diversifying their risks. Managers invest larger percentage of their wealth in mutual funds, but hold similar number of individual stocks and exhibit similar levels of portfolio concentration. As a result, Sharpe ratios of their investments are similar to their peers.

Additionally, we find no evidence that financial experts are less prone to behavioral biases. There's weak evidence that managers exhibit lower – in fact, negative – disposition effect. The lower disposition effect, however, is observed only in MF-related positions. On the other hand, managers turn their portfolios as often as their peers.

Interestingly, financial experts seem to be aware about the limitations to their investment abilities. Managers – particularly more experienced ones – which perform relatively poorly increase their allocations to MF-related positions: a one standard deviation decrease in past year portfolio return leads to an 8.4% increase in probability of having a position (or 37.7% relative to unconditional mean) in MF-related stocks and 9.1% increase in share of MF-related positions in the total value of the portfolio (or 124.6% relative to the sample mean). Still only about 22% of managers in our sample hold any position, which is also held by their mutual fund.

Our results can be summarized best in the following way: day-to-day knowledge of financial markets is of little value for investors with high level of general intelligence – both managers and their peers are among the most educated and wealthy investors. It is plausible however that financial knowledge may have a more material effect on investment outcomes for less financially sophisticated individuals.

We make several contributions. Firstly, we contribute to the literature on individual investor decisions. Investor sophistication has been linked to better investment outcomes. The role of financial knowledge so far has been underexplored. Our results demonstrate that for highly sophisticated investors expertise in finance does not improve investment decisions.

Secondly, we contribute to the ongoing debate about the importance of financial education. Employees are now increasingly responsible – particularly due to the shift from defined benefit to defined contribution pensions plans – for their financial security after retirement. Most workers of private

corporations have to decide on how much to save and what securities to invest. In response to this new challenge, both academics and policy makers have been promoting financial education as a way to improve quality of financial decision making by households. Its advocates argue that exposure to financial concepts in high school and financial education at the work place leads to higher savings rates (Bernheim, Garrett, and Maki, 2001), stock market participation (van Rooj, Lusardi, and Alessie, 2011), and investment in high-return assets, especially for people at the bottom of wealth distribution and with low education (Lusardi, 2005). On the other hand, Willis (2008) challenges this view as she finds that financial literacy can actually be detrimental to people's financial health: financial education "appears to increase confidence without improving ability, leading to worse decisions". Our results suggest that programs aiming at improving financial knowledge may have limited success in certain groups of investors.

Thirdly, our results help to explain a stylized fact that many high net worth individuals do not seek services of investment advisers, but prefer to invest on their own.⁴ Wealthy investors appear to be as good investors as professional asset managers. Low value added by investment advice for wealthy investors does not seem to justify the fees.

The rest of the paper is organized as follows. In section 1 we describe our data sources and present descriptive statistics of characteristics of managers and control groups of investors. Section 2 presents results. Section 3 discusses our findings. Section 4 concludes.

1. Data and Descriptive Statistics

1.1 Data Sources

Our data comes from several sources. For each mutual manager as well as for the control group of investors (described below) we have information on their age, wealth, location, and portfolio holdings on the level of individual – domestic and foreign - securities (stocks, bonds, mutual funds). Similarly, for each mutual fund we have their portfolio holdings as well as fund's characteristics. Due to availability of the overlap between different data sources, we are looking at manager's portfolio over span of 6 years, from July 2001 till June of 2007. Below we describe these data sources in more detail.

Individual investor portfolio holdings

Data on individual investor portfolio composition is obtained from Swedish government records (KURU). These data are available because Sweden levies a wealth tax. In order to collect this tax, the

⁴ In a recent survey of 1,000 young (under-50) wealthy (with investable assets of over half a million dollars) investors conducted by [Cisco](#) 30% of these investors do not have a financial adviser. Similarly, [Spectrem Group](#) study of investors under age 45 found that over 25% of wealthy investors with 100K-1MM and 12% of millionaires do not use any advisers. Between 40% and 67% of advisor-less high-net worth investors in these surveys believe they can do a better job of investing than a professional advisor.

government assembles records of financial assets, including mutual funds that are held outside defined contribution pension accounts. The records go down to the individual security level and are based on statements from financial institutions that are verified by taxpayers. The data set also provides information on real estate holdings and the income, demographic composition, education, and location of all households. For a more detailed description of this dataset see (Calvet et al, 2007).

Individual investor characteristics

LINDA (Longitudinal INDividual DATA for Sweden) is a register-based longitudinal dataset that is a joint endeavor between the Department of Economics at Uppsala University, the National Social Insurance Board (RFV), Statistics Sweden, and the Ministries of Finance and Labor. LINDA consists of a large representative panel of households for the population over the period 1960 to 2000. For each year, information on all family members of the sampled individuals is added to the dataset. The sampling procedure ensures that the data are representative for each year. Moreover, the same family is traced over time. This provides a time-series dimension that, in general, is lacking in surveys based on different cohorts polled over time.

The variables include individual characteristics (gender, age, marital status, country of birth, citizenship, year of immigration, place of residence at the parish level, education, profession, employment status), housing information (type and size of housing, owner, rental and occupation status, single-family or multi-family dwelling, year of construction, housing taxation value), and tax and wealth information. In particular, the income and wealth tax registers include information on labor income, capital gains and losses, business income and losses, pension contributions, taxes paid, and taxable wealth. A detailed description of the dataset is provided by Edin and Fredriksson (2000).⁵

Mutual fund managers

We obtain names of all mutual fund managers in Sweden as of March 30, 2005 from mutual fund websites. These as well as various other open sources were used to identify manager's age (often as precise as the date of birth). We then manually match mutual fund managers to their tax records, which we obtain from Swedish Tax Authority. We are able to successfully match 128 out of 218 (59%) managers in our sample.⁶ This allows us to match fund managers to their individual portfolio holdings and characteristics using a personal identifier. Unfortunately, not all managers have information available in tax returns. We ended up with 84 usable portfolios.

⁵ These data are available on the website <http://linda.nek.uu.se/>

⁶ Individual level information on tax returns is publicly available in Swedish Tax Authority offices. Some individuals can request their records to be withheld citing, for example, security concerns. There are 5 managers in our sample which were not able to match because their tax records were concealed.

Mutual fund holdings

By Swedish law, the positions of mutual funds registered in Sweden are reported quarterly to Swedish Financial Supervisory Authority, or Finansinspektionen. Since 2002 those filings are publicly available via Internet. Database contains fund and fund family ID, name, country and currency codes, and ISIN of security, number of shares held and market value of such holding as well as exchange rate used (if any).

Firm-level information and other data

Individual security returns (including dividends) are derived from several databases including COMPUSTAT Global, Datastream, Moneymate, and SIX Trust (Swedish analog of CRSP).

1.2. Peers of Mutual Fund Managers

To isolate the effect of financial expertise on investment we identify a control group of individual investors which are similar to mutual fund managers in terms of socio-economic status and general intelligence, but do not possess similar financial expertise. Matching is done 1999; we preserve the control group throughout our sample period. We match by wealth, labor and capital income (closest individual within 10% bound), age, gender, family status, and educational attainment. We did two versions of the match. In the second one we limited matched sample by people who are not employed by financial industry (11% of matches in the first match). The biggest industries represented in matched sample are business services (21% in the first match, 24% in the second), trade (20%, 23%), Mining and manufacturing (17%, 18%). Overall, control investors appear to be similar to fund managers along a large number of characteristics, but differ from them in terms of exposure to financial markets. Generally, the results for both matches are very close and for the sake of brevity we report the results only for the first match.

1.3. Characteristics of Managers and Their Peers

We present descriptive statistics of managerial income variables in Panel A of Table 1. Average yearly labor income of MF managers is almost 1 million SEK and is growing at about 10.9% per year. This compares favorably with the average salary of non-manual workers in the private sector (circa 371 thousands) and its growth (3.7%) as reported by Statistical Central Bureau (SCB) of Sweden. Capital income – mean (median) of 397 (107) thousands SEK -- is another significant source of managerial income. Average (median) assessed wealth is about 3.3 (2.2) times yearly salary. Real estate comprises about 2/3 of managerial wealth. Those means and medians correspond roughly to managers (and matched investors) being in top 1/2 of a percent of population in terms of labor and capital income.

Managers also keep considerable amount of wealth in individual stocks (Panel B): average (median) value of stock portfolio is 766 (136) thousands SEK. They hold a larger number of stocks – average

(median) of 6.5 (4) -- then the average investor.⁷ On average (median) 3 (2) of these positions and approximately 1/3 of their individual equity portfolio value is shared with mutual funds that managers work for.

In Table 2 we report descriptive statistics of bank, debt and real estate holdings of mutual fund managers and their peers. Median fund manager keeps similar amount of wealth in bank deposits, but obtains higher interest rates: median equally- weighted (value-weighted) interest rate is 28 bp (26 bp) higher. About 7% of managers have very low amount of funds in their bank account whereas it is only about 2% of matched sample is in that category.

Managers also have lower levels of debt. About 5% of managers do not report debt at all, while less than 1% of matched individuals do not have debt. Median manager has about 521,971 SEK in two credit lines, whereas median matched individual has 668,991 SEK in three credit lines. At the same time, the interest rate managers pay is significantly lower. For median equally weighted (value-weighted) interest rates the difference is 69 bp (83 bp). Those differences cannot be explained by risk associated with higher level of debt, as the difference of roughly 150 thousands SEK is trivial in terms of fraction of income of about a million SEK⁸.

It is interesting to note that managers hold very few bonds. Only 6% of manager-year observations have any bonds associated with them, and monetary values are low. Median value of bond holdings, conditional on holdings bonds, is SEK 24,252 (vs. median equity holdings of SEK 135,771). It is interesting to note that in coupon bonds the coupon seem to be significantly larger for managers than for matched individuals (median difference between 5% and 2.57%). While we were not able to find credit rating for those bonds, we know that in our sample there were no defaulted bonds. Sweden has also market for lottery bonds (bonds where coupon payment is determined by lottery making their risk idiosyncratic, see Green and Rydqvist (1997)). The fraction of lottery bonds among managers is significantly lower than among matched individuals (12% vs 30%). It seems that managers do not like additional idiosyncratic risk that those bonds are bringing in.

Overall, it seems that the managers are more knowledgeable than their peers about the array of available financial opportunities. They are able to deposit money at higher interest and borrow at lower interest rates; they also avoid idiosyncratic risk. From the traditional financial literacy view, there is no doubt that managers are as sophisticated as an individual can be.

⁷ Bodnaruk (2009) reports the average number of stocks per Swedish individual investor to be about 2.1.

⁸ We also investigated whether there is any difference between managers associated with banks and those who are not. It might be the case that managers employed by banks (like SEB or Handelsbanken) are able to obtain lower interest rates via employee discounts. We did not find any evidence of such discounts.

2. Results

2.1. Performance

We start by providing descriptive statistics of monthly returns by position for financial experts – mutual funds managers – and their less financially savvy peers. Since we lack return data on debt and real estate assets we focus on positions in individual equity and mutual funds. From Table 3, Panel A we could see that there are 36,203 monthly positions in stocks and mutual funds held by managers; about 9.8% (3,534 observations) of these positions are shared with the mutual fund of the manager (MF-related). Matched investors hold somewhat larger number of monthly positions – 42,777.

Difference in average returns per position for managers and non-managers is economically small – 9bp per month – and statistically insignificant. However, when we break down managers’ portfolios into MF-related and non-MF related positions we observe that managers significantly outperform their peers in MF-related positions – by 48bp per month. In contrast, managers do not deliver higher returns per position than their peers in equities and mutual funds, which they do not share with the mutual funds they are employed at.

We explore the performance of fund manager further in Table 3, Panel B. Here we report descriptive statistics of monthly portfolio returns by investor. As before, we consider positions only in equities and mutual funds. We value-weight positions within each investor’s portfolio; portfolio returns are equally weighted across investors. Consistent with prior results, portfolio returns are indistinguishable between managers and peers.

Panel C reports average portfolio return by investor group. We aggregate all positions of managers and their peers in two separate value-weighted portfolios. We also consider portfolios of MF-related and non-MF-related positions by managers. The results are qualitatively unaffected: we do not observe difference in performance between overall portfolio of managers and matched investors. Managers outperform less financially knowledgeable investors in stocks they share with their mutual funds.

In Table 4, Panel A we report one- and three- factor adjusted abnormal portfolio returns for portfolios of managers and matched investors. Both managers and their peers beat the market, but managers outperform matched investors neither when we consider CAPM nor when we add size and book-to-market factors.

It is plausible that managers may not have superior skills with respect to individual securities, but possess better market timing abilities. We explore this possibility by estimating Treynor-Mazuy (1966) and Henriksson-Merton (1981) market timing regressions. In case of Treynor-Mazuy, we add the quadratic term to the market model. In case of Henriksson-Merton model, the additional term is the

greater of 0 and excess return on the market. The results do not support the conjecture that fund managers excel in market timing.

When we investigate abnormal performance of portfolios of MF-related and non-MF-related positions (Table 4, Panel B) we find – consistent with previous results – that managers do much better in securities that they share with their mutual funds than in securities they do not. Difference in monthly abnormal returns is 56bp per month when we consider CAPM and 61bp per month for three-factor model, both significant at 10% level. Interestingly enough the outperformance of MF-related portfolio could be completely attributed to market timing. In case of Treynor-Mazuy, the economic effect of market timing is then 0.58% (0.52%) per month for equally-(value) weighted portfolios. In case of Henriksson-Merton model, the economic effect is related to the value of at-the-money call option and can be estimated as 0.87% (0.85%) per month for equally (value) weighted portfolios.

All of the above results provide evidence that fund managers do not possess superior stock picking skills than their peers lacking financial expertise, particularly so when they cannot capitalize on resources of their employers.

2.2. Diversification and Sharpe Ratio

We move on to explore diversification properties of managers' portfolios. We consider three measures of portfolio diversification: number of positions, portfolio concentration, and share of stocks relative to the total value of the portfolio of stocks and mutual funds. The results, presented in Table 5, indicate that managers allocate lower fraction of their portfolio to individual equities – 47.7% (52.2%) vs 66.1% (76.0%) on average (median) -- than their peers. However, they hold similar number of positions and their portfolio exhibit similar degree of concentration. As a result portfolio Sharpe ratios for managers are both statistically and economically not different from Sharpe ratios for matched investors. This allows us to conclude that managers do not appear to be better at diversifying their risks and obtaining superior reward per unit of risk than non-financial experts.

2.3. Behavioral Biases

We now proceed to investigate propensity of managers to fall victim of behavioral biases. We consider disposition effect and portfolio turnover (both in stocks and mutual funds and in stock positions only). The results are reported in Table 6. We find weak – in medians – evidence that fund managers exhibit lower disposition effect than their peers. However, by splitting portfolios of managers in MF-related and non-MF-related positions we observe that lower disposition effect is coming from MF-related holdings whereas there is no statistically discernable difference in disposition effect in non-MF-related positions of managers and holdings of matched investors.

The results on portfolio turnover are qualitatively similar. Managers reshuffle their MF-related positions much less than peers turn over their portfolios. However, on the level of overall portfolios and in non-MF-related positions we find that managers demonstrate similar levels of portfolio turnover to matched investors. To summarize, managers do not seem to be less prone to behavioral biases than non-financial experts with similar characteristics.

2.4. Portfolios of Managers and Portfolios of Mutual Funds of Managers

So far our results indicate that managers perform much better in positions they share with their mutual funds. We first analyze the choice of fund-related positions and then investigate whether managers are aware about the limitations to their investment abilities.

We start with basic frequency distribution of managerial holdings conditional on their mutual funds holding the security. From Table 7, Panel A we observe that managers are about 3.6 times more likely to pick a stock which is held by their mutual fund than when it is not. This finding is supported in multivariate analysis (Panels B and C) which we perform on all set of stocks and mutual funds than any of investors in our sample hold at any point in time. If a position is held by a mutual fund of a manager it is 0.3% (or 65% relative to sample mean) more likely to appear in manager's own portfolio; the size of shared positions are on average 2.8 times larger than for non-MF-related positions. Managers also prefer to invest in domestic securities, mutual funds, securities, which are also widely held by general population, but avoid volatile assets. They also load higher on stocks and mutual funds, which performed well recently and those which continue to do well in the near future.

We then explore how managers reshuffle their portfolio composition in response to the evidence about their investment ability. We relate a fraction of portfolio invested in MF-related positions to the past year return on their portfolio (Table 8). We find that some managers seem to be aware about the limitations in their investment skills: those of them which perform relatively poorly increase their allocations to MF-related positions: a one standard deviation decrease in past year portfolio return leads to an 8.4% increase in probability of having a position (or 37.7% relative to unconditional mean) in MF-related stocks and 9.1% increase in share of MF-related positions in the total value of the portfolio (or 124.6% relative to the sample mean). Even though economically the effect seems to be significant, still only about 22% of managers in our sample hold any MF-related position at any point in time.

It also appears that these more experienced managers – those with age of 38 and above – which both hold larger fraction of their portfolios in MF-related positions and rebalance their portfolio in response to past performance. At the same the relation between past portfolio return and allocation in MF-related stocks is at least weak for less experienced managers.

3. Discussion

Our results draw a consistent picture that financial experts – mutual fund managers – do not make better investment decisions than investors with similar level of sophistication, but lacking comparable financial expertise. Managers do not demonstrate better performance -- neither at position nor at portfolio level, do not diversify their risks better, and are not affected by behavioral biases to a lesser degree. It is tempting to conclude from this that knowledge of financial markets does not create value over general sophistication. There is an important caveat in our analysis, however, in that both our sample group of financial experts and the control group of matched investors belong to the most sophisticated investors in the country: these are the investors in the highest income bracket and highest level of educational attainment. It is plausible that marginal effect of financial expertise is trivial for these investors. Our results, nevertheless, make an important contribution as they demonstrate that there are limits to the value added by financial expertise.

There are several potential criticisms concerning validity of our results. First, it could be argued that the lack of evidence on differences between investment outcomes of managers and matched investors is driven by the small size of the sample of managers. We believe that this criticism is unfounded for two reasons. Firstly, this should not prevent us from finding statistical differences in our position-by-position analysis where the number of observations increases dramatically. Secondary, and even more importantly, most of the economic differences in performance, diversification, and behavioral biases characteristics of managers and their peers are very small and often even come with the wrong sign.

Another concern is related to the possibility of portfolios of peers being managed by (other) financial experts. If matched investors did not make their investment decisions themselves, but outsourced them to professional asset managers we would have decision makers with similar degree of financial expertise in both sample and control group; this would bias us against finding any result. While some peers may have used services of investment professionals it is highly unlikely that this phenomenon is prevalent: the average (median) portfolio value for matched investors is 365 (72) thousands SEK – roughly 40 (8) thousands US dollars. In wealth asset management business such small balances usually mean generic, cookie-cutter portfolios with little or no personalization and high management fees. Put it differently, delegating management of portfolios of this size makes little economic sense. Anecdotal evidence also points to matched investors bearing responsibility for managing their portfolios.

It is also plausible that managers and matched investors – being among the most affluent people in the country – interact with each other and, as a result, make similar investment decisions. Indeed, growing literature on peer effects (e.g. Hong, Kubik, and Stein, 2004, Brown, Ivkovic Smith, and Weisbenner, 2008) suggest that social interaction is an important determinant of portfolio choice. If these are peer effects, which are driving our results, we would expect a significant overlap in positions of managers and

peers. In fact, we find quite the opposite. Going back to Table 7 (Panels A and B) we see that holding of a security by a peer does not increase the likelihood that the security is also held by manager nor does it affect the size of the position. It is, therefore, unlikely that our results are due to social interaction between managers and peers.

4. Conclusions

We provide *direct* evidence on the effect of financial expertise on investment. We identify a group of individual investors which have both finance expertise and day-to-day experience with financial markets: mutual fund managers – and compare their investment decisions to the decisions made by investors with similar characteristics, but lacking comparable financial expertise. We find no evidence that financial experts are making better investment decisions: they do not outperform, do not diversify their risks better, and do not exhibit lower behavioral biases. Managers do much better in stocks they share with their mutual funds; however, less than 1/3 of them have any mutual fund-related positions. Overall, our results demonstrate that (for highly sophisticated investors) expertise in finance does not improve investment decisions.

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Table 1: Descriptive Statistics of Managers

Panel A reports managerial income variables based on LINDA data from 1998-2002. We report statistics for labor and capital income, wealth, and growth rate of labor income (based on Carroll and Samwick (1998) decomposition). Panel B reports stock portfolio related variables. We report value of portfolio and number of positions for each manager-year. All monetary values are in Swedish Krona (SEK).

Panel A: managerial income variables

	N	Mean	Median	Std Dev	IQR
Labor income	551	992,292	865,182	643,757	707,411
Capital income	147	397,326	107,412	887,432	385,783
Wealth (based on wealth tax)	157	3,327,263	1,794,738	5,003,563	1,744,523
Income Growth Rate	438	0.109	0.134	0.503	0.320

Panel B: stock portfolios of managers

	N	Mean	Median	Std Dev	IQR
Value of portfolio	504	766,196	135,771	3,045,111	407,943
Number of positions	504	6.486	4.000	6.266	7.000
Value of MF-related portfolio	103	159,767	75,037	257,791	173,029
Number of MF-related positions	103	2.952	2.000	2.396	3.000
Share of MF-related stocks	103	0.346	0.335	0.238	0.360

Table 2: Bank, debt, and real estate holdings: Managers vs. matched sample

In Panel A we report variables related to bank holdings of mutual funds' managers vs. matched sample. We report fraction of managers and peers who report bank holdings, amount deposited (in SEK), average number of bank accounts, equally- and value-weighted deposit rates (calculated for each bank account as total interest payments over the year divided by end-of-year bank account balance). Data are from KURU register and are available for 1999, 2000, 2003-2006. In Panel B we report variables related to debt. We report total debt amount (in SEK), number of lines, equally- and value-weighted debt interest measures (calculated for each bank account as total interest payments over the year divided by end-of-year debt account balance). In Panel C we report holdings of real estate based on KURU 2003-6. In Panel D we report the descriptive statistics for bondholdings. We report number of positions per year-person conditional on holding bonds, size of individual positions (in SEK), coupon in percent (conditional on being reported), fraction of lottery and short-term bonds, and lowest denomination for bonds held.

	<u>Managers</u>			<u>Peers</u>			<u>t-test</u>		<u>Wilcoxon</u>	
	N	Mean	Median	N	Mean	Median	t-stat	p-value	Z-stat	p-value
<u>Panel A: Bank holdings</u>										
% reported bank holdings		93.14%			97.84%		-3.42	0.001	-3.53	0.000
Total Deposits	407	181,527	62,361	497	326,674	76,294	-2.96	0.003	-1.52	0.128
# of bank accounts	407	1.585	1.000	497	1.497	1.000	1.47	0.142	0.87	0.384
Deposit rate (equally-weighted)	407	0.0208	0.0126	497	0.0188	0.0098	1.28	0.201	2.24	0.025
Deposit rate (value-weighted)	407	0.0204	0.0119	497	0.0181	0.0093	1.33	0.183	1.95	0.051
<u>Panel B: Bank Loans</u>										
% reported debt		95.29%			99.25%		-4.11	0.000	-4.35	0.000
Total Debt	526	873,684	521,971	658	990,087	668,991	-1.23	0.220	-3.43	0.001
# of open debt lines	526	2.688	2.000	658	3.027	3.000	-3.62	0.000	-4.20	0.000
Loan rate (equally-weighted)	526	0.0566	0.0328	658	0.0647	0.0397	-1.73	0.083	-3.80	0.000
Loan rate (value-weighted)	526	0.0368	0.0327	658	0.0437	0.0410	-3.07	0.000	-6.66	0.000
<u>Panel C: Real Estate</u>										
% reported real estate		58.37%			36.25%		4.20	0.000	4.10	0.000
Total value	122	573,311	362,098	58	542,406	333,177	0.30	0.767	0.48	0.629
# of items reported	122	1.049	1.000	58	1.086	1.000	-0.76	0.450	-0.56	0.576
<u>Panel D: Bond holdings</u>										
% with bond positions		6.14%			15.31%		-6.37	0.000	-6.30	0.000
# of positions	56	1.321	1.000	136	1.963	1.000	-2.940	0.004	-0.813	0.417
Bond Holdings	74	129,064	24,252	267	79,033	44,500	1.80	0.076	-1.3873	0.165
Coupon	31	5.429	5.000	74	4.414	2.570	1.74	0.087	2.21	0.027
Lottery bonds	74	0.122	0.000	267	0.296	0.000	-3.68	0.000	-3.03	0.003
fraction of short-term (<18 mo)	74	0.392	0.000	267	0.4157	0.000	-0.37	0.713	-0.37	0.713
Lowest denomination	74	2,543	1,000	267	4,470	1,000	-3.66	0.000	-3.53	0.000

Table 3: Performance of managers and their peers: raw returns

In Panel A we report univariate statistics per position of average monthly return for managers vs. matched sample. We also report separately positions of managers in securities that are owned by the funds they managed, and all other positions. We also report the results of mean and median tests between groups. Panel B reports average monthly portfolio returns by investor. Panel C provides statistics on average monthly portfolio return by investor group.

Panel A: returns by position

	N	Mean	Median		t-test	p-value	Z-stat	p-value
(1) Managers	36,203	0.0090	0.0085	(1)-(4)	1.38	0.169	2.12	0.034
(2) Managers: MF pos	3,534	0.0129	0.0130	(2)-(4)	2.67	0.008	2.24	0.025
(3) Managers: non-MF pos	32,669	0.0086	0.0081	(3)-(4)	0.75	0.454	1.71	0.087
(4) Matched individuals	42,777	0.0081	0.0058	(2)-(3)	-2.37	0.018	-1.70	0.089

Panel B: investor portfolio returns

	<u>Managers</u>			<u>Peers</u>			t-stat	p-value	Z-stat	p-value
	N	Mean	Median	N	Mean	Median				
returns	84	0.0059	0.0081	94	0.0056	0.0078	0.22	0.822	0.08	0.934

Panel C: portfolio returns by investor group

	N	Mean	Median		t-test	p-value	Z-stat	p-value
(1) Managers	72	0.0059	0.0112	(1)-(4)	-0.52	0.605	0.06	0.951
(2) Managers: MF pos	72	0.0108	0.0115	(2)-(4)	1.67	0.099	0.13	0.897
(3) Managers: non-MF pos	72	0.0053	0.0061	(3)-(4)	-1.00	0.321	-0.35	0.729
(4) Matched individuals	72	0.0064	0.0095	(2)-(3)	1.82	0.073	1.15	0.249

Table 4: Performance of managers and their peers: abnormal portfolio returns

In Panel A we report the results of CAPM and Fama-French regression of portfolio returns for return of portfolios of mutual funds managers, matched sample, and difference between them. In Panel B we report the results for portfolios of mutual funds managers' fund related positions, mutual funds managers' fund not-related positions, and difference between them. For the difference we also report Treynor-Mazuy and Henriksson-Merton market timing regressions. Positions are value-weighted within investor portfolios and then equally-weighted across investors. There are 72 observation months. Positions are value-weighted within investor portfolios and then equally-weighted across investors. There are 72 observation months. *EMSCI* is excess return on MSCI Swedish index, *EMSCI*² is square of *EMSCI*, *EMSCI*(+) = max(0, *EMSCI*), *HML* and *SMB* are growth- and size-factors built using *MSCI* size and growth/value portfolios.

Panel A: Managers vs Peers

	<u>Managers</u>		<u>Peers</u>		<u>Difference: managers vs peers</u>							
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
Intercept	0.0069	(2.41)	0.0074	(2.31)	-0.0005	(-0.54)	0.0011	(1.27)	0.0015	(1.35)	0.0013	(0.91)
EMSCI	1.1206	(16.40)	1.1414	(14.84)	-0.0208	(-0.87)	-0.0078	(-0.38)	-0.0145	(-0.60)	-0.0039	(-0.12)
EMSCI ²									-0.1825	(-0.53)		
EMSCI (+)											-0.0100	(-0.15)
HML							-0.1705	(-2.97)	-0.1769	(-3.00)	-0.1719	(-2.93)
SMB							-0.2183	(-4.72)	-0.2154	(-4.60)	-0.2179	(-4.67)
Adj R2	0.7905		0.7555		-0.0035		0.2978		0.2893		0.2865	

Panel B: MF-related vs non-MF-related portfolios of managers

	<u>MF-related</u>		<u>non-MF-related</u>		<u>Difference: MF-related vs non-MF-related</u>							
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
Intercept	0.0119	(2.44)	0.0063	(2.31)	0.0056	(1.87)	0.0061	(1.89)	-0.0057	(-0.98)	-0.0024	(-0.49)
EMSCI	1.2212	(10.48)	1.1020	(17.03)	0.1192	(1.66)	0.1218	(1.65)	0.0310	(0.24)	-0.0849	(-0.73)
EMSCI ²									3.8383	(2.08)		
EMSCI (+)											0.5364	(2.24)
HML							-0.0248	(-0.12)	0.3460	(1.09)	0.0474	(0.23)
SMB							-0.0732	(-0.44)	-0.6840	(-2.71)	-0.0971	(-0.60)
Adj R2	0.6054		0.8028		0.0241		-0.0016		0.0997		0.0543	

Table 5: Diversification and Sharpe Ratio

We report the results for measures of portfolio diversification (number of positions, Herfindahl index of portfolio concentration and share of individual stocks relative to overall value of portfolio of stocks and mutual funds) and Sharpe ratio for managers and matched investors (peers). We also report tests of differences between different groups.

	<u>Managers</u>			<u>Peers</u>			<u>t-test</u>		<u>Wilcoxon</u>	
	N	Mean	Median	N	Mean	Median	t-stat	p-value	Z-stat	p-value
share of stocks	84	0.474	0.523	96	0.661	0.760	-3.37	0.001	-3.30	0.001
HERF	504	0.523	0.499	576	0.547	0.472	-0.96	0.338	-0.58	0.561
N	504	6.486	4.000	576	6.464	4.000	0.05	0.962	1.28	0.201
Sharpe ratio	84	0.209	0.182	94	0.196	0.207	0.25	0.806	-0.03	0.975

Table 6: Behavioral biases

We report the results for disposition effects (defined as PLG-PLR) and position turnover both for overall portfolio of stocks and mutual funds and for stocks only. In Panel A we report the data for overall' managers' portfolio and matched sample. In Panel B we report the results for mutual funds' related positions vs. the rest for mutual funds managers. We also report tests of differences between different groups.

Panel A: Managers vs. matched

	<u>Managers</u>			<u>Peers</u>			<u>t-test</u>		<u>Wilcoxon</u>	
	N	Mean	Median	N	Mean	Median	t-stat	p-value	Z-stat	p-value
disposition effect	84	-0.0263	-0.0035	96	0.0330	0.0150	-1.58	0.115	-1.75	0.079
disposition effect: stocks only	84	-0.0210	-0.0060	96	0.0254	0.0386	-1.41	0.162	-2.07	0.039
Turnover	84	0.6305	0.6292	96	0.6067	0.6604	0.58	0.560	0.36	0.720
Turnover: stocks only	84	0.4900	0.4826	96	0.5052	0.4906	-0.31	0.759	-0.30	0.767

Panel B: Managers: MF related vs non-MF related positions

	<u>MF-related</u>			<u>Non-MF-related</u>			<u>t-test</u>		<u>Wilcoxon</u>	
	N	Mean	Median	N	Mean	Median	t-stat	p-value	Z-stat	p-value
disposition effect	22	-0.1960	-0.1562	84	-0.0162	0.0000	-2.76	0.007	-3.03	0.002
disposition effect: stocks only	22	-0.1960	-0.1562	84	-0.0078	0.0055	-2.97	0.004	-3.22	0.001
Turnover	22	0.3574	0.3167	84	0.6536	0.6631	-4.03	0.000	-3.91	0.000
Turnover: stocks only	22	0.3574	0.3167	84	0.5271	0.5689	-2.17	0.037	-1.97	0.049

Table 7: Portfolio Choice of Managers

In Panel A we report the frequency distribution of managerial holdings conditional on their mutual fund holding the security. In square brackets we report the percentage of overall sample. We also report the mean and median test of the difference between group of stocks that are held by mutual funds vs. the rest. In Panel B we report the probit regression of probability of choosing the security. MATCH is a dummy equal to one if individual is in matched sample, and zero if individual is mutual fund manager. MF Holds a dummy equal to 1 if mutual fund of a manager holds the stock, and zero otherwise. It is zero for matched sample. Domestic is a dummy equal to 1 if the security is Swedish stock or mutual fund, and zero otherwise. MF is a dummy equal to one if security is a mutual fund, and zero otherwise. Age and Age2 are age of individual and square of age. PopProb is probability of holding of a particular security by general population. Lag(return) and lead(return) are lagged and lead returns of a security over one year. StdDev(return) is standard deviation of stock return over 1 previous year. In specifications 3-6 we used year fixed effects. In specifications 4-6 we used individual' fixed effects. All coefficients are multiplied by 100. Panel C reports tobit regression (of log10 of the value of the position) on the same set of explanatory variables. In panels B and C errors are clustered on year level.

Panel A: frequency count

	<u>Mutual Funds holds</u>	
	No	Yes
manager does not hold	564,842	13,934
	[99.57%]	[98.45%]
manager holds	2,453	219
	[0.43%]	[1.55%]
	Statistics	p-value
T-test of the difference	19.24	0.000
Z-test of the difference	19.23	0.000

Panel B: Probit regression

	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat
MATCH*			0.015	(0.95)	0.015	(0.95)	-0.285	(-1.48)	-0.284	(-1.48)	-0.279	(-1.49)
MF Holds	0.308	(3.34)	0.294	(3.22)	0.294	(3.22)	0.269	(4.13)	0.264	(4.09)	0.233	(3.91)
domestic*	0.459	(10.56)	0.452	(10.52)	0.450	(10.45)	0.261	(10.47)	0.270	(10.34)	0.268	(10.58)
MF*	0.159	(4.73)	0.158	(4.78)	0.158	(4.78)	0.108	(5.68)	0.107	(5.66)	0.070	(3.21)
Age			0.073	(4.82)	0.073	(4.83)	-0.013	(-0.87)	-0.014	(-0.88)	-0.011	(-0.75)
Age2 /100			-0.072	(-4.45)	-0.072	(-4.45)	0.014	(0.58)	0.014	(0.59)	0.011	(0.50)
PopProb	10.766	(9.85)	10.594	(9.84)	10.584	(9.83)	6.116	(9.70)	6.058	(9.66)	5.881	(9.68)
Lag(return)									0.003	(5.49)	0.004	(5.78)
Lead(return)									0.023	(3.72)	0.024	(3.72)
StdDev(return)											-0.271	(-2.97)
Year FE	N		N		Y		Y		Y		Y	
Individual FE	N		N		N		Y		Y		Y	
Pseudo R2	0.1210		0.1234		0.1235		0.1965		0.1978		0.1987	
N	1256212		1256212		1256212		1256212		1256212		1256212	

Panel C: Tobit regression

	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
MATCH*			0.192	(0.91)	0.191	(0.91)	0.189	(0.91)	0.185	(0.88)	0.185	(0.89)
MF Holds	2.798	(3.12)	2.716	(2.99)	2.714	(2.99)	2.688	(2.99)	2.671	(2.97)	2.413	(2.77)
domestic	5.594	(10.16)	5.587	(10.13)	5.575	(10.06)	5.517	(10.07)	5.713	(9.97)	5.784	(10.23)
MF	1.911	(4.88)	1.930	(4.94)	1.928	(4.93)	1.910	(4.94)	1.921	(4.93)	1.190	(2.44)
Age			1.011	(4.89)	1.011	(4.90)	0.999	(4.89)	1.006	(4.90)	1.005	(4.89)
Age2 /100			-0.997	(-4.53)	-0.998	(-4.53)	-0.986	(-4.52)	-0.994	(-4.54)	-0.993	(-4.53)
PopProb	137.886	(9.62)	137.838	(9.63)	137.777	(9.63)	136.384	(9.64)	136.177	(9.61)	134.965	(9.82)
Lag(return)									0.070	(5.39)	0.090	(5.78)
Lead(return)									0.553	(3.90)	0.592	(3.93)
StdDev(return)											-7.720	(-3.31)
/sigma	11.128	(29.50)	11.091	(29.61)	11.091	(29.63)	10.976	(29.68)	10.963	(29.62)	10.944	(29.72)
Year FE	N		N		Y		Y		Y		Y	
Individual FE	N		N		N		Y		Y		Y	
Pseudo R2	0.0868		0.0888		0.0888		0.1310		0.1321		0.1332	
N	1256212		1256212		1256212		1256212		1256212		1256212	

Table 8: Past performance of Managers and Relative share of MF-related positions

We report the determinants of taking positions in mutual funds- related stocks. In Panel A we report the results of probit estimate (marginal effects and t-statistics). In Panels B and C we report the results of tobit estimate for share of portfolio and logarithm of monetary value of mutual funds related holdings. We used lagged explanatory variable, Lag(return portfolio) and Lead(return(portfolio) – lagged (lead) one year returns of individual managers’ portfolio, HiAge (LoAge)– dummy that is equal to one if age of manager is higher or equal (lower) than median (38 years), and zero otherwise. In specifications (3)-(6) we used the interaction between Position @ (t-1) and lag (return portfolio). In Specifications (7)-(8) we used interactions between HiAge and LoAge, and Lag(return portfolio) and Lead(return(portfolio)). We also report the result of the test of the difference between HiAge x Lead(return portfolio) and LoAge x Lead(return portfolio), HiAge x Lag(return portfolio) and LoAge x Lag(return portfolio). In Specifications (4), (6), (8) we used year fixed effects. In Specifications (5) and (6) we used individual managers’ fixed effect. We used robust estimate adjusted for clustering over year. We also report for tobit’ estimate σ in Panels B and C.

Panel A: Probability of taking position in MF-related stocks

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat	dF/dX	t-stat
Position @ (t-1)	0.780	(8.65)	0.790	(9.23)	0.847	(9.10)	0.844	(9.05)	0.070	(0.31)	0.020	(0.10)	0.752	(8.69)	0.750	(8.20)
Lag(return portfolio)	-0.248	(-6.80)	-0.292	(-9.99)	-0.199	(-2.28)	-0.302	(-1.76)	-0.452	(-2.26)	-1.494	(-2.10)				
Lead(return portfolio)			0.325	(3.04)	0.384	(2.80)	0.367	(2.10)	1.471	(4.48)	1.078	(1.99)				
Position @ (t-1) x lag (return portfolio)					-0.439	(-1.37)	-0.424	(-1.25)	-0.438	(-1.38)	-0.710	(-5.51)				
HiAge													0.103	(2.45)	0.114	(2.68)
HiAge x lag(return portfolio)													-0.352	(-4.09)	-0.537	(-4.00)
HiAge x lead(return portfolio)													0.288	(1.93)	0.267	(1.65)
LoAge x lag(return portfolio)													-0.143	(-1.38)	-0.259	(-1.94)
LoAge x lead(return portfolio)													0.347	(0.98)	0.336	(1.14)
Test of High Age interactions= Low Age interactions													χ^2	p-val	χ^2	p-val
													1.44	0.488	1.78	0.410
Pseudo R2	0.522		0.537		0.549		0.552		0.817		0.831		0.551		0.559	
Nobs	360		360		360		360		360		360		360		360	
Year FE	N		N		N		Y		N		Y		N		Y	
Individual FE	N		N		N		N		Y		Y		N		N	

Panel B: Share of portfolio in MF-related stocks

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
Position @ (t-1)	1.431	(20.91)	1.446	(19.61)	1.436	(13.40)	1.445	(13.94)	0.101	(0.86)	0.118	(1.16)	1.319	(19.71)	1.318	(20.55)
Lag(return portfolio)	-0.209	(-3.05)	-0.261	(-3.18)	-0.328	(-2.55)	-0.501	(-4.85)	-0.485	(-3.68)	-0.529	(-5.13)				
Lead(return portfolio)			0.413	(1.76)	0.409	(1.75)	0.492	(1.92)	0.416	(2.65)	0.340	(1.32)				
Position @ (t-1) x lag (return portfolio)					0.152	(0.44)	0.135	(0.39)	0.384	(2.87)	0.347	(2.46)				
HiAge													0.227	(2.75)	0.249	(2.69)
HiAge x lag(return portfolio)													-0.404	(-3.07)	-0.729	(-3.71)
HiAge x lead(return portfolio)													0.331	(2.16)	0.408	(1.91)
LoAge x lag(return portfolio)													0.095	(0.79)	-0.061	(-0.45)
LoAge x lead(return portfolio)													0.662	(1.71)	0.761	(2.30)
Intercept	-0.371	(-9.48)	-0.417	(-7.19)	-0.417	(-6.97)	-0.461	(-5.59)	0.264	(2.16)	0.288	(2.00)	-0.557	(-7.11)	-0.584	(-9.64)
σ	0.310	(11.35)	0.303	(12.64)	0.303	(12.38)	0.298	(13.06)	0.189	(12.48)	0.185	(11.42)	0.294	(1.33)	0.286	(12.99)
													χ^2	p-val	χ^2	p-val
Test of High Age interactions= Low Age interactions													5.72	0.004	4.47	0.012
N observations	360		360		360		360		360		360		360		360	
Pseudo R2	0.463		0.483		0.485		0.498		0.989		0.991		0.527		0.550	
Year FE	N		N		N		Y		N		Y		N		Y	
Individual FE	N		N		N		N		Y		Y		N		N	

Panel C: Dollar value in MF-related stocks

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
Log(Position Value @ (t-1))	1.801	(31.46)	1.824	(26.55)	1.821	(29.28)	1.817	(26.35)	-0.188	(-0.75)	-0.199	(-0.82)	1.678	(14.81)	1.655	(13.89)
Lag(return portfolio)	-2.440	(-4.56)	-3.149	(-4.97)	-3.484	(-2.53)	-4.855	(-2.25)	-3.848	(-4.31)	-6.032	(-4.82)				
Lead(return portfolio)			5.438	(2.90)	5.404	(2.77)	5.579	(2.18)	4.411	(2.72)	3.860	(1.99)				
Position @ (t-1) x lag (return portfolio)					0.671	(0.23)	0.662	(0.21)	2.909	(2.58)	2.187	(1.78)				
HiAge													1.992	(2.06)	2.095	(2.25)
HiAge x lag(return portfolio)													-3.852	(-3.19)	-6.125	(-3.18)
HiAge x lead(return portfolio)													4.551	(1.81)	4.692	(2.30)
LoAge x lag(return portfolio)													-0.843	(-0.54)	-2.155	(-1.00)
LoAge x lead(return portfolio)													7.614	(1.42)	7.754	(1.64)
Intercept	-5.165	(-12.68)	-5.835	(-12.58)	-5.838	(-12.80)	-5.748	(-6.34)	5.282	(2.59)	5.659	(2.32)	-6.905	(-10.08)	-6.682	(-8.56)
σ	3.646	(8.89)	3.568	(9.81)	3.571	(10.05)	3.554	(10.23)	2.117	(8.90)	2.083	(8.50)	3.503	(10.31)	3.470	(10.36)
													χ^2	p-val	χ^2	p-val
Test of High Age interactions= Low Age interactions													1.28	0.279	1.39	0.251
N observations	360		360		360		360		360		360		360		360	
Pseudo R2	0.265		0.276		0.276		0.278		0.478		0.483		0.283		0.286	
Year FE	N		N		N		Y		N		Y		N		Y	
Individual FE	N		N		N		N		Y		Y		N		N	

Figure 1: Distribution of matched sample over industries.

