Regulating Sophistication

The Effects of Investor Discrimination *

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August 2009

Abstract

I argue that differences in regulation between Sweden and the United States has made the demand side of the Swedish mutual fund market more sophisticated than its American counterpart. Using a Swedish data set I find, in accordance with studies conducted on American data, that net flows are positively linearly correlated with past performance, and I also find evidence for a non-linear, convex relationship. However, contrary to Frazzini and Lamont (2008), I find that stocks with high sentiment tend to out perform stocks with low sentiment. I conclude the thesis by attempting to link this discrepancy to differences in investor sophistication, though I am unable to present any statistically significant results.

Keywords: Mutual fund, investor sophistication, regulation, return predictability, smart money

*I would like to thank my tutor Paolo Sodini for his guidance and invaluable insights.
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1 Introduction

Are investors in the Swedish market for mutual funds more sophisticated than investors in the American market for mutual funds? In this thesis I argue that differences in legislation between Sweden and the United States has made the demand side of the Swedish market for mutual funds measurably, and statistically significantly, more sophisticated than the American counterpart.

Swedish legislation pertaining the fund industry is different from American legislation in a seemingly subtle facet: while Swedish law does not allow mutual funds to discriminate among investors, American mutual funds are free to do so. As a result, the fraction of outstanding shares in Swedish mutual funds held by Swedish households is significantly smaller than the fraction of outstanding American fund shares held by American households, and conversely the fraction of outstanding fund shares in Swedish mutual funds held by institutions is significantly larger than the fraction of outstanding fund shares in American mutual funds held by institutions. This is not, as one might initially think, because American mutual funds do not allow institutional investors, but because institutional investors are drawn, away from mutual funds, to funds which only allow institutional investors. These American funds, which only cater to institutions, are not considered mutual funds and do not appear in most studies of the American fund industry. Since the Swedish market has a larger fraction of institutional investors and since several studies have found that institutions are more sophisticated than individuals, in the sense that they tend to earn higher risk-adjusted returns, I hypothesize that the Swedish market for mutual funds is not under the effect of the "dumb money" effect found studying the American market.

I start out by investigating whether the relationship between past performance and subsequent net flows, that has been found in different forms in the American fund industry, also exist in the Swedish ditto. Specifically I estimate three different models: a linear model which uses past returns that have not been risk-adjusted, a linear model using risk-adjusted returns and a non-linear model using risk-adjusted returns. The purpose of the non-linear model is to determine if investors respond to poor performance less or more strongly than they respond to good performance. Previous studies have found that net flows are positively correlated to past performance, and specifically that good performance is rewarded to a greater extent than bad performance is punished, potentially perversing incentives for fund managers.

I proceed by investigating whether the sentiment expressed by investors in mutual funds can be used to predict subsequent returns, or expressed differently, if relatively

popular stocks among investors tend to outperform relatively unpopular stocks. Previous literature has found that relatively popular stocks among American investors tend to underperform relatively unpopular stocks; an effect that has been termed dumb money. The opposite of dumb money is of course smart money (i.e. popular stocks outperform unpopular stocks). Since I posit that the demand side of the Swedish fund industry is more sophisticated than that of the American fund industry, I hypothesize that I will find a smart money effect or at the very least no effect at all.

I find that net flows are indeed positively correlated with past performance and that good performance is rewarded more than bad performance is punished. In addition I also find the smart money effect that I was expecting. I conclude the thesis by attempting to link this discrepancy to the difference in sophistication. None of the coefficients I estimate are significant and thus I am unable to present any statistically significant evidence supporting my hypothesis that the smart money effect is driven by differences in sophistication between the Swedish and the American fund industries.

The thesis is composed as follows: in the second section I discuss relevant previous literature, in the third section I investigate the relationship between past performance and subsequent net flows, in the fourth section I identify the smart money/dumb money effect, in the fifth section I attempt to link the smart money effect to differences in sophistication and finally the sixth section concludes.

2 Previous literature

The persistence and predictability of mutual fund returns is a topic that has been studied extensively. In an early paper, Jensen (1967) introduces a new way of measuring fund manager skill: he regressed the realized returns of mutual funds on the market return. The estimated intercept in the regression (i.e. the part of the realized return that was not solely due to movements in the market) was his measure of manager performance, and it has since been called Jensen's alpha. In addition to defining this new performance measurement Jensen (1967) also shows that there is no persistence in fund performance when performance is measured using Jensen's alpha.

Several decades later, contrary to Jensen (1967), a number of papers document persistence in fund performance; among these were Hendricks, Patel, and Zeckhauser (1993), Goetzmann and Ibbotson (1994), and Brown and Goetzmann (1995). Hendricks, Patel, and Zeckhauser (1993) find evidence for short-term persistence in the relative performance of mutual funds; in particular they find that poorly performing funds tend to remain bad. Goetzmann and Ibbotson (1994) find similar results and conclude that past winners are likely to be future winners while past losers are likely to be future losers. While both Hendricks, Patel, and Zeckhauser (1993) and Goetzmann and Ibbotson (1994) examined relative performance Brown and Goetzmann (1995) find that risk-adjusted performance is also persistent.

Carhart (1997) introduces a new way of measuring performance, building on the factors first introduced in Fama and French (1993). The measure is similar to Jensen's alpha (Jensen, 1967), but is extended by the so called Fama/French factors as well as by a factor meant to capture the momentum effect shown in Jegadeesh and Titman (1993). Carhart (1997) shows that the persistence in performance found in Hendricks, Patel, and Zeckhauser (1993), Goetzmann and Ibbotson (1994), and Brown and Goetzmann (1995) was entirely due to the momentum effect of Jegadeesh and Titman (1993).

While the performance of fund managers has been studied extensively, the same thing cannot be said for the performance of investors in funds. The first paper specifically investigating the performance of fund investors was Gruber (1996), where he investigated what he called: the puzzle of the growth in actively managed funds. Gruber (1996) conjectures that fund investor can be divided into two different groups: a sophisticated clientele that is making money and a disadvantaged clientele that is losing money. While the sophisticated clientele directs its money to funds that have experienced good returns in the past, the disadvantaged clientele is unable or unwilling to do so due to one or several of the following reasons: they are unsophisticated, they are institutionally disad-

vantaged and unable to trade, and/or they are tax disadvantaged. Zheng (1999) corroborates the findings of Gruber (1996) and shows that funds which experience abnormal inflows of cash tend to do relatively well. Zheng (1999) also shows that it is possible to earn a positive abnormal return by investing in funds which have experienced large inflows of cash, though this effect seems to be confined to small funds. However Sapp and Tiwari (2004) shows that this "smart money" effect is linked to the momentum effect of Jegadeesh and Titman (1993) and Frazzini and Lamont (2008) goes even further by showing evidence for a "dumb money" effect. By forming portfolios based on a measure of sentiment derived from fund flows, Frazzini and Lamont (2008) show that popular stocks tend to underperform unpopular stocks.

A number of papers have shown that net flows to funds are positively correlated with past performance, the first of which was Ippolito (1992). Chevalier and Ellison (1997) and also Sirri and Tufano (1998) find that fund flows are more strongly correlated with good performance than with bad performance, i.e. investors do not punish badly performing funds to the same extent that they reward well performing funds. Chevalier and Ellison (1997) go on to show how this could cause a potential agency conflict, since managers are incentivized to adopt high-risk strategies due to the limited downside. Warther (1995) finds contemporaneous correlation between flows and performance. No paper has, to the best of my knowledge, found past performance to be uncorrelated or negatively correlated with subsequent net flows.

Several papers have shown that individual investors make sub-optimal investment decisions (see for instance Odean (1999), Barber and Odean (2000) and Barber and Odean (2001)). These papers document how investors suffer from self-attribution and tend to destroy wealth by trading excessively. Daniel, Grinblatt, Titman, and Wermers (1997) and Chen, Jegadeesh, and Wermers (2000) investigate whether institutional investors achieve better returns than individual investors, and Daniel, Grinblatt, Titman, and Wermers (1997) show that this is indeed the case. Calvet, Campbell, and Sodini (2007) show that financial sophistication matters and that higher sophistication is correlated with more efficient investing. Calvet, Campbell, and Sodini (2009) show that households are more likely to sell stock that has performed well, effectively counteracting any momentum effects.

3 Data

The data set used throughout this thesis was compiled from various different sources. Information about funds and their holdings were obtained from the Swedish Financial Supervisory Authority, return series and market capitalization rates were downloaded from Thomson Datastream, data about the activity of different types of investors was obtained from Statistics Sweden, information about the American fund industry was obtained from the Investment Company Institute, Fama/French factors were obtained from the website of Kenneth French and finally some complementary information about the funds were obtained from Morningstar . After briefly describing the data collection and cross-matching process I will address some potential issues with the data set.

The Swedish Financial Supervisory Authority has a government mandate to collect quarterly reports from all mutual funds registered in Sweden. All funds, with the exception of some funds considered special, are required to file quarterly reports detailing all of their holdings, their net asset value (NAV) and their total net asset value (TNA); among the funds considered special are hedge funds and other funds which utilize derivatives and other means of extensive leverage. These reports are compiled by the FSA and published on their website available to download by anybody. These files contain NAVs, TNAs and other information about the funds as well as the securities held by the funds, identified by their name and their International Security Identification Number (ISIN). Not reported in these files is the value of shares bought and sold during the preceding quarter. This information can be imputed by comparing TNAs and NAVs, but one also has to consider the effect of mergers and acquisitions that could inflate the imputed values if not corrected for. Information about mergers and acquisitions were obtained from a data set constructed by carefully examining fact sheets issued by funds. The imputation method used is described in greater detail later in this thesis.

The ISINs found in the files from the FSA allowed me to extend the data set with information about individual securities held by the funds. Thomson Datastream is a popular database which contains extensive information about a large number of securities from all over the world. By matching the information in the FSA files with the information contained in Datastream, using the ISINs of the respective securities, I was able to download return series as well as market capitalizations for the stocks held by the funds. Note that the methods used in this thesis do not require any detailed information about other types of securities such as bonds and derivatives.

Statistics Sweden offers a data set containing quarterly observations of the total value of all fund shares bought respectively sold in the past quarter, as well as the total value of

all outstanding fund shares, aggregated by fund type (such as equity fund, bond fund et cetera) and also by investor type (such as financial corporations, life insurance companies, households et cetera). In order to match this data set with the FSA/Datastream data set I needed to know the official classification of all funds contained in the FSA files, information that the FSA unfortunately does not supply. The FSA does however identify funds with their Swedish organization number (an identifier issued by the Swedish Tax Authority for purposes of taxation). These organization numbers allowed me to link the FSA/Datastream data set with the Morningstar database from which I was able to download the official fund types. In this thesis I only consider equity funds, thus all other funds were discarded from the data set.

3.1 Potential issues

The funds are required by law to provide the FSA with accurate information about their holdings, their TNAs and their NAVs. This makes misreported data quite rare, though not non-existent. Since the FSA is the only supplier of holdings data one cannot double-check the data, and thus I am forced to assume that the data is correct, unless it is very obviously wrong; some examples of obviously erroneous data is returns of several hundred percent in one quarter, holdings reported exactly twice et cetera.

A problem similar to that of misreported holdings is that occasionally funds do not report holdings at all, leading to missing values in the time-series. Attempting to impute these values could lead to bias, and I have chosen to drop these funds from the data set; furthermore in an attempt to minimize bias caused by erroneous data I have chosen to include only funds which exist throughout all of the five years considered. This choice was a trade-off between on the one hand risking introducing bias caused by biased imputation or erroneous data and on the other hand introducing survivorship bias by dropping funds that did not exist for all of the considered quarters. In an effort to balance these potential sources of bias I chose to limit my data set to the period spanning the first quarter of 2004 and the last quarter of 2008. As a result my dataset covers on average 91% of the total value of all funds. I believe this number is large enough to make potential selection bias small enough so that it does not affect the results achieved.

Another potential selection bias stems from the fact that some companies, in an apparent effort to avoid Swedish legislation, register their funds in other countries (predominantly in Luxemburg). These funds do not report their holdings to the FSA and are not included in my data set nor in any official statistics. However since these funds are not subjects to Swedish law they are potentially able to discriminate among investors

and they are thus inconsequential to this thesis and would not have been included even if the data was readily available. One also needs to consider the possibility of selection bias due to the incompleteness of some of the data sources; for instance not all stocks are covered by Thompson Datastream and not all funds are available in the Morningstar database. Also, Datastream was found to contain erroneous information for some stocks; in order to avoid these errors a lower bound of 100 million SEK was set for the market capitalization of stocks and all stocks with lower market capitalization where dropped from the sample. One should also note that the statistics on the investor composition of the Swedish and American fund industry are compiled by different entities and are likely not directly comparable; however, the reported difference between the respective industries is large enough to safely conclude that institutional investors are more prevalent in Sweden than in the United States.

The most compromising issue with my data set is the aggregated nature of the data obtained from Statistics Sweden. The first problem stems from the fact that only aggregates, broken down by fund type, are available; thus the data set does not allow me to tell which specific funds experienced net inflows and which specific funds experienced net outflows (i.e. I can only tell what the net flow for all equity funds was). This leads to potential bias due to the fact that whereas the FSA only provides data on holdings for funds not considered special, the SCB data contains flows and total values for all funds including the special funds. Fortunately special funds are quite small compared to regular funds but nonetheless they pose a potential bias. Furthermore, the explanatory power of my tests would have been much greater had data not been aggregated in this manner.

Table 1: Descriptive statistics

This table shows descriptive statistics for the data set on Swedish funds used throughout this thesis. Effort has been made to make this table look as similar as possible to the corresponding table in Frazzini and Lamont (2008) in order to better facilitate a comparison between the two data sets. Some of the statistics shown in Frazzini and Lamont (2008) are not meaningful for my data set and have been excluded. The table also shows some statistics on the structure of the market for Swedish and American funds.

	Min	Max	Mean	Std	Level	
	Full sample, 2004-2008				2004	2008
Panel A: time-series (quarterly observations, 2004-2008)						
Number of funds in the sample per quarter	202	202	202	202	202	202
Number of stocks in the sample per quarter	2324	3777	3132	533	2324	3675
Percent coverage of fund universe (VW)	87.5	94.0	90.6	2.2	92.7	92.6
Panel B: funds (Pooled quarter-fund observations, 2004-2008)						
TNA, millions of SEK	4	37,107	2,592	4,060	1,989	1,813
Number of holdings per fund	8	1,050	117	117	106	135
x (Percent of fund universe, actual)	0.00	6.75	0.50	0.75	0.50	0.50
$\hat{x}$ (Percent of fund universe, counterfactual)	0.00	7.23	0.50	0.77	0.50	0.50
Panel C: stocks (Pooled stock-fund observations, 2004-2008)						
Number of funds per stock	1	122	7	12	9	7
z (Percent owned by funds, actual)	0.00	68.15	0.75	2.43	0.85	0.62
$\hat{z}$ (Percent owned by funds, counterfactual)	0.00	67.02	0.75	2.46	0.80	0.64
$FLOW = z - \hat{z}$	-18.02	7.35	0.00	0.30	0.05	-0.02
Panel D: market structure (yearly observations, 2004-2008)						
Percentage held by households (American)	92.1	93.8	92.9	0.59	93.8	92.1
Percentage held by households (Swedish)	39.8	50.7	44.5	3.92	50.7	39.8
Aggregate return, households (Swedish)	-18.1	9.9	0.2	8.5	7.6	-18.1
Aggregate return, all (Swedish)	-18.5	10.4	0.4	8.8	8.2	-18.5

4 Net flows and past performance

The relationship between past performance and subsequent net flows is an important one. If we believe that manager skill exists and is persistent (e.g. Hendricks, Patel, and Zeckhauser (1993), Goetzmann and Ibbotson (1994), and Brown and Goetzmann (1995)), it is socially optimal for net flows to be positively correlated with past performance. Consider the opposite: what if net flows were negatively correlated with good past performance? Since fund managers are paid a percentage of money invested, they would be incentivized to perform badly in order to secure higher net flows and as a result a higher salary. Now consider how the fund manager would go about in underperforming the market: he would invest in companies which he believed were destroying wealth, thereby not only decreasing the utility of the individual investor but the misallocation of capital would also decrease societal welfare. Thus, from a regulatory standpoint, if we believe that past performance is a good predictor of future performance we also need to make sure that there is no legislation, taxation issues or otherwise, that would cause past performance to be negatively correlated with subsequent net flows.

As previously discussed, studies conducted using American data (e.g. Ippolito (1992), Chevalier and Ellison (1997) and Sirri and Tufano (1998)) find positive correlation between past performance and subsequent net flows. In order to verify that this is also the case in the Swedish market, I first need to impute the net flows to funds since these are not supplied by the FSA. The net flows are imputed using a method exactly like the one used in Frazzini and Lamont (2008). Consider equations 1 and 2 below. The net flow in SEK (f) is imputed as the difference between the current TNA and the TNA of the previous quarter corrected for the return on the underlying assets expressed as the ratio between the contemporary NAV and the NAV of the previous quarter. The net flow is corrected for bias caused by mergers and acquisitions (MGN). Finally the net flow (in SEK) is normalized by dividing the net flow (in SEK) by the TNA of the previous quarter. The result is a relative net flow (F) that is comparable between funds of different size.

$$f_t^i = TNA_t^i - \frac{NAV_t^i}{NAV_{t-1}^i} TNA_{t-1}^i - MGN_t^i \tag{1}$$

$$F_t^i = \frac{f_t^i}{TNA_{t-1}^i} \tag{2}$$

Performance can be defined in a variety of ways; in this thesis I will consider the two most commonly used measures of fund performance: returns in excess of the risk-free

rate and returns adjusted for risk using the four factors of Carhart (1997). In addition, I will consider the risk-adjusted return in both a linear and a non-linear environment.

4.1 A linear, non-risk-adjusted model

With this model I will estimate the linear correlation between past returns in excess of the risk free rate as defined here and henceforth as the return on the 3 month Swedish treasury bill. Before performing the estimation let us consider the possible outcomes and their legislative implications (in an attempt to avoid systematic misallocation of capital).

- **Net flows are positively correlated with past excess returns:** This is the result we would get if the average investor believed that past excess returns were positively correlated with subsequent excess returns. From a legislative viewpoint, we would be concerned only if past returns were negatively correlated with future returns as this would cause misallocation of capital; should past returns be positively correlated or not correlated at all there would be no policy implications.
- **Net flows are negatively correlated with past excess returns:** This is the result we would get if for some reason the average investor believed high past excess returns were a bad omen for future excess returns. Again, from a legislative standpoint we would be concerned if past excess returns were in fact positively correlated with future returns.
- **Net flows are uncorrelated with past excess returns:** This is the result we would get if the average investor did not believe that past returns had any predictive power over future returns. This would not have any legislative implications.

Consider the relationship shown in equation 3, where F is the relative net flow for fund i at time t and R is the return in excess of the risk-free rate. In order to control for any exogenous shocks I include dummy variables for each quarter. The results of this equation can be found in table 2. We find that net flows are strongly correlated with past excess returns with a t-value of 6. It is apparent that the average investor believes good past excess returns are positively correlated with good future excess returns. Whether this is in fact the case is a question I will leave for future research.

$$F_t^i = \beta_0 + \beta_1 R_{t-1}^i + Dummies + \epsilon_i^t \tag{3}$$

Table 2: A linear, non-risk-adjusted model

The table shows the regression results obtained when quarterly net flows were regressed on quarterly returns in excess of the risk free rate from the previous quarter.

Source	SS	df	MS
Model	1.14428543	18	.063571413
Residual	15.1436875	3617	.004186809
Total	16.2879729	3635	.004480873

Number of obs = 3636
$R^2 = 0.0703$
Adj $R^2 = 0.0656$

F_t^i	Coef.	Std. Err.	t	$P > \|t\|$	[95% Conf.	Interval]
R_{t-1}^i	.1385258	.0230558	6.01	0.000	.093322	.1837295
Intercept	.0110731	.0045656	2.43	0.015	.0021218	.0200244

4.2 A linear, risk-adjusted model

Raw excess returns are crude measures of performance for one simple reason: they do not take into account the ex ante level of risk associated with the achieved return. Thus in order to achieve fair comparison we need to adjust for the risk exposure. A common and popular way of doing this is described in Carhart (1997). A fair measure of manager skill is achieved by regressing the realized returns on the Fama/French factors (market risk premium, high-minus-low and small-minus-big) as described in Fama and French (1993), as well as a factor controlling for the momentum effect (Jegadeesh and Titman, 1993). Consider equation 4, where R is the realized return, MktRP is the market risk premium, SMB is the small-minus-big factor, HML is the high-minus-low factor and MOM is the momentum factor. By estimating this regression one obtains the fraction of the realized return due to factor loadings (the betas), the fraction of the return due to chance (the epsilon) and the fraction of the return due to manager skill (the alpha). Since Carhart (1997) finds that some managers are able to persistently outperform the market, as previously discussed, we would expect net flows to be positively correlated with past alpha.

$$R_t = \alpha + \beta_1 MktRP_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \epsilon_t \tag{4}$$

There is a problem with this approach though, as we note that there is no time subscript for the alpha. In order to obtain a time-series of alphas we have to make the rather restrictive assumption that the factor loadings (the betas) stay constant throughout the time-period. By making this assumption we can calculate time-varying alphas as the residual between realized returns and returns predicted using the factor loadings. This can be done as follows: first estimate equation 4 separately for each fund and save the factor loadings. Next for each fund and quarter calculate a predicted return using the betas from equation 4 and the realized factor returns and calculate the alphas as the difference between the actual realized return and the predicted return as shown in equations 5. Note that for these estimations I use the Swedish risk-free rate, the Swedish market risk premium and the American SMB, HML and MOM factors obtained from the website of Kenneth French.

$$\alpha_t^i = R_t^i - (R_t^f + \beta_1^i MktRP_t + \beta_2^i SMB_t + \beta_3^i HML_t + \beta_4^i MOM_t) \tag{5}$$

Table 3: Net flows and linear risk-adjusted performance

The table shows the results of the second pass of the two-pass regression conducted to estimate the relationship between net flows and a lagged measure of risk-adjusted performance. The measure of risk-adjusted performance is defined as the difference between realized returns and returns predicted using factor loadings obtained by regressing returns on the factors specified in Carhart (1997).

Source	SS	df	MS
Model	1.05823734	18	.058790963
Residual	15.2297356	3617	.004210599
Total	16.2879729	3635	.004480873

Number of obs = 3636
$R^2 = 0.0650$
Adj $R^2 = 0.0603$

F_t^i	Coef.	Std. Err.	t	$P > \|t\|$	[95% Conf.	Interval]
α_t^i	.1188081	.030217	3.93	0.000	.0595641	.1780521
Intercept	.0109345	.0045917	2.38	0.017	.001932	.019937

After obtaining a time-series of alphas for each fund I estimate the relationship expressed in equation 6. Recall that we expect net flows to be positively correlated with past alphas. The results from estimating this model can be found in table 3. Note that we find the significant positive correlation we were expecting, but also note that, compared to the results from the previous model, the correlation is smaller and less significant and in addition the R-square measure is slightly decreased. My conjecture is that the average investor makes investment decisions based on the performance of funds relative to their benchmarks, as these figures are readily available. The alphas are decent but not optimal proxies for the actual benchmarks of the funds, likely due to the fact that I am using American factors and since the assumption of constant factor loadings is too restrictive. However since the American factors are good enough to achieve a statistically significant correlation coefficient I will leave a re-estimation of the model using Swedish factors to future research.

$$F_t^i = \beta_0 + \beta_1 \alpha_{t-1}^i + Dummies + \epsilon_i^t \tag{6}$$

4.3 A non-linear, risk-adjusted model

If we believe that positive performance is more persistent than negative performance, then we would expect net flows to be more strongly correlated with good performance and less correlated with bad performance, i.e. we would expect the net flow/past performance relationship to have a convex shape. The intuition behind this is quite straight-forward: if poor past performance does not predict poor future performance, then there is no incentive to withdraw money from the poorly performing fund; however, if good past performance predicts good future performance then there is a strong incentive to move money into these funds. As previously discussed, this relationship has been discussed in a number of studies conducted on American data (e.g. Ippolito (1992), Chevalier and Ellison (1997) and Sirri and Tufano (1998)).

In the previous section we found a decent, although not perfect, benchmark for managerial skill that we can use to investigate whether the convex relationship between past performance and net flows exist in the Swedish fund market. Consider equation 7, which is similar to equation 6 with one addition: a non-linear element constructed by interacting the alphas with a dummy variable which is 1 when alphas are positive and otherwise 0 (this is similar to using the median or the mean of the alphas since both the median and the mean are very close to zero). The result is that β_1 captures the correlation between net flows and past performance when past performance is poor

and $\beta_1 + \beta_2$ captures the correlation between net flows and past performance when past performance is good. The results from this estimation can be found in table 4. Note that while the coefficient that captures correlation with poor performance is insignificant, the correlation between past performance and subsequent net flows when performance is relatively good is not only statistically significant but also much higher than the correlation coefficients found with the other models; thus the relationship is convex as expected.

$$F_t^i = \beta_0 + \beta_1 \alpha_{t-1}^i + \beta_2 I_{\alpha>0} \alpha_{t-1}^i + Dummies + \epsilon_i^t \tag{7}$$

In this section I have confirmed both a linear positive correlation between net flows and past excess returns, a linear positive correlation between net flows and past risk-adjusted returns and a non-linear convex relationship between net flows and past risk-adjusted returns and in addition I have offered intuition for why these relationships are important and why we expect to find them in the Swedish data set. The findings were all according to hypothesis.

Table 4: Net flows and non-linear risk-adjusted performance

The table shows the convex relationship between net flows and a lagged measure of risk-adjusted performance. The measure of risk-adjusted performance is defined as the difference between realized returns and returns predicted using factor loadings obtained by regressing returns on the factors specified in Carhart (1997).

Source	SS	df	MS
Model	1.09583953	19	.057675765
Residual	15.1921334	3616	.004201364
Total	16.2879729	3635	.004480873

Number of obs = 3636
$R^2 = 0.0673$
Adj $R^2 = 0.0624$

F_t^i	Coef.	Std. Err.	t	$P > \|t\|$	[95% Conf.	Interval]
α_t^i	.0216981	.0443253	0.49	0.625	-.065207	.1086033
$I_{\alpha_t^i>0}\alpha_t^i$	.2351023	.078586	2.99	0.003	.0810249	.3891796
Intercept	.0080332	.004688	1.71	0.087	-.0011583	.0172246

5 Sentiment

Do more popular stocks offer better returns than less popular stocks, or do unpopular stocks offer better returns than more popular stocks? If we are to believe the efficient market hypothesis introduced by Fama (1965) the answer is that neither statement is correct, but in a recent paper Frazzini and Lamont (2008) show how their measure of investor sentiment can be used to construct a zero-cost portfolio of stocks that offers a statistically significant positive return. What Frazzini and Lamont (2008) find is that more popular stocks tend to perform worse than unpopular stocks, and by forming a zero-cost portfolio that is long in the unpopular stocks and short in the popular stocks, one is able to achieve a return in excess of any relevant risk measure. Since it is the unpopular stocks that outperform the popular stocks Frazzini and Lamont (2008) call this effect "dumb money". My hypothesis is that, since the Swedish market has a larger fraction of institutional investors as compared to the American market, I will arrive at a different result when I replicate their methods using my Swedish data set. The methods used in this section are taken, without modification, from their paper, and are briefly reiterated below. For a more complete description of the methods employed I refer the reader to the original paper.

5.1 Methodology

The basic idea of Frazzini and Lamont (2008) is to calculate a measure of investor sentiment for each stock, then sort the stocks in quintile portfolios based on this measure of sentiment and finally compare the average returns of these quintile portfolios. Sentiment is calculated as the difference between the actual percentage of the total market capitalization of a company held by all equity funds and a counter-factual percentage of the total market capitalization of a company held by all equity funds had net flows to funds been allocated proportionately to their relative sizes. Frazzini and Lamont (2008) call their measure of investor sentiment FLOW, and its definition is shown in equation 8, where z is the actual percentage of the total market capitalization of stock j held by all equity funds (as defined in equation 9, where POS is the total value of stocks held by equity fund i in company j divided by the market capitalization of company j) and $\hat{z}$ is the counter-factual ditto.

$$FLOW_t^j = z_t^j - \hat{z}_t^j \tag{8}$$

$$z_t^j = \sum_i POS^{ij}/MKTCAP_t^j \tag{9}$$

The next step is to calculate the counter-factual net flows, i.e. the net flows that would have been factual had the aggregate net flow been allocated among funds proportionately to the TNA of the funds. In order to better understand this, look at equations 10, 11 and 12. Equations 10 and 11 define the aggregate TNA (TNA^{Agg}) and the aggregate net flow (F^{Agg}) as the sum of all TNAs and the sum of all net flows respectively. Equation 12 define x_t^i as the fraction of the aggregate TNA that comes from fund i. So, in other words, the counter-factual flows are the flows that would have happened had the aggregate net flow (F_t^{Agg}) been allocated proportionately (i.e. proportionately to x_t^i).

$$TNA_t^{Agg} = \sum_i TNA_t^i \tag{10}$$

$$F_t^{Agg} = \sum_i F_t^i \tag{11}$$

$$x_t^i = \frac{TNA_t^i}{TNA_t^{Agg}} \tag{12}$$

Frazzini and Lamont (2008) do not only investigate short-term sentiments but also long-term sentiments. Let me start by showing how short-term counter-factual flows are calculated and let me then extend the model to long-term counter-factual flows. Consider equation 13 below, describing how short-term counter-factual flows ($\hat{F}$) are calculated. The short-term counter-factual flow is calculated by allocating the aggregate net flow at time t according to the relative size of fund i at time $t-1$. The counter-factual flows are then used to construct counter-factual TNAs as described in equation 14.

$$\hat{F}_t^i = x_{t-1}^i F_t^{Agg} = \frac{TNA_{t-1}^i}{TNA_{t-1}^{Agg}} F_t^{Agg} \tag{13}$$

$$\widehat{TNA}_t^i = \frac{NAV_t^i}{NAV_{t-1}^i} TNA_{t-1}^i + \hat{F}_t^i \tag{14}$$

Note that this procedure only captures the sentiment formed over one quarter, and Frazzini and Lamont (2008) also wanted to investigate the effects of sentiment formed over several quarters. This achieved by first determining the desired period (2 quarters, 1 year, 2 years et cetera), and then recursively allocate net flows according to the

proportion of all equity funds represented by the fund at the beginning of the period. Consider equations 15 and 16, where counter-factual net flows are calculated using the relative size of fund i at time $s-k$ (where k is the desired period), after which the counter-factual flows are recursively added to the actual TNA as of time $s-k$ in order to calculate long-term counter-factual TNAs.

$$\hat{F}_t^i = x_{s-k}^i F_t^{Agg} = \frac{TNA_{s-k}^i}{TNA_{s-k}^{Agg}} F_t^{Agg} \tag{15}$$

$$\widehat{TNA}_t^i = \frac{NAV_t^i}{NAV_{t-1}^i} \widehat{TNA}^i{}_{t-1} + \hat{F}_t^i \tag{16}$$

The counter-factual TNAs are then used to calculate the counter-factual proportion of the counter-factual aggregate TNA held by fund i as described in equation 17. Using this counter-factual proportion we are finally able to calculate the counter-factual fraction of the market capitalization of company j held by fund i at time t, counter-factual in the sense that this is the fraction of the market capitalization that would have been held by the combined equity fund industry had net flows been allocated purely in proportion to the relative sizes of the respective funds (see equation 18).

$$\hat{x}_t^i = \frac{\widehat{TNA}_t^i}{\widehat{TNA}_t^{Agg}} \tag{17}$$

$$\hat{z}_t^j = \left(\sum_i \hat{x}_t^i \frac{POS_t^{ij}}{TNA_t^i} TNA_t^{Agg} \right) / MKTCAP_t^j \tag{18}$$

Value-weighted quintile portfolios are finally constructed by sorting all stocks on the FLOW variable of the previous quarter. Note that, since the sorting is done based on the sentiment of the previous quarter, this strategy is fully implementable. These portfolios are rebalanced monthly and the return on each portfolio, in excess of the risk-free rate, is recorded as well as the excess return of a zero-cost portfolio formed by buying the quintile porfolio with the highest sentiment stocks and selling short the portfolio with the lowest sentiment stocks.

Intuitively, what this method measures is the sentiment of investors of equity funds. Suppose for instance that suddenly pharmaceutical companies became popular among investors. This would cause net flows to funds that invest in pharmaceutical stocks to exceed their expected values, resulting in high measured sentiment for these pharmaceutical stocks. If the subsequent performance of these pharmaceutical stocks were to be

relatively good, that is if investors were correct in their enthusiasm for these stocks, then the return of the zero-cost portfolio would be relatively high. The method is designed to answer the question: are investors in equity funds smart or are they dumb?

5.2 Results

Consider the possible outcomes and their implications:

- **High sentiment predicts bad performance:** This is the Dumb Money scenario described in Frazzini and Lamont (2008). Frazzini and Lamont (2008) come to the conclusion that individual investors are taken advantage of by companies that issue new, overpriced, stocks when they detect high sentiment in the market.
- **High sentiment predicts good performance:** This Smart Money scenario is the opposite to the results of Frazzini and Lamont, and is what we would expect if we believe Swedish mutual fund investors are more sophisticated than American mutual fund investors.
- **High sentiment does not predict neither good nor bad performance:** This is the scenario we would expect if we believe the efficient market hypothesis (Fama, 1965) is correct in its semi-strong form.

Looking at table 5 we see that the excess return on the zero-cost portfolio formed by buying high sentiment stock and selling short low sentiment stock is statistically significantly different from zero in the case of the portfolios formed using 3-months, 6-month and 1-year flows, and almost significant for the portfolios formed using 2-year flows. Note that the return on the zero-cost portfolio constructed using 3-year flows is negative but not very significant. As previously discussed, this is evidence for a Smart Money effect which is the opposite of what Frazzini and Lamont (2008) found in their paper.

Table 5: Flows and excess returns on quintile portfolios

This table is a replication of table 2 in Frazzini and Lamont (2008). The first panel shows averages of the sorting variable, while the second panel shows the average excess return of portfolios formed by sorting stocks based on their flow and then dividing them into quintile portfolios. The last column in the second panel shows the return on a portfolio with a long position in the fifth quintile and a short position in the first quintile. T-values are shown below the coefficient estimates and statistically significant coefficients are reported in bold text.

Flow	Q1 (low)	Q2	Q3	Q4	Q5 (high)	Q5-Q1
3-month flow	-0.071	-0.001	0.000	0.001	0.066	0.137
6-month flow	-0.114	-0.002	0.000	0.002	0.106	0.220
1-year flow	-0.175	-0.003	0.000	0.005	0.174	0.349
2-year flow	-0.177	-0.005	0.001	0.009	0.249	0.425
3-year flow	-0.213	-0.004	0.001	0.009	0.302	0.515
Portfolio returns	Q1 (low)	Q2	Q3	Q4	Q5 (high)	L/S
3-month flow	0.204	0.238	0.447	0.551	0.840	**0.636**
	(0.302)	(0.409)	(0.871)	(1.043)	(1.234)	(2.124)
6-month flow	0.257	0.210	0.437	0.615	0.929	**0.672**
	(0.360)	(0.356)	(0.782)	(1.074)	(1.299)	(2.311)
1-year flow	0.052	0.167	0.257	0.375	0.730	**0.679**
	(0.070)	(0.261)	(0.414)	(0.565)	(0.861)	(2.022)
2-year flow	-0.792	-0.458	-0.474	-0.352	-0.111	0.681
	(-0.794)	(-0.565)	(-0.652)	(-0.426)	(-0.104)	(1.447)
3-year flow	-1.349	-1.556	-1.411	-1.068	-1.908	-0.559
	(-1.064)	(-1.398)	(-1.257)	(-0.848)	(-1.233)	(-0.831)

6 Sophistication

I have previously touched upon the differences between American and Swedish legislation. In this section of the thesis I will describe the difference, I will show how the differences in legislation affects the structure of the market for equity funds and finally I will attempt to link the resulting differences in sophistication to the discrepancy with American studies found in the previous section. Swedish law (SFS 2004:46 ch. 1 1) defines two types of funds: mutual funds and special funds. I have translated the definition of these different types of funds below.

> **mutual fund:** the shares of which can be redeemed at the request of the owner of a share and which consists of financial assets, if it was formed through investments from the public and is owned by the investors and managed according to the rules listed in chapter 5.

Note that the law requires funds that want to be considered mutual funds to accept investments from the public. This has to be interpreted in contrast with the definition of special funds.

> **special fund:** the shares of which can be redeemed at the request of the owner of a share and which consists of financial assets, if it was formed through investments from the public or from a specific and defined group of investors and owned by the investors and managed according to the rules listed in chapter 6.

Note that while the law apparently allows special funds to define a specific group of investors from which it will accept investments, the law does not allow mutual funds to do so. What is of interest here is that there is no such law in the United States, where it is common for mutual funds to only accept investments from institutional investors. The effect of this difference can be clearly seen in the composition of the respective markets for mutual funds, where in 2004 American households owned 93.8% of all outstanding American mutual fund shares while the corresponding figure for the Swedish market in 2004 was 50.7%. The difference was even stronger in 2008 when 92.1% of American mutual fund shares were held by American households while at the same time only 39.8% of Swedish shares in mutual funds were held by Swedish households (see figure 1). Since several studies have found that institutions are more sophisticated than individuals I hypothesize that the discrepancy with regards to American studies found in the previous section can be explained by this difference in sophistication among investors in mutual funds.

Figure 1: Market structure

The plot shows the fraction of the total value of all outstanding shares in equity mutual funds that were held by American respectively Swedish households. The Swedish data was obtained from Statistics Sweden, and the American data was obtained from the Investment Company Institute.

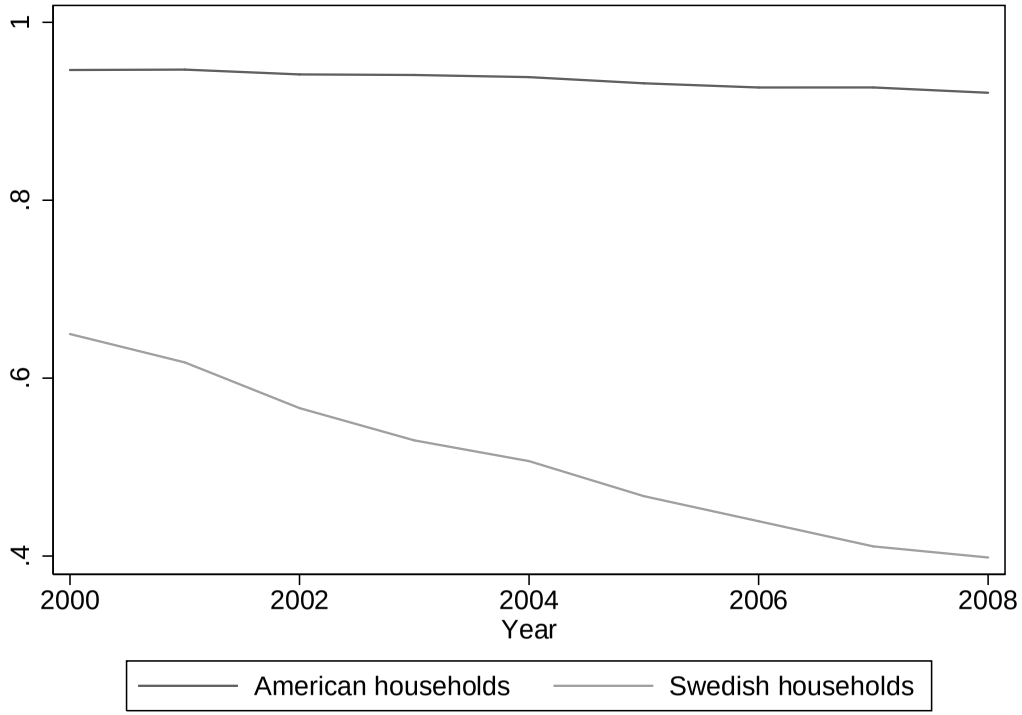
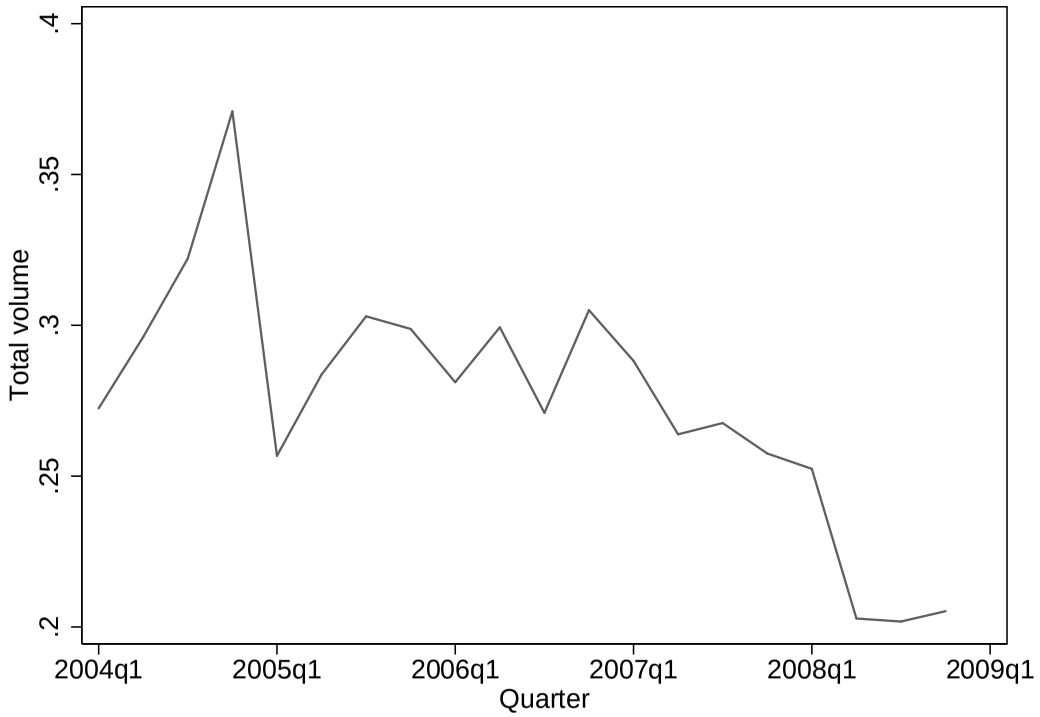


Figure 2: Household activity

The figure shows quarterly observations of the fraction of the total volume, defined as the sum of inflows and outflows, that originated from households.



6.1 Linking smart money to sophistication

Recall that my data set contains quarterly observations of inflows, outflows and outflows to all equity funds as well as the total value of all outstanding shares in equity funds all broken down by different types of investors. With the hypothesis that institutional investors drive the smart money effect I want to test whether the return on the zero-cost portfolios is relatively low when households are particularly active and relatively high when households are relatively inactive. The intuition behind this is that since the smart money effect is driven by sentiment, and since sentiment is driven by market activity, and finally since we expect institutional investors to be more sophisticated than individual investors, we would expect lower returns on the zero-cost portfolio when households are relatively more active.

In order to test the hypothesis I start by defining two different measures of market activity: net flow and total volume. While net flow is conventionally defined as the difference between the inflow and the outflow the total volume is defined as the sum of inflows and outflows. Note that the total volume could be several billions of SEK even when the net flow is zero. I then define θ to be the fraction of total net flow originating from households and γ to be the fraction of total volume originating from households, as shown in equations 19 and 20 below.

$$\theta_t = \frac{NETFLOW_t^{HOUSEHOLDS}}{NETFLOW_t^{TOTAL}} \tag{19}$$

$$\gamma_t = \frac{VOLUME_t^{HOUSEHOLDS}}{VOLUME_t^{TOTAL}} \tag{20}$$

I proceed to regress the monthly returns on the zero-cost portfolio on these measures of household activity as shown in equation 21. The relationship is estimated for each of the period lengths used in section 5. If my hypothesis is correct we would see insignificant correlation coefficients with the net flows and negative correlation coefficients with total volume. The results from the regression can be found in table 6.

$$R_t^i = \beta_0 + \beta_1\theta_{t-1} + \beta_2\gamma_{t-1} + \epsilon_t \tag{21}$$

The results from the estimation are inconclusive. While the coefficient for total volume appears to be larger than the coefficient for net flow, none of these are significant. Also note that contrary to what we expected, the sign of the correlation coefficient with total volume seems to be predominantly positive, though as previously mentioned very

insignificant. These results are likely due to the disaggregated nature of the data. I would be very interested to see what the results would be if the model was estimated on a per fund basis as it is entirely possible that my hypothesis is correct but that the households trade significantly among quite similar funds, which would generate low net flows, high total volumes and low correlation coefficients. A simple imputation of the average returns of households as compared to the average of all investors shows that the average returns of households is slightly lower than the average return of the average investor (see table 1, panel D). I consider this suggestive evidence, but further research is needed to confirm my hypothesis.

Table 6: Sophistication

The table shows the relationship between the return on the L/S portfolios described in table 5 and the ratio of the activity of households compared to the activity of all investors both in terms of net flows and in terms of total volume defined as the sum of inflows and outflows.

		Coef.	Std. Err.	t	$P > \|t\|$	[95% Conf.	Interval]
1 quarter	Net	-.0022442	.0015917	-1.41	0.165	-.0054397	.0009512
	Volume	.0751751	.0773797	0.97	0.336	-.080171	.2305212
2 quarters	Net	.0003859	.0015471	0.25	0.804	-.0027248	.0034966
	Volume	-.0180812	.0754557	-0.24	0.812	-.1697951	.1336327
1 year	Net	.0017701	.0016399	1.08	0.287	-.0015394	.0050796
	Volume	.1137246	.1076956	1.06	0.297	-.103614	.3310632
2 years	Net	.0014126	.0020297	0.70	0.492	-.0027326	.0055578
	Volume	.0545688	.1478808	0.37	0.715	-.2474442	.3565817
3 years	Net	.0014049	.0024	0.59	0.566	-.0036373	.0064471
	Volume	.1414154	.2293871	0.62	0.545	-.3405089	.6233398

7 Conclusion

The main finding of this thesis is that, while studies have found American investors in mutual funds to be "dumb money", I find that Swedish investors in mutual funds are "smart money". The technical definitions of these terms are as follows: "dumb money" is in effect when relatively popular stocks tend to underperform relatively unpopular stocks while "smart money" is in effect when relatively popular stocks tend to outperform relatively unpopular stocks.

I was able to show that past performance, measured both as returns in excess of the risk-free rate and using a risk-adjusted measure, is positively linearly correlated with subsequent net flows, and in particular that good performance is more correlated with subsequent net flows compared to poor performance.

Finally, after finding the smart money effect, I attempted to link the discrepancy to the differences in regulation between Sweden and the United States though I was not able to confirm my hypothesis with and statistical significance.

7.1 Further research

With my data set I was able to show that it definitely appears that there is a difference between the American and the Swedish fund industries, however I was unable to verify my hypothesis that the reason as to why the average American fund investor appears to be dumb money and the average Swedish fund investor appears to be smart money is because of differing regulations draining the American mutual fund industry from sophisticated institutional investors. I believe that further research regarding this discrepancy is warranted, and furthermore I believe that a powerful data set, preferably with disaggregated net flows, would be able to confirm my hypothesis. I also believe further research, investigating whether the assumption that I make in connection with the investigation of the relationship between net flows and past performance holds true using Swedish data, would be warranted.

References

Barber, Brad, and Terrance Odean, 2000, Trading is hazardous to your wealth: the common stock investment performance of individual investors, *Journal of Finance* 55, 773–806.

——— , 2001, Boys will be boys: gender, overconfidence, and common stock investment, *Quarterly Journal of Economics* 116, 261–292.

Brown, Steven., and William Goetzmann, 1995, Performance persistance, *Journal of Finance* 50, 679–698.

Calvet, Laurent E., John Y. Campbell, and Paolo Sodini, 2007, Down or out: Assessing the welfare costs of household investment mistakes, *Journal of Political Economy* 115, 707–747.

——— , 2009, Fight or flight? Portfolio rebalancing by individual investors, *Quarterly Journal of Economics* 124, 301–348.

Carhart, Mark, 1997, On persistence in mutual fund performance, *Journal of Finance* 52, 57–82.

Chen, Hsiu-Lang, Narasimhan Jegadeesh, and Russ Wermers, 2000, The value of active mutual fund management: An examination of the stockholdings and trades of fund managers, *Journal of Finanancial and Quantitative Analysis* 35, 343–368.

Chevalier, Judith, and Glenn Ellison, 1997, Risk taking by mutual funds as a response to incentives, *Journal of Political Economy* 105, 1167–1200.

Daniel, Kent, Mark Grinblatt, Sheridan Titman, and Russ Wermers, 1997, Measuring mutual fund performance with characteristic-based benchmarks, *Journal of Finance* 52, 1035–1058.

Fama, Eugene, 1965, The behavior of stock market prices, *Journal of Business* 38, 34–105.

Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on bonds and stocks, *Journal of Financial Economics* 33, 3–53.

Frazzini, Andrea, and Owen A. Lamont, 2008, Dumb money: mutual fund flows and the cross-section of stock returns, *Journal of Financial Economics* 88, 193–424.

Goetzmann, William N., and Roger G. Ibbotson, 1994, Do winners repeat? Patterns in mutual fund performance, *Journal of Portfolio Management* 20, 9–17.

Gruber, Martin J., 1996, Another puzzle: The growth in actively managed mutual funds, *Journal of Finance* 51, 783–810.

Hendricks, Darryll, Jayendu Patel, and Richard Zeckhauser, 1993, Hot hands in mutual funds: Short-run persistance of relative performance, 1974-1988, *Journal of Finance* 48, 93–130.

Ippolito, Richard A., 1992, Consumer reaction to measures of poor quality: evidence from the mutual fund industry, *Journal of Law and Economics* 35, 45–70.

Jegadeesh, Narasimham, and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48, 65–91.

Jensen, Michael C., 1967, The performance of mutual funds in the period 1945-1964, *Journal of Finance* 2, 389–416.

Odean, Terrance, 1999, Do investors trade too much?, *American Economic Review* 89, 1279–1298.

Sapp, Travis, and Ashsih Tiwari, 2004, Does stock return momentum explain the smart money effect?, *Journal of Finance* 59, 2605–2622.

Sirri, Erik R., and Peter Tufano, 1998, Costly search and mutual fund flows, *Journal of Finance* 53, 1589–1622.

Warther, Vincent A., 1995, Aggregate mutual fund flows and security returns, *Journal of Financial Economics* 39, 209–235.

Zheng, Lu, 1999, Is money smart? A study of mutual fund investors fund selection ability, *Journal of Finance* 54, 901–933.

Table A-1: List of funds in the data set

This table lists all of the funds in the data set. The left column contains the names and the right column the owner company.

AMF Pensions Aktiefond - Global	AMF Fonder AB
AMF Pensions Aktiefond - Sverige	AMF Fonder AB
AMF Pensions Aktiefond - Världen	AMF Fonder AB
AMF Pensions Europafond - Euro	AMF Fonder AB
Alfred Berg Amerika	Banco Fonder AB
Alfred Berg Fjärran Östern	Banco Fonder AB
Alfred Berg Optimal Norden	Banco Fonder AB
Alfred Berg Ryssland	Banco Fonder AB
Alfred Berg Sverige	Banco Fonder AB
Banco Etisk Europa	Banco Fonder AB
Banco Etisk Global	Banco Fonder AB
Banco Etisk Norden	Banco Fonder AB
Banco Etisk Sverige	Banco Fonder AB
Banco Etisk Sverige Special	Banco Fonder AB
Banco Euro Top 50	Banco Fonder AB
Banco Hjälp	Banco Fonder AB
Banco Human Pension	Banco Fonder AB
Banco Ideell Miljö	Banco Fonder AB
Banco Kultur	Banco Fonder AB
Banco Offensiv	Banco Fonder AB
Banco Samarit Pension	Banco Fonder AB
Banco Småbolag	Banco Fonder AB
Banco Svensk Miljö	Banco Fonder AB

Banco Teknik & Innovation	Banco Fonder AB
Humanfonden	Banco Fonder AB
Samaritfonden	Banco Fonder AB
Carlson Småbolagsfond	Carlson Fonder Aktiebolag
Carlson Sweden Micro Cap	Carlson Fonder Aktiebolag
Carlson Sverigefond	Carlson Fonder Aktiebolag
Carlson Utlandsfond	Carlson Fonder Aktiebolag
Cicero Biotech & Healthcare	Cicero Fonder AB
Cicero SRI Sverige	Cicero Fonder AB
Danske Invest Global Index	Danske Capital AB
Danske Invest Global Teknologi	Danske Capital AB
Danske Invest SRI Global	Danske Capital AB
Danske Invest SRI Sverige	Danske Capital AB
Danske Invest Sverige	Danske Capital AB
Danske Invest Sverige/Europa	Danske Capital AB
Danske Invest Utland	Danske Capital AB
Öhman Etisk Index Europa	E. Öhman J:or Fonder AB
Öhman Etisk Index Japan	E. Öhman J:or Fonder AB
Öhman Etisk Index Pacific	E. Öhman J:or Fonder AB
Öhman Etisk Index USA	E. Öhman J:or Fonder AB
Öhman Hjärt-Lungfond	E. Öhman J:or Fonder AB
Öhman IT-fond	E. Öhman J:or Fonder AB
Öhman Nordisk Miljöfond	E. Öhman J:or Fonder AB
Öhman Sverigefond	E. Öhman J:or Fonder AB
Öhman Varumärkesfond	E. Öhman J:or Fonder AB
Eldsjäl Biståndsfond	Eldsjäl Fond AB
Enter Sverige	Enter Fonder AB

Folksam LO Sverige	Folksam LO Fond AB (publ)
Folksam LO Världen	Folksam LO Fond AB (publ)
Folksam LO Västfonden	Folksam LO Fond AB (publ)
Gustavia Balkan	Gustavia Capital Management AB
Gustavia Sverige	Gustavia Capital Management AB
Bosparfonden SBC/Handelsbanken	Handelsbanken Fonder AB
Göteborgs Universitets Forskningsfond	Handelsbanken Fonder AB
Handelsbanken Sverige/Världen	Handelsbanken Fonder AB
Handelsbankens Aktiefond Index	Handelsbanken Fonder AB
Handelsbankens Amerikafond	Handelsbanken Fonder AB
Handelsbankens Asienfond	Handelsbanken Fonder AB
Handelsbankens Europafond	Handelsbanken Fonder AB
Handelsbankens Europafond Index	Handelsbanken Fonder AB
Handelsbankens Japanfond	Handelsbanken Fonder AB
Handelsbankens Latinamerikafond	Handelsbanken Fonder AB
Handelsbankens Nordenfond	Handelsbanken Fonder AB
Handelsbankens Nordiska Småbolagsfond	Handelsbanken Fonder AB
Handelsbankens Radiohjälpsfond	Handelsbanken Fonder AB
Handelsbankens Reavinstfond	Handelsbanken Fonder AB
Handelsbankens Småbolagsfond	Handelsbanken Fonder AB
Handelsbankens Tillväxtmarknadsfond	Handelsbanken Fonder AB
Handelsbankens Utlandsfond	Handelsbanken Fonder AB
Handelsbankens Österuropafond	Handelsbanken Fonder AB
SPP Aktiefond Sverige	Handelsbanken Fonder AB
SPP Aktieindexfond Europa	Handelsbanken Fonder AB
SPP Aktieindexfond USA	Handelsbanken Fonder AB
Kaupthing Kina	Kaupthing Fonder AB

Kaupthing Småbolag	Kaupthing Fonder AB
Kaupthing TIME	Kaupthing Fonder AB
Lannebo Småbolag	Lannebo Fonder AB
Lannebo Sverige	Lannebo Fonder AB
Lannebo Vision	Lannebo Fonder AB
Länsförsäkringar Asienfond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Europafond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Fastighetsfond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Globalfond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Småbolagsfond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Sverigefond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Teknologifond	Länsförsäkringar Fondförvaltning AB
Länsförsäkringar Totalfond	Länsförsäkringar Fondförvaltning AB
Institutionella Aktiefonden Europa	Nordea Fonder Aktiebolag
Institutionella Aktiefonden Världen	Nordea Fonder Aktiebolag
Nordea Allemansfond Alfa	Nordea Fonder Aktiebolag
Nordea Allemansfond Beta	Nordea Fonder Aktiebolag
Nordea Allemansfond Olympia	Nordea Fonder Aktiebolag
Nordea Avtalspensionsfond Maxi	Nordea Fonder Aktiebolag
Nordea Etiskt Urval	Nordea Fonder Aktiebolag
Nordea Europafond	Nordea Fonder Aktiebolag
Nordea Fjärran Österfond	Nordea Fonder Aktiebolag
Nordea Global	Nordea Fonder Aktiebolag
Nordea Japanfond	Nordea Fonder Aktiebolag
Nordea Latinamerikafond	Nordea Fonder Aktiebolag
Nordea Nordamerikafond	Nordea Fonder Aktiebolag
Nordea Nordenfond	Nordea Fonder Aktiebolag

Nordea Selekta Europa	Nordea Fonder Aktiebolag
Nordea Spektra	Nordea Fonder Aktiebolag
Nordea Sverigefond	Nordea Fonder Aktiebolag
Nordea Tillväxtbolagsfond	Nordea Fonder Aktiebolag
Nordea Östeuropafond	Nordea Fonder Aktiebolag
SEB Aktiesparfond	SEB Investment Management AB
SEB Cancerfonden	SEB Investment Management AB
SEB Choice Asienfond ex. Japan	SEB Investment Management AB
SEB Choice Emerging Marketsfond	SEB Investment Management AB
SEB Choice Japanfond	SEB Investment Management AB
SEB Choice Latinamerikafond	SEB Investment Management AB
SEB Choice Nordamerikafond	SEB Investment Management AB
SEB Choice Nordamerikafond Medelstora bolag	SEB Investment Management AB
SEB Choice Nordamerikafond Småbolag	SEB Investment Management AB
SEB Etisk Globalfond	SEB Investment Management AB
SEB Europafond	SEB Investment Management AB
SEB Europafond Offensiv	SEB Investment Management AB
SEB Europafond Småbolag	SEB Investment Management AB
SEB Fastighetsfond	SEB Investment Management AB
SEB Globalfond	SEB Investment Management AB
SEB Internetfond	SEB Investment Management AB
SEB Läkemedelsfond	SEB Investment Management AB
SEB Nordenfond	SEB Investment Management AB
SEB Private Banking Europeisk Aktieportfölj	SEB Investment Management AB
SEB Schweizfond	SEB Investment Management AB
SEB Stiftelsefond Sverige	SEB Investment Management AB
SEB Stiftelsefond Utland	SEB Investment Management AB

SEB Sverigefond	SEB Investment Management AB
SEB Sverigefond - Stora Bolag	SEB Investment Management AB
SEB Sverigefond Chans/Risk	SEB Investment Management AB
SEB Sverigefond Småbolag Chans/Risk	SEB Investment Management AB
SEB Teknologifond	SEB Investment Management AB
SEB Östersjöfond / WWF	SEB Investment Management AB
SEB Östeuropafond	SEB Investment Management AB
Skandia Allt i Ett Offensiv	Skandia Fonder AB
Skandia Cancerfonden	Skandia Fonder AB
Skandia Europa	Skandia Fonder AB
Skandia Far East	Skandia Fonder AB
Skandia Ider för Livet	Skandia Fonder AB
Skandia Japan	Skandia Fonder AB
Skandia Småbolag Europa	Skandia Fonder AB
Skandia Småbolag Sverige	Skandia Fonder AB
Skandia Sverige	Skandia Fonder AB
Skandia Time Global	Skandia Fonder AB
Skandia USA	Skandia Fonder AB
Skandia Världen	Skandia Fonder AB
Skandia Världsnaturfonden	Skandia Fonder AB
Spiltan Aktiefond Stabil	Spiltan Fonder AB
Spiltan Aktiefond Sverige	Spiltan Fonder AB
Carnegie Sverige	Swedbank Robur Fonder AB
Folksams Aktiefond Asien	Swedbank Robur Fonder AB
Folksams Aktiefond Europa	Swedbank Robur Fonder AB
Folksams Aktiefond Japan	Swedbank Robur Fonder AB
Folksams Aktiefond Sverige	Swedbank Robur Fonder AB

Folksams Aktiefond USA	Swedbank Robur Fonder AB
Folksams Framtidsfond	Swedbank Robur Fonder AB
Folksams Globala Aktiefond	Swedbank Robur Fonder AB
Folksams Idrottsfond	Swedbank Robur Fonder AB
Folksams Tjänstemannafond Sverige	Swedbank Robur Fonder AB
KPA Etisk Aktiefond	Swedbank Robur Fonder AB
Swedbank Robur Aktiefond Pension	Swedbank Robur Fonder AB
Swedbank Robur Allemansfond I	Swedbank Robur Fonder AB
Swedbank Robur Allemansfond II	Swedbank Robur Fonder AB
Swedbank Robur Allemansfond III	Swedbank Robur Fonder AB
Swedbank Robur Allemansfond IV	Swedbank Robur Fonder AB
Swedbank Robur Allemansfond V	Swedbank Robur Fonder AB
Swedbank Robur Amerikafond	Swedbank Robur Fonder AB
Swedbank Robur Contura	Swedbank Robur Fonder AB
Swedbank Robur Ethica Global MEGA	Swedbank Robur Fonder AB
Swedbank Robur Ethica Miljö Sverige	Swedbank Robur Fonder AB
Swedbank Robur Ethica Sverige MEGA	Swedbank Robur Fonder AB
Swedbank Robur Ethica Sverige-Global	Swedbank Robur Fonder AB
Swedbank Robur Europafond	Swedbank Robur Fonder AB
Swedbank Robur Europafond MEGA	Swedbank Robur Fonder AB
Swedbank Robur Exportfond	Swedbank Robur Fonder AB
Swedbank Robur Finansfond	Swedbank Robur Fonder AB
Swedbank Robur Globalfond	Swedbank Robur Fonder AB
Swedbank Robur Globalfond MEGA	Swedbank Robur Fonder AB
Swedbank Robur Hockeyfond	Swedbank Robur Fonder AB
Swedbank Robur IP Aktiefond	Swedbank Robur Fonder AB
Swedbank Robur Japanfond	Swedbank Robur Fonder AB

Swedbank Robur Kapitalinvest	Swedbank Robur Fonder AB
Swedbank Robur Kommunikationsfond	Swedbank Robur Fonder AB
Swedbank Robur Medica	Swedbank Robur Fonder AB
Swedbank Robur Nordenfond	Swedbank Robur Fonder AB
Swedbank Robur Pacificfond	Swedbank Robur Fonder AB
Swedbank Robur Privatiseringsfond	Swedbank Robur Fonder AB
Swedbank Robur Realinvest	Swedbank Robur Fonder AB
Swedbank Robur Rysslandsfond	Swedbank Robur Fonder AB
Swedbank Robur Småbolagsfond Europa	Swedbank Robur Fonder AB
Swedbank Robur Småbolagsfond Norden	Swedbank Robur Fonder AB
Swedbank Robur Småbolagsfond Sverige	Swedbank Robur Fonder AB
Swedbank Robur Sverigefond	Swedbank Robur Fonder AB
Swedbank Robur Sverigefond MEGA	Swedbank Robur Fonder AB
Swedbank Robur Talenten Aktiefond MEGA	Swedbank Robur Fonder AB
Swedbank Robur Vasaloppsfond	Swedbank Robur Fonder AB
Lärarfond 21-44	Svenska Lärarfonder Aktiebolag
Västernorrlandsfonden	Västernorrlandsfonden AB