UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Do Winners Keep Winning?

A Study of the Performance Persistence in Swedish Mutual Funds

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Abstract

We investigate whether performance persistence exists on the Swedish market for equity based mutual funds for the years 1992 – 2011. We test for one-year persistence for the risk-neutral returns for eight fund categories. The method includes both an autoregression of present returns on past returns and a cross product ratio test. The results suggest that performance persistent exists on the Swedish market. The main significant evidence is found for funds investing in Sweden, Europe and globally. The persistency found is most prevalent for the period spanning from 2000 to 2010.

Contents

1 Introduction

The Swedish market for mutual funds has seen a great increase over the last 30 years. Even though the first Swedish fund equivalent of what we today call a mutual fund was started in 1958 it was not until 1984 with the introduction of the "Allemansfond" (SFS 1997:465) that the Swedish market for mutual funds saw a more intense increase (SIFA, 2009). From a value of 65 billion SEK in 1986 the Swedish market for mutual funds amounts to 1 800 billion SEK by the end of 2011 with equity funds making up for half of the 1800 billion SEK (SIFA, 2012).

Given the size of the Swedish mutual fund market it might be difficult to get a sufficient overview. From an investor's point of view it may seem rational to base ones decision on what fund to invest in on historical returns. For instance the Morningstar ratings of mutual funds are based on historical returns. Though for the historical return of a mutual fund to be a valid investment criterion, persistence in performance must exist from a historical time period to a later one.

Since 1986 only three studies on performance persistence have been made on the Swedish market with the latest one including data up until 2006. Whereas Dahlqvist, Engström and Söderlind (2000) found no evidence of performance persistence for equity based mutual funds, Jern (2002) and Garbalinska and Gustafsson (2007) did. One should, however, point out that the evidence found in the latter studies was not mainly for the same fund categories. Given the great increase of the Swedish market for mutual funds, the somewhat mixed results of the earlier studies and that data from five more years have become available we consider the area attractive for further studies.

Thus, the question we try to answer is if performance persistence does exist on the Swedish market for equity based mutual funds. Do certain funds consistently perform better than others?

In more formal words the hypothesis tested and its corresponding null hypothesis can be stated as follows:

- H0: Performance persistence does not exist on the Swedish market for equity based mutual funds.
- H1: Performance persistence exists on the Swedish market for equity based mutual funds.

The theoretical framework of this thesis is based on the efficient market hypothesis (Fama, 1965). In short, an efficient market can be described as a market in which prices always reflect all relevant information. On a market with performance persistence prices are predictable. Predictability in prices means that all available information is not reflected in prices and thus that the market is not efficient given that only rational investors exist.

This study studies performance data up until 2011 including five more years of newer data compared to the latest study of performance persistence on the Swedish market (Garbalinska & Gustafsson, 2007). We have no reason to believe that the market characteristics have changed to such a degree since the latest study that it will affect the results of our study. We expect our results to be in line with earlier study by Garbalinska and Gustafsson (2007) and Jern (2002) thus show evidence of performance persistence in Swedish equity mutual funds.

The methodology of this study includes both parametric and non-parametric methods. Firstly a sample of Swedish equity based mutual funds, with data spanning from 1992 to 2011, was taken and every fund was categorized depending on its choice of geographical investment region. A risk-neutral performance measure was then calculated for every fund and year. Tests were then made in order to determine if significant persistence in performance exists from one year to the next one for each category and year. The parametric method used was a regression of the funds' performance in one category in one year on the performance the previous year. The non-parametric method used was the cross product ratio test where one categorizes the funds in each category every year depending on whether it either over-perform or under-perform two years in a row or show negative relationship in performance over the two years. A statistic is then calculated and the significance of this statistic is tested.

The theory essential of the thesis and a review of previous research are presented in sections 2 and 3 respectively. A detailed description of the methodology used can be found in section 4, an overview of the data used is presented in section 5 whereas the results and the analysis can be found in sections 5 and 6 respectively.

2 Theory

The theoretical foundation of this thesis is based on the efficient market hypothesis (EMH). Even though several theories similar to the EMH have been put forward in previous years, it was not until 1965 that an efficient market was firstly defined in literature. It was Fama (1965) who defined it and an efficient market is subject to three basic assumptions:

1. Relevant information is available and costless to all market participants.
2. On the market a large number of profit maximizing rational investors who compete against each other exist.
3. If irrational investors exist on the market their trade does not affect prices. This is due to the fact that the trade of irrational investors is assumed to be purely random and that the effect on prices can thus be cancelled out. If the trade of those investors is not random but correlated rational arbitrageurs quickly eliminate those effects leaving prices unaffected.[1]

In short an efficient market can be described as a market in which prices always reflect relevant information.

There are three sub-hypothesises to the general efficient market hypothesis all depending on what one include in the term "relevant information".

The weak form of the EMH assumes that prices reflect historical market data such as prices and trading volumes. Given this assumption it is impossible for an investor to beat the current market by analysing historical market data. Prices have already adjusted. It is though still possible to achieve excess returns using fundamental analysis and inside information.

The semi-strong form of the EMH assumes that prices reflect all publicly available information including fundamental data making it impossible to achieve excess returns using a fundamental analysis in contrast to the weak form.

Finally the strong form of EMH, the most extreme of the three assumptions, assumes that prices reflect all relevant information irrespective of whether the information is considered to be public or insider information. Given that prices, in the context of the strong form of EMH, already reflect all relevant information one cannot achieve excess returns using a fundamental analysis or insider information.

[1] Some question marks have though been raised regarding the view of irrational investors and arbitrageurs. Rational arbitrageurs may experience unexpected losses given that irrational investors may continue acting irrational turning the expected profit for the arbitrageur into an unexpected loss. This may make arbitrageurs hesitate when it comes to exploiting existing arbitrage opportunities (De Long et al, 1990).

Looking at markets today, they are not always aligned with the efficient market hypothesis. Anomalies to the efficient market hypothesis have been seen. Thaler (1999) listed many of them and we list some of his findings:

- If the EMH holds trading should only occur when new public information is available or when investors need to liquidate. Though trading activity in shares is often high irrespectively of the fact that no new information is available or that no obvious reason to liquidation is to be seen.
- Volatility in share prices is too high given no change in future dividend expectations.
- Different measures, such as the earnings-price ratio, can be used as good predictors for future winners.

Academics have found it easier to find anomalies from EMH than explaining them. As of today, academics are divided into two opposing sides when it comes to explaining the anomalies observed.

The behaviourists try to explain the deviations from efficient markets by the shortcomings of investors. They claim that shortcomings in the cognitive ability of investors make them take irrational decisions. This makes the assumption of rational investors fail and thus the efficient market hypothesis itself (Yalçin, 2010).

One the other side we find Fama and French (1988) arguing that anomalies can be explained by either chance or asset pricing models overreacting to new information. Fama and French also argue that long-term anomalies disappear if one makes reasonable changes to the methods used to measure anomalies.

The relevant form of the EMH to this thesis is the weak form. As stated above one should not, according to the weak form of the EMH, be able predict future returns from historical market data. Thus finding evidence of prevalent performance persistence will thus reject the weak form of the EMH since one then can predict future returns.

In terms of linking this thesis to the weak form of the EMH an assumption can be made. We want allow there to be irrational investors without automatically failing the EMH for rational investors. This is true given that shorting of funds is not possible. We define an irrational investor as an investor who does not evaluate his or her investment appropriately based on relevant information, for the weak form of the EMH, historical market data. If performance persistence can be derived from underperforming funds keep underperforming, but no consistent over performing funds, this persistence may be subject to irrational investors. One may not want to reject the EMH in this scenario since the market for rational investors is still effective, i.e. investors cannot retrieve excess returns from analysing historical data.

3 Review of Previous Research

The history of performance persistence testing of mutual funds is soon to reach its 50th birthday. Even though the first studies on performance persistence could not demonstrate any evidence of persistence later studies have come to contradict or at least complicate the early conclusions.

Roughly speaking, tests on performance persistence can be divided into two categories, non-parametric and parametric. Whereas parametric tests require an assumption to be made about the distribution of the data no such assumption is needed to be made performing a non-parametric test. Thus, non-parametric tests are widely used when a specific assumption of the distribution of the data cannot be made.

A common parametric method testing for performance persistence is an autoregression of the performance in time period t on the performance in time period t-1. Common non-parametric tests include the cross-product ratio test, Spearman's rank correlation and Kolomogorov-Smirnov tests (Garbalinska & Gustafsson, 2007).

Modern studies on performance persistence test whether persistence does exist given relevant fund-specific attributes. Finding evidence of such persistence supports the hypothesis of existing market timing skills of fund managers.

The first studies on performance persistence were made by Sharpe (1966) and Jensen (1968) that studied US fund data from the 1940s to the 1960s. Sharpe finds evidence of significant persistence in performance whilst Jensen does not. In his study Jensen use the so called Jensen's Alpha. Using this method one can calculate the risk-adjusted performance taking into account the relative risk of the fund to the index. Later studies by Dunn and Thiesen (1983) study US fund returns from 1974 to 1988, and Carlson (1970) study US fund returns from 1948 to 1967, supports the conclusion that past performance has no influence on future performance. Carlson (1970) also notes that the conclusion about whether funds beat the market or not is highly dependent on the choice of market proxy and time period.

The early 1990s saw several studies supporting the hypothesis of existing performance persistence. Those include Hendricks, Patel and Zeckenhauser (1993), Goetzmann and Ibbotson (1994), Shukla and Trzinka (1994) and Brown and Goetzmann (1995). Though one should take into account that the studies made in the early 1990s were made on newer data compared to the other studies mentioned above.

The study presented by Hendricks et al. (1993) was a response to criticism received by Brown, Goetzmann, Ibbotson and Ross (1992). Brown et al. show that the existence of survivorship bias in the data has a significant effect on the conclusions about the performance persistence. Other studies have though finds that survivorship bias has no effect on the performance persistence. Among those Elton, Gruber, Das and Hlavka (1993).

Hendricks et al. (1993) use quarterly data and finds evidence of performance persistence with persistence peaking at a one year evaluation period.

Researchers are not united behind one theory for the reason of the existence of survivorship bias. One view is expressed by Grinblatt and Titman (1992). The idea is that a fund that is not performing considerably well is more likely to be closed or merged with another better performing fund. Thus only including surviving funds for a time period may end up with one exaggerating the existence of significant performance persistence. Though this interpretation needs an assumption of market efficiency to hold. Given no market efficiency underperforming funds will not be closed.

Later studies have tried to explain the performance persistence found by other factors and have succeed to some extent. Carhart (1997) finds that the performance persistence found by Hendricks et al. (1993) could almost completely be explained by other factors. The performance persistence of the well performing funds is mostly driven by a momentum strategy followed by those funds. This momentum strategy (Jegadeesh & Titman, 1993) consists of buying stocks that have performed well in the past and sell stocks which have not performed well in the past. Carhart (1997) can however not explain the persistence in underperformance by the worst performing funds meaning that the only evidence for performance persistence is found for the worst performing funds. Carhart (1997) concludes that his results "do not support the existence of skilled or informed mutual fund portfolio managers".

Looking at more recent studies the results are still somewhat contradictory. Whereas Avramov and Wermers (2006) find some evidence of performance persistence Fama and French (2008) do not.

Most early studies on performance persistence were made by US scholars and it is not until recently that studies on the Swedish market have been made. To our knowledge only three previous studies on the Swedish market for mutual funds have been made.

Dahlqvist, Engström and Söderlind (2000) studied Swedish mutual funds returns 1993-1997 and used Jensen's alpha as their performance measure. In order to compute the alphas they ran a regression on the returns of the funds on several different benchmark assets. They then used a cross-sectional analysis to evaluate the funds given fund-specific attributes such as fund size, fee structure, trading activity and past performance. They only find evidence of performance persistence for money market funds.

Jern (2002) studied Swedish mutual funds returns between 1992 and 2001. Jern ran a regression of present alphas on previous alphas and finds evidence of one-year performance persistence for funds categorized as either Asian, North American or global and two-year persistence only for funds categorized as Asian.

Garbalinska and Gustafsson (2007) studied Swedish mutual funds from 1993 to 2006. Using parametric and non-parametric methods they analysed both raw and abnormal returns and found evidence of one-year performance persistence for funds investing in Sweden, Europe, Eastern Europe and globally.

Of the three we consider the study of Dahlqvist et al. to be the most extensive one. Dahlqvist et al. take into account fund-specific attributes, besides relative risk of the fund to its index and investment area when testing for persistency. Thus getting the closest to a test whether skilful fund managers do exist on the specific market. Even though some of the fund-specific attributes may be down to the fund manager to decide upon.

To summarize, in general the early studies of performance persistence do not find any evidence of existing persistence in mutual funds. Later studies have introduced the importance of survivorship bias in the data even though the effect of its existence on the conclusions about the performance persistence is debatable. Several studies in the early 1990s find evidence of existing performance persistence. Though later studies have come to conclude that some of these results could be explained by the fund following a specific strategy and not by market timing skills of the fund manager. The Swedish market is relatively unexplored and only a few studies have been done on the subject. The conclusions drawn in those studies are mixed and there is no evident view on whether performance persistence exists on the Swedish market or not.

4 Methodology

As mentioned in the literature review there are two main methods testing for performance persistence, parametric and non-parametric methods. Due to insecurity whether our data could be assumed to follow a normal distribution we have chosen to perform both a parametric and a non-parametric test.

As our parametric test we have chosen to use an autoregression of the performance in time period t on the performance an earlier time period.

Our choice of non-parametric test fell on the cross product ratio test.

Doing the tests we are controlling for the choice of geographical investment region for the different funds. Thus we controlled if there is any difference in persistence depending on the choice of geographical investment region.

We also choose to only test for one-year persistence. Looking at previous studies of performance persistence tests on persistence for different lengths of time periods have been made. Though tests of persistence on a one-year time period is one of the most common time periods used and one of the most common time periods where one has found persistence in performance.

The gathered data has been compiled in Microsoft Excel. Statistical calculations and estimations of regression models are done using Stata 12.

One must also decide on what measure of performance to perform the tests on. What measure of performance is the right one to use? Previous studies' tests have been performed on both raw returns and risk-neutral measures of the raw returns. To limit ourselves we choose to perform our test only on a risk-neutral measure of the raw returns and our choice of measure is the Jensen's Alpha.

Our choice of methodology is similar to the one used by Garbalinska and Gustafsson (2007). In contrast to Garbalinska and Gustafsson (2007) we have chosen to study a longer time period spanning from 1992 to 2011 and to test for performance persistence for every year compared to Garbalinska and Gustafsson (2007) that tested for performance persistence for every second year on data from 1993 to 2006.

Our study on performance persistence only includes tests on a risk-neutral performance measure. One should also note that our study is made on a sample affected by survivorship bias which may affect our results.

4.1 Performance Measure

Jensen's Alpha, firstly developed by Jensen (1968), has been used in several previous studies on performance persistence. The Alphas are estimated for each fund and subperiod using a regression model. The model looks as follows:

$$r_{it} - r_{ft} = \alpha_{it} + \beta_{im} \times (r_{mt} - r_{ft})_{it} + \epsilon_{it}$$

where

r_{it} is the raw return for fund i in the time period t,
r_{ft} is the risk-free rate f in the time period t,
β_{im} is the relative volatility of fund i to its benchmark index m,
r_{mt} is the raw return for benchmark index m in the time period t and
α_{it} is the Jensen's Alpha for fund i in the time period t.
ϵ_{it} is the error term.

Jensen's Alpha tells us if the fund in question has under- or overperformed relatively to its benchmark index and its relative riskiness to its benchmark index. A positive Jensen's Alpha indicates that the fund beats the benchmark index while a negative Jensen's Alpha indicates that the fund gets beaten by the benchmark index for time period t. A value of zero for Jensen's Alpha suggests that the fund in question has performed equally well as the benchmark index.

The betas are allowed to vary yearly in order to catch the effect of a changed fund strategy affecting the risk level of a fund. Given the considerably high average goodness of fit measures achieved for the different regions (see table C2 in the appendix), with *North America* being the exception, we argue that the Jensen's Alphas are to be considered reliable since the risk is reflected in the benchmark to a large degree.

4.2 Performance Persistence Measures

4.2.1 Autoregression

Running an autoregression is one of the two tests we run testing for performance persistence. Our estimated regression model looks as follows (Jern, 2002)

$$\alpha_t = \beta_0 + \beta_1 \alpha_{t-1} + \epsilon,$$

where α_t is the risk-neutral return (in our case Jensen's Alpha) in period t, α_{t-1} is the risk-neutral return in the previous time period and ϵ_{it} is the error term. Our sample was split into seven geographical regions depending upon the funds choice of geographical investment area. We then run a regression on the return data for every two consecutive years for each geographical region. A positive value on the coefficient β_1 then means that persistence does exist for the risk-neutral returns over the two years in that category. A negative value on the coefficient β_1 suggests that there is a negative relationship whilst a β_1 value equal to zero means that the there is no existing relationship between the risk-neutral returns in the two periods.

We also run an autoregression for the full period, spanning from 1992-2011, in order to test for performance persistence for this period. In practice this means that a regression is run of all the alphas in one category on the corresponding alphas the previous year.

To test whether the coefficient β_1 is significant or not we run a significance test assuming normal distribution of the regression errors. In line with previous studies on performance persistence we use a significance level of five per cent.

4.2.2 Cross Product Ratio Test

Due to uncertainty about whether the data is normally distributed we have also chosen to perform a non-parametric test, more specifically the cross product ratio test (Brown and Goetzmann, 2005). This test does not take into account the magnitude of the positive or negative performance of a fund a given year. It solely considers whether the fund is a winner or a loser.

A fund is categorised as a winner (W) if its risk-neutral performance, the Jensen's Alpha, for the given year is higher than or equal to the median of alphas for the given year and geographical region. Consequently a fund is categorised as a loser (L) if its risk-neutral performance for the given year and geographical region is lower than the median. Looking for evidence of one-year persistence in performance the evidence of persistence is strengthened if the fund in question is categorised as either a winner for two consecutive years (WW) or a loser for two consecutive years (LL). The evidence of persistence is thus weakened if the fund is categorised as a winner and then a loser the following year (WL) or a loser and then a winner the following year (LW).

From the four categories mentioned above one do calculate the cross product ratio (CPR) for every two consecutive years and each geographical region as follows

$$Cross\ Product\ Ratio\ (CPR) = \frac{N_{WW} \times N_{LL}}{N_{WL} \times N_{LW}}$$

where

N_{WW} is the number of funds categorised as winners for the two consecutive years in question,
N_{LL} is the number of funds categorised as losers for the two consecutive years in question,
N_{WL} is the number of funds categorised as winners the first year and losers the second year and
N_{LW} is the number of funds categorised as losers the first year and winners the second year.

If the number of funds classified as WW or LL is equally high as the number classified as WL or LW there is no evidence of persistence and the cross product ratio will be equal to one. A cross product ratio higher than one indicates that there is persistence (the higher the share of funds in a given time period that are classified as either WW or LL the stronger the evidence of persistence becomes). A cross product ratio lower than one point towards a negative relationship between the performance in the two periods (the higher the share of funds that are categorised as either WL or LW the stronger the evidence of a negative relationship becomes).

Besides testing for performance persistence for every year we also test for the full period. In order to calculate the CPR statistic for the full period we summarize the number of observations in each category (WW, LL, WL and LW) for all years and then calculate CPR statistic in the usual manner explained above.

In order to test the significance of the cross product ratio we calculate two different statistics, one Z-statistic and one χ^2 – statistic. The Z-statistic is calculated as follows

$$Z = \frac{CPR}{\sigma_{\ln(CPR)}}$$

where $\sigma_{\ln(CPR)}$ is calculated as follows

$$\sigma_{\ln(CPR)} = \sqrt{\frac{1}{N_{WW}} + \frac{1}{N_{LL}} + \frac{1}{N_{WL}} + \frac{1}{N_{LW}}}.$$

As with Z-statistics in general we assume it to follow a normal distribution. A test of the normality assumption is provided in table C2 in the appendix. Given a 5 per cent significance level a Z-statistic larger than 1.96 implies that the cross product ratio is significantly larger than 1. This implies evidence of performance persistence for the given year(s).

As mentioned above we have also decided to compute a second statistic, namely a χ^2 – statistic. This is due to the fact that our dataset suffers from survivorship bias. Carpenter and Lynch (1999) have argued that the results emerging from the calculation of the χ^2 – statistic are more robust to survivorship bias. The χ^2 – statistic is calculated as follows

$$\chi^2 = \frac{\sum(O_i + E_i)^2}{E_i}$$

where O_i denotes the observed frequencies and E_i the expected frequencies of the four categories.

In more detail the χ^2 – statistic is calculated as follows (Garbalinska and Gustafsson, 2007):

$$\chi^2 = \frac{(N_{WW} - D1)^2}{D1} + \frac{(N_{WL} - D2)^2}{D2} + \frac{(N_{LW} - D3)^2}{D3} + \frac{(N_{LL} - D4)^2}{D4}$$

where

$$D1 = (N_{WW} + N_{WL}) \times \frac{N_{WW}+N_{LW}}{N},$$

$$D2 = (N_{WW} + N_{WL}) \times \frac{N_{WW}+N_{LL}}{N},$$

$$D3 = (N_{LW} + N_{LL}) \times \frac{N_{WW}+N_{LW}}{N},$$

$$D4 = (N_{LW} + N_{LL}) \times \frac{N_{WL}+N_{LL}}{N}$$

and N denotes the total number of funds.

Given a one degree of freedom, a test statistic above 3.84 points toward the existence of performance persistence.

In order to calculate the Z-statistic observations in all categories (WW, LL, WL and LW) are needed. For the periods where no observations are categorized as WL or LW one can argue that these periods should be noted as positive since the statistical value is in fact infinitely positive($\frac{1}{0} \rightarrow \infty$).

In order to note a significant χ^2-value we also need a positive Z-statistic. The reason for this is that if the Z-statistic is negative this points toward reversed performance persistence, i.e. a winning fund in one period is expected to lose in the next one.

5 Data

We retrieved the necessary data from Morningstar Direct, a database available at the School of Business, Economics and Law at the Gothenburg University. Morningstar Direct claims that their database is free from survivorship bias. However, we were not able to retrieve any data from dead funds, rendering our dataset with only surviving funds.

In choice of frequency of return data we have followed previous studies by Dahlquist et al (2000) and Garbalinska and Gustafsson (2007) and chosen weekly returns. We reject daily returns as these might be subject to inappropriate noise, and longer frequencies as we believe fund managers evaluate their holdings more often. We do not necessarily believe they change their holdings from week to week, but if we would have chosen longer return frequencies the characteristics of a fund may change, leaving comparison inappropriate. As we have chosen weekly returns, we have also chosen the one week risk-free rate.

We have collected data on 214 Sweden based equity funds. These funds have been divided into seven subcategories based on the geographical region they invest in. The reason for dividing the funds according to region is that we need an accurate performance measure for each year and fund. There is not one benchmark that is appropriate for all funds. The volatility and developments of markets differs, why it is hard to find a benchmark appropriate for all funds. For this reason we have also divided the funds investing in Sweden into two different subcategories, one includes funds investing in small cap stock and one is excluding. We believe small cap stocks are subject to different risks that are not reflected in our benchmark, for this reason we believe the results will differ. The alphas of small cap funds will in general be overvalued since the market risk is the only one present in our model and, as stated, these funds are subjected to different risks. We have defined funds as being Sweden based if their domicile is Sweden.

As we in this study have chosen to only test for one year persistence, and not shorter time periods, we have excluded funds with less than two years of data. We have also excluded funds that are heavily invested in a specific sector. The reason to exclude these funds, as stated by Garbalinska and Gustafsson (2007), is that a different benchmark would be needed for these funds. For the same reason we have excluded funds that invest in a single country, with Sweden being the exception.

The return data on the funds are their weekly net asset value (NAV). We used these NAV's to calculate the weekly log-returns for each fund as:

$$R_t = ln\left[\frac{NAV_t}{NAV_{t-1}}\right]$$

For calculation of the risk-adjusted returns we needed both benchmarks and a risk-free rate. The benchmarks were collected from the Datastream database while the risk-free rate was collected from Riksbanken, the Swedish central bank. The MSCI benchmark for each region was used as market proxy, and the one-week risk-free rate, the STIBOR (Stockholm Interbank Offered Rate) was used as risk-free rate.

Regions and their respective benchmark index

Region	Benchmark
Sweden (for both ex. and incl. small cap)	MSCI Sweden
Europe	MSCI Europe
Global	MSCI World
Asia (excluding Japan)	MSCI Pacific (not including Japan)
North America	MSCI North America
Global Emerging Markets	MSCI Emerging Markets
Europe Emerging Markets	MSCI Emerging Markets Eastern Europe

Table 4.1. In this table the different geographical regions with its respective benchmark are listed.

When calculating Jensen's Alphas for funds investing in Sweden we used MSCI Sweden as benchmark, for funds investing in Europe we use MSCI Europe etc. (see table 4.1). In contrast to the benchmarks, the only risk free rate needed was the STIBOR risk-free rate. The reason for this is that all funds are based in Sweden.

6 Results of Tests

6.1 Autoregression Results

The normality assumption made for the regressions is of great importance to the trustworthiness of the autoregression results. If the normality assumption fails the significant tests of the coefficients become invalid. As seen in figure 5.1.1 below many of the residuals in each subperiod in each category are either not tested due to too few observations or are failing the test. Though one should take into account the test is oversensitive and may reject a distribution that on graphical inspection is not problematic. We have however not been able to confirm the normality of the residuals on graphical inspection. Since our uncertainty about the distribution of the regression residuals is still substantial it makes us believe that the results from the non-parametric tests are more reliable. Nevertheless we have chosen to present the results from the autoregressions.

Summary of normality test results 1

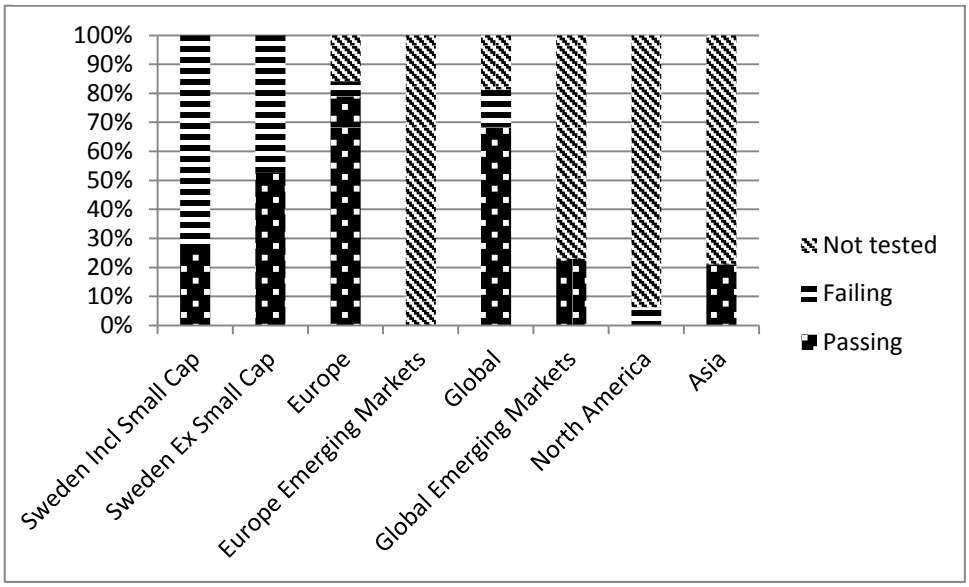

Figure 5.1.1. Share of subperiods in each category that fail, pass and are not tested.

The full results from the autoregressions are all presented in the tables in appendix A. A summary of the results is presented in table 5.1.1 below. Significant results are found for at least one subperiod for all categories. The most prevalent persistence is found for the *Sweden Incl Small Cap, Sweden Ex Small Cap* and *Europe* categories and to some extent also for the *Global* category. The main significant results are found in 2001-2006 and to some extent also in 2009-2010 and 1994-1997.

Summary of regression results

	Sweden Incl Small Cap	Sweden Ex Small Cap	Europe	Europe Emerging Markets	Global	Global Emerging Markets	North America	Asia
1992-1993	-0.776 (0.016)	-0.0887 (0.647)	9.963 (0.588)	-	-0.713 (0.176)	-	-	0.536 (0.477)
1993-1994	0.329* (0.002)	0.126 (0.612)	-0.0224 (0.935)	-	0.634 (0.094)	-	-	0.285 (0.569)
1994-1995	0.0207 (0.896)	-0.0720 (0.494)	0.537 (0.135)	-	1.070* (0.000)	-	-	-0.805 (0.460)
1995-1996	0.636 (0.162)	0.671* (0.039)	-0.392 (0.421)	-	0.437 (0.096)	-	0.118 (0.905)	-0.168 (0.815)
1996-1997	0.652* (0.000)	0.542* (0.028)	-0.336 (0.443)	-	-0.174 (0.106)	-	0.859 (0.058)	0.855* (0.019)
1997-1998	-1.075 (0.001)	-0.945 (0.044)	-0.696 (0.226)	-	0.168 (0.783)	-	-0.619 (0.268)	-0.191 (0.371)
1998-1999	-0.345 (0.002)	-0.276 (0.010)	-0.0186 (0.898)	0.444 (0.759)	0.369 (0.208)	2.127 (0.131)	-1.828 (0.178)	0.899 (0.430)
1999-2000	0.327 (0.084)	0.250 (0.327)	0.365 (0.240)	-0.222 (0.406)	0.0555 (0.756)	0.110 (0.682)	-0.781 (0.028)	0.575 (0.192)
2000-2001	-0.149 (0.225)	0.156 (0.096)	0.667* (0.001)	0.508 (0.170)	0.258* (0.016)	1.142 (0.457)	-0.286 (0.384)	-0.176 (0.106)
2001-2002	0.327* (0.000)	0.563* (0.000)	0.627* (0.000)	0.996* (0.005)	0.236 (0.138)	0.102 (0.773)	-0.411 (0.433)	1.003 (0.070)
2002-2003	0.0126 (0.939)	0.256* (0.006)	-0.351 (0.153)	-0.0753 (0.857)	0.252 (0.263)	-0.244 (0.698)	-0.162 (0.563)	0.0252 (0.876)
2003-2004	0.417* (0.000)	0.283 (0.055)	0.658* (0.000)	1.198* (0.012)	0.733* (0.000)	-0.730 (0.557)	0.391 (0.123)	-2.009 (0.398)
2004-2005	0.653* (0.000)	-0.287 (0.037)	0.661* (0.000)	1.217* (0.028)	0.441* (0.001)	0.100 (0.648)	1.292 (0.401)	-0.443 (0.290)
2005-2006	0.379* (0.000)	0.122 (0.404)	0.934* (0.000)	0.0171 (0.878)	0.712* (0.000)	0.702 (0.674)	-0.0467 (0.804)	-0.0724 (0.671)
2006-2007	-0.169 (0.070)	0.143 (0.220)	-0.478 (0.005)	-0.701 (0.077)	0.138 (0.210)	-0.00829 (0.993)	-0.00292 (0.996)	-0.412 (0.541)
2007-2008	0.700* (0.003)	-0.551 (0.019)	1.161* (0.007)	-4.143 (0.104)	-0.426 (0.105)	-0.824 (0.331)	2.226* (0.015)	-2.180 (0.001)
2008-2009	-0.578 (0.000)	0.227 (0.246)	-0.232 (0.106)	-0.265 (0.164)	-0.324 (0.000)	-0.172 (0.495)	-1.423 (0.025)	0.0283 (0.903)
2009-2010	0.260* (0.000)	0.234* (0.000)	0.899* (0.000)	0.248 (0.089)	0.515* (0.000)	0.213* (0.036)	0.602 (0.125)	0.211 (0.074)
2010-2011	-0.143 (0.134)	-0.236 (0.039)	-0.162 (0.127)	-0.622 (0.402)	-0.416 (0.013)	0.293 (0.472)	-0.133 (0.656)	-0.542 (0.422)
Full Period	-0.016 (0.604)	0.024 (0.498)	0.152* (0.005)	-.097 (0.416)	0.004 (0.919)	-0.116 (0.175)	0.383* (0.000)	-0.313 (0.000)

Table 5.1.1. In the above table the autoregression results are presented. The value of the coefficient and its corresponding p-value (parentheses) is presented for every subperiod for every category. Significant results are marked by an asterisk. Subperiods with no data available are marked with a hyphen.

Regression result for 03/04 for the category Sweden incl. small cap

Figure 5.1.1. Regression results for Sweden incl. small cap category for the years 2003/2004.

Regression result for 07/08 for the category Sweden incl. small cap

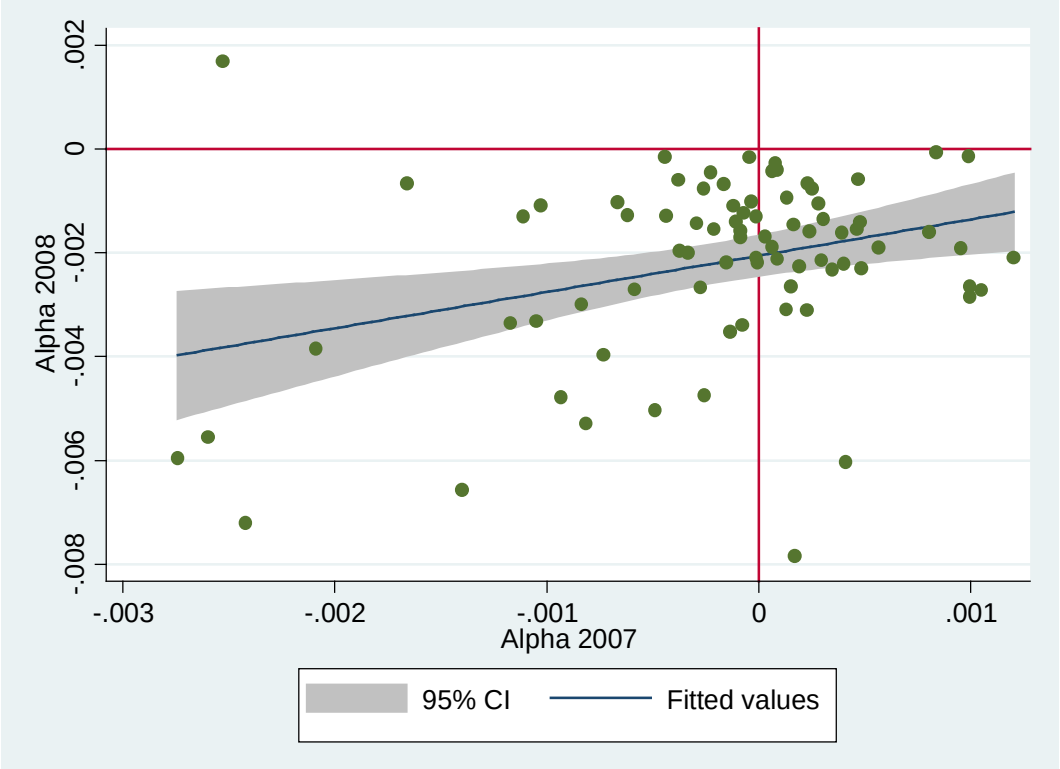

Figure 5.1.3. Regression results for Sweden incl. small cap category for the years 2007/2008.

In figure 5.1.2 and 5.1.3 the regressions for the years 2003/2004 and 2007/2008 respectively, for the category *Sweden incl small cap*, are shown. On the y-axis one can read the values of the alphas for the dependent year and on the x-axis the values of the alphas the lagged year. Both graphs represent periods with positive betas that are statistically significant. Looking at the periods that are statistically significant one can separate the periods that just show performance persistence and periods that indicate the possibility of outperforming the market.

As seen in table 5.1.2 below the greatest difference compared to the earlier output from the regressions can be seen in the results from Europe. For this category we have seven periods with statistically significant positive betas. However, only in two of these periods we can find indications of funds consistently outperforming the market.

Analysis of regression results

	Sweden Incl Small Cap	**Sweden Ex Small Cap**	**Europe**	**Europe Emerging Markets**	**Global**	**Global Emerging Markets**	**North America**	**Asia**
1992-1993				-		-		
1993-1994	•			-		-		
1994-1995				-	×	-		
1995-1996		•		-		-		
1996-1997	•	○		-		-		×
1997-1998								
1998-1999								
1999-2000								
2000-2001			×		×			
2001-2002	•	•	×	×				
2002-2003		○						
2003-2004	•		○	•	•			
2004-2005	•		×	•	•			
2005-2006	•		•		•			
2006-2007								
2007-2008	×		×				×	
2008-2009								
2009-2010	•	•	•		•	•		
2010-2011								

Table 5.1.2. In this table all subperiods with significant performance persistence are marked with a dot. A black dot represents periods where funds show that the possibility of outperforming the market, the crosses represent periods where funds do not outperform the market, and rings represent periods with small tendencies of the possibility of outperforming the market. Subperiods with no data available are marked with a hyphen.

Proportion of significant subperiods

	Sweden Incl Small Cap	Sweden Ex Small Cap	Europe	Europe Emerging Markets	Global	Global Emerging Markets	North America	Asia
Significant subperiods	42.11% (36.84%)	26.32% (15.79%)	36.84% (10.53%)	23.08% (15.38%)	31.58% (21.05%)	7.69% (7.69%)	5.26% (0%)	5.26% (0%)
Significant subperiods (N < 8 excluded)	42.11% (36.84%)	26.32% (15.79%)	43.75% (12.50%)	-	31.25% (25.00%)	33.33% (33.33%)	0% (0%)	0% (0%)
Number of subperiods N ≥ 8	19	19	16	0	16	3	1	4

Table 5.1.2. In the above table the proportion of significant periods are shown for each category. The number in parenthesis denotes the proportion of periods that show tendencies of the possibility to outperform the market. In the row "Significant subperiods (N < 8 excluded)" only periods with eight observations or more or counted, and in the row "Number of subperiods N ≥ 8" the number of subperiods with eight observations or more are presented.

In table 5.1.2 the proportion of significant subperiods for each category can be read. Also the number of subperiods with more than eight observations for each category is presented. The numbers presented are not associated with any direct analysis, i.e. a certain number does not have a certain interpretation. However, the numbers in the table can be used as an aid when looking at the extent of performance persistence for a certain category. Useful information in this table is that categories with more subperiods with a greater number of observations in general produce more subperiods that show evidence of performance persistence. This indicates that a potential reason for the few significant results in the other categories is due to the lack of observations.

6.2 Cross Product Ratio Test Results

The full results from the cross product ratio tests are in all presented in tables in appendix B. A summary of those results are presented in table 5.2.1 below. The cross product ratio test results confirm the results from the autoregression to a large extent finding prevalent evidence of performance persistence for the *Sweden Incl Small Cap, Sweden Ex Small Cap, Europe* and *Global* categories.

The evidence for the *Europe* category is somewhat different compared to the autoregression. Significant results are found for fewer years compared to the autoregression. On the other the hand significant persistence for the full period is found using the cross product ratio test.

For all subperiods with significant results according z-statistic we have also found significant persistence according to the Chi-Square statistic. This may imply that the survivorship bias is not that problematic taking into account that the chi square has been argued to be more robust to survivorship bias.

Summary of cross product ratio test results

	Sweden Incl Small Cap	Sweden Ex Small Cap	Europe	Europe Emerging Markets	Global	Global Emerging Markets	North America	Asia
1992-1993	-1.47 (2.396)	0.299 (0.09)	N/A (3)	-	-0.8 (0.667)	-	N/A (2)	N/A
1993-1994	0.331 (0.11)	1.022 (1.103)	N/A (3)	-	N/A (6*)	-	N/A (2)	0 (0)
1994-1995	-1.337 (1.887)	-1.754 (3.6)	N/A (0.75)	-	N/A (7*)	-	N/A (2)	0.371 (0.139)
1995-1996	1.073 (1.173)	1.549 (2.571)	0.299 (0.09)	-	1.914 (4.412*)	-	0 (0)	0.8 (0.667)
1996-1997	3.136 (12.462)	2.055* (4.735*)	-1.47 (2.396)	-	-1.549 (2.571)	-	N/A (4*)	0.8 (0.667)
1997-1998	-3.238 (12.5)	-2.049 (4.545)	1.47 (2.396)	N/A (2)	0.533 (0.286)	N/A (2)	N/A (2.222)	N/A
1998-1999	-3.278 (12.655)	-1.43 (2.112)	0.873 (0.782)	0 (0)	-0.989 (1)	N/A (3)	N/A (5)	0.8 (0.667)
1999-2000	2.456* (6.4*)	-0.2 (0.04)	2.211* (6.198*)	0 (0)	-0.675 (0.46)	0 (0)	N/A (5)	0.8 (0.667)
2000-2001	-0.283 (0.08)	0.665 (0.444)	0.989 (1)	N/A (4*)	1.326 (1.801)	0 (0)	-0.371 (0.139)	-0.438 (0.194)
2001-2002	3.098* (10.286*)	3.109* (10.744*)	2.344* (6.343*)	N/A (4*)	0 (0)	0 (0)	-0.371 (0.139)	N/A (3.938*)
2002-2003	1.705 (2.959)	1.528 (2.381)	1.073 (1.173)	0 (0)	0.848 (0.724)	N/A (4)	N/A (2.222)	0.438 (0.194)
2003-2004	3.332* (11.972*)	1.786 (3.273)	1.263 (1.636)	0.371 (0.139)	2.795* (8.526*)	0 (0)	-0.371 (0.139)	-1.064 (1.215)
2004-2005	2.555* (6.778*)	-0.149 (0.022)	2.721* (8.909*)	-0.371 (0.139)	1.256 (1.6)	N/A (4*)	0.371 (0.139)	1.064 (1.215)
2005-2006	4.273* (20.629*)	2.264* (5.333*)*	1.263 (1.636)	0.371 (0.139)	2.118* (4.667*)	0 (0)	0.371 (0.139)	-1.064 (1.215)
2006-2007	-0.697 (0.486)	0 (0)	-2.049 (4.545)	-0.8 (0.667)	-1.33 (1.793)	0.371 (0.139)	-0.371 (0.139)	-0.438 (0.194)
2007-2008	0 (0)	-1.591 (2.571)	2.721* (8.909*)	N/A (6)	0.434 (0.189)	N/A (3.938)	N/A (2.222)	0 (0)
2008-2009	-1.62 (2.652)	0.653 (0.427)	-1.753 (3.222)	0.8 (0.667)	-2.264 (5.333)	-0.628 (0.4)	0.241 (0.058)	0 (0)
2009-2010	3.502* (12.89*)	0.374 (0.14)	2.768 (9.077)	0.8 (0.667)	3.792* (16.525*	0.849 (0.737)	N/A (2.1)	1.022 (1.103)
2010-2011	0.4 (0.16)	-1.079 (1.171)	-1.166 (1.385)	0.8 (0.667)	-2.858 (8.654)	-0.257 (0.066)	-1.346 (2)	0.299 (0.09)
Full Period	4.072* (16.676*)	1.674 (2.806)	3.96* (15.969*	1.092 (1.2)	1.869 (3.5)	-0.34 (0.115)	-1.359 (1.861)	0.801 (0.643)

Table 5.2.1. In the above table a summary of the cross product ratio results are presented . The value and the p-value (parentheses). Significant results are marked by an asterisk.. Subperiods with no data available are marked with a hyphen.

Proportion of significant subperiods

	Sweden Incl Small Cap	Sweden Ex Small Cap	Europe	Europe Emerging Markets	Global	Global Emerging Markets	North America	Asia
Significant subperiods	31.58% (31.58%)	15.79% (15.79%)	21.05% (21.05%)	0% (15.38%)	15.79% (31.58%)	0% (7.69%)	0% (5.26%)	0% (5.26%)
N < 8 excl.	31.58% (31.58%)	15.79% (15.79%)	25.00% (25.00%)	-	18.75% (25.00%)	0% (0%)	0% (0%)	0% (0%)
Number of subperiods N ≥ 8	19	19	16	0	16	3	1	4

Table 5.2.2. In the above table the proportion of significant periods is shown for each category. The first number denotes the proportion of significant Z-values, and the number in parenthesis denotes the proportion of periods with significant χ^2-values. In the row "N < 8 excl." only periods with eight observations or more or counted, and in the row "Number of subperiods N ≥ 8" the number of subperiods with eight observations or more are presented.

In table 5.2.2 the proportion of significant subperiods for each category can be read. Also the number of subperiods with more than eight observations for each category is presented. The numbers presented are not associated with any direct analysis, i.e. a certain number does not have a certain interpretation. However, the numbers in the table can be used as an aid when looking at the extent of performance persistence for a certain category. Useful information in this table is that categories with more subperiods with a greater number of observations in general produce more subperiods that show evidence of performance persistence. This indicates that a potential reason for the few significant results in the other categories is due to the lack of observations.

7 Analysis

The results presented in the previous section show evidence of existing performance persistence for several regions and both for subperiods and several full periods. Even though it is easy to conclude that performance persistence exists on the Swedish market it is somewhat harder to conclude what determinants that explain this persistence.

Firstly, the performance persistence seems to be more prevalent for the *Sweden Incl Small Cap* category compared to the *Sweden ex. Small Cap* category. This could possibly be explained by that our benchmark, the MSCI Sweden, doesn't incorporate all the risk a small cap stock is subject to and consequently inflate the value of the Jensen's Alpha. A fund investing more in small cap compared to its benchmark will thus be a constant over-performer and therefore show signs of persistence even though it is a false alarm. An example of such an increased risk which small cap stocks are subject to in comparison to a large cap stocks is the risk for the company to fail and go bankrupt.

Besides the technical explanation of a bad choice of benchmark, the persistency found for the *Sweden Incl Small Cap* category could also be attributed to issues of inefficiency. Small cap stocks are usually not analysed to the same extent as large cap stocks (Arbel and Strebel, 1983) with the result of less publicly available information about small stocks. It might, thus, be easier to achieve positive abnormal returns analysing small cap stocks compared to large cap stocks. This may end up with a larger discrepancy in risk-neutral returns between funds which may then drive the performance persistence seen.

A higher discrepancy in risk-neutral returns between funds may also lead to a larger survivorship bias because it then becomes clearer which funds that are not performing very well.

Secondly, the general performance persistence found could be explained by market inefficiencies where some investors do have an informational advantage and thus perform better. The market inefficiency makes it possible for investors to beat the market. The greater the inefficiency is on the market the greater is the performance persistence. But to what extent is this true?

Both the European (Borges, 2010) and the North American (Chan, Gup and Pan, 2003) markets are considered to be fairly efficient but our results show that the persistence is much greater for the European and Swedish market compared to the North American one. Our results for the North American market should be taken with a pinch of salt however, due to the low number of observations and the fairly low value on goodness-of-fit measure for CAPM regression. Though the results of Garbalinska and Gustafsson (2007) gives support that there is no existing performance persistence for funds investing in North America. Given that both the European and North American market are both considered fairly efficient markets, according to efficient market hypothesis, no prevalent performance persistence should be found for the two markets. Could though the difference in performance persistence be explained by a difference in fund managers' ability to exploit the inefficiency? The ability to exploit inefficiencies may be all down to the individual fund managers' knowledge of the

market. It seems somewhat likely that Swedish fund managers of funds investing in Sweden and Europe are t well-informed about the Swedish market and to some extent also the European market given the close geographical and economical connections between Sweden and Europe. This argument intuitively seems stronger for small cap stocks since information is not available to the same extent as for large cup stocks. The difference in knowledge between the Swedish and European market and the North American one could thus explain the difference in performance persistence.

Following the same argument Swedish fund managers would have an informational disadvantage when it comes to Asian market compared to Asian fund managers.

Thirdly, the number of observations is vital to how strong conclusions one can draw from the results. For the early years and for the *Asia*, *North America*, *Global Emerging Markets* and *Europe Emerging Markets* categories in general the number of observations is fairly small. This limits how strong conclusions one can draw about the possible performance persistence. The nature of the cross product ratio test also adds to this uncertainty. The cross product ratio test is sensitive to the number of observations and is more likely to sign for significant results the higher the number of observations is.

8 Conclusions

The object of this thesis was to determine whether performance persistence exists on the Swedish market for equity mutual funds or not. We expected to find performance persistence since similar previous studies on the Swedish market find such evidence. We performed both a parametric and a non-parametric test testing for one-year persistence of the risk-neutral returns. The reason for including a non-parametric test was that we had problems with the normality assumptions.

In order to calculate valid risk-neutral returns the he dataset was divided into eight categories depending on the funds choice of geographical investment region. The reason for dividing the funds accordingly is that suitable benchmarks are available for geographical investment regions.

The thesis is based on the weak form of the efficient market hypothesis. If performance persistence exists the weak form of the efficient market hypothesis can be rejected since prices then do not reflect historical returns. If the performance persistence found is derived from funds constantly under-performing, relative to its index in risk-neutral terms, we can make an alternative interpretation of the efficient market hypothesis and conclude that the market is efficient for rational investors.

The results confirm the existence of performance persistence on the Swedish market. Prevalent performance persistence is found for funds investing in Sweden, Europe and globally. Thus the weak form of the efficient market hypothesis is rejected for those markets. We find strong evidence that those markets are not efficient for all investors', however we find weak evidence of those markets not being efficient for rational investors.

From an investors point of view we have strong evidence of the existence of funds that constantly underperform and weak evidence of the existence of funds that constantly overperform, i.e. we have strong evidence of the existence of funds investors should avoid and weak evidence of the existence of funds investors should invest in.

To conclude, for investors investing in funds investing in Sweden, Europe and globally, from the year 2000 to 2010, avoiding funds that underperformed the previous year should be considered a valid investment criteria even though it should not be the only one.

9 References

Arbel, A., Strebel, P. (1983). Pay Attention to Neglected Firms. *Journal of Portfolio Management*, Winter 1983, 9(2), 37-42.

Avramov, D., Wermers, R. (2006). Investing in mutual funds when returns are predictable. *Journal of Financial Economics 81*, 339-377.

Borges, M., R. 2010. Efficient market hypothesis in European stock markets. *The European Journal of Finance*, 16(7).

Brown, S., J., Goetzmann, W., N. (1995). Performance Persistence. *The Journal of Finance*, 50(2), 679-698.

Brown, S., J., Goetzmann, W., Ibbotson, R., G., Ross, S., A. (1992). Survivorship Bias in Performance Studies. *The Review of Financial Studies*, 5(4), 553-580.

Carhart, M., M. (1997) On Persistence in Mutual Fund Performance. *The Journal of Finance*, 52(1), 57-82.

Carlson, R., S. (1970). Aggregate Performance of Mutual Funds 1948-1967. *The Journal of Financial and Quantitative Analysis*, 5(2), 1-32.

Carpenter, J., N., Lynch, A., W. (1999). Survivorship bias and attrition effects in measures of performance persistence. *Journal of Financial Economics*, 54(3), 337-374.

Chan, K. C., Gup, B. E. and Pan, M.-S. (1997), International Stock Market Efficiency and Integration: A Study of Eighteen Nations. *Journal of Business Finance & Accounting*, 24: 803–813.

Dahlqvist, M., Engström, S., & Söderlind, P. (2000). Performance and Characteristics of Swedish Mutual Funds. *Journal of Financial and Quantitative Analysis*, 35(3), 409-423.

De Long, B., Schleifer, A., Summers, H., L., Waldsmann, R., J. Noise Trader in Financial Markets. Journal of Political Economy, 98(4), 703-738.

Dunn, C., P., Thiesen, R., D. 1983. How consistently do active managers win?. *The Journal of Portfolio Management*, 9(4), 47-50.

Fama, E. (1965). Random Walks in Stock Market Price. *The Journal of Business*, 38(1), 34-105.

Fama, E., F., French, K., R. (1988). Dividend Yields and Expected Stock Returns. *Journal of Financial Economics*, 22(4), 3-25.

Fama, E., F., French, K., R. (2008). Mutual Fund Performance. Draft. Correct as of 14th August 2012. Available online: http://faculty.chicagobooth.edu/john.cochrane/teaching/35150_advanced_investments/fama_french_mutual_performance.pdf

Garbalinska, J., & Gustafsson, K. (2007). Performance Persistence in Sweden-based Equity Mutual Funds. Stockholm School of Economics. Stockholm. Sweden.

Goetzmann, W., N., Ibbotson, R., G. (1994). Do Winners Repeat? Patterns in mutual fund performance. *Journal of Portfolio Management*, 20(2), 9-18.

Grinblatt, M., Titman, S. (1992). The Persistence of Mutual Fund Performance. *The Journal of Finance*, 47(5), 1977-1984.

Hendricks, D., Patel, J., Zeckenhauser, R. (1993). Hot Hands in Mutual funds: Short-Run Persistence of Relative Performance, 1974-1988. *The Journal of Finance,* 48(1), 93-130.

Jegadeesh, N., Titman, S. (1993). Returns to Buying Winners and Selling Losers: Implications for Stock Market Effeciency. *The Journal of Finance*, 48(1), 65-91.

Jensen, C., M. (1967). The Performance of Mutual Funds in the Period 1945-1964. *The Journal of Finance*, 23(2), 389-416.

Jern, B. (2002). Kan historien användas till att hitta vinnarna bland Internationella Aktiefonder?. *The Journal of the Economic Society of Finland*, 2(02), 77-87.

SIFA. (2009). *30 Years of Investment Funds*. Correct as of 14th August 2012. Available online: http://www.fondbolagen.se/Documents/Fondbolagen/Studier%20-%20dokument/30_Years_With_Funds.pdf

SIFA. (2012). *Net Assets*. Correct as of 14th of August 2012. Available online: http://fondbolagen.se/Documents/Fondbolagen/English/Statistics/AssetValues/Net%20assets%201986-2011.xls

Sharpe, F., W. (1966). Mutual Fund Performance. *The Journal of Business*, 29(2), Part 2, 119-138.

Shukla, R., Trzcinka, C. (1994). Persistent performance in the mutual fund market: Tests with fund investment advisers. *Review of Quantitative Finance and Accounting*, 4(2), 115-135.

SFS 1997:465. *Lag (1983:890) om allemanssparande*. Stockholm, Ministry of Finance.

Thaler, R. H. (1999). The End of Behavioral Finance. *Financial Analysts Journal*, *55*(6), 12.

Yalçin, K. C. (2010). Market Rationality: Efficient Market Hypothesis versus Anomalies. *European Journal of Economic and Political Studies*, 3(2), 23-38.

Appendix A: Detailed Tables of Regression Results

Sweden Incl Small Cap	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1992-1993	-0.776	0.016	0.490	0.416	0.710	0.647	11
1993-1994	0.329*	0.002	0.680	0.012	0.015	0.009	11
1994-1995	0.0207	0.896	0.002	0.000	0.001	0.000	13
1995-1996	0.636	0.162	0.100	0.004	0.078	0.010	21
1996-1997	0.652*	0.000	0.777	0.881	0.544	0.818	26
1997-1998	-1.075	0.001	0.328	0.040	0.099	0.041	32
1998-1999	-0.345	0.002	0.265	0.000	0.001	0.000	35
1999-2000	0.327	0.084	0.076	0.878	0.087	0.206	40
2000-2001	-0.149	0.225	0.030	0.280	0.004	0.016	50
2001-2002	0.327*	0.000	0.232	0.246	0.290	0.274	56
2002-2003	0.0126	0.939	0.000	0.000	0.192	0.003	57
2003-2004	0.417*	0.000	0.405	0.523	0.007	0.030	61
2004-2005	0.653*	0.000	0.342	0.000	0.013	0.000	65
2005-2006	0.379*	0.000	0.244	0.001	0.001	0.000	70
2006-2007	-0.169	0.070	0.045	0.000	0.007	0.000	74
2007-2008	0.700*	0.003	0.107	0.037	0.004	0.005	80
2008-2009	-0.578	0.000	0.160	0.020	0.000	0.000	85
2009-2010	0.260*	0.000	0.450	0.003	0.013	0.002	95
2010-2011	-0.143	0.134	0.023	0.000	0.001	0.000	100
Full Period	-0.016	0.604	0.000	0.000	0.000	0.000	

Table A1. Statistically significant betas are marked by an asterisk.

Sweden Ex. Small Cap	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1992-1993	-0.089	0.647	0.032	0.361	0.860	0.623	9
1993-1994	0.126	0.612	0.039	0.222	0.257	0.185	9
1994-1995	-0.072	0.494	0.060	0.981	0.776	0.960	10
1995-1996	0.671*	0.039	0.310	0.017	0.037	0.016	14
1996-1997	0.542*	0.028	0.283	0.725	0.863	0.926	17
1997-1998	-0.945	0.044	0.188	0.157	0.035	0.050	22
1998-1999	-0.276	0.010	0.278	0.082	0.173	0.087	23
1999-2000	0.250	0.327	0.039	0.811	0.363	0.625	27
2000-2001	0.156	0.096	0.079	0.303	0.278	0.300	36
2001-2002	0.563*	0.000	0.299	0.873	0.165	0.353	41
2002-2003	0.256*	0.006	0.175	0.029	0.006	0.006	42
2003-2004	0.283	0.055	0.085	0.007	0.008	0.003	44
2004-2005	-0.287	0.037	0.093	0.008	0.123	0.017	47
2005-2006	0.122	0.404	0.015	0.009	0.021	0.007	48
2006-2007	0.143	0.220	0.030	0.001	0.002	0.000	52
2007-2008	-0.551	0.019	0.097	0.071	0.081	0.052	56
2008-2009	0.227	0.246	0.024	0.000	0.000	0.000	59
2009-2010	0.234*	0.000	0.214	0.000	0.005	0.000	65
2010-2011	-0.236	0.039	0.062	0.000	0.001	0.000	69
Full Period	0.024	0.498	0.001	0.000	0.000	0.000	

Table A2. Statistically significant betas are marked by an asterisk.

Europe	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1992-1993	9.963	0.588	0.363	-	-	-	3
1993-1994	-0.022	0.935	0.010	-	-	-	3
1994-1995	0.537	0.135	0.956	-	-	-	3
1995-1996	-0.392	0.421	0.094	0.751	0.446	0.697	9
1996-1997	-0.336	0.443	0.067	0.010	0.013	0.008	11
1997-1998	-0.696	0.226	0.158	0.237	0.481	0.328	11
1998-1999	-0.019	0.898	0.002	0.533	0.294	0.423	11
1999-2000	0.365	0.240	0.123	0.372	0.327	0.361	13
2000-2001	0.667*	0.001	0.534	0.154	0.953	0.311	16
2001-2002	0.627*	0.000	0.539	0.394	0.214	0.276	19
2002-2003	-0.351	0.153	0.105	0.591	0.090	0.168	21
2003-2004	0.658*	0.000	0.658	0.833	0.582	0.838	22
2004-2005	0.661*	0.000	0.695	0.695	0.269	0.469	22
2005-2006	0.934*	0.000	0.679	0.724	0.937	0.937	22
2006-2007	-0.478	0.005	0.329	0.659	0.303	0.503	22
2007-2008	1.161*	0.007	0.310	0.182	0.402	0.248	22
2008-2009	-0.232	0.106	0.110	0.072	0.947	0.164	25
2009-2010	0.899*	0.000	0.644	0.587	0.135	0.245	25
2010-2011	-0.162	0.127	0.094	0.926	0.127	0.276	26
Full Period	0.152*	0.005	0.026	0.729	0.000	0.000	

Table A3. Statistically significant betas are marked by an asterisk.

Europe Emerging Markets	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1998-1999	0.444	0.759	0.058	-	-	-	4
1999-2000	-0.222	0.406	0.353	-	-	-	4
2000-2001	0.508	0.170	0.688	-	-	-	4
2001-2002	0.996*	0.005	0.990	-	-	-	4
2002-2003	-0.075	0.857	0.021	-	-	-	4
2003-2004	1.198*	0.012	0.908	-	-	-	5
2004-2005	1.217*	0.028	0.842	-	-	-	5
2005-2006	0.017	0.878	0.009	-	-	-	5
2006-2007	-0.701	0.077	0.584	-	-	-	6
2007-2008	-4.143	0.104	0.523	-	-	-	6
2008-2009	-0.265	0.164	0.420	-	-	-	6
2009-2010	0.248	0.089	0.556	-	-	-	6
2010-2011	-0.622	0.402	0.180	-	-	-	6
Full Period	-0.097	0.416	0.010	0.001	0.001	0.000	

Table A4. Statistically significant betas are marked by an asterisk.

Global	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1992-1993	-0.713	0.176	0.403	-	-	-	6
1993-1994	0.634	0.094	0.544	-	-	-	6
1994-1995	1.070*	0.000	0.928	-	-	-	7
1995-1996	0.437	0.096	0.277	0.033	0.209	0.059	11
1996-1997	-0.174	0.106	0.203	0.994	0.878	0.988	14
1997-1998	0.168	0.783	0.007	0.105	0.290	0.131	14
1998-1999	0.369	0.208	0.110	0.903	0.585	0.855	16
1999-2000	0.056	0.756	0.006	0.947	0.492	0.780	19
2000-2001	0.258*	0.016	0.212	0.708	0.435	0.672	27
2001-2002	0.236	0.138	0.072	0.933	0.284	0.541	32
2002-2003	0.252	0.263	0.038	0.481	0.011	0.041	35
2003-2004	0.733*	0.000	0.558	0.053	0.005	0.008	38
2004-2005	0.441*	0.001	0.250	0.094	0.481	0.169	40
2005-2006	0.712*	0.000	0.277	0.783	0.612	0.847	42
2006-2007	0.138	0.210	0.036	0.001	0.000	0.000	45
2007-2008	-0.426	0.105	0.057	0.009	0.111	0.017	47
2008-2009	-0.324	0.000	0.253	0.210	0.631	0.387	48
2009-2010	0.515*	0.000	0.500	0.953	0.084	0.205	51
2010-2011	-0.416	0.013	0.108	0.000	0.001	0.000	56
Full Period	0.004	0.919	0.000	0.828	0.000	0.000	

TableA5. Statistically significant betas are marked by an asterisk.

Global Emerging Markets	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1998-1999	2.127	0.131	0.958	-	-	-	3
1999-2000	0.110	0.682	0.101	-	-	-	4
2000-2001	1.142	0.457	0.295	-	-	-	4
2001-2002	0.102	0.773	0.051	-	-	-	4
2002-2003	-0.244	0.698	0.091	-	-	-	4
2003-2004	-0.730	0.557	0.196	-	-	-	4
2004-2005	0.100	0.648	0.124	-	-	-	4
2005-2006	0.702	0.674	0.106	-	-	-	4
2006-2007	-0.008	0.993	0.000	-	-	-	5
2007-2008	-0.824	0.331	0.188	-	-	-	7
2008-2009	-0.172	0.495	0.060	0.238	0.435	0.303	10
2009-2010	0.213*	0.036	0.341	0.602	0.850	0.858	13
2010-2011	0.293	0.472	0.048	0.978	0.109	0.218	13
Full Period	-0.116	0.175	0.023	0.332	0.365	0.403	

Table A6. Statistically significant betas are marked by an asterisk.

North America	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1995-1996	0.118	0.905	0.009	-	-	-	4
1996-1997	0.859	0.058	0.887	-	-	-	4
1997-1998	-0.619	0.268	0.380	-	-	-	5
1998-1999	-1.828	0.178	0.505	-	-	-	5
1999-2000	-0.781	0.028	0.843	-	-	-	5
2000-2001	-0.286	0.384	0.256	-	-	-	5
2001-2002	-0.411	0.433	0.214	-	-	-	5
2002-2003	-0.162	0.563	0.123	-	-	-	5
2003-2004	0.391	0.123	0.602	-	-	-	5
2004-2005	1.292	0.401	0.241	-	-	-	5
2005-2006	-0.047	0.804	0.024	-	-	-	5
2006-2007	-0.003	0.996	0.000	-	-	-	5
2007-2008	2.226*	0.015	0.896	-	-	-	5
2008-2009	-1.423	0.025	0.669	-	-	-	7
2009-2010	0.602	0.125	0.404	-	-	-	7
2010-2011	-0.133	0.656	0.035	0.018	0.085	0.032	8
Full Period	0.383*	0.000	0.164	0.077	0.063	0.045	

Table A7. Statistically significant betas are marked by an asterisk.

Asia	Estimated β_1	P-value	R^2	Skewness	Kurtosis	P-value	No. of funds
1992-1993	0.536	0.477	0.535	-	-	-	3
1993-1994	0.285	0.569	0.186	-	-	-	4
1994-1995	-0.805	0.460	0.192	-	-	-	5
1995-1996	-0.168	0.815	0.015	-	-	-	6
1996-1997	0.855*	0.019	0.783	-	-	-	6
1997-1998	-0.191	0.371	0.202	-	-	-	6
1998-1999	0.899	0.430	0.161	-	-	-	6
1999-2000	0.575	0.192	0.380	-	-	-	6
2000-2001	-0.176	0.106	0.436	-	-	-	7
2001-2002	1.003	0.070	0.514	-	-	-	7
2002-2003	0.025	0.876	0.005	-	-	-	7
2003-2004	-2.009	0.398	0.146	-	-	-	7
2004-2005	-0.443	0.290	0.219	-	-	-	7
2005-2006	-0.072	0.671	0.039	-	-	-	7
2006-2007	-0.412	0.541	0.079	-	-	-	7
2007-2008	-2.180	0.001	0.838	0.069	0.157	0.082	8
2008-2009	0.028	0.903	0.003	0.145	0.428	0.188	8
2009-2010	0.211	0.074	0.386	0.338	0.345	0.342	9
2010-2011	-0.542	0.422	0.094	0.720	0.633	0.843	9
Full Period	-0.313	0.000	0.102	0.001	0.028	0.002	

Table A8. Statistically significant betas are marked by an asterisk.

Appendix B: Detailed Tables of CPR Rest Results

Sweden Incl Small Cap	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1992-1993	2	1	4	4	0.125	1.414	-1.470	2.396	11
1993-1994	3	3	3	2	1.500	1.225	0.331	0.110	11
1994-1995	2	2	5	4	0.200	1.204	-1.337	1.887	13
1995-1996	7	6	4	4	2.625	0.900	1.073	1.173	21
1996-1997	11	11	2	2	30.25	1.087	3.136*	12.462*	26
1997-1998	3	3	13	13	0.053	0.906	-3.238	12.500	32
1998-1999	4	3	14	14	0.061	0.852	-3.278	12.655	35
1999-2000	14	14	6	6	5.444	0.690	2.456*	6.400*	40
2000-2001	12	12	13	13	0.852	0.566	-0.283	0.080	50
2001-2002	20	20	8	8	6.250	0.592	3.098*	10.286*	56
2002-2003	18	17	11	11	2.529	0.544	1.705	2.959	57
2003-2004	22	22	9	8	6.722	0.572	3.332*	11.972*	61
2004-2005	22	21	11	11	3.818	0.524	2.555*	6.778*	65
2005-2006	27	27	8	8	11.391	0.569	4.273*	20.629*	70
2006-2007	17	17	20	20	0.723	0.467	-0.697	0.486	74
2007-2008	20	20	20	20	1.000	0.447	0.000	0.000	80
2008-2009	18	17	25	25	0.490	0.441	-1.620	2.652	85
2009-2010	33	32	15	15	4.693	0.441	3.502*	12.890*	95
2010-2011	26	26	24	24	1.174	0.400	0.340	0.160	100
Full Period	281	274	215	212	1.689	0.129	4.072*	16.676*	

Table B1. Statistically significant betas are marked by an asterisk.

Sweden Ex. Small Cap	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1992-1993	3	2	2	2	1.500	1.354	0.299	0.090	9
1993-1994	3	3	2	1	4.500	1.472	1.022	1.103	9
1994-1995	1	1	4	4	0.063	1.581	-1.754	3.600	10
1995-1996	5	5	2	2	6.250	1.183	1.549	2.571	14
1996-1997	7	6	2	2	10.500	1.144	2.055*	4.735*	17
1997-1998	3	3	8	8	0.141	0.957	-2.049	4.545	22
1998-1999	4	4	8	7	0.286	0.876	-1.430	2.112	23
1999-2000	7	6	7	7	0.857	0.772	-0.200	0.040	27
2000-2001	10	10	8	8	1.563	0.671	0.665	0.444	36
2001-2002	16	15	5	5	9.600	0.727	3.109*	10.744*	41
2002-2003	13	13	8	8	2.641	0.635	1.528	2.381	42
2003-2004	14	14	8	8	3.063	0.627	1.786	3.273	44
2004-2005	12	11	12	12	0.917	0.584	-0.149	0.022	47
2005-2006	16	16	8	8	4.000	0.612	2.264*	5.333*	48
2006-2007	13	13	13	13	1.000	0.555	0.000	0.000	52
2007-2008	11	11	17	17	0.419	0.547	-1.591	2.571	56
2008-2009	16	16	14	13	1.407	0.523	0.653	0.427	59
2009-2010	17	17	16	15	1.204	0.497	0.374	0.140	65
2010-2011	15	15	20	19	0.592	0.486	-1.079	1.171	69
Full Period	186	181	164	159	1.291	0.153	1.674	2.806	

Table B2. Statistically significant betas are marked by an asterisk.

Europe	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1992-1993	2	1	0	0	-	-	-	3.000	3
1993-1994	2	1	0	0	-	-	-	3.000	3
1994-1995	1	1	1	0	-	-	-	0.750	3
1995-1996	3	2	2	2	1.500	1.354	0.299	0.090	9
1996-1997	2	1	4	4	0.125	1.414	-1.470	2.396	11
1997-1998	4	4	2	1	8.000	1.414	1.470	2.396	11
1998-1999	4	3	2	2	3.000	1.258	0.873	0.782	11
1999-2000	6	5	1	1	30.000	1.538	2.211*	6.198*	13
2000-2001	5	5	3	3	2.778	1.033	0.989	1.000	16
2001-2002	8	7	2	2	14.000	1.126	2.344*	6.343*	19
2002-2003	7	6	4	4	2.625	0.900	1.073	1.173	21
2003-2004	7	7	4	4	3.063	0.886	1.263	1.636	22
2004-2005	9	9	2	2	20.250	1.106	2.721*	8.909*	22
2005-2006	7	7	4	4	3.063	0.886	1.263	1.636	22
2006-2007	3	3	8	8	0.141	0.957	-2.049	4.545	22
2007-2008	9	9	2	2	20.250	1.106	2.721*	8.909*	22
2008-2009	4	4	9	8	0.222	0.858	-1.753	3.222	25
2009-2010	10	10	3	2	16.667	1.017	2.768*	9.077*	25
2010-2011	5	5	8	8	0.391	0.806	-1.166	1.385	26
Full Period	98	90	61	57	2.537	0.235	3.960*	15.969*	

Table B3. Statistically significant betas are marked by an asterisk.

Europe Emerging Markets	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1997-1998	1	1	0	0	-	-	-	2.000	2
1998-1999	1	1	1	1	1.000	2.000	0.000	0.000	4
1999-2000	1	1	1	1	1.000	2.000	0.000	0.000	4
2000-2001	2	2	0	0	-	-	-	4.000*	4
2001-2002	2	2	0	0	-	-	-	4.000*	4
2002-2003	1	1	1	1	1.000	2.000	0.000	0.000	4
2003-2004	2	1	1	1	2.000	1.871	0.371	0.139	5
2004-2005	1	1	2	1	0.500	1.871	-0.371	0.139	5
2005-2006	2	1	1	1	2.000	1.871	0.371	0.139	5
2006-2007	1	1	2	2	0.250	1.732	-0.800	0.667	6
2007-2008	0	0	3	3	0.000	-	-	6.000	6
2008-2009	2	2	1	1	4.000	1.732	0.800	0.667	6
2009-2010	2	2	1	1	4.000	1.732	0.800	0.667	6
2010-2011	2	2	1	1	4.000	1.732	0.800	0.667	6
Full Period	20	18	15	14	1.714	0.494	1.092	1.200	

Table B4. Statistically significant betas are marked by an asterisk.

Global	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1992-1993	1	1	2	2	0.250	1.732	-0.800	0.667	6
1993-1994	3	3	0	0	-	-	-	6.000	6
1994-1995	4	3	0	0	-	-	-	7.000	7
1995-1996	5	4	1	1	20.000	1.565	1.914*	4.412*	11
1996-1997	2	2	5	5	0.160	1.183	-1.549	2.571	14
1997-1998	4	4	3	3	1.778	1.080	0.533	0.286	14
1998-1999	3	3	5	5	0.360	1.033	-0.989	1.000	16
1999-2000	4	4	6	5	0.533	0.931	-0.675	0.460	19
2000-2001	9	8	5	5	2.880	0.798	1.326	1.801	27
2001-2002	8	8	8	8	1.000	0.707	0.000	0.000	32
2002-2003	10	10	8	7	1.786	0.684	0.848	0.724	35
2003-2004	14	14	5	5	7.840	0.737	2.795*	8.526*	38
2004-2005	12	12	8	8	2.250	0.645	1.256	1.600	40
2005-2006	14	14	7	7	4.000	0.655	2.118*	4.667*	42
2006-2007	9	9	14	13	0.445	0.609	-1.330	1.793	45
2007-2008	13	12	11	11	1.289	0.585	0.434	0.189	47
2008-2009	8	8	16	16	0.250	0.612	-2.264	5.333	48
2009-2010	20	20	6	5	13.333	0.683	3.792*	16.525*	51
2010-2011	8	9	20	19	0.189	0.582	-2.858	8.654	56
Full Period	151	148	130	125	1.375	0.171	1.869	3.500	

Table B5. Statistically significant betas are marked by an asterisk.

Global Emerging Markets	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1995-1996	1	0	0	0	-	-	-	-	1
1996-1997	0	0	1	0	-	-	-	-	1
1997-1998	0	0	1	1	0.000	-	-	2.000	2
1998-1999	2	1	0	0	-	-	-	3.000	3
1999-2000	1	1	1	1	1.000	2.000	0.000	0.000	4
2000-2001	1	1	1	1	1.000	2.000	0.000	0.000	4
2001-2002	1	1	1	1	1.000	2.000	0.000	0.000	4
2002-2003	0	0	2	2	0.000	-	-	4.000	4
2003-2004	1	1	1	1	1.000	2.000	0.000	0.000	4
2004-2005	2	2	0	0	-	-	-	4.000*	4
2005-2006	1	1	1	1	1.000	2.000	0.000	0.000	4
2006-2007	2	1	1	1	2.000	1.871	0.371	0.139	5
2007-2008	1	0	3	3	0.000	-	-	3.938	7
2008-2009	2	2	3	3	0.444	1.291	-0.628	0.400	10
2009-2010	4	4	3	2	2.667	1.155	0.849	0.737	13
2010-2011	3	3	4	3	0.750	1.118	-0.257	0.066	13
Full Period	22	18	23	20	0.861	0.441	-0.340	0.115	

Table B6. Statistically significant betas are marked by an asterisk.

North America	WW	LL	WL	LW	CPR	σ	Z	χ^2	No. of funds
1992-1993	0	0	1	1	0.000	-	-	2.000	2
1993-1994	0	0	1	1	0.000	-	-	2.000	2
1994-1995	1	1	0	0	-	-	-	2.000	2
1995-1996	1	1	1	1	1.000	2.000	0.000	0.000	4
1996-1997	2	2	0	0	-	-	-	4.000*	4
1997-1998	1	0	2	2	0.000	-	-	2.222	5
1998-1999	0	0	3	2	0.000	-	-	5.000	5
1999-2000	0	0	3	2	0.000	-	-	5.000	5
2000-2001	1	1	2	1	0.500	1.871	-0.371	0.139	5
2001-2002	1	1	2	1	0.500	1.871	-0.371	0.139	5
2002-2003	1	0	2	2	0.000	-	-	2.222	5
2003-2004	1	1	2	1	0.500	1.871	-0.371	0.139	5
2004-2005	2	1	1	1	2.000	1.871	0.371	0.139	5
2005-2006	2	1	1	1	2.000	1.871	0.371	0.139	5
2006-2007	1	1	2	1	0.500	1.871	-0.371	0.139	5
2007-2008	2	2	1	0	-	-	-	2.222	5
2008-2009	3	1	1	2	1.500	1.683	0.241	0.058	7
2009-2010	3	2	2	0	-	-	-	2.100	7
2010-2011	1	1	3	3	0.111	1.633	-1.346	2.000	8
Full Period	23	16	30	22	0.558	0.430	-1.359	1.861	

Table B7. Statistically significant betas are marked by an asterisk.

Asia	WW	LL	WL	LW	CPR	Σ	Z	χ^2	No. of funds
1992-1993	1	1	1	0	-	-	-	0.750	3
1993-1994	1	1	1	1	1,000	2,000	0,000	0.000	4
1994-1995	1	2	1	1	2,000	1,871	0,371	0.139	5
1995-1996	2	2	1	1	4,000	1,732	0,800	0.667	6
1996-1997	2	2	1	1	4,000	1,732	0,800	0.667	6
1997-1998	0	0	3	3	0,000	-	-	6.000	6
1998-1999	2	2	1	1	4,000	1,732	0,800	0.667	6
1999-2000	2	2	1	1	4,000	1,732	0,800	0.667	6
2000-2001	1	2	2	2	0,500	1,581	-0,438	0.194	7
2001-2002	3	3	0	1	-	-	-	3.938*	7
2002-2003	2	2	2	1	2,000	1,581	0,438	0.194	7
2003-2004	1	1	2	3	0,167	1,683	-1,064	1.215	7
2004-2005	3	2	1	1	6,000	1,683	1,064	1.215	7
2005-2006	1	1	3	2	0,167	1,683	-1,064	1.215	7
2006-2007	1	2	2	2	0,500	1,581	-0,438	0.194	7
2007-2008	2	2	2	2	1,000	1,414	0,000	0.000	8
2008-2009	2	2	2	2	1,000	1,414	0,000	0.000	8
2009-2010	3	3	2	1	4,500	1,472	1,022	1.103	9
2010-2011	2	3	2	2	1,500	1,354	0,299	0.090	9
Full Period	32	35	30	28	1,333	0,359	0,801	0.643	

Table B8. Statistically significant betas are marked by an asterisk.

Appendix C: Other Tables

	Average R^2	Per cent of Jensen's Alphas´ being significant at 5%
Sweden incl. small cap	.817	6.496%
Sweden ex. small cap	.868	1.879%
Europe	.811	3.427%
Europe emerging markets	.850	27.586%
Global	.712	3.390%
Global emerging markets	.826	1.042%
North America	.426	5.319%
Asia	.712	0.752%

Table C1. Average goodness-of-fit measures and per cent of the Jensen's Alphas´ being significant for the CAPM regressions.

No. of observations	W	V	Z	Prob>z
123	0.991	0.873	-0.304	0.619

Table C2. Results of the Shapiro-Wilk test for normality.