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Do winners persist?

- A study of funds denominated in Euros

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Abstract

The purpose of this paper is to investigate whether there is evidence of performance persistence among 726 funds with net asset values denominated in Euros. The study is carried out on data ranging from April 1992 to April 2009. Persistence is searched for in raw, risk adjusted and alpha performance. The results attained provide evidence for the distinguishing of performance persistence in the short term. In the long term there is no unison evidence for performance persistence.

Content

1 INTRODUCTION AND PURPOSE 5

1.1 Introduction 5

1.2 Purpose 6

1.3 Outline 6

2 THE EUROPEAN FUND MARKET 7

3 THEORY 9

3.1 The notion of performance persistence 9

3.2 Efficient market hypothesis 9

3.3 Random walk hypothesis 11

3.4 Timing ability 12

4 PREVIOUS RESEARCH 14

5 DATA 20

5.1 Data set 20

5.2 The risk-free return 20

5.3 The market return 21

5.4 Survivorship bias 21

6 METHODOLOGY 22

6.1 Method 22

6.2 Definition of mutual fund performance 23

6.3 The capital asset pricing model 23

6.4 Spearman's rank correlation coefficient 24

6.5 Performance measures 24

6.5.1 Treynor measure 24

6.5.2 Jensen measure 25

6.6 Searching for performance persistence 26

6.6.1 Unadjusted for risk 27

6.6.2 Adjusted for risk using the Treynor measure 27

6.6.3 Using the Jensen measure 27

6.7 Evaluating timing ability 28

7 RESULTS 29

7.1 Performance persistence, unadjusted for risk 29
7.2 Performance persistence using the Treynor measure 30
7.3 Performance persistence using the Jensen measure 32
7.4 Timing 33

8 ANALYSIS 34
8.1 Analysis of results 34
8.1.1 Raw results 34
8.1.2 Results attained using the Treynor measure 34
8.1.3 Results attained using the Jensen measure 35
8.2 Results and previous research 35
8.3 Results and efficient market hypothesis 36
8.4 Timing ability results 37
8.5 The effect of extraordinary circumstances 37
8.5.1 The dotcom bubble 38
8.5.2 The subprime crisis 39

9 CONCLUSION 41

BIBLIOGRAPHY 43

1 Introduction and purpose

This section paints a backdrop to the study. It gives a brief introduction to the subject of performance persistence as well as to the study. Moreover the purpose of the study will be stated. The segment is concluded with a short outline of the paper.

1.1 Introduction

Whether performance persistence can be discerned or not has been the focus of numerous studies over the past half-century. The reason for its popularity can be explained by a number of obvious appeals. The existence of persistence would discredit the fundamental hypothesis of the perfectly efficient market. As performance persistence implies that certain funds succeed in achieving excessive returns over long periods, its existence would strengthen the notion of the able fund manager picking the cherries of the market. Consequently it would justify the management fees charged by funds.

This study investigates whether performance persistence exists among funds with net asset values denominated in Euros. The reason for the criteria that fund assets have to be denominated in Euros is to regard performance persistence from a European Union point of view, to investigate the circumstances which a European investor faces when investing in community currency assets. A persistence study of funds denominated in Euros, meaning funds that are available and feasible alternatives for the general European investor, has not been conducted on such a large number of funds as is done in this paper. Hopefully this study will shed a tiny sliver of light on the character of the European fund market.

1.2 Purpose

The purpose of this study is to investigate whether Euro-denominated funds display performance persistence. This will be determined by computing Spearman's rank correlation coefficient on rankings of both raw data, data computed using the Treynor measure, as well as data computed using the Jensen measure.

1.3 Outline

Section 2 gives a short review of the European fund market. Section 3 accounts for theories relevant to the study. Section 4 details a number of previous researches done on the subject. Section 5 describes the data sample used in the study. Section 6 gives account of the methodology of the study. Section 7 comprises a presentation of the results. In section 8 an analysis is made of the results. Section 9 concludes the study.

2 The European fund market

The following is a report on the circumstances which the European fund market finds itself in right now. Furthermore this section gives a recollection of the development of the fund market over recent years, as well as presenting views on its future.

In the following account of the European fund industry a distinction is made between UCITS-funds and non-UCITS funds. UCITS stands for Undertakings for Collective Investments In Transferable Securities. A UCITS-fund is encompassed by a number of European Union directives allowing it to conduct its business throughout the European Union. As this study views fund performance from the perspective of a general European investor, it is appropriate to especially point out the developments in a truly general and border-crossing fund type.

At the end of 2008 European investments funds had assets of 6'142 billion Euros under management, of which 4'593 billion Euros, or 74.8% of the total European fund market, were attributable to UCITS-funds. During 2008 total European fund assets decreased by 1,768 billion Euros, a 22.3% percent drop from the year before. For the whole of 2008 assets in the UCITS-fund category dropped by 25.4%, while non-UCITS funds s lost 11.5%.[1]

Concerning UCITS-fund assets, market losses made up 77% of the total decrease. Total net outflows, comprising sales and redemptions, amounted to 335 billion Euros, a figure summing to 6% of end of 2007 assets, a record amount. Quarterly outflows increased gradually throughout 2008 with a

[1] EFAMA, (February 2008), p. 2, 10.

fourth quarter net outflow of 142 billion Euros. As disruptions to the market reached enormous proportions in October with the fall of Lehman Brothers, so did net sales, amounting to 40% of 2007's total outflows. Beginning with the governmental bailouts in November, outflows diminished greatly, some categories such as balanced, money market and equity funds even registered net inflows for the last two months.[2]

In a report on the results of the European Investment Fund Industry for 2008, the European Fund and Asset Management Association states that the largest difficulties for funds in 2008 were the crisis in financial markets, tougher competition from banks as well as fears of recession. All three factors caused investors to withdraw amounts from funds as well demanding fund services less. As banks scrambled to attract deposits to prop up their liquidity and governments rushed to guarantee bank deposits, the risk-free investment alternative to funds gained ground. [3]

Looking beyond last year, European investment funds have experienced a doubling of managed assets over the past ten years, as fund assets went from 3,042 billion Euros in 1998 to 6,142 billion Euros in 2008. Concerning the outlook for the European fund industry, EFAMA points towards low interest rates, low valuations in the stock markets and growth potential in emerging markets, as possible factors which might contribute to the recovery of the industry. Said factors can assist in once again attracting investors to funds, nevertheless EFAMA is clear in its opinion that financial markets must clear before funds can register recovering net inflows.[4]

[2] EFAMA, (February 2008), p. 2, 5, 6, 8.
[3] EFAMA, (February 2008), p 2.
[4] EFAMA, (February 2008), p 4.

3 Theory

This section presents theories and viewpoints relevant to the focus of this study. It clarifies the notional environment of performance persistence, and sheds light on the fundamental conflict between the possibilities of projecting future performances and the hypothesis that the marketplace is efficient, to varying degrees, with respect to information.

3.1 The notion of performance persistence

Performance persistence is the existence of a correlation between previous period performance and the performance in a following period.[5] Such a relationship implies that there exists a possibility of predicting future performances of funds, equities etcetera, by analyzing their historical data.

3.2 Efficient market hypothesis

According to Jensen the simplest way of expressing whether market efficiency relative to a certain information set *I* exists, is that it is impossible to make a profit by trading on said information *I*.[6] Rephrased, the efficient market hypothesis states that the current price of an asset incorporates all available information.[7] The hypothesis is divided into three categories of efficiency; weak, semi-strong and strong.

Tests for *weak*-form efficiency were the first carried out when research on the subject began, and have concluded that market efficiency exists in this

[5] Carhart & Carpenter & Lynch & Musto, (2002), p. 1453.
[6] Jensen, (1978), p. 96.
[7] Bodie & Merton, (2000), p. 206.
Elton & Gruber & Brown & Goetzmann, (2007), p. 400.

range.[8] A market with weak efficiency includes all information to be found in historical prices in its pricing of assets. In later years the first category of efficiency has come to include a broader span of testing for the predictability of returns. It now encompasses the prediction of future returns on the basis of past returns, dividends and interest rates.[9] The absence of weak-form efficiency would mean that investors could achieve excess returns by studying historical prices and from that predict future price movements.

The *semi-strong* efficient market includes all publically available information in prices. In later research semi-strong efficiency has come to include the promptness with which prices adjust to public information.[10] Common references made to market efficiency usually imply this type.[11] Category tests conducted assess whether prices adjust efficiently to for example annual statements, earnings reports, sales reports and statistical data on consumer confidence, just to name a few.[12] Semi-strong form tests also go by the name of *event studies*. Such studies, which have grown increasingly important since the 1970s, document reactions of stock price to decisions made by companies. Examples are the conclusion that stock prices increase with dividend hikes and decrease with dividend cuts, and that the issuing of new stock usually affects stock prices negatively, while redemptions do just the opposite.[13] Most event studies conducted conclude that stock prices adjust to altered outlooks within one day. Fama therefore concludes that markets can be considered, with few exceptions, semi-strong.[14]

[8] Fama, (1970), p. 388.
[9] Fama, (1991), p. 1576.
[10] Fama, (1991), p. 1576-1577.
Elton & Gruber & Brown & Goetzmann, (2007), p. 401.
[11] Jensen, (1978), p. 97.
[12] Fama, (1970), p. 383.
[13] Fama, (1991), p. 1600. Fama refers to studies by Charest (1978), Ahrony and Swary (1980) and Asquith and Mullins (1983) on dividends, and studies by Asquith and Mullins (1986), Masulis and Korwar (1986) on the issuing of new stock.
[14] Fama, (1991) p. 1601-1602.

Strong market efficiency would mean that all information, both public and private, is incorporated in the asset's price. Tests assess whether any actor in the marketplace can make a profit on the basis of a monopoly on certain information. Fama suggests renaming such tests; *tests for private information*.[15] The focus of such tests, which the reader might have concluded, is whether insiders can use their privileged information to achieve excess returns. Certain research lends support to the idea that strong efficiency does not completely exist in the marketplace. Insider trading, illegal nevertheless, is highly profitable, certain firms specializing in security analysis such as Value Line do have somewhat of an upper hand, and fund managers sometimes know before the market does.[16]

3.3 Random walk hypothesis

The random walk model assumes that there is independence among successive returns and that these distributed evenly over time. The return of each period is independent and unaffected by past returns.[17] As the random walk model is intimately linked with the efficient market hypothesis they directly support each other's stances. This link exists in that in efficient markets all information will immediately be incorporated into security prices. This "instantaneous adjustment", which Fama refers to it as, has a certain element of vagueness to it, therefore over- and under-adjustments will huddle around the correct adjustment, which will be achieved on average. In addition, the time it takes for an original price to fully adjust to new information, is itself an independent and random variable. The independence and randomness lies in that some price adjustments will occur in anticipation, before the market actually takes part of the information, and others will straggle. The picture which Fama has painted of the efficient market's adjustment to information is that of successive and independent price change. Characteristics, which he concludes, define a random walk

[15] Fama, (1991), p. 1576-1577.
[16] Fama, (1991), p. 1603.
[17] Elton & Gruber & Brown & Goetzmann, (2007), p. 403.

market.[18] According to Fama the random walk model is valid as long as information on past prices cannot be used to make excess profits, implying that a minimum of weak-form efficiency must exist in the marketplace. This means that any investment strategy cannot be better and yield a higher return than just buying and holding.[19]

As numerous tests have yielded support to the random walk hypothesis, Fama concludes his 1995 article by announcing a shift in the burden of proof of the fallibility of the random walk, to proponents of fundamental analysis. It is up to them to provide evidence that consistent excess returns are delivered.[20] He states that fundamental analysis is of no additional value to the investor, unless he has possession of new information that prices have not yet adapted to. If there is no new information involved, random pickings of securities will according to the model yield a better result.[21] The random walk hypothesis stands in direct contrast to the notion of performance persistence among funds. According to the model, any consistent achievements of excess returns should not be possible.

3.4 Timing ability

When attempting to explain fund performance, an investigation of timing abilities often is worth the while. The concept of timing ability is a method of measuring asset managers' skills in reading the market and playing it accordingly. If an asset manager has a superior ability in interpreting market signals and indicators, he would be able to avoid bear markets while making full use of bull markets. If he expected a slump in the market, he would shift to lower beta alternatives in order to minimize losses. Conversely, when expecting a surge he would go heavier into higher beta assets as that would fully exploit profit possibilities.[22] In figure 3.4, the able manager's timing ability is illustrated by line *a*. In short, the possession of timing ability

[18] Fama, (1995), p. 76.
[19] Fama, (1995), p. 76-77.
[20] Fama, (1995), p. 78-79.
[21] Fama, (1995), p. 80.
[22] Elton & Gruber & Brown & Goetzmann, (2007), p. 651.

implies that managed assets would experience milder downturns and stronger upturns relative to the rest of the market.

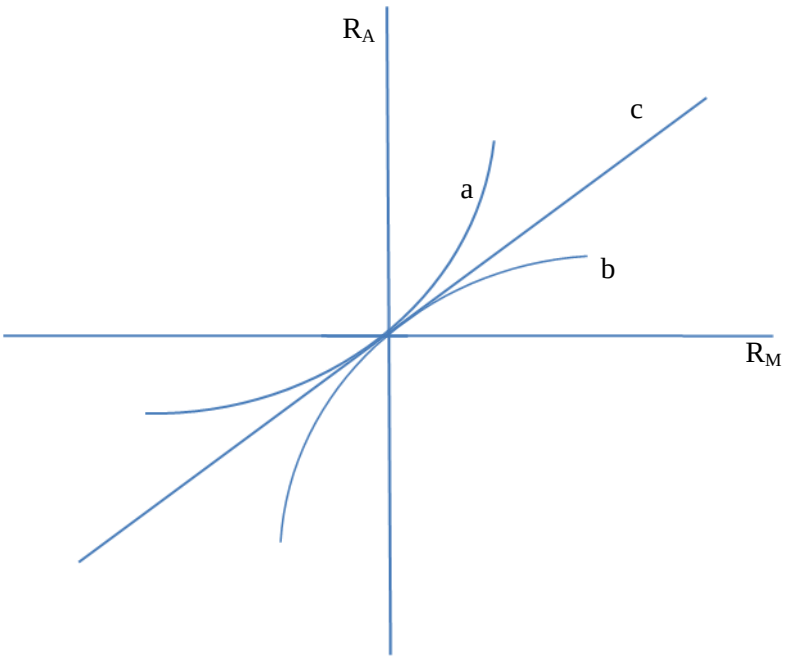

Fig. 3.4: Showing the theoretical plot of positive timing ability (a), negative timing ability (b), and the absence of timing ability (c).

4 Previous research

This part of the study accounts for previous research done on the subject of performance persistence and performance analysis. Brief descriptions are given of the purposes of these studies as well as of the results attained.

Mutual Fund Performance – Sharpe (1966)

Observing a persistence of differences in performance among 34 funds between the years 1954 and 1963, Sharpe investigated three methods of predicting future performance. Data from between the years 1944 to 1953 was used to compute fund rankings according to reward-to-variability ratios, the Treynor Index and expense ratios and size. These were then compared to reward-to-variability ratios for 1954 to 1963. Sharpe observed that when ranking funds after their reward-to-variability ratios, with a correlation coefficient of +0.3157 and a Spearman's correlation coefficient of 0,360, those ranking low one year would probably rank low in later periods as well. A pattern that was recognized for high ranking funds as well. He concluded that the ratio could vaguely predict future performances. Rankings according to the Treynor Index based on 1944 to 1953 were an even better predictor with a correlation coefficient of +0.4008 and Spearman's rank correlation coefficient of 0.454. Ranking according to the fund's expense ratio yielded a correlation coefficient of -0.3746, while the correlation coefficient between fund size and performance was +0.1523. Sharpe concluded that even though past performances do matter slightly, persistence performance differences can be explained in large by differing expense ratios, supporting the concept of an efficient market. He went on to emphasize the necessity of further research.

French Mutual Fund Performance – Evaluation of Internationally Diversified Portfolios – McDonald (1973)

The paper investigated monthly data between the years 1964 and 1969 of eight French funds. McDonald found that three out of eight funds had monthly returns of one percent or more than the systematic risk taken gave reason to expect. An additional three funds had such excess monthly returns in the range between one-half and one percent. The remaining two funds had risk-related excess returns marginally higher than zero. The study went on to conclude that fund managers were superior analysts in forecasting returns on French securities. McDonalds explains this partly with the perceived inefficiency of the French securities market to price in information, as well as the French banks' and fund managers' access to information.

The Persistence of Mutual Fund Performance – Grinblatt, Titman (1992)

The purpose of the study was to investigate whether there is persistence in fund performance. The sample set consisted of data between 1974 and 1984 for 279 funds. The paper concluded that there is a positive persistence in performance. Mutual funds were expected to achieve a 0.28% abnormal return in the second five year period for every 1% abnormal return achieved in the first five year period. The study also showed that the 10% worst-performing funds in the first five-year period delivered an abnormal performance of -3.5% per year in the next five year period.

Hot Hands in Mutual Funds: Short-Run Persistence of Relative Performance, 1974-1988 – Hendricks, Patel, Zeckhauser (1993)

The paper investigated quarterly data for a total of 165 funds between 1974 and 1988. It concluded that there is short-term performance persistence in that funds having returned a 1% superior return in one four-quarter period, will deliver a superior growth of 3% in the next four quarters. Though

applied over an additional four quarters the return will fall to 2%. The study not only concludes the existence of hot hands, but also icy hands. Funds having generated inferior growth in the past year will continue to deliver disappointing performances. No constant super performers were observed, though continuous sub performers were recognized.

Performance Persistence – Brown, Goetzmann (1995)

The study encompassed 372 funds from 1976 to 1988. It found relative performance persistence even when adjusted for risk. The authors explain most of the persistence with funds lagging passive benchmarks. It was observed that while winners and losers usually maintain, rankings can sometimes reverse. Therefore the persistence is attributed in part to a common strategy among managers, leading to a correlation between their persistence, and in part by the survival of unremitting under performers.

The Persistence of Risk-Adjusted Mutual Fund Performance – Elton, Gruber, Blake (1996)

The authors studied data from 1977 through 1993 for 188 funds. The study concludes that there is a possibility of predicting future performance from previous ones. Those funds delivering good yields in the past will do so in the future as well. It is observed that the top decile of funds ranked by alpha values computed over three years, will deliver an excess return of 0.009% a month for the next three years. The bottom decile will conversely yield a negative return of -0.437% per month for the next three years. The top decile alpha ranked of funds outperformed the bottom decile funds eleven out of twelve times, as well as the average fund nine times out of twelve. When instead using alpha computed over one year to rank funds, the top decile funds yielded an excess return of 0.015% each month for the coming three years, while the bottom decile delivered -0.397%. The top decile outperformed the bottom decile fund as well as the average fund twelve out

twelve times. The top decile funds in a ranking according to alpha computed over one year, will deliver an excess return of 1.50% in next coming year.

On Persistence in Mutual Fund Performance – Carhart (1997)

Carhart studied data from 1962 to 1993 for 1892 funds, with an average yearly sample size of 509 funds. He notices that even though winners and losers are likely to maintain their status, 80% of the top decile funds differ every year. He also observed that winners and losers often turn into their opposites the following year. The author interpreted the short period of time winners actually remain winners as evidence of the ephemeral character of excess returns. Nevertheless, Carhart concluded the existence of a short-term performance persistence spanning over one year, which according to him, was explained rather by chance, common factors, expense ratios and transaction costs. In all he declared that, even though top performing funds stand a slightly above average chance of delivering excess returns the first following year, the only significant persistence is that of the worst under performers.

Performance Persistence: Evidence for the European Mutual Funds Market – Grünbichler, Pleschiutschnig (1999)

The data sample studied comprised monthly net asset values for a total 333 European equity mutual funds between 1988 and 1998, of which 105 funds contributed with data for the all ten years. The authors found evidence for the existence of performance persistence. This persistence was observed to highly dependent on the time range studied, and was the strongest over six month periods.

Performance and Characteristics of Swedish Mutual Funds – Dahlquist, Engström, Söderlind (2000)

The study encompassed 210 funds between the years 1992 through 1997. When investigating performance persistence, the study used the alpha values of the previous year to rank funds. The authors observed no persistence in performance among equity and bond funds. For money market funds however, a strong persistence was discerned. A winner of last year had a probability of 0.35 of remaining a winner in the following year, while a loser had probability of 0.25 of staying a loser. The authors note that without deducting fees, the probabilities are even higher.

Performance Persistence of International Mutual Funds – Droms, Walker (2001)

The study made use of data from 1977 to 1996 for a total of 529 funds. The authors found strong performance persistence in the short run. 57% of funds that were winners in Year 1 were winners in Year 2. Out of the Year 1 loser funds, 56% remained losers in Year 2. However, for longer evaluation periods of two, three and four years, performance persistence was not statistically significant.

Do Winners Repeat with Style? – Ibbotson, Patel (2002)

The data studied spanned from 1975 through 2000. The funds in the sample were adjusted for their style, meaning that fund profiles and investment objective were taken into consideration. Funds were ranked according to their alpha values. When winners were defined as those funds having a positive alpha both in the first and in the second period, 54% of winners repeat. The average alpha for winners in the second period was 1.51%. In a second analysis winners were defined as funds ranking in the top half in two successive periods. 54% of winners repeated, and the average alpha of winners in the second period was 1.50%. The authors went on to analyze

fund performances with winners defined on an absolute basis. When winners were defined as those funds having a first period alpha of at least 1% and a positive second period alpha, the repeat win rate was 55%, with an average second period alpha of 1.74%. When winners had to have a first period alpha of at least 5% and a positive second period alpha, the repeat rate was 59% and the average second period alpha was 3.02%. The highest performance persistence was observed when winners were defined as funds having a minimum alpha of 10% in the first period and a positive second period. The repeat rate was 62% and the average successive period alpha was 4.29%. The third ranking method analyzed sorted funds by their relative alpha values. When winners were defined as the top 40% of funds with a top half alpha in the second period, 56% repeated with a second period average alpha of 1.86%. When the selection was narrowed to the top decile funds, 61% of funds repeated and the average second period alpha was 3.41%. The strongest performance persistence was identified among the top 5% of funds. Among those 64% repeated their win, with a second period average alpha of 4.49%. The study therefore concluded that performance persistence exists.

European Mutual Fund Performance – Otten, Bams (2002)

The study covered 506 funds from 1991 through 1998. The authors first categorized funds according to their domicile. The funds were then ranked within their categories based on previous one-year returns and placed in portfolios in according to their rank. The discrepancy between excess returns for high-ranked portfolios and low-ranked portfolios varied from 0.83% for French funds and 6.08% for UK funds. The alpha values for ranged between 0.71% and 7.28%. The authors concluded that there was only vague support for performance persistence, with the exception for UK funds.

5 Data

This section specifies and gives reasons for the criteria with which the data was selected and describe the process of gathering the data. It also presents the data and variables used in the study, and accounts for their limitations.

5.1 Data set

The data collected encompasses the net asset values (NAV) of 726 funds between April 1992 and April 2009. Only funds with data spanning over the full seventeen years were included. Funds were selected on the criteria that the net asset value should be denominated in Euros. The fact that the net asset value is in Euros obviously does not imply that the fund is based in Europe, therefore the sample consists of funds from various parts of the world. As no differentiation was made between funds holding different asset classes, different ratios of assets or having special geographical focuses, the sample consists of a wide variety of fund types. This benefits the study as performance persistence is viewed from global perspective, albeit from a European window. The list of funds matching the stated criteria was collected by using Datastream Advance. This yielded a list of 726 funds, of which the monthly net asset values were gathered. These monthly net asset values take dividends and fees into consideration. Performance persistence was investigated using unadjusted fund data as well as data adjusted for risk.

5.2 The risk-free return

The risk-free return used in the latter computation was the one month EURIBOR. It is synthetic as the regular one month EURIBOR was not listed until December 1998. Data for the risk free interest rate was collected using Datastream Advance.

5.3 The market return

For a European investor, the natural alternative to investing in funds denominated in Euros must logically be to invest in individual stocks or an index denominated in Euros. Therefore the benchmark used to compare fund returns to was the Dow Jones EURO STOXX 600, which provides a broad coverage of European large, mid and small capitalization companies. Monthly data for the benchmark was collected from Datastream Advance.

5.4 Survivorship bias

Survivorship bias occurs when data collected on funds only incorporates those funds which have survived the whole sample period. As funds which have closed down are not included, the worst underperformers are not taken into account in the study. As the bottom dwellers are removed the result is that overall performance seems better than it really is. In addition, there are numerous possible reasons for funds performing average or above average, one of which might be excessive risk taking. Consequently the surviving population might consist of a large portion of risky funds.[23] Brown, Goetzmann, Ibbotson and Ross have demonstrated that a sample which is tainted by survivorship bias will yield a phony facade of performance persistence.[24] Another side to the coin which is not emphasized as much is that funds on the opposite side of the spectrum, which have performed very well, merge with other funds or that the manager(s) leave and the fund closes, something which would bias the results negatively.

[23] Elton & Gruber & Brown & Goetzmann, (2007), pp. 428-429.
Brown & Goetzmann & Ibbotson & Ross, (1992), pp. 560-561.
[24] Brown & Goetzmann & Ibbotson & Ross, (1992), p. 561, 576.

6 Methodology

This section describes and explains the methods used in the search for performance persistence. Certain essential concepts that are the focal points of the study are presented and described. We also delve into the individual theoretical backdrops of the methods utilized; the capital asset pricing model, the Treynor measure, the Jensen measure and Spearman's rank correlation coefficient.

6.1 Method

First of all the raw performances of the funds are calculated by the method described under section 6.2. This study searches for performance persistence in data processed in three different ways; raw data on performances, performances as given by the Treynor measure, and performances as given by the Jensen measure. When the performance according to each of these methods has been calculated, the funds are sorted on a monthly basis according to the size of their monthly performances. Thereafter the Spearman's rank correlation coefficient is calculated for each month's fund ranking, relative to the ranking the first month in the data sample. The purpose is to determine how alike the monthly performances of the funds, given by the monthly rankings, are to the funds' performances the first month in the sample. If performance persistence exists, the changes in the rankings should be as small as possible. Perfect persistence would for example exist if the rankings have not changed at all since the first month.

The point of using different methods for the computation of fund performance lies in that the different measures shed light on different aspects of fund management. The results will thus provide information concerning which aspects of funds' performances it is that persist.

By incorporating raw performances we can determine whether funds are persistent in delivering absolute returns. By using the Treynor measure we can establish whether there is persistence in risk-adjusted returns. Utilizing the Jensen measure enables us to find out whether there is persistence among alpha returns.

6.2 Definition of mutual fund performance

A list of funds and their monthly net asset values between April 1992 and April 2009 was gathered. The net asset value readings were then utilized to calculate the percentage monthly returns for the funds as follows:

$$R_{MONTH} = (NAV_{T+1} - NAV_T) / NAV_T$$

6.3 The capital asset pricing model

The capital asset pricing model is a method of pricing assets according to the amount of risk associated with them.[25] The model is described by the following equation:

$$R_i = R_F + \beta_i (R_M - R_F)$$

Where R_i is the expected return of asset *i*, R_F is the risk-free return, β_i is the beta-measure of asset *i*, and R_M is the return of the market portfolio.

The equation gives the security market line (SML), which describes the link between asset risk and return.[26] Expected return differs depending on the amount of risk taken on. More assumed risk calls for higher expected returns. The measure of risk used in the capital asset pricing model, the beta measure, only covers systematic risk. That is risk which cannot be

[25] Haugen, (1997), p. 196.
[26] Haugen, (1997), p. 207.

eliminated by diversification. Therefore, the only taking of risk that the market rewards is that of systematic risk.[27]

6.4 Spearman's rank correlation coefficient

Spearman's rank correlation yields a correlation coefficient ρ between -1 and 1, signifying how well two rankings correlate. -1 would imply perfect negative correlation, 1 would indicate perfect positive correlation, while 0 would mean an absence of correlation.

$$\rho = 1 - \frac{6 \, \Sigma \, d_i^2}{n\,(n^2 - 1)}$$

Where ρ is Spearman's rank correlation coefficient, d_i is the numerical difference between the rankings of the values, and n denotes the number of ranked values.

6.5 Performance measures

Performance persistence research usually encompasses data both unadjusted and adjusted for risk. In this particular study fund returns were adjusted for risk by using the Treynor measure. When searching for persistence in performance relative to the selected benchmark, the Jensen measure was used.

6.5.1 Treynor measure

The Treynor measure gives the slope of the security market line mentioned in section 6.2 above. That is the line connecting the risky asset, in our case any of the 726 funds, and the risk-free rate which we have defined as the one month synthetic EURIBOR. The ratio gives a measurement of asset performance by placing the asset's excess return compared to the risk-free alternative, in relation to the amount of systematic risk assumed by investing in that particular asset.[28]

[27] Elton & Gruber & Brown & Goetzmann, (2007), p. 291.
[28] Hodges & Taylor & Yoder, (2003), p. 504.

$$\text{Treynor measure} = (R_A - R_F) / \beta_A$$

Where R_A is the return of the asset, R_F is the risk-free return and β_A is the beta-coefficient of the asset.

A weakness of the Treynor measure is that it does not take into consideration differences in assumed non-systematic risk. It only incorporates assumed market risk, i.e. systematic risk that cannot be eliminated by diversification. This is why it is said that the Treynor measure is insensitive to the breadth dimension of performance.[29] The measure consequently supposes that the assets in question are part of a larger diversified portfolio, which eliminates the specific risks.

6.5.2 Jensen measure

The Jensen measure, also known as the Jensen differential performance index, Jensen ratio or Jensen's alpha, gives a measure of performance relative to a benchmark, the security market line. It states the difference between an asset's expected return and actual return. The expected return is computed using the capital asset pricing model, which specifies the return which is stipulated by the security market line. Graphically, the Jensen measure gives the vertical distance between a point on the security market line, corresponding to the asset's assumed risk, and the asset's actual return. In short, the Jensen measure quantifies the difference between the asset's actual return and the return which it, according to CAPM, should deliver due to its risk.[30] A fund with a positive Jensen measure indicates that the manager has an ability of picking winning assets which yield high returns relative to the risk they add to the fund.

$$Jensen\ \ measure = R_A - \left(R_F + (R_M - R_F)\,\beta_A \right)$$

[29] Haugen, (1997), pp. 314-315.
[30] Haugen, (1997), pp. 311.
Elton & Gruber & Brown & Goetzmann, (2007), pp. 645-647.

Where R_A is the asset's return, R_F is the risk-free return, R_M is the return of the market portfolio, and β is the beta measure of the asset.

6.6 Searching for performance persistence

All seventeen years of data was used to search for performance persistence unadjusted for risk, though as two years of data was used to compute a two-year rolling beta value, the first risk adjusted values are observed for May 1994.

After a monthly Spearman's rank correlation coefficient has been computed for every different way of searching for performance persistence, a two-tailed hypothesis test will be conducted, either accepting or rejecting the null hypothesis that performance persists.

$$Z = \frac{X - \mu}{\sigma / \sqrt{N}}$$

Where X is the average Spearman's rank correlation coefficient over the sample period, μ equals zero. σ is the standard deviation of all the observations of Spearman's rank correlation coefficient throughout the sample period, and N is the number of observations in the sample.

The null hypothesis implies that the average correlation is zero, meaning that there is no performance persistence. The region for which we accept the null hypothesis at the 5% level of significance is between -1.96 standard deviation units and +1.96 standard deviation units. If the Z-value falls outside the acceptance region, i.e. if it either is larger or smaller than -1.96 or +1.96, we reject the null hypothesis and accept H_1.

6.6.1 Unadjusted for risk

The funds were ranked according to their performance on a monthly basis, for which the sample's first month was consumed. Thereafter Spearman's rank correlation coefficient, relative to the funds' rankings in May 1992 which was the first month with a computed performance, was calculated for every month starting with June 1992. The results are thus based on data between June 1992 and April 2009.

6.6.2 Adjusted for risk using the Treynor measure

As was explained under section 6.3.1, the Treynor measure is calculated by dividing a fund excess return over the risk-free return by the fund's beta measure. Two years worth of data was deemed sufficient to create a reliable rolling beta value; consequently the initial two years of data collected, April 1992 to April 1994, were used for this purpose. After the Treynor measure had been calculated for each fund they were ranked according to it. Thereafter the Spearman's rank correlation coefficient was calculated, beginning with May 1994. As Spearman's needs one month to get started, so to say, the risk adjusted results are based on data between June 1994 and April 2009.

6.6.3 Using the Jensen measure

As the Jensen measure makes use of the beta measure in its computation the two initial years of data are used as a foundation to create a reliable beta value. Therefore the first month for which we can calculate a Jensen measure is May 1994. Since yet another month is used in order to calculate the first Spearman's rank correlation coefficient, our first data observation is for June 1994. The data sample consequently comprises June 1994 to April 2009. After the Jensen measure was calculated for each fund, they were sorted by it on a monthly basis, after which Spearman's rank correlation coefficient was calculated, referring back to the first month of the sample, which was June 1994.

6.7 Evaluating timing ability

A test for the presence of timing ability among the sample funds was conducted by computing their total performance over the 16-year and 11-month period between May 1992 and April 2009, and then ranking them according to it. Thereafter the funds in the top decile were selected, producing a collection of the 10% top performing funds, a sample of 73 funds. Their monthly performances were then plotted against those of the benchmark, the Dow Jones EURO STOXX 600, over the same time period.

7 Results

This section presents the results of the different tests for performance persistence carried out. Raw performance as well as performance adjusted for risk was analyzed, the latter by utilizing the Treynor measure. By using the Jensen measure the risk adjusted data was related to the benchmark, the Dow Jones EURO STOXX 600. Additionally a timing graph will illustrate the timing abilities found among the funds.

7.1 Performance persistence, unadjusted for risk

When the Spearman's rank correlation coefficient is plotted over time, it can graphically be seen that the evidence in favor of performance persistence is nonexistent. The correlation coefficient never rises above 0.1. The only pattern which can be discerned is the correlation coefficient's oscillation around zero. A pattern which is supported by the fact that the mean correlation coefficient over the 16 year and 11 month sample period is 0.002795.

Mean	-0,0026945879
Standard deviation	0,0378210424
N	203

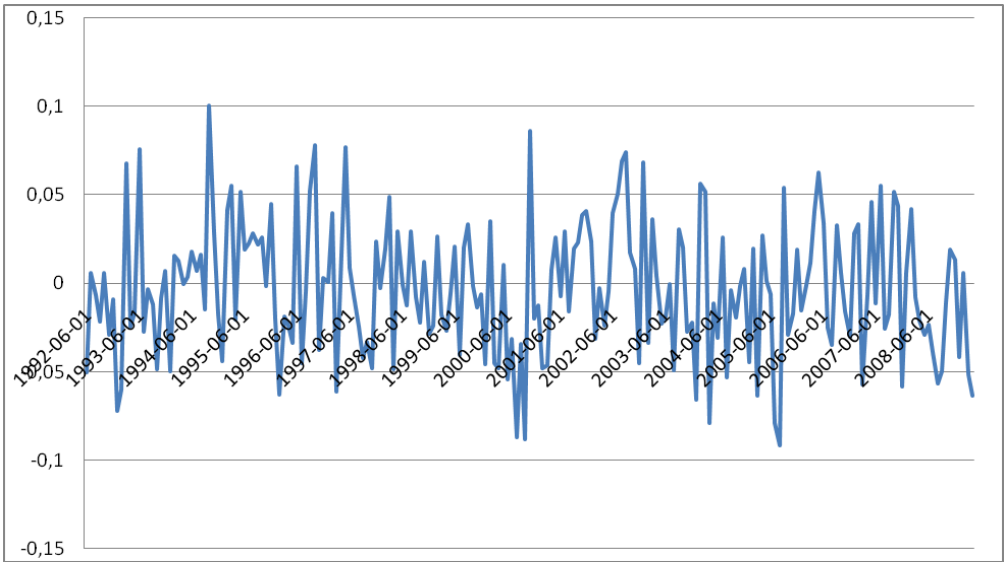

Fig. 7.1: Spearman's rank correlation coefficient – unadjusted for risk, June 1992 to April 2009.

In order to statistically determine whether there is evidence for performance persistence in the raw data we conduct a two-tailed hypothesis test at the 5% level of significance. As we mentioned above we accept the null hypothesis if our Z-value is either larger or smaller than -1.96 and +1.96.

H_0 = no performance persistence exists

$H_§$ = performance persistence exists

$$Z = \frac{-0{,}0026945879 - 0}{0{,}0378210424 / \sqrt{203}} = -1{,}01510$$

The computed Z-value of -1,01510 falls within the acceptance region of the null hypothesis. Therefore we accept the absence of performance persistence.

7.2 Performance persistence using the Treynor measure

When plotting Spearman's rank correlation coefficient for the ranks of data computed using the Treynor measure, we can distinguish a clear downward

trend over the sample time period from initially quite high levels of correlation (0.89). The sloping trend eventually ends up oscillating in and out of negative territory.

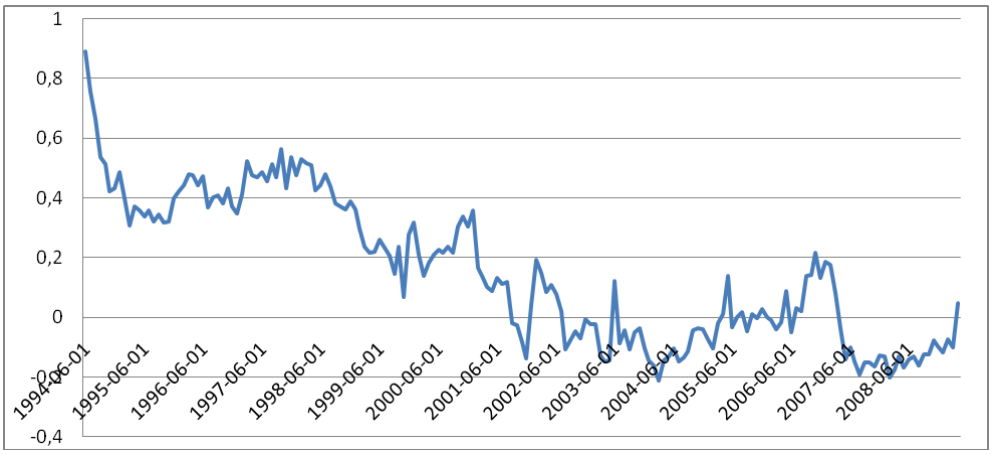

Fig. 7.2: Spearman's rank correlation coefficient – using Treynor's measure, June 1994 to April 2009.

Mean	0,1528600809
Standard deviation	0,2398462385
N	179

By conducting a two-tailed hypothesis test at the 5% level of significance we can decide whether we should accept or reject the absence of performance persistence in data computed with the Treynor measure.

H_0 = no performance persistence exists

$H_§$ = performance persistence exists

$$Z = \frac{0{,}1528600809 - 0}{0{,}2398462385 / \sqrt{179}} = 8{,}5268$$

Our Z-value of 8,5268 falls well within the rejection region of the null hypothesis. Consequently we accept $H_§$, which signifies that performance persistence exists in this particular data.

7.3 Performance persistence using the Jensen measure

When computing Spearman's rank correlation coefficient on data attained by using the Jensen measure we get a highly oscillating (the standard deviation is 0.27) plotting over the sample period. However, the correlation stays at decent levels throughout the study, maintaining a mean value of 0.35.

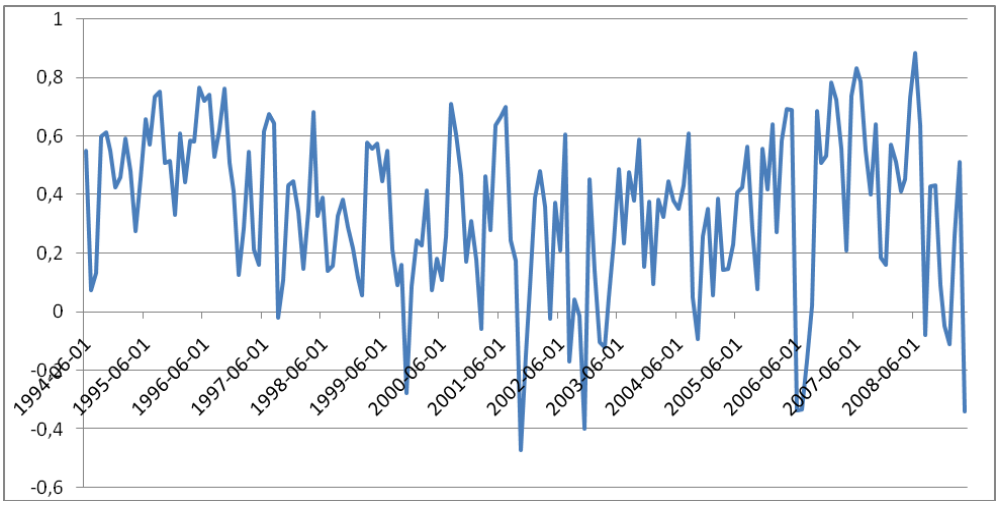

Fig. 7.3: Spearman's rank correlation coefficient – using Jensen's measure, June 1994 to April 2009.

Mean	0,3484978707
Standard deviation	0,2730509293
N	179

In order to statistically decide wheter there is performance persistence among data computed with the Jensen measure we run a two-tailed hypothesis test.

H_0 = no performance persistence exists

$H_§$ = performance persistence exists

$$Z = \frac{0{,}3484978707 - 0}{0{,}2730509293/\sqrt{179}} = 17{,}07586$$

At the 5% level of significance we should reject the null hypothesis as our Z-value is well outside its acceptance region of ±1.96. We therefore conclude that performance persistence exists in the data computed using the Jensen measure.

7.4 Timing

The raw monthly returns between May 1992 and April 2009, of the 73 funds in the top decile and of the benchmark, the Dow Jones EURO STOXX 600 were plotted against each other, yielding the result presented in figure 7.4 below.

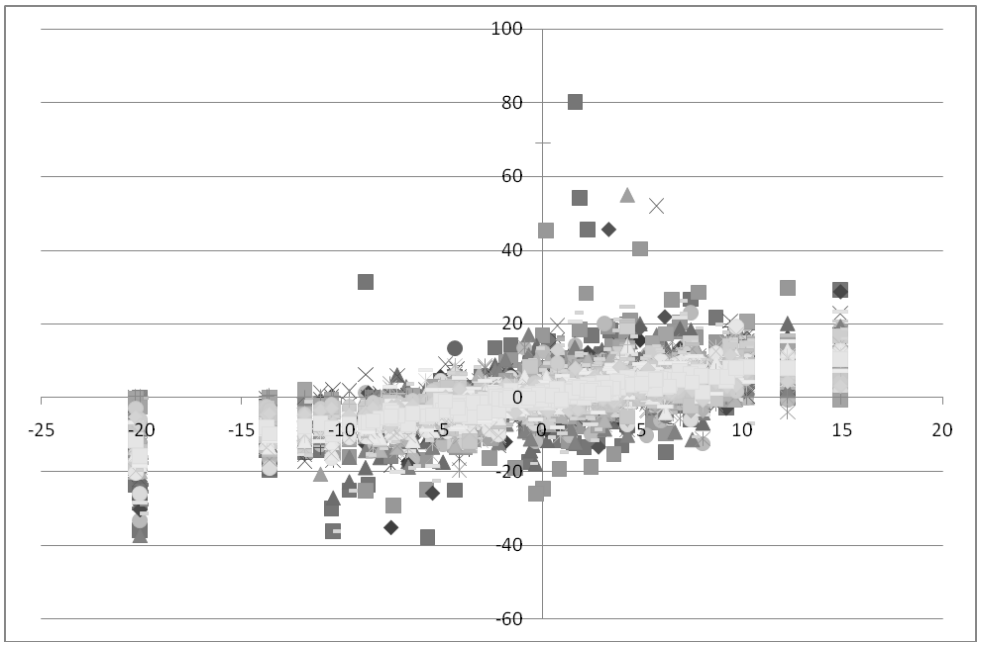

Fig. 7.4: Plottings of the performances of the 73 top decile funds against the benchmark showing no evidence of timing abilities.

8 Analysis

This section interprets the results attained above in order to draw conclusions from them. The results will also be put in relation to previous research on the subject of performance persistence and the efficient market hypothesis. We also consider other implications of the results and round things off by reflecting on the effects of a tumultuous market on persistence.

8.1 Analysis of results

8.1.1 Raw results

The results for the Spearman's rank correlation coefficient computed on rankings of raw data, does not leave room for any other conclusion than that there does not exist any performance persistence.

8.1.2 Results attained using the Treynor measure

The Spearman's rank correlation coefficient for the rankings of fund performances computed by using the Treynor measure, demonstrate quite a defined pattern. The correlation starts of being high (0.89) and ends low, even negative, after 14 years and 11 months. The results show that there is noteworthy short term performance persistence during the initial couple of months. This implies that funds which achieve returns in excess of the risk-free rate, placed in relation to the amount of market risk they have assumed, do succeed in maintaining their pole position. It means that there exists an ability among fund managers to allocate capital in a manner which yields excess returns, though only in the short run.

When the results over the whole sample time period are studied, there is no explicit evidence for performance persistence in the long run. Within the

first year the correlation between the ranks fell to the weak levels of 0.31. Even though the correlation did pick up somewhat in the coming couple of years it never rose above 0.6 again. In 1998, after four years, it once and for all continued its downward journey. This reinforces the notion that excess returns cannot be sustainably achieved in the longer run.

8.1.3 Results attained using the Jensen measure

Among funds which deliver returns in excess of what is expected of them from the capital asset pricing model, the evidence for performance persistence is quite volatile. Correlation swings are large, though they occur over a relatively high mean of 0.35. Over longer periods of time the monthly rankings of Jensen measure performances exhibit correlation which is higher than that found for the Treynor data. It is quite remarkable that the ranking for the month of June 2008 has a 0.8 correlation with the same month fourteen years earlier. The results imply that funds achieving alpha returns in relation to their theoretical CAPM returns hold an ability to maintain these returns over longer periods. Of course, the fluctuations in the correlation could mean that funds delivering alpha returns one month might eradicate all or much of their accumulated performance the next month, when they are ranked among the losers.

8.2 Results and previous research

Most studies conducted on performance persistence support some kind for persistence, especially short-term. This study is no exception, as the results attained support the notion of short-term risk-adjusted performance persistence. Correlation is the highest in the immediately following months. These results are consistent with a fair number of previous researches. Hendricks et al. (1993) attained the results that overachievers of one year will persist for the next, but no more. Carhart (1997) reached the same conclusion; risk-adjusted performance persistence is mostly short-term. Grünbichler et al. (1999) concluded that persistence was the strongest over one year, as did Droms et al. (2001). There is a notable difference between

the researches just mentioned and this study. While they conclude short-term performance persistence over a one-year period, this study concludes the same, though with the adjustment that it is the strongest over the first few months. In this research no long term risk-adjusted performance persistence was observed, correlation entered into a long term downward trend from the first month. This finding too, is consistent with the results of the researchers just referred to. It serves to mention Hendricks et al. (1993) who did not discern any long term performance persistence, except among losers. However, Elton, Gruber and Blake (1996) found that past risk-adjusted performance can be used to predict not only short-term future performances but also long-term. This result is not compatible with that found in this study, which indicates that the predictive value of historical performances decreases steadily over time.

8.3 Results and efficient market hypothesis

As was mentioned under section 3.2, an efficient market implies that it is impossible to achieve excess returns consistently, as all information is disseminated and incorporated into current asset prices. When analyzing the results of the raw rankings the efficient market hypothesis holds. Correlation is next to none, meaning that previous rankings cannot be utilized to predict future returns.

The rankings of Treynor measure performances initially display high performance persistence. This means that the efficient market hypothesis does not hold in the short run for funds delivering returns in excess of the risk-free rate, relative to their risk level. Putting it crudely, it is possible to pick last month's risk adjusted winner, and roughly have an 89% chance of receiving excess risk adjusted returns the first month, and a 76% chance of excess returns the second month. In the longer run the performance persistence falls even to negative levels, therefore in a longer perspective the efficient market hypothesis holds. The results illustrate that is not possible

to achieve excessive returns consistently for longer periods of time, which is in line with the notion of market efficiency.

I find the results attained using Jensen measure performance to be the most interesting. The Jensen measure is, as was explained under section 6.3.2.2, a measure of the alpha return achieved over the expected return as is given by CAPM. The Jensen alpha can be used to measure how good a fund is at picking winners that yield higher returns for the same risk as the market. The results that correlation among Jensen measure rankings is quite high throughout the data period, albeit with a decent amount of volatility, implies that alpha achievers among funds are reasonably able to maintain their skill of picking assets which give excess returns in relation to their risk level. This result does not go well with the notion of strong-form market efficiency. In direct contrast to the hypothesis, it shows that certain funds to some extent have an upper hand, a superior ability of picking investments.

8.4 Timing ability results

It was of interest to conduct a test for timing ability as it could provide us with some explanation of the existence of performance persistence. Evidence in favor of timing ability would indicate that exceptional fund performance is due to fund managers' superior abilities, that observed excess returns are not just the result of haphazard luck. Figure 7.4 is perfectly in line with the absence of market timing abilities. Except for a tiny number of notable exceptions yielding large excess returns while the market return is low and even negative, there is no graphical evidence of a curvature of the R_A versus R_M plots.

8.5 The effect of extraordinary circumstances

Bearing in mind the present turbulent circumstances on the financial markets of the world, it would be quite interesting to observe how the notion of performance persistence fares when there are structural shifts in the

marketplaces. Both situations involve market circumstances during which certain assets fared particularly well, in hindsight on lose grounds.

8.5.1 The dotcom bubble

In March 2000 a bubble which had gained momentum for the past five years burst. Stocks which had been pushed higher and higher on speculative and flimsy grounds plummeted. When ranking the 726 European funds according to their monthly performances as given by the Treynor measure, and then computing the Spearman's rank correlation coefficient between their ranking in February 2000 and the following months we get the results plotted in figure 8.6.1.

The results are not surprising as tech-stocks and investing funds registering excellent performances at the pinnacle of the bubble in February 2000, would find themselves ranked among the loser funds. Correlation between the ranking in February 2000 and the following couple of years should notionally be very low.

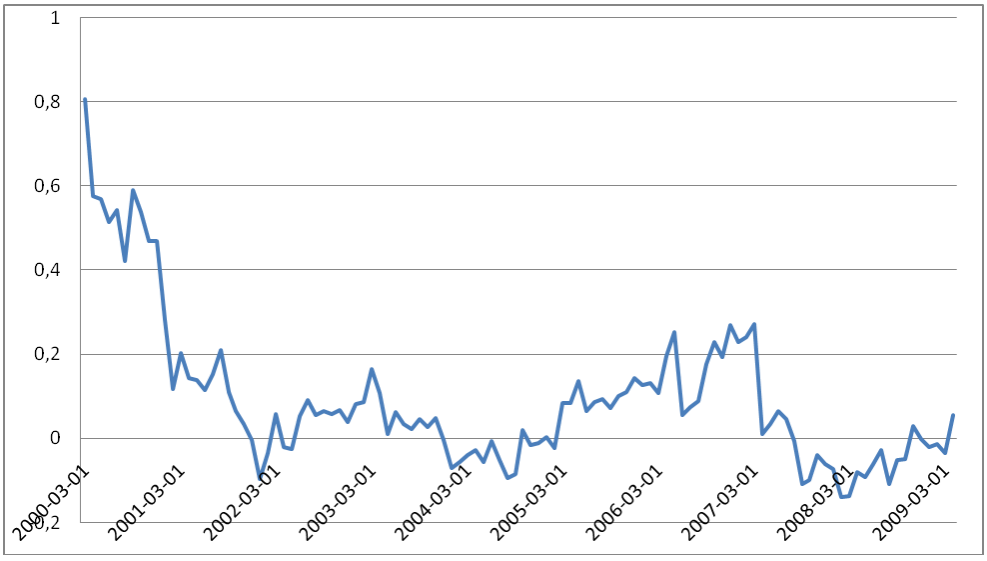

Fig. 8.6.1: Spearman's from the start of the dotcom bubble in March 2000.

From the plotting in figure 8.6.1 we can note that the correlation drops rapidly the first year and second year after the burst. The correlation lands

around zero, implying, quite expectedly, that the performances of funds in February 2000 does not provide any clues or hints whatsoever to later performances.

8.5.2 The subprime crisis

In June of 2007 what would come to be known as the subprime crisis began with the collapse of two Bear Stearns hedge funds. This marked the beginning of a massive downturn in the world's financial markets. By ranking the funds according to their Treynor measure, and then computing Spearman's rank correlation coefficient using May 2006 as the base month, we can plot the diagram depicted in figure 8.6.2 a.

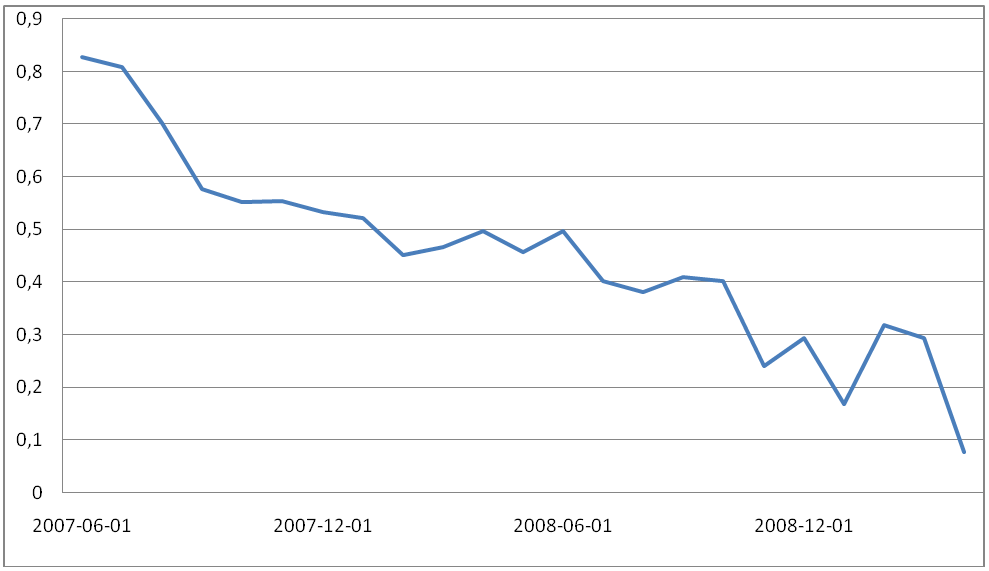

Fig. 8.6.2 a: Spearman's from the start of the subprime crisis in June 2006.

The expected decline in the correlation between the rankings is comparable to that of the dotcom bubble. In fact, if the Spearman's rank correlation coefficients for both meltdowns are plotted together for the initial 23 months after the start of each crisis, we can more easily compare the development of the correlation.

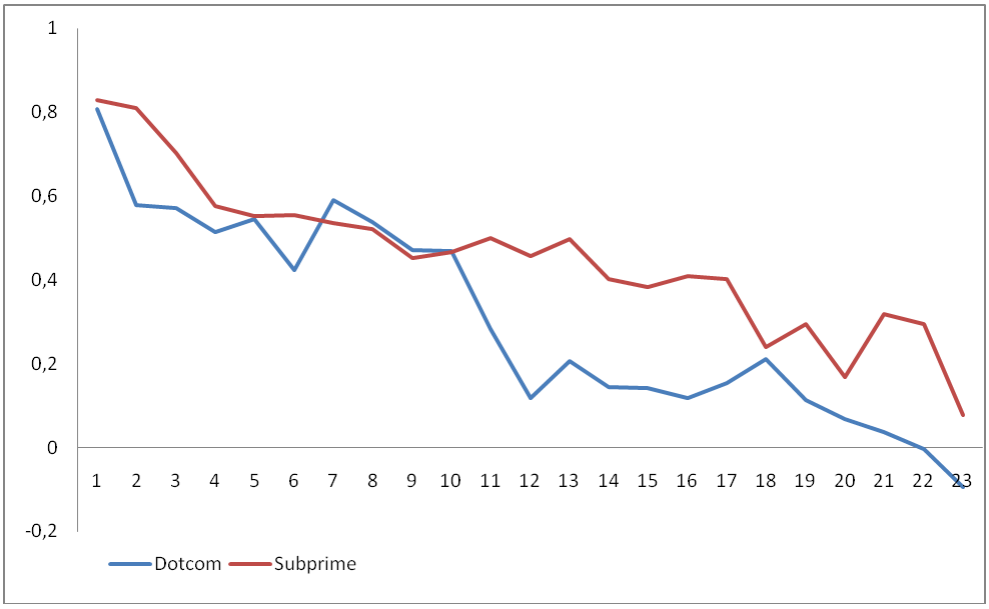

Fig. 8.6.2 b: The development of Spearman's, during the first 23 months after the start of each crisis, for the funds during the dotcom bubble and the subprime crisis.

Figure 8.6.2 b clearly illustrates that rank correlation falls quite rapidly both during the initial 23 months of both the dotcom bubble and the subprime crisis. During both periods the correlation starts of a quite high levels, around 0.8, and then quickly makes its way to around zero. Although during the dotcom bubble the descent was somewhat more rapid, and 23 months was more than enough for it to become negative.

The conclusion which can be drawn from the developments of the rank correlation coefficients during the dotcom bubble and the subprime crisis, is that volatile times toss the funds around in the rankings. A previous ranking does not contribute any useful information to what future rankings will be

9 Conclusion

This section concludes the results attained in the study and provides comments by the author.

The results attained provide evidence that Risk-adjusted performance persistence exists in the very short term. Evidence of alpha-return performance persistence is ambiguous, though indicates that there might be persistence over longer periods of time. Any persistence observed is not the result of the timing abilities of the funds. During tumultuous circumstances in the financial markets rank correlation drops quickly, expectedly so since former winners often are sold off.

There are many possible explanations for persistence only to be observable in the shorter term. Quite plausibly, funds heavily invested in certain assets which perform well one month will be equally heavy invested the following month, during which the assets can perform well once again due to a number of factors. Such factors could be momentum, a trend, or a temporary high demand for certain assets. An illustration of this could be that the price of a raw material rises significantly and consistently over a few months. Naturally any number of products or materials can be substituted for the raw material, for example banking services, loan provisions, IT services, IT manufacturing. Companies with ties to this material as well as funds focusing their investments on this material would most experience an increase in their market capitalization over the same months. Consequently funds as well as in companies related to the material will experience persistence in their performance over those months. That is, until the assets turn sour at which point the performance of the fund will do the same, and it will find itself among the losers. A possible focus of future studies could be to determine how long funds can maintain their rank within a certain decile,

and how big the average movement in the ranking is when they drop outside that decile.

Another explanation for the non-existence of longer term persistence, as well as timing, are fund specific rules setting boundaries for the manager's liberty to act freely on the basis of his judgment of financial circumstances. Most funds are required by law to keep investments in single position under a certain percentage of the fund's total assets. Moreover, many if not most funds have outspoken guidelines by which they must adhere, often related to the fund's investment profile. A balanced fund for example, probably is required by its own statute to maintain a certain ratio between equities and bonds. A fund profiling itself as aggressive most probably cannot sell all of its equity assets and take up positions in bonds just because the managers fears a bear market. Such a course of action would probably violate the fund's internal statutes, as well deter possible investors since the fund is not true to its profile. Such legislative regulations, as well as internal statutes and profiles, hinder fund managers from taking full advantage of bull markets, avoid bear markets and move away from investments industries and materials that have performed well but are about to fall back. Ibbotson and Patel (2002) researched performance persistence in funds adjusted for their style, though the study only included funds with varying equity profiles. Mixed, balanced, bond, international and sector funds were excluded. An investigation of performance persistence among funds with very narrow investment profiles would be a possible objective of future research. Rationally, it is when boundaries and terms for investments are the most narrow that managerial skill plays the largest role. And is that not what research of performance persistence is all about? Finding out whether the ability of beating the market exists?

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