Universidade do Minho
Escola de Economia e Gestão

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The Performance of German Equity Mutual Funds

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A special thanks to my family for always believing that I could achieve my goals. Thank you for your dedication and unconditional support.

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Resumo

Este estudo avalia o desempenho de fundos de investimento alemães que investem no mercado doméstico, Europeu e global, usando modelos não condicionais e condicionais de avaliação de desempenho. A amostra inclui 159 fundos alemães no período de Janeiro de 2010 a Dezembro de 2018.

Os resultados sugerem que os gestores de fundos domésticos têm um desempenho neutro, ao passo que os gestores de fundos internacionais têm um desempenho negativo. Estes resultados são consistentes com a existência de efeito distância, uma vez que os gestores de fundos que investem localmente têm um desempenho melhor do que aqueles que investem em mercados mais longínquos.

No geral, os resultados confirmam que modelos multi-fatores, com a inclusão de fatores de risco adicionais, são superiores aos modelos de um fator na explicação das rendibilidades dos fundos de investimento. Além disso, observa-se que o uso do modelo condicional completo com alfas e betas variáveis no tempo aumenta o poder explicativo dos modelos.

Palavras-chave: Avaliação de Desempenho, Fundos de Investimento Alemães, Modelo Condicional, Modelos Multi-fatores.

Abstract

This study evaluates the performance of German mutual funds that invest in the domestic, European and global market, using unconditional and conditional models of performance evaluation. The dataset includes 159 German funds over the period of January 2010 to December 2018.

The results suggest that mutual fund managers investing domestically have a neutral performance, whereas those investing internationally show negative performance. These results are consistent with the existence of a distance effect, since fund managers who invest locally perform better than those who invest in foreign markets.

Overall, the results confirm that multi-factor models, with the inclusion of additional risk factors, are better than single models in explaining mutual fund returns. In addition, the use of the full conditional model with time-varying alphas and betas increases the explanatory power of the models.

Keywords: Performance Evaluation, German Mutual Funds, Conditional Model, Multi-Factor Models.

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1. Introduction

1.1. Objectives and Motivation of this Research

The growth and wide popularity of mutual funds worldwide is in large part due to the fact that this type of investment provides diversification and professional management services to investors. In fact, the main functions of mutual funds can be explained by the economies of scale that allows them not only to provide "liquid access to a diversified basket of securities" but also to collect and process "information at a cost lower than that of individual investors" (Lückoff, 2011, p. 18).

While the mutual fund industry in the United States (U.S.) is still the largest one in the world, the European market has become the second biggest one. In 2017, assets managed in Europe reached a record value of €25.2 trillion. However, according to EFAMA (2018), the pool of assets remains associated just to a small number of countries. At the end of 2016, the United Kingdom (UK) was the largest asset management market in Europe (35.4%), followed by France (17.4%) and Germany (9.2%) (EFAMA, 2018). The Netherlands and Italy complete the five most important European mutual fund countries (Otten and Bams, 2002).

But, even so, the European market remains underexplored, since the literature on mutual fund performance mostly focuses on the U.S. fund industry. This is because U.S. funds are older, more developed and much larger than in the rest of the world (Ferreira et al., 2013). It is argued that countries with a strong regulatory framework may benefit from a more developed mutual fund industry, because they act to protect fund investors. As the mutual fund industry in the U.S. is characterized largely by regulation, it tends to have a larger fund industry (Khorana et al., 2005). However, due to the smaller importance of mutual funds in the European equity market over the American market, "mutual funds might be in a better position to follow or even beat the market" (Otten and Bams, 2002, p. 99).

The main purpose of this dissertation is to evaluate the performance of equity mutual funds in a highly developed market, although somewhat overlooked in the literature, namely the Germany case. As Germany is the biggest economy in the European Union (EU) measured by gross domestic product (Eurostat, 2018), it has also one of the biggest markets for mutual funds. At the end of 2018, mutual funds domiciled in Germany held €2,037,195 million in assets, which equalled 13.4% of the assets held by European funds (EFAMA, 2019).

The objective of this study is to focus on German funds that invest not only in their local market (domestic funds) but also globally or outside of their local market (international funds) and analyze whether these funds underperform or outperform the market. The dataset consists of 159 equity mutual funds over the period of January 2010 to December 2018.

This study is organized into 6 chapters, the first of which refers not only to the introduction of the research and its objectives but also provides an overview of the context and evolution of mutual funds, describing their history and growth, with a particular focus on the German market. The second chapter presents and discusses the literature on the topic. In the third chapter, the methodology used in the performance evaluation is presented, while in the fourth, a description of the data used for this dissertation is provided. Next, the results of the empirical analysis are analyzed and discussed. Finally, the last section summarizes the main conclusions of the study, as well as its limitations and suggestions for future research.

1.2. Context and Evolution of Mutual Funds

This section is divided into three subsections. The history and the growth of the mutual fund industry are discussed in subsections 1.2.1. and 1.2.2, respectively. Subsequently, subsection 1.2.3. addresses the evolution of the mutual fund industry in the German market.

1.2.1. Brief History of Mutual Funds

Most academics, including Rouwenhorst (2004), mention that the first mutual fund was created in the Netherlands. In 1774, a Dutch merchant and broker, Abraham van Ketwich, launched an investment trust after the financial crisis of 1772 to 1773. It was called *Eendragt Maakt Magt* ("unity creates strength") and its goal was to provide diversification for small investors. Influenced by the success of the first closed-end fund, van Ketwich introduced his second mutual fund in 1779, the *Concordia Res Parvae Crescunt* ("small matters grow by consent"). In 1893, the fund was officially liquidated.

The growth of mutual funds industry quickly spread across the Europe. During the 19th century, the innovative investment instrument appeared in the UK. More specifically, in 1868, the first investment trust outside of the Netherlands, *Foreign and Colonial Government Trust*, was established in London to ensure potential investors. Today, this investment fund is still traded on the London Stock Exchange. Afterwards, in 1873, the *Scottish American Investment Trust* was launched by Robert Fleming at Dundee (Hutson, 2005).

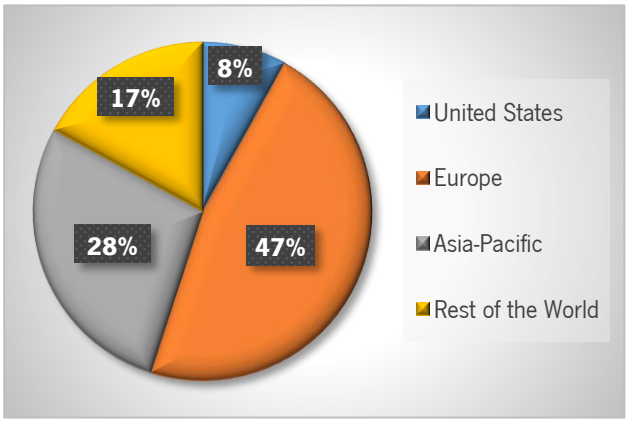
During the 1890s, investment trusts were introduced in U.S. In 1893, the *Boston Personal Property Trust* was the first closed-end fund in the country. The most of the early U.S. investment trusts funds were closed-end funds, issuing a limited number of shares. However, in 1924, the *Massachusetts Investors ´ Trust* became the first open-end fund. This fund went public in 1928 and appeared in Boston (Business World, 2017).

The rules of investing in mutual funds changed significantly after the crash of the stock market in 1929. The creation of the U.S. Securities and Exchange Commission (SEC), the approval of the Securities Act of 1933 and the enactment of the Securities Exchange Act of 1934 set up precautions to protect investors. The SEC also helped to create the Companies Act 1940, in order to require companies to file their financial information and afford disclosure to investors in the form of a prospectus.

1.2.2. The Growth of Mutual Funds

According to the Investment Company Institute (2019), the number of global open-end funds delimited for sale ascended to 118,978 in 2018, increasing significantly from 2017 (113,646) and exponentially since 2009 (82,991). However, the number of funds in the U.S. is very low compared with Europe (Figure 1). A possible explanation can be the fact that a U.S. investor can only buy funds registered in SEC, being thus regulated by U.S. securities law.

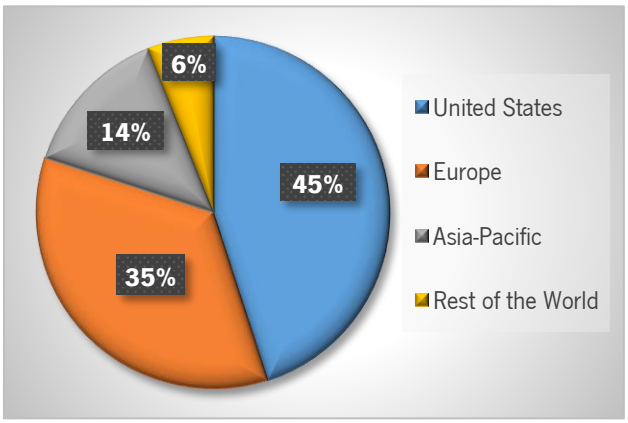
Figure 1 - Number of Worldwide Regulated Open-End Fund



Source: **Investment Company Institute (2019)**

Although the origin of mutual funds has been in Europe, it grew quickly in the U.S. (Figure 2). In 2018, the U.S. remained as the world´s largest regulated fund market, representing almost half (45%) of the total worldwide mutual fund assets (US$46.7 trillion), with US$21.1 trillion, whereas Europe has a little more than one third (35%), with US$16.5 trillion.

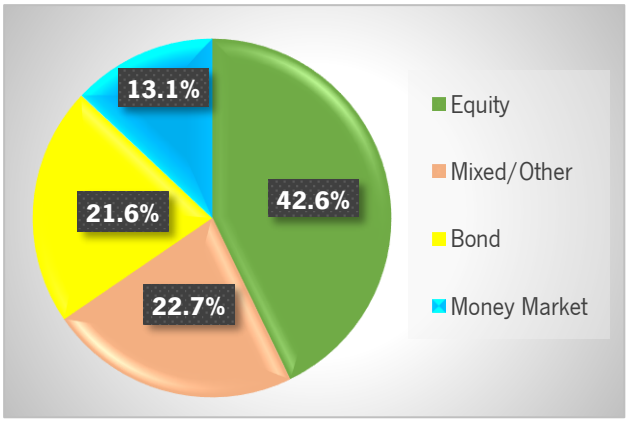
Figure 2 - Total Net Assets of Worldwide Regulated Open-End Fund



Source: **Investment Company Institute (2019)**

In relation to the type of funds (Figure 3), the equity funds were the biggest category (42.6%), with US$19.9 trillion of the total net assets, followed by mixed/others funds (22.7%) that include balanced/mixed funds, guaranteed/protected funds and real estate funds. Next follow bond mutual funds (21.6%), also known as debt funds, and money market funds (13.1%).

Figure 3 – Worldwide Total Net Assets by Type of Fund



Source: **Investment Company Institute (2019)**

1.2.3. The German Mutual Fund Market

In an attempt to establish a mutual fund market in Germany, the first investment fund company was launched in 1923. During a period of high instability between the First and Second World War, the *Zickert´sche Kapitalverein* ("Zickert´s Capital Association") was started by Hermann Zickert in the state of Brandenburg. In 1926, the second German fund management company, the *Bayerische Investment AG*, was created in Munich as a joint-stock corporation. However, both funds were liquidated in 1931 and 1932, respectively (Ber et al., 2007).

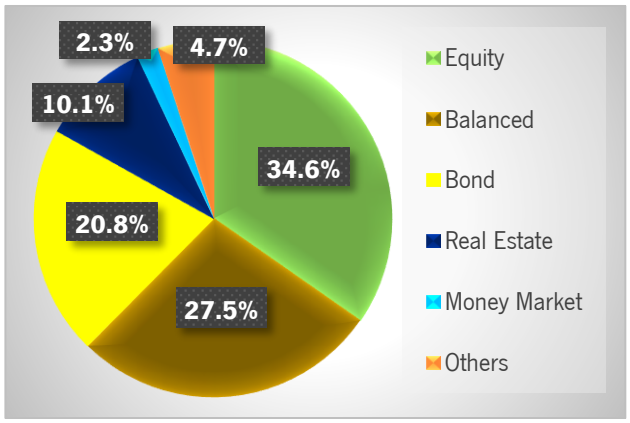
The main reasons for the unsuccessful attempts to establish investment fund companies in the longer term were the losses suffered in the Great Depression and the high level of interest rates on the German capital market. In spite of tax privileges introduced by the *German Reich*, common name for the German nation state, for capital management companies to protect the economy, the peak of the Great Depression did not stimulate new attempts to start funds (Müller, 2016).

Only in 1949, the first post-war investment fund company was launched by four banks in Munich. The *Allgemeine Deutsche Investment-Gesellschaft mbH* (ADIG) started the first two equity funds, FONDRA and FONDAK, which still exist today. In 1957, the investment fund companies were regulated in law by the Investment Company Act, *Gesetz über Kapitalanlagegesellschaften* (KAGG). This measure was extremely important in order to set up a large number of investment companies (Ber et al., 2007 and Müller, 2016).

In the beginning, the industry was dominated essentially by domestic equity funds. In 1959, the first real estate mutual fund, *Immobilien-Sondervermögen*, was created. Bond funds were also introduced in the 1960s. By the end of this decade, a high number of international equity funds tried to reach the German market. However, these funds investing internationally were unsuccessful to generate inflows, because the industry was dominated by equity funds investing domestically. In 1994, pure money market funds were officially allowed in order to attract large investments (Ber et al., 2007).

Nowadays, assets under management (AuM) in the German fund industry represent a total of €974 billion. This result show a slight decrease compared to the homologous period of 2017 (€1,022 billion) (BVI, 2019). Figure 4 shows that equity funds continued to be the largest volume of open-end mutual funds, with €337 billion (34.6%), while balanced funds represented almost a third (27.5%) of all assets managed. Bond funds also reached a considerable market share (20.8%), whereas real estate funds constituted about 10% of the market. Ultimately, money market funds and other funds, together, accounted for only 7%.

Figure 4 - Assets Managed by Type of Fund in the German Market



Source: BVI (2019)

2. Literature Review

The global mutual fund market has grown considerably in recent decades, motivating academic interest on its performance. Several studies have been conducted in an attempt to evaluate how mutual funds perform and whether equity mutual funds are able to earn positive risk-adjusted returns. Most studies, such as Jensen (1968), Malkiel (1995), Gruber (1996) and Fama and French (2010), among others, show that mutual funds, on average, underperform the market, although a few others, like those of Daniel et al. (1997) and Kacperczyk et al. (2005), find that mutual funds outperform their benchmarks and, whence, yield average abnormal returns.

The Capital Asset Pricing Model (CAPM) builds on modern portfolio theory (MPT) developed by Markowitz (1952). According to MPT, an investor can construct "mean-variance efficient" portfolios that will maximize the returns for a given level of risk. Consequently, the CAPM, introduced by Sharpe (1964) and Lintner (1965), explains the risk-return trade-off standing in the market, where risk is measured by the covariance between the return on these assets with the return on the market portfolio. Motivated by the CAPM, Treynor (1965), Sharpe (1966) and Jensen (1968) developed the risk-adjusted performance measures known as traditional measures of performance evaluation. In other words, they have used single factor models to conclude that funds managers are not able to beat the market.

The use of CAPM is debatable (Rossi, 2016). At the theoretical level, there have been strong objections to performance measures based on the CAPM. For example, Admati and Ross (1985) showed that the traditional risk-return measures are not useful and, hence, they classified the security market line (SML) analysis as "inappropriate", because the SML does not consider the conditional expectation of manager´s return on those of the benchmark. At the empirical level, academics have documented the existence of additional factors, namely the "size effect" (e.g., Banz, 1981) and the book-to-market ratio (e.g., Fama and French, 1992), which are relevant for asset pricing. Nevertheless, authors like Black et al. (1972) and Laubscher (2002) find support for CAPM.

The emergence of the arbitrage pricing theory (APT) of Ross (1976) motivated the development of multi-factor pricing models. The main advantage of APT over CAPM is that it allows for multiple risk factors. Moreover, it does not require the identification of the market portfolio (Lee and Lee, 2006). However, APT fails to identify the relevant variables in the risk-return relationship.

In this context, Fama and French (1993) proposed the three-factor model that includes not only the market but also the size factor - Small Minus Big (SMB) and the value factor - High Minus Low (HML). This model considers that value and small stocks tend to outperform growth and large stocks, respectively. Later, Carhart (1997) added a new factor known as Momentum (MOM) to account for the fact that portfolios of past winners tend to outperform in the subsequent period. Recently, Fama and French (2015) improved the previous three-factor model by adding two additional factors, such as the profitability (RMW) and the investment (CMA), and Fama and French (2018) extend it to a six-factor model by adding the momentum factor.

In spite of the lack of consensus about the number and the identity of the factors, empirical evidence on mutual fund performance supports the use of multi-factor models over single-factor models (e.g., Huij and Verbeek, 2009). However, either models of performance evaluation are unconditional in the sense that they assume that expected returns and risk are constant over time.

But, indeed, both expected returns and risk are time-varying. In the conditional performance evaluation, they vary over time with the state of the economy, as measured by predetermined public information variables (Ferson and Qian, 2004). Ferson and Schadt (1996), one of the first studies on conditional performance evaluation, find that lagged information variables are statistically and economically significant in the analysis of investment performance (Lee and Lee, 2006).

Nonetheless, the more complete version of the conditional model, authored by Christopherson et al. (1998), considers that not only risk (beta) is time-varying and dependent upon market conditions but also fund performance (alpha) might behave in a similar way. In this regard, the performance measures that result are the conditional alphas, which tend to assess performance better than traditional performance measures (Ferson and Qian, 2004). Besides, more recent studies support this approach by considering lagged factor loading instruments as a tools for estimating conditional models (Cederburg et al., 2018).

Despite the considerable growth of the German mutual fund industry during the last decade (BVI, 2018), there are few studies on the performance of German mutual funds. Otten and Bams (2002) investigate European mutual fund performance using the unconditional and conditional Carhart (1997) four-factor model. They find predominantly negative alphas in their dataset of funds that includes 57 German funds. In turn, Bessler et al. (2009) evaluate the performance of German equity mutual funds using the unconditional and conditional CAPM, the Fama and French (1993) three-factor model and the stochastic discount factor (SDF) model. They find an underperformance of 50 surviving funds.

Other studies express the dichotomy between active and passive funds. Stotz (2007) uses Jensen´s (1968) alpha and the Carhart (1997) four-factor model to evaluate 141 German equity funds (129 active funds and 12 index funds) since December 1989 to August 2005. The results show that actively managed equity funds, on average, underperform the benchmark. Fahling et al. (2019) apply the Fama and French (1993) three-factor model to evaluate 194 active funds over 10 years. They document that the mean return of all active funds underperform the market, as active funds did not provide statistically significant alphas. However, through risk-adjusted returns, the results indicate that active funds perform slightly better compared to the market.

Finally, Cuthbertson and Nitzsche (2013) proposed the false discovery rate (FDR) and the Fama and French (1993) three-factor model to assess the performance of 555 German equity funds investing both domestically and internationally over the period of January 1990 to December 2009. They find that the majority of German funds have a zero-alpha performance, in other words, the funds neither beat nor are inferior to their benchmarks.

This study investigates the performance of domestic and international German funds using unconditional and conditional measures of performance evaluation. Fund performance is evaluated at the individual and aggregate level in order to assess whether the results are consistent with the studies previously mentioned.

3. Methodology

This section presents the unconditional and conditional models used to evaluate performance. As mentioned before, unconditional models have shortcomings and, whence, they may lead to biased estimates of performance (Leite et al., 2009). Thus, the conditional model will be also used. Firstly, Jensen´s alpha (1968), the Carhart (1997) four-factor model and the six-factor model (Fama and French, 2018) are implemented in their unconditional form. Secondly, the conditional model of Christopherson et al. (1998) is employed to estimate time-varying betas and alphas for the Carhart (1997) four-factor model.

3.1. Unconditional Models

Jensen´s (1968) alpha is one of the most used methods by academics to measure the portfolio performance. This measure is the intercept (α_p) of the following regression based on CAPM:

$$r_{p,t} = \alpha_p + \beta_p r_{m,t} + \varepsilon_{p,t} \quad (1)$$

where $r_{p,t}$ represents the excess return of fund p over the period t, β_p is the systematic risk of the fund p, $r_{m,t}$ represents the excess return of the market over the period t and $\varepsilon_{p,t}$ is the error term. A significantly positive alpha indicates a superior performance, whereas a statistically significant negative alpha shows an inferior performance of the fund manager relative to the market.

The alpha can be generalized to a multi-factor model, namely to the model of Carhart (1997), as follows:

$$r_{p,t} = \alpha_p + \beta_p r_{m,t} + \beta_{SMB}(SMB_t) + \beta_{HML}(HML_t) + \beta_{MOM}(MOM_t) + \varepsilon_{p,t} \quad (2)$$

where SMB_t (Small Minus Big) is the difference in returns between a portfolio of small stocks and a portfolio of large stocks, HML_t (High Minus Low) is the difference in returns between a portfolio of high book-to-market stocks and a portfolio of low book-to-market stocks, MOM_t (Momentum) is the difference in returns between a portfolio of past 1-year winners and a portfolio of past 1-year losers and the β_p, $\beta_{SMB,}$ β_{HML} and β_{MOM} are the factor coefficients (betas on each of the factors).

The Carhart (1997) four-factor model, based on the Fama and French (1993) three-factor model, is an important tool to perform the regression analysis in the evaluation of mutual funds, which includes the momentum effect as the fourth factor (Bodie et al., 2014, pp. 432-433).

More recently, Fama and French have developed their original three-factor model into a five-factor model by adding new additional risk factors, as the profitability and investment. However, the Fama and French (2015) five-factor model remains unable to explain the momentum effect, widely accepted by many authors (e.g., Blitz et al., 2018).

Hence, I decided to implement a six factor-model (Fama and French, 2018), adding the momentum factor ignored by the previous model. This model is expressed by the following equation:

$$r_{p,t} = \alpha_p + \beta_p r_{m,t} + \beta_{SMB}(SMB_t) + \beta_{HML}(HML_t) + \beta_{RMW}(RMW_t) + \beta_{CMA}(CMA_t) + \beta_{MOM}(MOM_t) + \varepsilon_{p,t} \quad (3)$$

where RMW_t (profitability factor) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability, CMA_t (investment factor) is the difference between the returns on diversified portfolios of the stocks of low and high investment firms (conservative and aggressive), and the β_{RMW} and β_{CMA} are the factor coefficients (betas on each of the factors).

3.2. Conditional Models

Based on Ferson and Schadt (1996), Christopherson et al. (1998) defined conditional betas and alphas as linear functions of a vector of predetermined information variables, Z_{t-1}, that represents the public information available at time $t\text{-}1$ for predicting the returns at time t.

Thus, the conditional single-factor version of Jensen´s (1968) measure with time-varying alphas and betas, developed by Christopherson et al. (1998), is given by:

$$r_{p,t} = \alpha_{0p} + A'_p z_{t-1} + \beta_{0p} r_{m,t} + \beta'_p (z_{t\text{-}1} * r_{m,t}) + \varepsilon_{p,t} \quad (4)$$

where α_{0p} is an average alpha, A'_p is a vector that measures the response of the conditional alpha to the information variables, $z_{t-1} = Z_{t-1} - (Z)$ is a vector of deviations of Z_{t-1} from the (unconditional) average values, β_{0p} is an average beta and the β'_p is the vector that measures the response of the conditional beta of portfolio p to the public information variables (PIV).

To measure the state of the economy, Ferson and Schadt (1996) and Christopherson et al. (1998) use five public information variables, namely: the short-term interest rate (STR), which is viewed as "predictors of inflation " (Fama, 1975); the term spread (TS), which is a measure of the slope of the term structure of interest rates, related to short term economic cycles (Fama and French, 1989); the default spread (DS), which is the difference between the yields of high risk bonds and low risk bonds; the dividend yield (DY) of a market index, that moves in a similar way to the default spread with long term economic conditions (Fama and French, 1989); and the dummy variable (D) for the month of January, to control for securities presenting higher returns in that month (Keim and Stambaugh, 1986). Note that the January dummy still aims to capture the seasonality in returns and risk.

In this dissertation, three public information variables will be used: the short-term rate, the term spread, and the dividend yield, as in Bessler et al. (2009) and Leite and Cortez (2009), among others.

The Carhart (1997) four-factor model is one of the models that better explains the performance evaluation, because it considers not only the market risk but also others factors, as the momentum effect. According to Bessler and Kurmann (2012), this model "controls for the most important stock return patterns in empirical finance", which reinforces the use of four-factor model in their conditional form.

Therefore, the conditional Carhart (1997) four-factor model with time-varying alphas and betas and the three public information variables mentioned previously is estimated based on the following regression:

$$
\begin{aligned}
r_{p,t} = {} & \alpha_p + \alpha_{\mathrm{STR}}(\mathrm{STR}_{t-1}) + \alpha_{TS}(TS_{t-1}) + \alpha_{DY}(DY_{t-1}) + \beta_p \mathrm{MKT_t} + \\
& \beta_{\mathrm{STR*MKT}}(\mathrm{STR}_{t-1} * \mathrm{MKT_t}) + \beta_{TS*\mathrm{MKT}}(TS_{t-1} * \mathrm{MKT_t}) + \beta_{DY*\mathrm{MKT}}(DY_{t-1} * \mathrm{MKT_t}) + \\
& \beta_{SMB}(SMB_t) + \beta_{\mathrm{STR}*SMB}(\mathrm{STR}_{t-1} * SMB_t) + \beta_{TS*SMB}(TS_{t-1} * SMB_t) + \\
& \beta_{DY*SMB}(DY_{t-1} * SMB_t) + \beta_{HML}(HML_t) + \beta_{\mathrm{STR}*HML}(\mathrm{STR}_{t-1} * HML_t) + \\
& \beta_{TS*HML}(TS_{t-1} * HML_t) + \beta_{DY*HML}(DY_{t-1} * HML_t) + \beta_{MOM}(MOM_t) + \\
& \beta_{\mathrm{STR}*MOM}(\mathrm{STR}_{t-1} * MOM_t) + \beta_{TS*MOM}(TS_{t-1} * MOM_t) + \\
& \beta_{DY*MOM}(DY_{t-1} * MOM_t) + \varepsilon_{p,t}
\end{aligned}
\tag{5}
$$

where STR_{t-1}, TS_{t-1} and DY_{t-1} represents the public information variables: short-term interest rate, term spread and dividend yield, respectively.

4. Data

4.1. Dataset

This dissertation aims to investigate the performance of German mutual funds. The first step in choosing the dataset was to obtain a list with the identification of German investment funds from DataStream. Currently, the German market has 2477 funds. They are divided by category, as presented in table I.

Table I - German Funds by category (in 22/10/2019)

Category	Number of funds
1. Mixed Assets	1106
2. Equity	756
3. Bond	399
4. Real Estate	82
5. Alternative	78
6. Money Market	25
7. Commodity	24
8. Others	7
Total	**2477**

This table presents the number of German funds by category.

Considering the relevance of equity mutual funds in financial markets, this category was chosen for the research. The period of the analysis is from January 2010 to December 2018, incorporating funds with at least 9 years of existence. This restriction has been incorporated since it is accepted in the literature that age of the fund is one of the important determinants of performance. Thus, the dataset was reduced to 295 funds. The dataset is thus not free of survivorship bias, a problem that may lead to overstatement of performance (Elton et al., 1996).

The Thomson Reuters DataStream provides information on a fund´s country of domicile and geographic focus. Through the Lipper Global Classification provided by DataStream (Table II), it was possibly to classify funds in terms of their geographic investment style: domestic funds, which are funds that invest in their domicile country (Equity Germany) and international funds, which are either funds that invest in Europe (Equity Europe) or funds that invest globally (Equity Global). All the categories mentioned before include not only large cap but also small and mid-cap funds.

Table II - Category of German Equity Funds by their geographic investment style

Category	Number of funds
Equity Global	114
Equity Europe	55
Equity Germany	37
Total	**206**

This table presents the number of German equity funds by their geographic investment style.

In addition to DataStream, the Financial Times (FT) markets data[1] is used. This source provides important data to classify the funds, such as Morningstar category, total net assets and ISIN code. However, both sources have the limitations of not being able to ensure that the fund has this rating over time.

So, funds where the ISIN code is not available in FT markets data and funds with ambiguous criteria, that is, funds where it is difficult to understand whether they belong exclusively to the German, European and Global markets will not be included. In case of funds with different share classes, only the oldest one was selected or the fund with higher total net assets. Note that index funds and exchange traded funds were also excluded.

Therefore, the study includes a final dataset of 159 equity mutual funds, classified as follows: 32 Equity Germany, 46 Equity Europe and 81 Equity Global. Appendices 1, 2 and 3 present the list of equity mutual funds with geographical focus in Germany, Europe and Global markets, respectively.

[1] https://markets.ft.com/data

The return for each fund collected from DataStream is given by the Total Return Index, which assumes that all cash distributions, such as dividends, are reinvested. To assess the performance of equity funds, the monthly returns are calculated in a discrete way and equally weighted portfolios are constructed.

Table III presents some summary statistics for the equally weighted portfolios of funds. The mean of the monthly returns for all portfolios is positive and very close to zero. In order to address the normality of the distribution, the skewness and kurtosis were considered. On the one hand, regarding the symmetry of the distributions, all portfolios have negative skewness, which indicates that the tail is on the left side of the distribution. On the other hand, regarding to the peak of the distribution, the portfolios have a positive excess kurtosis, which indicates a leptokurtic distribution. In the Jarque-Bera test, the results reject the null hypothesis that the portfolios are normally distributed. The evidence of non-normality returns for all portfolios supports the use of conditional models in performance evaluation (Adcock et al., 2012).

Table III - Summary Statistics on the Returns of the Equally Weighted Portfolios of Funds

	Germany	Europe	Global
Mean	0.66%	0.48%	0.56%
Std. Deviation	4.66%	3.43%	3.13%
Minimum	-18.51%	-11.63%	-9.62%
Maximum	12.05%	8.17%	9.58%
Skewness	-0.4888	-0.5083	-0.5789
Kurtosis	4.8238	3.8318	4.3789
Jarque-Bera (JB)	19.2678	7.7650	14.5873
p-value (JB)	0.0001	0.0206	0.0007
Obs.	108	108	108

This table presents some descriptive statistics for monthly returns, expressed in percentage, of the equally weighted portfolios of domestic, European and global funds computed for the period of January 2010 to December 2018. P-value (JB) is the probability that the Jarque-Bera statistic exceeds, in absolute value, the observed value under the null hypothesis of a normal distribution.

4.2. Benchmark Indices and Risk Factors

The selection of the appropriate benchmark is important for inferences about performance. It is well documented that performance evaluation is sensitive to the choice of benchmark, so the use of a variety of benchmark indices can vary the inferences about mutual fund performance (Grinblatt and Titman, 1994). In this sense, three indices were chosen, according to each geographic focus of investment: MSCI World (EUR), MSCI Europe (EUR) and MSCI Germany (EUR). The monthly returns of the indices were collected from DataStream. The Morgan Stanley Capital International (MSCI) is a common and widely used benchmark. This reason can be explained by the fact that MSCI World and MSCI Europe represent 23 and 15 Developed Markets (DM), respectively. Also, the MSCI Germany covers about 85% of the German equity universe.

In relation to the risk factors, Small Minus Big (SMB), High Minus Low (HML), Momentum (MOM), Robust Minus Weak (RMW) and Conservative Minus Aggressive (CMA) factors, they were obtained from Kenneth French´s website[2]. Regarding the funds investing in German and European markets, I use the European factors, while for the Global market I adopt the Developed factors provided in the website. The risk-free rate is proxied by the 1-month Euribor obtained from the European Central Bank[3].

Table IV presents some summary statistics for the market indices used as benchmarks. The distributions are negatively skewed and the investment returns are considered to be risky, because a large kurtosis is associated with a high level of risk. The Jarque-Bera test continues to reject the null hypothesis of normal distribution, except for the European benchmark.

[2] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[3] https://sdw.ecb.europa.eu/

Table IV - Summary Statistics on the Returns of the Benchmarks of Funds

	MSCI Germany	MSCI Europe	MSCI World
Mean	0.66%	0.58%	0.91%
Std. Deviation	4.67%	3.47%	3.01%
Minimum	-18.85%	-10.30%	-8.42%
Maximum	11.79%	8.30%	9.10%
Skewness	-0.4712	-0.3617	-0.5271
Kurtosis	4.8695	3.2819	3.9436
Jarque-Bera (JB)	19.7234	2.7130	9.0082
p-value (JB)	0.0001	0.2576	0.0111
Obs.	108	108	108

This table presents some descriptive statistics for monthly returns, expressed in percentage, computed for the period of January 2010 to December 2018, for the three indices used: MSCI Germany (EUR), MSCI Europe (EUR) and MSCI World (EUR). P-value (JB) is the probability that the Jarque-Bera statistic exceeds, in absolute value, the observed value under the null hypothesis of a normal distribution.

4.3. Predetermined Information Variables

Three public information variables are used in the conditional model: the short-term rate, the term spread, and the dividend yield (as in Bessler et al., 2009 and Leite and Cortez, 2009). Furthermore, these variables will refer to the European market, considering that the adoption of the Euro as currency increased the degree of integration in European stock markets (Hardouvelis et al., 2006).

The yield on a 3-month Euro interest rate is used as proxy for the short-term rate. The term spread corresponds to the difference between the Euro 10-year government bond yield and the 3-month Euro government benchmark. Lastly, the dividend yield is based on the FTSE Euro 100 Index. This data were obtained from DataStream.

To alleviate the problem of spurious regressions, I perform the stochastic detrending of the information variables, as suggested by Ferson et al. (2003a). This procedure consists in subtracting a 12-month moving average. Furthermore, to avoid possible scale effects, these variables are used in their mean zero values (Bernhardt and Jung, 1979). Also note that they are used lagged 1-month.

According to Ferson et al. (2003b), there is a spurious regression bias if the expected return is persistent, which leads to highly autocorrelated lagged variables. Appendix 4 shows the descriptive statistics and autocorrelations for the public information variables (Table A), as well as their correlation matrix (Table B). In table A, the results suggest low first-order autocorrelation coefficients for all series, varying from 77% to 82%. This leads to a levels of persistence in which the spurious regression is not a problem. In table B, none of the correlation coefficients are high, indicating a weak relationship between them.

5. Empirical Results

This section of the dissertation presents the results of the regressions and the discussion of the performance estimates obtained through the application of the unconditional and conditional models.

In the implementation of these linear regression models, the presence of autocorrelation and heteroscedasticity will be tested, using the Breusch (1978) and Godfrey (1978) test and the White (1980) test, respectively. On the one hand, the Huber-White standard errors approach will be used to correct the presence of heteroscedasticity. On the other hand, in the presence of autocorrelation or both of these phenomena, the standard errors will be adjusted according to the method of Newey and West (1987).

In this study, the number of lags suggested by Newey and West (1994) will be used by the expression:

$L = 4 \times \left(\frac{T}{100}\right)^{2/9}$, where T is the number of observations.

5.1. Performance of the Unconditional Models

This dissertation starts by estimating Jensen´s (1968) measure, which considers only the market risk factor as an independent variable.

As can be observed in table V, while the portfolio´s alpha of the domestic funds is positive, the alpha of the European funds is negative. However, none of the portfolios presents statistically significant alphas. In terms of the individual funds, there are 7 negative and statistically significant alphas in domestic funds and 14 in European funds. Moreover, 3 alphas are positive and statistically significant at the 5% level in both portfolios. This means that, in general, the performance of the majority of funds is neutral. In contrast, global funds present a negative and statistically significant alphas at the 1% level. This evidence suggests an underperformance in relation to the market. At the individual fund level, 55 of the 78 funds exhibit negative and statistically significant alphas.

Regarding systematic risk, the portfolio of global funds has a higher beta than the portfolio of the domestic and European funds. With respect to the explanatory capacity of the model, the adjusted coefficients of determination are relatively high for all portfolios, which reveals that these indices do a satisfactory job in explaining fund returns.

Table V - Empirical results of the unconditional Jensen (1968) one-factor model

Panel A: Domestic Equity Funds			
Portfolio	α_p	β_p	Adj. R^2
Equally Weighted	0.0002 (0.001)	0.9755*** (0.019)	95.82%
N+	11 [3]	32 [32]	-
N-	21 [7]	0 [0]	-
Panel B: European Equity Funds			
Portfolio	α_p	β_p	Adj. R^2
Equally Weighted	-0.0008 (0.001)	0.9635*** (0.030)	95.01%
N+	13 [3]	46 [46]	-
N-	33 [14]	0 [0]	-
Panel C: Global Equity Funds			
Portfolio	α_p	β_p	Adj. R^2
Equally Weighted	-0.0034*** (0.001)	0.9938*** (0.029)	91.42%
N+	3 [0]	81 [81]	-
N-	78 [55]	0 [0]	-

This table presents estimates of performance and risk for the three equally weighted portfolios of the German mutual funds, using the unconditional Jensen (1968) one-factor model of equation (1). Panel A, B and C reports the results for the domestic, European and global equity funds, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. Standard errors are reported in parentheses. N+ and N- indicate the number of individual funds presenting positive and negative estimates, respectively. In brackets, the number of funds whose estimates are statistically significant at the 5% level are reported.

As the results of this model only control for one risk factor, the next step is to estimate the performance based on multi-factor models. Table VI show the results of the Carhart (1997) model, which include more three risk factors as independent variables: Small Minus Big (SMB), High Minus Low (HML) and Momentum (MOM).

In relation to performance, global funds continue to perform negatively and German domestic funds performance remains neutral, as the portfolio´s alpha is not statistically significant. Individually, the tendency of the alphas is the same as in the previous model. The main difference is in Panel B, because the portfolio of European funds now shows a negative and statistically significant alpha at the 1% level. Out of 42 funds, 19 show negative and statistically significant alphas at the 5% level.

The market risk coefficients and the adjusted coefficients of determination increase compared to the one-factor model. In this multi-factor model, the risk for the investor is higher using European and global funds than domestic funds.

With respect to the additional risk factors, the results show that German mutual funds are more exposed to the size factor. The positive and statistically significant betas for all portfolios indicate a clear tendency of German funds to be oriented towards small cap stocks. Regarding the HML factor, German funds are more exposed to growth stocks, because the coefficients associated to this factor are negative for all indices and statistically significant in case of the domestic and European funds. Finally, the betas of the momentum factor are not statistically significant for any of the fund portfolios.

Table VI - Empirical results of the unconditional Carhart (1997) four-factor model

Panel A: Domestic Equity Funds						
Portfolio	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
Equally W.	-0.0004	1.0065***	0.2265***	-0.1363***	-0.0173	96.78%
	(0.001)	(0.016)	(0.036)	(0.032)	(0.034)	
N+	7 [2]	32 [32]	30 [26]	1 [0]	11 [1]	-
N-	25 [6]	0 [0]	2 [0]	31 [21]	21 [0]	-
Panel B: European Equity Funds						
Portfolio	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
Equally W.	-0.0016***	1.0231***	0.2184***	-0.1575***	0.0009	96.87%
	(0.000)	(0.024)	(0.037)	(0.029)	(0.027)	
N+	4 [0]	46 [46]	45 [31]	5 [2]	23 [5]	-
N-	42 [19]	0 [0]	1 [1]	41 [28]	23 [1]	-
Panel C: Global Equity Funds						
Portfolio	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
Equally W.	-0.0032***	1.0199***	0.2200***	-0.0388	-0.0396	93.81%
	(0.001)	(0.029)	(0.046)	(0.035)	(0.033)	
N+	0 [0]	81 [81]	74 [47]	32 [9]	24 [7]	-
N-	81 [57]	0 [0]	7 [1]	49 [24]	57 [12]	-

This table presents estimates of performance and risk for the three equally weighted portfolios of the German mutual funds, using the unconditional Carhart (1997) four-factor model of equation (2). Panel A, B and C reports the results for the domestic, European and global equity funds, respectively. Additionally, SMB, HML and MOM represent the coefficients of the size, book-to-market and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. Standard errors are reported in parentheses. N+ and N- indicate the number of individual funds presenting positive and negative estimates, respectively. In brackets, the number of funds whose estimates are statistically significant at the 5% level are reported.

The results of the six-factor model (Fama and French, 2018), that adds the momentum factor to the Fama and French (2015) five-factor model, are presented in table VII.

The results are consistent with those obtained with the Carhart (1997) four-factor model and show not only a neutral performance for domestic funds but also a significant underperformance of European and global funds. Therefore, this evidence is consistent with the existence of a distance effect. According to this argument, mutual fund managers that invest locally tend to perform better than those that invest in the European and global markets, because they know better their own markets than an outside manager (e.g., Romacho and Cortez, 2006; Leite et al., 2009).

In terms of market exposures, German mutual funds are more sensitive to the European and global markets, since both present betas higher than 1. The size factor exhibits, once again, positive and statistically significant coefficients, in line with the four-factor model. The coefficient for the book-to-market factor is only significant for the European funds, indicating that these funds are more exposed to growth stocks.

Regarding the additional risk factors, the profitability factor presents negative and statistically significant values for domestic and European funds, meaning that these portfolios are more exposed to stocks with weak profitability. The investment factor already shows negative and statistically significant betas for all markets, indicating that German mutual funds are more exposed to conservative firms.

Note that the MOM factor shows positive and statistically significant betas for the domestic and European funds at the 10% and 1% level, respectively. Thus, the funds in these portfolios are more exposed to stocks with good past performance. Concerning to the adjusted coefficient of determination, there is a slight increase in the explanatory power of the model compared to the previous Carhart (1997) four-factor model. In this sense, the explanatory power of the six-factor model (Fama and French, 2018) is the highest among the other unconditional models.

Table VII - Empirical results of the unconditional Fama and French (2018) six-factor model

Panel A: Domestic Equity Funds								
Portfolio	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
Equally W.	-0.0008	0.9957***	0.2954***	-0.0304	-0.1156***	-0.2031***	0.0619*	97.19%
	(0.001)	(0.014)	(0.035)	(0.042)	(0.036)	(0.065)	(0.036)	
N+	7 [0]	32 [32]	30 [28]	14 [0]	2 [0]	3 [0]	26 [5]	-
N-	25 [9]	0 [0]	2 [0]	18 [0]	30 [7]	29 [11]	6 [0]	-
Panel B: European Equity Funds								
Portfolio	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
Equally W.	-0.0020***	1.0190***	0.2912***	-0.0885***	-0.1350***	-0.1422**	0.0743***	97.57%
	(0.000)	(0.019)	(0.033)	(0.032)	(0.028)	(0.045)	(0.024)	
N+	3 [0]	46 [46]	45 [32]	13 [1]	6 [0]	6 [1]	38 [16]	-
N-	43 [24]	0 [0]	1 [1]	33 [12]	40 [18]	40 [11]	8 [1]	-
Panel C: Global Equity Funds								
Portfolio	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
Equally W.	-0.0033***	1.0198***	0.2307***	0.0451	0.0736	-0.1751**	-0.0290	93.85%
	(0.001)	(0.030)	(0.048)	(0.060)	(0.053)	(0.074)	(0.038)	
N+	0 [0]	81 [81]	71 [47]	44 [11]	65 [10]	6 [1]	23 [5]	-
N-	81 [60]	0 [0]	10 [2]	37 [4]	16 [0]	75 [16]	58 [9]	-

This table presents estimates of performance and risk for the three equally weighted portfolios of the German mutual funds, using the unconditional six-factor model (Fama and French, 2018) of equation (3). Panel A, B and C reports the results for the domestic, European and global equity funds, respectively. Additionally, SMB, HML, RMW, CMA and MOM represent the coefficients of the size, book-to-market, profitability, investment and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. Standard errors are reported in parentheses. N+ and N- indicate the number of individual funds presenting positive and negative estimates, respectively. In brackets, the number of funds whose estimates are statistically significant at the 5% level are reported.

5.2. Performance of the Conditional Models

The fact that the previous models neglect the variability of risk over time may cause biases in the performance estimates. In order to overcome this limitation, the performance of the funds will be evaluated using the conditional approach, which will allow to capture the effect of variation in risk and returns over time.

In the mutual fund performance, the Carhart (1997) four-factor model has been widely applied. For example, Fletcher (2014) finds that the conditional Carhart (1997) model is the most reliable to explain expected returns in evaluating UK fund performance. So, the conditional version of this model will be used to test the performance of German mutual funds.

The results of the conditional model are presented in table VIII. The adjusted coefficients of determination are not much different from those obtained with the unconditional four-factor model, although there is a slight increase in domestic and European portfolios. This means that the incorporation of the information variables has a positive impact in the explanatory power of the conditional model.

The performance of funds investing in Europe and globally remains negative and statistically significant, while the portfolio of domestic fund continues neutral. At the individual fund level, there are less European and global funds that exhibit negative and statistically significant alphas at the 5% level. These results reinforce the existence of a distance effect previously documented.

Consistent with Christopherson et al. (1998), the conditional alphas did not improve significantly compared to the unconditional ones. Nevertheless, these findings are in contrast with the most empirical studies. On the one hand, Ferson and Schadt (1996) and Leite et al. (2009) show a tendency for better performance when lagged information variables are incorporated in performance estimates. On the other hand, Bessler et al. (2009) and Leite and Cortez (2009) reveal that their inclusion decrease the alphas in a conditional approach.

For all fund categories, the levels of systematic risk remain statistically significant at the 1% level, but decrease compared to the unconditional four-factor model. Even so, the investor in the German mutual funds is more exposed to the risk of the benchmark of European funds than to domestic and global funds.

The conditional betas of the size and book-to-market factors are, once again, similar to those provided by the unconditional four-factor model. The SMB factor presents positive and statistically significant coefficients for both portfolios. In the HML factor, the coefficients are negative, being statistically significant for domestic and European markets. The main difference is related to the momentum factor, as the momentum coefficient of the European portfolio is statistically significant, although only at the 10% level.

Regarding the public information variables, the dividend yield seems the one that better explains stock returns. In fact, it is the only public information variable that presents statistically significant coefficients associated to time-varying alphas for the European portfolio at the 1% level. We also observe some statistical significant coefficients of the public information variables associated to the risk factors.

The Wald test was also performed in order to test if the coefficients are jointly equal to zero. The null hypothesis that the conditional alphas are equal to zero cannot be rejected, except for the portfolio of European market. This means that there is no evidence of time-varying alphas for the domestic and global portfolios. However, there is evidence of time-varying betas and of time varying alphas and betas for the domestic and European portfolios. In the global market, the null hypothesis of the conditional betas and of the conditional alphas and betas being jointly equal to zero cannot be rejected at the 5% level, but can be the 10% level. Overall, the evidence shown by the Wald test support the use of conditional models in performance evaluation.

Table VIII - Empirical results of the full conditional Carhart (1997) four-factor model

	Panel A: Domestic Equity Funds			**Panel B: European Equity Funds**			**Panel C: Global Equity Funds**		
Portfolio	Equally W.	N+	N-	Equally W.	N+	N-	Equally W.	N+	N-
α_p	-0.00002	9 [1]	23 [4]	-0.0016***	9 [0]	37 [17]	-0.0026***	3 [0]	78 [41]
α_{STR}	-0.0035	7 [0]	25 [0]	-0.0031	19 [0]	27 [2]	-0.0026	32 [1]	49 [2]
α_{TS}	0.0016	22 [0]	10 [0]	-0.0006	18 [0]	28 [3]	-0.0048	20 [0]	61 [11]
α_{DY}	-0.0033	7 [0]	25 [4]	-0.0047***	5 [0]	41 [15]	-0.0057	7 [0]	74 [17]
β_p	0.9685***	32 [32]	0 [0]	0.9711***	46 [46]	0 [0]	0.9628***	81 [81]	0 [0]
$\beta_{\text{STR*MKT}}$	-0.0345	16 [2]	16 [3]	-0.0556	15 [0]	31 [1]	0.0199	43 [2]	38 [1]
$\beta_{\text{TS*MKT}}$	-0.1396	6 [0]	26 [3]	-0.1057	13 [1]	33 [5]	0.0957	53 [13]	28 [4]
$\beta_{\text{DY*MKT}}$	0.0760*	25 [6]	7 [0]	0.2070***	40 [20]	6 [1]	0.2348**	73 [33]	8 [1]
β_{SMB}	0.1878***	30 [20]	2 [0]	0.1688***	39 [21]	7 [1]	0.1949***	72 [35]	9 [0]
$\beta_{\text{STR*}SMB}$	0.6960**	25 [10]	7 [1]	0.2162	31 [5]	15 [1]	0.4095*	65 [21]	16 [1]
$\beta_{\text{TS*}SMB}$	-0.1985	8 [1]	24 [0]	-0.0331	22 [2]	24 [2]	-0.0638	35 [0]	46 [0]
$\beta_{\text{DY*}SMB}$	0.1807*	24 [8]	8 [0]	0.1831**	41 [14]	5 [1]	0.2037*	60 [22]	21 [1]
β_{HML}	-0.1241***	1 [0]	31 [19]	-0.1435***	5 [1]	41 [27]	-0.0398	28 [9]	53 [23]
$\beta_{\text{STR*}HML}$	-0.2024	8 [1]	24 [2]	-0.0262	26 [0]	20 [1]	-0.0724	32 [4]	49 [3]
$\beta_{\text{TS*}HML}$	0.1222	24 [0]	8 [4]	0.0923	28 [6]	18 [3]	0.0457	43 [1]	38 [1]
$\beta_{\text{DY*}HML}$	0.0364	20 [0]	12 [2]	-0.0801	15 [0]	31 [7]	0.0182	39 [8]	42 [8]
β_{MOM}	0.0129	20 [4]	12 [3]	0.0409*	31 [13]	15 [0]	-0.0243	34 [6]	47 [6]
$\beta_{\text{STR*}MOM}$	-0.3607**	3 [1]	29 [7]	-0.1131	16 [2]	30 [4]	-0.1809	23 [0]	58 [3]
$\beta_{\text{TS*}MOM}$	0.0396	21 [0]	11 [0]	-0.0189	24 [1]	22 [1]	0.1425	64 [3]	17 [0]
$\beta_{\text{DY*}MOM}$	-0.3744**	3 [1]	29 [16]	-0.2672**	10 [0]	36 [17]	-0.2362*	11 [0]	70 [18]
W_1	0.2411			0.0040			0.2009		
W_2	0.0002			0.0000			0.0909		
W_3	0.0003			0.0000			0.0518		
Adj. R^2	97.00%	-	-	97.38%	-	-	93.80%	-	-

This table presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for the three equally weighted portfolios of the German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel A, B and C reports the results for the domestic, European and global equity funds, respectively. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. Standard errors are reported in parentheses. N+ and N- indicate the number of individual funds presenting positive and negative estimates, respectively. In brackets, the number of funds whose estimates are statistically significant at the 5% level are reported. W1, W2 and W3 are the chi-square statistical probability values of the Newey and West (1987) Wald test for the null hypothesis that the coefficients of the conditional alphas, the conditional betas and the conditional alphas and betas are jointly equal to zero, respectively.

6. Conclusions

This dissertation focuses on the performance of German mutual funds, which is one of the most representative mutual fund market in Europe. The purpose is to evaluate fund performance at the aggregate and individual fund level using unconditional and conditional models of performance evaluation. The dataset includes 32 domestic equity funds, 46 European equity funds and 81 global equity funds from January 2010 to December 2018.

In relation to the models used, my results support that the multi-factor models increase the explanatory power of the models compared to the single-factor model. Furthermore, the use of a conditional model that allows for time-varying alphas and betas also increases the explanatory power of the model, but it has no impact in the performance estimates.

Overall, German funds that invest domestically show a neutral performance. However, German funds investing internationally tend to underperform the market. These results are consistent with the existence of a distance effect and support the argument that the local managers perform better than the international managers, as shown by Romacho and Cortez (2006) and Leite et al. (2009).

In relation to the additional risk factors, German funds are more exposed to small caps and growth stocks. Another conclusion is that German funds do not seem to have a significantly exposure to the momentum effect. Furthermore, these funds are more exposed to companies with weak profitability and more conservative firms.

The results of the performance evaluation models used suggest that German mutual fund managers are not able to beat the market, which is consistent with the few performance evaluation studies conducted on the German market and with the general empirical literature on mutual fund performance.

As the main limitation of this study, I consider the non-inclusion of funds that ceased to exist. The dataset is not free of survivorship bias. Another limitation is associated to the sources used in this research, forcing us to assume that the classification of the funds does not change over time.

As for future research, it would be interesting to include inactive funds in the dataset, to analyze the timing abilities of German fund managers and also to extend this type of analysis to other countries besides Germany.

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Appendices

Appendix 1 - List of Equity Mutual Funds with Geographical Focus in Germany

Nos.	Funds Name	Morningstar Category	Launch Date	ISIN
D1	AL Trust Aktien Deutschland	Germany Large-Cap Equity	01 Jun 1987	DE0008471608
D2	Allianz Adifonds A EUR	Germany Large-Cap Equity	15 Oct 1958	DE0008471038
D3	Allianz Nebenwerte Deutschland A EUR	Germany Small/Mid-Cap Equity	16 Sep 1996	DE0008481763
D4	Allianz Thesaurus AT EUR	Germany Large-Cap Equity	08 Nov 1958	DE0008475013
D5	Allianz Vermögensbildung Deutschland A EUR	Germany Large-Cap Equity	01 Jul 1970	DE0008475062
D6	Amundi German Equity A ND	Germany Large-Cap Equity	01 Oct 1990	DE0009752303
D7	Concentra A EUR	Germany Large-Cap Equity	26 Mar 1956	DE0008475005
D8	Deka-Deutschland Aktien Strategie	Germany Large-Cap Equity	12 Nov 1990	DE0008479288
D9	DekaFonds CF	Germany Large-Cap Equity	26 Nov 1956	DE0008474503
D10	DWS Aktien Strategie Deutschland LC	Germany Large-Cap Equity	01 Feb 1999	DE0009769869
D11	DWS Deutschland LC	Germany Large-Cap Equity	20 Oct 1993	DE0008490962
D12	DWS German Equities Typ O	Germany Large-Cap Equity	12 Dec 1994	DE0008474289
D13	DWS German Small/Mid Cap LD	Germany Small/Mid-Cap Equity	17 Oct 2005	DE0005152409
D14	DWS Investa LD	Germany Large-Cap Equity	17 Dec 1956	DE0008474008
D15	Fondak A EUR	Germany Large-Cap Equity	30 Oct 1950	DE0008471012
D16	Frankfurter-Sparinvest Deka	Germany Large-Cap Equity	02 Oct 1989	DE0008480732
D17	FVB-Deutscher Aktienfonds	Germany Large-Cap Equity	16 Feb 1998	DE0009766865
D18	G&W-HDAX-Trendfonds	Germany Large-Cap Equity	16 Sep 1997	DE0009765446
D19	HANSAsecur	Germany Large-Cap Equity	02 Jan 1970	DE0008479023
D20	HSBC German Equity	Germany Large-Cap Equity	11 Jul 1989	DE0008489808
D21	LBBW Aktien Deutschland	Germany Large-Cap Equity	06 Oct 1992	DE0008484650
D22	LBBW Exportstrategie Deutschland	Germany Large-Cap Equity	16 Jun 1997	DE0009771964
D23	MEAG ProInvest	Germany Large-Cap Equity	04 Oct 1990	DE0009754119
D24	Metzler Aktien Deutschland AR	Germany Large-Cap Equity	02 Jan 1992	DE0009752238
D25	Monega Germany	Germany Large-Cap Equity	09 Apr 2001	DE0005321038
D26	ODDO BHF Frankfurt-Effekten-Fonds DR-EUR	Germany Large-Cap Equity	27 May 1974	DE0008478058
D27	SEB Aktienfonds	Germany Large-Cap Equity	15 Aug 1988	DE0008473471
D28	UBS (D) Aktienfonds-Special I Deutschland	Germany Large-Cap Equity	01 Oct 1973	DE0008488206
D29	UBS (D) Equity Fund – Smaller German Companies	Germany Small/Mid-Cap Equity	01 Mar 1993	DE0009751651
D30	UniDeutschland	Germany Large-Cap Equity	01 Feb 1994	DE0009750117
D31	UniDeutschland XS	Germany Small/Mid-Cap Equity	04 Oct 2006	DE0009750497
D32	UniFonds	Germany Large-Cap Equity	12 Apr 1956	DE0008491002

This table reports the name of the German domestic funds provided by Thomson Reuters DataStream and, consequently, their Morningstar category, the launch date and the ISIN code provided by Financial Times markets data.

Appendix 2 - List of Equity Mutual Funds with Geographical Focus in Europe

Nos.	Funds Name	Morningstar Category	Launch Date	ISIN
E1	Allianz Aktien Europa A EUR	Europe Large-Cap Blend Equity	01 Sep 1997	DE0008471483
E2	Allianz EuropaVision A EUR	Europe Large-Cap Blend Equity	27 Jan 1997	DE0009769679
E3	Allianz Vermögensbildung Europa A EUR	Europe Large-Cap Value Equity	13 Jan 1997	DE0008481813
E4	Allianz Wachstum Europa A EUR	Europe Large-Cap Growth Equity	13 Jan 1997	DE0008481821
E5	AriDeka CF	Europe Large-Cap Blend Equity	05 Feb 1962	DE0008474511
E6	AXA Europa	Europe Large-Cap Value Equity	14 Jan 1998	DE0009775643
E7	Börsebius TopSelect	Europe ex-UK Large-Cap Equity	22 Dec 2005	DE000A0HF4N6
E8	Degussa-Aktien-Universal-Fonds	Europe Large-Cap Blend Equity	06 Sep 2000	DE0005316988
E9	Deka Europa Aktien Strategie	Europe Large-Cap Value Equity	31 Oct 1989	DE0008479247
E10	Deka-EuropaPotential TF	Europe Flex-Cap Equity	15 Sep 1999	DE0009786285
E11	Deka-EuropaSelect CF	Europe Large-Cap Growth Equity	31 Mar 1998	DE0009786186
E12	Deutsche Postbank Europafonds Aktien	Europe Large-Cap Blend Equity	18 Dec 1998	DE0009797720
E13	DWS Europe Dynamic	Europe Large-Cap Blend Equity	30 May 2005	DE0005152375
E14	DWS European Opportunities LD	Europe Mid-Cap Equity	11 Jul 1985	DE0008474156
E15	DWS Eurovesta	Europe Large-Cap Blend Equity	07 Nov 1988	DE0008490848
E16	DWS Qi European Equity SC	Europe Large-Cap Blend Equity	21 Apr 2008	DE000A0M6W69
E17	DWS Qi LowVol Europe NC	Europe Large-Cap Blend Equity	12 Dec 1994	DE0008490822
E18	DWS Top Europe LD	Europe Large-Cap Blend Equity	11 Oct 1995	DE0009769729
E19	First Private Europa Aktien ULM A	Europe Large-Cap Value Equity	26 Jan 1999	DE0009795831
E20	HANSAeuropa Class A	Europe Large-Cap Value Equity	02 Jan 1992	DE0008479155
E21	HP&P Euro Select UI Fonds A	EUR Aggressive Allocation	01 Sep 1999	DE0009790766
E22	Industria A EUR	Europe Large-Cap Blend Equity	19 Jan 1959	DE0008475021
E23	Invesco Europa Core Aktienfonds	Other Equity	25 Jan 1991	DE0008470337

This table reports the name of the German funds investing in Europe provided by Thomson Reuters DataStream and, consequently, their Morningstar category, the launch date and the ISIN code provided by Financial Times markets data.

Appendix 2 - List of Equity Mutual Funds with Geographical Focus in Europe (Continued)

E24	Lazard European MicroCap	Europe Small-Cap Equity	01 Jun 2006	DE000A0H1FW8
E25	LBBW Aktien Europa	Europe Large-Cap Blend Equity	21 Jul 1997	DE0009780221
E26	LEA-Fonds DWS	Europe Large-Cap Blend Equity	01 Oct 1999	DE0009769992
E27	LIGA-Pax-Aktien-Union	Europe Large-Cap Blend Equity	05 May 1997	DE0009750216
E28	LINGOHR-EUROPA-SYSTEMATIC-INVEST	Europe Flex-Cap Equity	01 Oct 2003	DE0005320097
E29	MEAG EuroInvest A	Europe Large-Cap Blend Equity	30 Mar 1998	DE0009754333
E30	Mesina-Aktienfonds-UBS (D)	Europe Large-Cap Blend Equity	23 Oct 2002	DE0009797118
E31	Metzler Aktien Europa AR	Europe Large-Cap Blend Equity	02 Jan 1992	DE0009752220
E32	Monega FairInvest Aktien R	Europe Large-Cap Blend Equity	19 Oct 2006	DE0007560849
E33	ODDO BHF Algo Ethical Leaders CRW-EUR	Europe Large-Cap Blend Equity	27 Aug 2002	DE0007045437
E34	ODDO BHF Algo Europe CRW-EUR	Europe Large-Cap Blend Equity	29 Jul 1992	DE0008478181
E35	Postbank Europa P	Europe Large-Cap Blend Equity	04 Jan 1999	DE0009770289
E36	SEB Europafonds	Europe Large-Cap Blend Equity	02 Oct 1989	DE0008474388
E37	Siemens Euroinvest Aktien	Europe Large-Cap Value Equity	01 Jun 1999	DE0009772582
E38	TBF EUROPEAN OPPORTUNITIES EUR R	Europe Flex-Cap Equity	31 Jan 1998	DE0009781989
E39	UBS (D) Konzeptfonds Europe Plus	EUR Aggressive Allocation	03 Jul 2000	DE0005320329
E40	UniEuropa -net-	Europe Large-Cap Blend Equity	01 Jul 1997	DE0009750232
E41	UniInstitutional European MinRisk Equities	Europe Large-Cap Blend Equity	31 Mar 1998	DE0009750554
E42	Universal-Shareconcept BC I	Europe ex-UK Small/Mid-Cap Equity	01 May 2004	DE000A0BLTJ4
E43	VB Kassel Göttingen Union Select	Europe Large-Cap Blend Equity	27 Nov 2000	DE0005314496
E44	Ve-RI Equities Europe R	Europe Large-Cap Blend Equity	04 Nov 1991	DE0009763201
E45	VPV-Spezial Amundi - A (D)	Europe Large-Cap Blend Equity	15 Jan 1996	DE0008480468
E46	W&W Quality Select Aktien Europa	Europe Large-Cap Blend Equity	18 Jul 2000	DE0009780569

This table reports the name of the German funds investing in Europe provided by Thomson Reuters DataStream and, consequently, their Morningstar category, the launch date and the ISIN code provided by Financial Times markets data.

Appendix 3 - List of Equity Mutual Funds with Geographical Focus in Global

Nos.	Funds Name	Morningstar Category	Launch Date	ISIN
G1	Acatis Aktien Global Fonds A	Global Large-Cap Value Equity	21 May 1997	DE0009781740
G2	ACCELLERATE V Acc	EUR Flexible Allocation - Global	18 Oct 2007	DE000A0DPZE9
G3	Advisor Global	Global Large-Cap Blend Equity	01 Mar 2002	DE0005547160
G4	AHF Global Select	Global Large-Cap Blend Equity	20 Mar 2008	DE000A0NEBC7
G5	Aktien Opportunity UI T	EUR Aggressive Allocation - Global	08 Jul 2008	DE000A0Q2SK3
G6	AL Trust Chance	Global Large-Cap Blend Equity	05 Sep 2006	DE000A0H0PH0
G7	AL Trust Global Invest	Global Large-Cap Growth Equity	16 Sep 1996	DE0008471715
G8	Allianz Interglobal A EUR	Global Large-Cap Growth Equity	15 Feb 1971	DE0008475070
G9	Allianz Strategiefonds Wachstum Plus A EUR	Global Large-Cap Value Equity	02 Dec 2002	DE0009797274
G10	ALL-IN-ONE	Global Large-Cap Blend Equity	01 Aug 2002	DE0009789727
G11	Ampega Global Aktienfonds	Global Large-Cap Blend Equity	21 Jan 2000	DE0009847301
G12	Amundi Top World	Global Large-Cap Value Equity	16 Jun 1997	DE0009779736
G13	AXA Welt	Global Large-Cap Value Equity	27 Jan 1989	DE0008471376
G14	CONVEST 21 VL A (EUR)	Global Large-Cap Value Equity	15 Feb 1996	DE0009769638
G15	Deka Aktienfonds RheinEdition Global	Global Large-Cap Value Equity	01 Oct 1997	DE0009786129
G16	Deka Globale Aktien Strategie	Global Large-Cap Blend Equity	01 Nov 1999	DE0009799064
G17	Deka-bAV Fonds	Global Large-Cap Blend Equity	01 Dec 1998	DE0009786228
G18	Deka-BR 100	Global Large-Cap Blend Equity	01 Jul 2002	DE0005424519
G19	Deka-Digitale Kommunikation TF	Sector Equity Communications	19 Nov 1996	DE0009771923
G20	Deka-GlobalChampions CF	Global Large-Cap Blend Equity	27 Dec 2006	DE000DK0ECU8
G21	Deka-MegaTrends CF	Global Large-Cap Growth Equity	21 May 2001	DE0005152706
G22	DekaSpezial CF	Global Large-Cap Blend Equity	24 Jul 1978	DE0008474669
G23	Deka-UmweltInvest CF	Sector Equity Ecology	27 Dec 2006	DE000DK0ECS2
G24	Deutsche Postbank Global Player	Global Large-Cap Blend Equity	17 Mar 2000	DE0009797753
G25	DWS Akkumula LC	Global Large-Cap Blend Equity	03 Jul 1961	DE0008474024
G26	DWS Concept DJE Globale Aktien	EUR Aggressive Allocation - Global	03 Jul 1995	DE0009777003
G27	DWS Global Growth LD	Global Large-Cap Growth Equity	14 Nov 2005	DE0005152441
G28	DWS Global Small/Mid Cap	Global Flex-Cap Equity	01 Dec 1970	DE0008476508
G29	DWS SDG Global Equities LD	Global Large-Cap Blend Equity	27 Feb 2006	DE0005152466
G30	DWS Telemedia Typ O ND	Sector Equity Communications	04 Jul 1994	DE0008474214
G31	DWS Top World	Global Large-Cap Blend Equity	17 Jan 1997	DE0009769794
G32	DWS Vermögensbildungsfonds I LD	Global Large-Cap Blend Equity	01 Dec 1970	DE0008476524
G33	E.ON Aktienfonds DWS	Global Large-Cap Blend Equity	30 Jun 2000	DE0009848036
G34	Earth Exploration Fund UI EUR R	Sector Equity Natural Resources	09 Oct 2006	DE000A0J3UF6
G35	Fiag Universal Dachfonds	Global Large-Cap Blend Equity	29 Dec 1999	DE0009848424
G36	First Private Aktien Global A	Global Flex-Cap Equity	01 Dec 2006	DE000A0KFRT0
G37	FIVV-MIC-Mandat-Offensiv	Global Large-Cap Blend Equity	04 Oct 2000	DE0009790865
G38	Fondis A EUR	Global Large-Cap Value Equity	26 Jan 1955	DE0008471020
G39	Fondspicker Global UI	EUR Flexible Allocation - Global	22 Aug 2007	DE000A0MRAC3
G40	Fürst Fugger Privatbank Wachstum	EUR Flexible Allocation - Global	26 Jul 2002	DE0009799452

This table reports the name of the German global funds provided by Thomson Reuters DataStream and, consequently, their Morningstar category, the launch date and the ISIN code provided by Financial Times markets data.

Appendix 3 - List of Equity Mutual Funds with Geographical Focus in Global (Continued)

G41	Gottlieb Daimler Aktienfonds DWS	Global Large-Cap Growth Equity	20 May 1999	DE0009769901
G42	HI Topselect D	Global Large-Cap Blend Equity	17 May 2001	DE0009817726
G43	HI-Aktien Spezial 3-Fonds	Global Large-Cap Blend Equity	16 Feb 2007	DE000A0MKLM4
G44	HI-FBG Individual W-PT	EUR Flexible Allocation - Global	01 Apr 2008	DE000A0M58D7
G45	IAC-Aktien Global P	EUR Aggressive Allocation - Global	15 Feb 2008	DE000A0M2JB5
G46	Inovesta Classic	Global Large-Cap Blend Equity	26 May 2000	DE0005117493
G47	inprimo AktienSpezial	Global Large-Cap Blend Equity	01 Oct 1997	DE0009781906
G48	KCD-Union Nachhaltig AKTIEN MinRisk	Global Large-Cap Blend Equity	01 Mar 2001	DE0005326532
G49	Keppler Lingohr Global Equity MC	Global Large-Cap Value Equity	02 May 2006	DE000A0JDCH4
G50	Keppler-Global Value-INVEST	Global Large-Cap Value Equity	02 Jul 2007	DE000A0JKNP9
G51	LBBW Rohstoffe & Ressourcen	Sector Equity Natural Resources	21 Feb 2005	DE0005326482
G52	LINGOHR-SYSTEMATIC-INVEST	Global Large-Cap Value Equity	01 Oct 1996	DE0009774794
G53	Löwen-Aktienfonds	Global Large-Cap Blend Equity	02 Jan 1997	DE0009769802
G54	MEAG GlobalChance DF	Global Large-Cap Blend Equity	02 Oct 2000	DE0009782789
G55	MEAG Nachhaltigkeit A	Global Large-Cap Value Equity	01 Oct 2003	DE0001619997
G56	Metzler Wachstum International	Global Large-Cap Growth Equity	02 Jan 1992	DE0009752253
G57	Monega Innovation R	Global Flex-Cap Equity	02 Apr 2001	DE0005321020
G58	morgen Aktien Global UI	Global Flex-Cap Equity	02 Jan 1992	DE0008490723
G59	MPF Global Fonds-Warburg	Global Large-Cap Blend Equity	08 Oct 2001	DE0005153860
G60	MuP Vermögensverwaltung Horizont 10	EUR Flexible Allocation - Global	29 Feb 2008	DE000A0M2H70
G61	Naspa-Aktienfonds Global CF	Global Large-Cap Blend Equity	02 Jan 1997	DE0009771956
G62	ODDO BHF Algo Global CRW-EUR	Global Large-Cap Blend Equity	02 Jan 1998	DE0009772988
G63	RIV Aktieninvest Global	Global Flex-Cap Equity	28 Dec 2009	DE000A0YFQ76
G64	RWS-Dynamik A	Global Large-Cap Blend Equity	15 Aug 2000	DE0009763334
G65	SI BestSelect	EUR Flexible Allocation - Global	14 Dec 2007	DE000A0MP268
G66	Siemens Global Growth	Global Flex-Cap Equity	15 Sep 2000	DE0009772657
G67	Siemens Weltinvest Aktien	Global Large-Cap Value Equity	01 Apr 2000	DE0009772624
G68	TBF GLOBAL VALUE EUR R	Global Large-Cap Blend Equity	03 Mar 1997	DE0009781633
G69	terrAssisi Aktien I AMI P (a)	Global Large-Cap Blend Equity	20 Oct 2000	DE0009847343
G70	UBS (D) Equity Fund – Global Opportunity	Global Large-Cap Blend Equity	01 Oct 1973	DE0008488214
G71	UBS (D) Konzeptfonds I	Global Large-Cap Blend Equity	03 Jan 2000	DE0009785162
G72	Uni21.Jahrhundert -net-	Global Large-Cap Blend Equity	01 Sep 1999	DE0009757872
G73	UniFavorit: Aktien	Global Large-Cap Growth Equity	01 Nov 2005	DE0008477076
G74	UniGlobal	Global Large-Cap Blend Equity	02 Jan 1960	DE0008491051
G75	UniNachhaltig Aktien Global	Global Large-Cap Blend Equity	01 Oct 2009	DE000A0M80G4
G76	UniSelection: Global I	Global Large-Cap Blend Equity	01 May 2001	DE0005326789
G77	UniStrategie: Offensiv	EUR Aggressive Allocation - Global	02 Oct 2000	DE0005314447
G78	W&W Dachfonds GlobalPlus	Global Large-Cap Blend Equity	02 May 2002	DE0005326334
G79	W&W Quality Select Aktien Welt	Global Large-Cap Blend Equity	19 Dec 2001	DE0005326326
G80	Weberbank Premium 100	Other	18 Sep 2000	DE0005319826
G81	WM Aktien Global UI-Fonds B	Global Flex-Cap Equity	03 Dec 1999	DE0009790758

This table reports the name of the German global funds provided by Thomson Reuters DataStream and, consequently, their Morningstar category, the launch date and the ISIN code provided by Financial Times markets data.

Appendix 4 - Summary statistics for the information variables (with stochastic detrending)

Table A – Descriptive Statistics and Autocorrelations

	STR	TS	DY
Mean	0.0000	0.0000	0.0000
Std. Dev.	0.1749	0.2722	0.3893
Min.	-0.5601	-0.7011	-1.4012
Max.	0.5399	0.5546	1.3530
Skewness	0.1516	-0.2187	0.2418
Kurtosis	4.2766	2.3892	5.0411
ρ_1	0.7895	0.7726	0.8192
ρ_3	0.5199	0.4249	0.5392
ρ_6	0.0311	-0.0939	0.1953
ρ_{12}	-0.2823	-0.0137	-0.1340

Table B – Correlation Matrix

	STR	TS	DY
STR	1.0000		
TS	0.0825	1.0000	
DY	-0.2712	-0.3565	1.0000

This appendix presents some summary statistics for the lagged information variables for the period of January 2010 to December 2018: short-term interest rate (STR), term spread (TS) and the dividend yield (DY). These variables are stochastically detrended by subtracting a moving average over a period of 12 months. Table A presents various statistics for these variables. Table B presents the correlation matrix among the instruments. Both tables are related to the European funds.

Appendix 5 - Performance estimates using the unconditional Jensen (1968) one-factor model in Germany (individual results)

Panel A: Domestic Equity Funds							
Fund	α_p	β_p	Adj. R^2	Fund	α_p	β_p	Adj. R^2
D1	-0.0016**	1.0324	92.59%	D17	-0.0016***	0.9147	97.28%
D2	-0.00003	0.9473	90.01%	D18	-0.0024	0.7055	75.98%
D3	0.0042**	0.8339	76.22%	D19	-0.0019*	1.0291	89.18%
D4	-0.0001	0.9715	90.40%	D20	-0.0005	0.9955	99.15%
D5	0.0001	0.9986	91.74%	D21	-0.0020***	0.9907	98.84%
D6	-0.0006	0.9779	94.31%	D22	-0.0003	0.9850	86.76%
D7	0.0008	0.9758	89.49%	D23	0.0002	1.0633	89.03%
D8	0.000004	0.9939	92.35%	D24	-0.0006	0.9579	95.77%
D9	-0.0008	1.0214	93.01%	D25	-0.0013**	1.0280	93.03%
D10	0.0028*	1.0925	90.43%	D26	-0.0019**	1.0221	92.18%
D11	0.0012	1.1174	93.57%	D27	-0.00005	0.9872	96.21%
D12	0.0001	1.1426	93.17%	D28	-0.0005	0.9724	98.43%
D13	0.0053**	0.8586	75.53%	D29	0.0043	0.6959	56.49%
D14	-0.0007	1.1437	94.83%	D30	-0.0008**	0.9903	99.33%
D15	-0.0002	0.9849	90.73%	D31	0.0059**	0.7449	60.63%
D16	-0.0004	1.0088	93.32%	D32	-0.0017***	1.0318	98.95%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Jensen (1968) one-factor model of equation (1). Panel A reports the results for the domestic equity funds. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 6 - Performance estimates using the unconditional Jensen (1968) one-factor model in Europe (individual results)

Panel B: European Equity Funds							
Fund	α_p	β_p	Adj. R^2	Fund	α_p	β_p	Adj. R^2
E1	-0.0019*	1.0300	84.62%	E24	0.0064**	0.7511	47.58%
E2	-0.0026***	0.8491	81.06%	E25	-0.0027***	0.9979	96.36%
E3	-0.0007	1.0255	86.36%	E26	-0.0030**	1.0562	88.31%
E4	0.0019	0.9697	78.23%	E27	-0.0013*	0.9523	94.43%
E5	-0.0020***	1.0306	91.92%	E28	-0.0016	1.1551	82.51%
E6	-0.0021**	1.0489	90.05%	E29	-0.0010	1.1326	84.46%
E7	-0.0014	1.0493	77.60%	E30	-0.0012	0.9803	93.89%
E8	-0.0022***	0.9870	96.42%	E31	-0.0013**	0.9473	96.20%
E9	-0.0015**	1.0391	92.06%	E32	-0.0015*	1.0057	85.89%
E10	0.0015	0.9196	70.52%	E33	0.0009	0.9331	90.89%
E11	0.0009	0.9677	82.30%	E34	0.0001	1.0020	86.51%
E12	0.0003	0.8560	80.16%	E35	-0.0031**	1.1534	85.88%
E13	-0.0008	1.0974	82.90%	E36	-0.0007	0.9549	96.10%
E14	0.0021	1.0197	74.64%	E37	-0.0033***	1.0787	90.65%
E15	-0.0023*	1.0858	88.76%	E38	-0.0010	0.9467	73.37%
E16	0.0014	0.8962	83.33%	E39	-0.0015**	0.9650	92.37%
E17	0.0001	0.9257	80.95%	E40	-0.0011	1.0324	92.95%
E18	-0.0005	1.0227	84.71%	E41	0.0025**	0.7334	84.98%
E19	-0.0010	1.0435	89.72%	E42	0.0010	0.6642	58.01%
E20	-0.0029**	1.1171	83.22%	E43	-0.0011	0.7575	79.86%
E21	-0.0021**	0.7179	80.71%	E44	-0.0022	0.7947	63.16%
E22	-0.0026**	0.8813	83.89%	E45	-0.0015*	0.9724	88.75%
E23	0.0031**	0.7647	81.22%	E46	-0.0017*	1.0103	93.22%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Jensen (1968) one-factor model of equation (1). Panel B reports the results for the European equity funds. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at 1% level.

Appendix 7 - Performance estimates using the unconditional Jensen (1968) one-factor model in Global (individual results)

Panel C: Global Equity Funds											
Fund	α_p	β_p	Adj. R^2	Fund	α_p	β_p	Adj. R^2	Fund	α_p	β_p	Adj. R^2
G1	-0.0031**	0.9885	85.11%	G28	-0.0059***	1.0829	76.27%	G55	-0.0043**	1.1130	76.49%
G2	-0.0011	0.2311	51.05%	G29	-0.0066***	1.1088	76.03%	G56	-0.0036***	1.0982	92.14%
G3	-0.0028***	1.0164	82.65%	G30	-0.0002	0.8385	69.00%	G57	-0.0036	1.1084	59.61%
G4	-0.0052***	0.9726	77.43%	G31	-0.0028***	1.0371	88.69%	G58	-0.0053*	0.9377	49.31%
G5	-0.0054***	1.0244	74.48%	G32	-0.0039***	1.1032	89.21%	G59	-0.0027***	0.8161	80.41%
G6	-0.0044***	0.9791	79.75%	G33	-0.0034**	0.9478	77.45%	G60	-0.0045**	0.8403	67.29%
G7	-0.0030***	1.0608	83.48%	G34	-0.0134	1.0486	13.04%	G61	-0.0020*	1.0670	89.56%
G8	-0.0018*	1.1171	87.37%	G35	-0.0047***	0.8151	87.46%	G62	-0.0017	1.0054	84.32%
G9	-0.0022***	1.0899	90.43%	G36	-0.0020	0.9980	83.19%	G63	-0.0018	0.7401	65.60%
G10	-0.0046***	0.9074	80.76%	G37	-0.0030**	0.8668	75.68%	G64	-0.0039***	0.7823	75.55%
G11	-0.0020*	1.0617	83.17%	G38	-0.0017***	1.0775	91.32%	G65	-0.0047***	1.0419	78.83%
G12	-0.0036***	1.1847	88.65%	G39	-0.0041***	0.8568	77.90%	G66	0.0010	1.0557	59.06%
G13	-0.0026***	1.1112	90.92%	G40	-0.0033**	0.9594	80.64%	G67	-0.0032**	1.1095	82.89%
G14	-0.0018***	1.0740	91.45%	G41	-0.0022	1.0644	81.21%	G68	-0.0019	0.9704	55.98%
G15	-0.0035***	1.0879	81.51%	G42	-0.0050***	0.9866	75.64%	G69	-0.0027	1.1366	75.13%
G16	-0.0034**	1.1482	80.70%	G43	-0.0016	0.7282	54.35%	G70	-0.0007	0.9593	86.80%
G17	-0.0029***	1.1011	91.84%	G44	-0.0044**	0.9154	75.70%	G71	-0.0041***	1.0269	86.19%
G18	-0.0026***	1.0880	92.01%	G45	-0.0028**	0.8837	75.90%	G72	-0.0045***	1.0137	86.11%
G19	0.0006	0.9297	69.99%	G46	-0.0052***	0.9395	80.37%	G73	0.0006	0.9882	89.42%
G20	-0.0030***	1.0788	85.91%	G47	-0.0066***	0.9160	63.67%	G74	-0.0018***	1.0242	96.79%
G21	-0.0028***	1.1284	90.39%	G48	-0.0025**	0.9401	88.62%	G75	-0.0017*	0.9739	89.16%
G22	-0.0027***	1.1075	90.90%	G49	-0.0039	0.9246	58.30%	G76	-0.0031***	1.1317	92.07%
G23	-0.0050**	1.0769	69.88%	G50	-0.0041**	1.0094	78.06%	G77	-0.0032**	1.0605	87.18%
G24	-0.0012	0.9708	87.91%	G51	-0.0067	0.7045	19.29%	G78	-0.0044***	1.0104	93.87%
G25	-0.0039***	1.0945	88.77%	G52	-0.0058***	1.1220	72.14%	G79	-0.0028***	1.0555	94.61%
G26	-0.0030	0.9200	68.35%	G53	-0.0050***	0.9628	82.51%	G80	-0.0050***	0.9920	82.22%
G27	-0.0017	1.0065	85.58%	G54	-0.0036***	1.0369	81.43%	G81	-0.0041	1.0096	46.85%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Jensen (1968) one-factor model of equation (1). Panel C reports the results for the global equity funds. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 8 - Performance estimates using the unconditional Carhart (1997) four-factor model in Germany (individual results)

Panel A: Domestic Equity Funds													
Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
D1	-0.0018**	1.0535	0.1277*	-0.0912	-0.0226	92.69%	D17	-0.0014**	0.9039	-0.0639	0.0467*	0.0044	97.31%
D2	-0.0014	1.0049	0.2776***	-0.2460***	0.0193	92.09%	D18	-0.0017	0.7119	0.0958	-0.0293	-0.1081	75.98%
D3	0.0019	0.9097	0.4929***	-0.3315***	0.0851	83.18%	D19	-0.0018	1.0593	0.2515***	-0.1328*	-0.0983	89.88%
D4	-0.0013	1.0183	0.2640***	-0.2021***	0.0227	91.92%	D20	-0.0008**	1.0035	0.0419**	-0.0348**	0.0200	99.21%
D5	-0.0002	1.0161	0.1755**	-0.0796	-0.0004	92.18%	D21	-0.0020***	0.9996	0.0671***	-0.0385**	-0.0248	98.89%
D6	-0.0007	0.9990	0.2003***	-0.0945**	-0.0420	94.90%	D22	-0.0009	1.0349	0.3594***	-0.2184***	-0.0555	88.67%
D7	-0.0009	1.0411	0.3075***	-0.2784***	0.0479	92.15%	D23	0.0006	1.0923	0.2582***	-0.1283	-0.1241	89.77%
D8	-0.0006	1.0303	0.2446***	-0.1586***	-0.0155	93.34%	D24	-0.0009	0.9812	0.1641***	-0.1018***	-0.0162	96.23%
D9	-0.0013	1.0502	0.2056***	-0.1259**	-0.0165	93.60%	D25	-0.0012	1.0417	0.1038*	-0.0592	-0.0571	93.05%
D10	0.0006	1.1484	0.3116***	-0.2423***	0.1294**	93.23%	D26	-0.0016*	1.0314	0.1535***	-0.0443	-0.0638	92.39%
D11	0.0006	1.1576	0.2952***	-0.1766***	-0.0346	94.70%	D27	-0.0004	1.0038	0.1218***	-0.0730**	-0.0041	96.42%
D12	-0.0011	1.1821	0.2412***	-0.1719***	0.0420	94.18%	D28	-0.0003	0.9740	0.0498*	-0.0088	-0.0214	98.45%
D13	0.0042**	0.9175	0.4391***	-0.2594***	-0.0150	79.12%	D29	0.0040	0.7498	0.6165***	-0.2476***	-0.1188	64.28%
D14	-0.0012	1.1661	0.1442**	-0.0975*	0.0103	95.06%	D30	-0.0009**	0.9944	-0.0030	-0.0161	0.0031	99.33%
D15	-0.0011	1.0279	0.2875***	-0.1876***	0.0100	92.30%	D31	0.0049**	0.8236	0.7444***	-0.3544***	-0.0792	72.10%
D16	-0.0009	1.0395	0.2108***	-0.1339***	-0.0249	93.96%	D32	-0.0019***	1.0422	0.0614**	-0.0452**	-0.0037	99.00%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Carhart (1997) four-factor model of equation (2). Panel A reports the results for the domestic equity funds. Additionally, SMB, HML and MOM represent the coefficients of the size, book-to-market and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 9 - Performance estimates using the unconditional Carhart (1997) four-factor model in Europe (individual results)

Panel B: European Equity Funds													
Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
E1	-0.0029**	1.1179	0.3128***	-0.2342***	-0.0329	87.26%	E24	0.0036*	0.9697	0.9509***	-0.5765***	-0.0385	74.82%
E2	-0.0032***	0.8835	0.0540	-0.0925	0.0079	81.19%	E25	-0.0031***	1.0134	0.0444	-0.0404*	0.0214	96.42%
E3	-0.0002	1.0227	0.0978	0.0080	-0.0468	86.55%	E26	-0.0039***	1.1232	0.2087***	-0.1787***	-0.0129	89.59%
E4	-0.0016	1.1559	0.4099***	-0.4947***	0.1036**	90.73%	E27	-0.0016***	0.9735	0.0524	-0.0567*	-0.0021	94.47%
E5	-0.0020***	1.0687	0.1724***	-0.1027**	-0.0633*	92.57%	E28	-0.0007	1.1974	0.4633***	-0.1128	-0.1982***	87.38%
E6	-0.0024**	1.0774	0.1385***	-0.0750	-0.0078	90.34%	E29	-0.0010	1.1561	0.2400***	-0.0605	-0.0510	85.68%
E7	-0.0012	1.0836	0.2845**	-0.0906	-0.0879	79.07%	E30	-0.0016*	1.0051	0.1566***	-0.0639**	0.0064	94.85%
E8	-0.0019***	0.9648	-0.1427***	0.0575***	0.0034	97.19%	E31	-0.0019***	0.9778	0.1242***	-0.0797***	0.0217	96.91%
E9	-0.0012	1.0465	0.0345	-0.0219	-0.0586	92.07%	E32	-0.0019*	1.0814	0.3271***	-0.2029***	-0.0968	88.58%
E10	-0.0016	1.1091	0.6611***	-0.5002***	0.0415	86.01%	E33	-0.0008	1.0078	0.0760	-0.1992***	0.0735*	94.02%
E11	-0.0018**	1.1211	0.3684***	-0.4076***	0.0643	91.02%	E34	-0.0004	1.0839	0.3866***	-0.2182***	-0.0850*	90.35%
E12	-0.0021*	0.9703	0.1712***	-0.3040***	0.0988**	86.89%	E35	-0.0019	1.0995	0.0312	0.1454**	-0.0573	87.54%
E13	-0.0033***	1.2251	0.3815***	-0.3360***	0.0889	88.40%	E36	-0.0012*	0.9787	0.0518	-0.0630***	0.0180	96.27%
E14	-0.00001	1.1610	0.6347***	-0.3709***	0.0076	85.44%	E37	-0.0032***	1.0734	0.0081	0.0144	-0.0101	90.41%
E15	-0.0039***	1.1662	0.2514***	-0.2113***	0.0562	91.15%	E38	-0.0014	0.9925	0.3964***	-0.1171*	-0.0239	78.88%
E16	-0.0002	1.0012	0.2719***	-0.2797***	0.0127	87.83%	E39	-0.0020***	1.0207	0.2338***	-0.1487***	-0.0506	94.01%
E17	-0.0022	1.0065	0.1672**	-0.2107***	0.1421**	84.52%	E40	-0.0024**	1.0861	0.1337***	-0.1412***	0.0583	94.12%
E18	-0.0032***	1.1350	0.2350***	-0.2957***	0.1301*	89.65%	E41	0.0007	0.8033	0.0402	-0.1861***	0.0952***	89.85%
E19	-0.0005	1.0513	0.1642**	-0.0206	-0.0761	90.52%	E42	0.0003	0.7528	0.4190***	-0.2351***	-0.0685	64.59%
E20	-0.0023	1.1300	0.2015**	-0.0348	-0.1031*	83.98%	E43	-0.0014	0.7496	0.0645	0.0255	0.0551	81.46%
E21	-0.0018	0.7411	0.1735**	-0.0628	-0.0813	81.84%	E44	-0.0040**	0.8572	0.1093	-0.1628**	0.1241	64.86%
E22	-0.0034***	0.9635	0.2237***	-0.2213***	-0.0480	86.80%	E45	-0.0012	0.9842	0.0364	-0.0337	-0.0573	88.76%
E23	0.0011	0.8314	0.1515**	-0.1735***	0.1283***	85.31%	E46	-0.0025**	1.0400	0.0718	-0.0779**	0.0425	93.52%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Carhart (1997) four-factor model of equation (2). Panel B reports the results for the European equity funds. Additionally, SMB, HML and MOM represent the coefficients of the size, book-to-market and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 10 - Performance estimates using the unconditional Carhart (1997) four-factor model in Global at the individual fund level

Panel C: Global Equity Funds													
Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
G1	-0.0026**	1.0014	0.2569***	-0.1069*	-0.1176***	86.67%	G21	-0.0027***	1.1501	0.1970***	-0.0558	-0.0268	91.54%
G2	-0.0011	0.2215	0.0206	-0.0727***	-0.0266	56.30%	G22	-0.0026***	1.1164	0.0628	0.00002	-0.0108	90.87%
G3	-0.0021**	1.0274	0.1738**	-0.0084	-0.1248*	83.57%	G23	-0.0049***	1.1419	0.5065***	-0.1088	-0.0347	79.04%
G4	-0.0047***	1.0203	0.3766***	-0.0332	-0.0769	84.60%	G24	-0.0012	0.9642	0.0852	-0.1305**	-0.0273	88.65%
G5	-0.0049***	1.0704	0.1316	0.2114***	-0.0249	81.89%	G25	-0.0035***	1.1139	0.0658	0.0915*	-0.0254	90.05%
G6	-0.0040***	1.0177	0.2645***	0.0218	-0.0601	84.45%	G26	-0.0034*	0.9664	0.3298***	-0.1165	0.0537	74.33%
G7	-0.0032***	1.0686	0.3302***	-0.3000***	-0.0569	86.90%	G27	-0.0018**	1.0286	0.3170***	-0.1984***	-0.0337	88.44%
G8	-0.0022***	1.1327	0.1916***	-0.1703***	0.0464	88.73%	G28	-0.0045***	1.0961	0.4954***	-0.2167***	-0.3040***	81.97%
G9	-0.0021***	1.0925	0.0226	0.0062	-0.0145	90.19%	G29	-0.0070***	1.1571	0.2505***	-0.0393	0.0905	80.81%
G10	-0.0049***	0.9086	0.1563**	-0.1938***	0.0056	82.26%	G30	-0.0006	0.8241	-0.2209**	0.0776	0.0906	69.84%
G11	-0.0017	1.0527	-0.1194	0.1038	-0.0211	83.32%	G31	-0.0027***	1.0469	0.0834	-0.0201	-0.0102	88.69%
G12	-0.0034***	1.2028	0.1347**	0.0023	-0.0337	89.22%	G32	-0.0034***	1.1210	0.1087*	0.0622	-0.0623	90.34%
G13	-0.0026***	1.1216	0.0749	-0.0062	-0.0090	90.97%	G33	-0.0023*	0.9383	0.0928	0.0006	-0.1876**	79.07%
G14	-0.0015***	1.0778	0.0653	-0.0113	-0.0419	91.36%	G34	-0.0095	1.2042	1.6833***	-0.2041	-0.7229**	28.72%
G15	-0.0023**	1.1110	0.0551	0.2443***	-0.1343**	86.31%	G35	-0.0049***	0.8349	0.1720***	-0.0748*	0.0088	89.32%
G16	-0.0023*	1.1656	0.3447***	-0.0809	-0.2186***	83.36%	G36	-0.0024*	1.0221	0.2740***	-0.1807***	0.0183	85.82%
G17	-0.0027***	1.1115	0.0606	0.0327	-0.0294	92.06%	G37	-0.0028**	0.8834	0.2635***	-0.1375**	-0.0680	77.36%
G18	-0.0024***	1.0950	0.0627	0.0113	-0.0368	92.03%	G38	-0.0015**	1.0821	0.0699	-0.0104	-0.0420	91.25%
G19	-0.0001	0.9219	-0.1836*	0.0310	0.1395*	70.57%	G39	-0.0039***	0.8936	0.3641***	-0.1294**	-0.0493	83.78%
G20	-0.0026**	1.0842	0.0274	0.0619	-0.0541	85.97%	G40	-0.0031**	0.9830	0.3148***	-0.1462**	-0.0702	83.23%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Carhart (1997) four-factor model of equation (2). Panel C reports the results for the global equity funds. Additionally, SMB, HML and MOM represent the coefficients of the size, book-to-market and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 10 - Performance estimates using the unconditional Carhart (1997) four-factor model in Global at the individual fund level (Continued)

Panel C: Global Equity Funds													
Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
G41	-0.0020*	1.1072	0.3134***	-0.0273	-0.0414	85.90%	G62	-0.0017	1.0171	0.1802**	-0.1194**	-0.0189	84.92%
G42	-0.0045***	1.0280	0.3690***	-0.0617	-0.0872	80.82%	G63	-0.0016	0.7879	0.4507***	-0.1438**	-0.0603	76.58%
G43	-0.0014	0.7509	0.2400**	-0.0742	-0.0551	55.61%	G64	-0.0038***	0.8040	0.1116*	0.0160	0.0085	77.07%
G44	-0.0046***	0.9428	0.0301	0.0918	0.0780	78.22%	G65	-0.0043***	1.0818	0.3759***	-0.0847	-0.0842	83.42%
G45	-0.0021*	0.8758	-0.1174	0.1712***	-0.0816	77.41%	G66	-0.0006	1.1176	0.5291***	-0.4054***	0.2058**	70.61%
G46	-0.0047***	0.9611	0.2511***	-0.0616	-0.0892	82.26%	G67	-0.0028**	1.1402	0.0318	0.1889***	0.0056	86.39%
G47	-0.0067***	0.9563	0.1957*	0.0256	0.0344	67.30%	G68	-0.0005	1.0430	0.6174***	0.0111	-0.2329**	70.51%
G48	-0.0023**	0.9553	0.0076	0.1078**	-0.0013	89.93%	G69	-0.0023	1.1540	0.1488	0.0131	-0.0676	75.38%
G49	-0.0024	0.9851	0.3561***	0.2087**	-0.1931**	72.06%	G70	-0.0019*	0.9522	-0.0518	-0.1720***	0.1801***	90.83%
G50	-0.0036**	1.0353	-0.0521	0.2600***	0.0040	82.60%	G71	-0.0038***	1.0584	0.1645***	0.0596	-0.0261	89.29%
G51	-0.0049	0.7859	0.8925***	-0.1510	-0.3495**	32.31%	G72	-0.0049***	1.0342	0.1869***	-0.1259**	0.0453	87.69%
G52	-0.0039***	1.1829	0.4597***	0.1739***	-0.2845***	85.80%	G73	-0.0002	1.0002	0.1163**	-0.1652***	0.1080***	91.61%
G53	-0.0044***	0.9705	0.0608	0.0764	-0.0925	83.22%	G74	-0.0020***	1.0271	0.0721**	-0.0883***	0.0184	97.14%
G54	-0.0027***	1.0570	0.2994***	-0.0501	-0.1724***	84.05%	G75	-0.0020**	0.9850	0.1092*	-0.0871*	0.0335	89.67%
G55	-0.0031**	1.1504	0.1720*	0.2126***	-0.1416**	82.49%	G76	-0.0028***	1.1356	0.1751***	-0.1116**	-0.0793*	92.66%
G56	-0.0042***	1.1193	0.2328***	-0.2058***	0.0716**	94.99%	G77	-0.0030***	1.0974	0.2040***	0.0293	-0.0048	90.94%
G57	-0.0035	1.2013	0.7428***	-0.1966**	-0.0317	75.13%	G78	-0.0044***	1.0255	0.1612***	-0.0737*	-0.0148	94.73%
G58	-0.0065***	1.0232	0.5676***	-0.2559**	0.1886**	65.15%	G79	-0.0032***	1.0732	0.1396***	-0.0990***	0.0567**	95.94%
G59	-0.0026***	0.8273	-0.0045	0.0757	0.0154	80.85%	G80	-0.0047***	1.0027	0.1312*	-0.0255	-0.0572	82.34%
G60	-0.0046***	0.8792	0.3451***	-0.1292	-0.0100	72.45%	G81	-0.0062***	1.1340	0.6099***	-0.2069**	0.3803***	74.92%
G61	-0.0015	1.0705	0.0335	0.0489	-0.0637	89.68%							

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional Carhart (1997) four-factor model of equation (2). Panel C reports the results for the global equity funds. Additionally, SMB, HML and MOM represent the coefficients of the size, book-to-market and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 11 - Performance estimates using the unconditional Fama and French (2018) six-factor model in Germany (individual results)

Panel A: Domestic Equity Funds																		
Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
D1	-0.0022**	1.0408	0.1842***	0.0288	-0.0879	-0.2211*	0.0511	92.90%	D17	-0.0014**	0.9040	-0.0609	0.0441	-0.0222	0.0102	0.0106	97.27%
D2	-0.0018*	0.9946	0.3330***	-0.1441*	-0.0721	-0.1996*	0.0825	92.27%	D18	-0.0021	0.6940	0.1233	0.1340	-0.0074	-0.2904	-0.0466	76.09%
D3	0.0013	0.9003	0.5967***	-0.2285*	-0.1646*	-0.2209	0.1821***	83.77%	D19	-0.0024*	1.0507	0.3886***	-0.0435	-0.3002***	-0.1793	0.0382	90.93%
D4	-0.0017*	1.0040	0.3269***	-0.0631	-0.0792	-0.2641***	0.1013**	92.26%	D20	-0.0009**	0.9959	0.0565**	0.0352	-0.0072	-0.1257***	0.0476***	99.27%
D5	-0.0007	0.9969	0.2433***	0.1007	-0.0864	-0.3309***	0.0943	92.71%	D21	-0.0020***	1.0025	0.0794**	-0.0634*	-0.0358	0.0389	-0.0206	98.89%
D6	-0.0011	0.9889	0.2604***	0.0045	-0.0952	-0.1899*	0.0273	95.17%	D22	-0.0016	1.0121	0.4785***	0.0012	-0.1851*	-0.4143**	0.0886	89.89%
D7	-0.0013	1.0269	0.3507***	-0.1429	-0.0300	-0.2578**	0.1093	92.33%	D23	0.0001	1.0838	0.3653***	-0.0435	-0.2371***	-0.1658	-0.0100	90.30%
D8	-0.0010	1.0221	0.2982***	-0.0786	-0.0884	-0.1566	0.0457	93.45%	D24	-0.0010	0.9784	0.1709***	-0.0720	0.0140	-0.0634	-0.0088	96.18%
D9	-0.0018**	1.0328	0.2850***	0.0388	-0.1236*	-0.3051**	0.0859	94.19%	D25	-0.0015*	1.0297	0.1641***	0.0533	-0.1038	-0.2066*	0.0191	93.29%
D10	0.0001	1.1380	0.3974***	-0.1385	-0.1540**	-0.2049	0.2219***	93.57%	D26	-0.0021**	1.0154	0.2501***	0.1077	-0.1807**	-0.2802**	0.0531	93.13%
D11	0.00002	1.1335	0.3589***	0.0498	-0.0504	-0.4170***	0.0657	95.30%	D27	-0.0007	0.9892	0.1652***	0.0641	-0.0406	-0.2518***	0.0590	96.72%
D12	-0.0015	1.1721	0.3187***	-0.0726	-0.1390	-0.1930	0.1270**	94.45%	D28	-0.0004	0.9742	0.0571*	-0.0097	-0.0185	-0.0006	-0.0147	98.42%
D13	0.0034*	0.9006	0.5752***	-0.0907	-0.2412*	-0.3311	0.1312	80.37%	D29	0.0030	0.7419	0.8465***	-0.1502	-0.4942***	-0.2236	0.0902	67.90%
D14	-0.0016**	1.1506	0.1967***	0.0466	-0.0717	-0.2623*	0.0873*	95.29%	D30	-0.0009**	0.9964	-0.0158	-0.0352	0.0260	0.0343	-0.0125	99.33%
D15	-0.0017*	1.0119	0.3651***	-0.0328	-0.1083	-0.2942**	0.1043*	92.82%	D31	0.0039*	0.8144	0.9260***	-0.2454	-0.3496**	-0.2486	0.0860	73.98%
D16	-0.0013*	1.0251	0.2955***	0.0040	-0.1467***	-0.2589**	0.0760	94.54%	D32	-0.0019***	1.0410	0.0717**	-0.0326	-0.0176	-0.0258	0.0075	98.99%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional six-factor model (Fama and French, 2018) of equation (3). Panel A reports the results for the domestic equity funds. Additionally, SMB, HML, RMW, CMA and MOM represent the coefficients of the size, book-to-market, profitability, investment and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 12 - Performance estimates using the unconditional Fama and French (2018) six-factor model in Europe (individual results)

Panel B: European Equity Funds

Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
E1	-0.0036***	1.1010	0.4011***	-0.0620	-0.1410	-0.3252**	0.0804	88.34%	E24	0.0024	0.9803	1.1804***	-0.5247***	-0.4388***	-0.1809	0.1411*	79.07%
E2	-0.0033***	0.8836	0.0774	-0.0833	-0.0643	-0.0178	0.0345	80.91%	E25	-0.0032***	1.0138	0.0729*	-0.0299	-0.0654	-0.0237	0.0482*	96.45%
E3	-0.0007	1.0229	0.1982***	0.0536	-0.2374**	-0.0938	0.0526	87.48%	E26	-0.0044***	1.1237	0.3154***	-0.1311	-0.2466***	-0.1030	0.0919	90.60%
E4	-0.0018	1.1548	0.4145***	-0.4753***	0.0385	-0.0592	0.1018**	90.60%	E27	-0.0017**	0.9697	0.0602	-0.0234	-0.0011	-0.0625	0.0106	94.40%
E5	-0.0023***	1.0701	0.2370***	-0.0806	-0.1446**	-0.0540	-0.0035	92.87%	E28	-0.0016	1.1767	0.6083***	0.1204	-0.2284**	-0.4524***	-0.0321	89.54%
E6	-0.0029***	1.0796	0.2478***	-0.0377	-0.2506***	-0.0852	0.0934*	91.45%	E29	-0.0015	1.1451	0.3235***	0.0654	-0.1415	-0.2431	0.0449	86.22%
E7	-0.0018	1.0710	0.3700**	0.0488	-0.1404	-0.2686	0.0130	79.61%	E30	-0.0019**	0.9915	0.1845***	0.0540	-0.0168	-0.2164***	0.0557*	95.16%
E8	-0.0017***	0.9729	-0.1816***	-0.0256	0.0457	0.1601***	-0.0431*	97.49%	E31	-0.0020***	0.9752	0.1194***	-0.0588	0.0337	-0.0436	0.0188	96.89%
E9	-0.0012	1.0520	0.0569	-0.0546	-0.0785	0.0564	-0.0422	92.00%	E32	-0.0025**	1.0659	0.4177***	-0.0390	-0.1440	-0.3131**	0.0146	89.75%
E10	-0.0027**	1.1052	0.8640***	-0.3601***	-0.3770***	-0.3120**	0.2278***	90.06%	E33	-0.0009	1.0074	0.1025	-0.1823***	-0.0546	-0.0366	0.0992**	94.00%
E11	-0.0022***	1.1132	0.4166***	-0.3178***	-0.0525	-0.1837*	0.1184**	91.22%	E34	-0.0011	1.0727	0.5034***	-0.0710	-0.1974***	-0.2944***	0.0392	92.02%
E12	-0.0024**	0.9788	0.2638***	-0.3218***	-0.2224***	0.0099	0.1711***	87.75%	E35	-0.0022*	1.0850	0.0741	0.2753***	-0.0582	-0.2330	0.0089	87.72%
E13	-0.0040***	1.2247	0.5235***	-0.2585***	-0.2900***	-0.1747	0.2206***	89.90%	E36	-0.0013**	0.9738	0.0681*	-0.0175	-0.0188	-0.0845	0.0411	96.29%
E14	-0.0011	1.1560	0.8564***	-0.2140**	-0.4227***	-0.3414**	0.2154***	89.71%	E37	-0.0032***	1.0699	0.0062	0.0390	0.0097	-0.0418	-0.0045	90.23%
E15	-0.0046***	1.1569	0.3819***	-0.0761	-0.2550***	-0.2655**	0.1946***	92.95%	E38	-0.0020	0.9665	0.4330***	0.1078	0.0527	-0.4264**	0.0409	79.79%
E16	-0.0009	0.9932	0.3998***	-0.1531**	-0.2402***	-0.2541**	0.1429***	90.09%	E39	-0.0024***	1.0167	0.3223***	-0.0728*	-0.1717***	-0.1564*	0.0380	94.97%
E17	-0.0024	1.0011	0.1887**	-0.1547*	-0.0058	-0.1134	0.1653**	84.36%	E40	-0.0028***	1.0686	0.1814***	0.0159	-0.0451	-0.2886***	0.1306***	94.78%
E18	-0.0037***	1.1490	0.3770***	-0.3319***	-0.3571***	0.0353	0.2435***	91.49%	E41	0.0008	0.8163	0.0557	-0.2751***	-0.0666	0.1505	0.0872**	89.95%
E19	-0.0010	1.0360	0.2334**	0.1316	-0.0934	-0.2857*	0.0113	91.30%	E42	-0.0005	0.7566	0.5918***	-0.1707	-0.3488***	-0.1636	0.0785	68.56%
E20	-0.0030*	1.1190	0.3398***	0.1151	-0.2792***	-0.2876	0.0484	85.73%	E43	-0.0017	0.7405	0.1224	0.1220	-0.1007	-0.1797	0.1245*	82.03%
E21	-0.0017	0.7354	0.1174	-0.0404	0.1768*	-0.0456	-0.1327**	82.52%	E44	-0.0044**	0.8607	0.2069	-0.1371	-0.1990	-0.0704	0.2020**	65.26%
E22	-0.0035***	0.9749	0.2552***	-0.2887***	-0.0893	0.1028	-0.0381	86.67%	E45	-0.0014	0.9805	0.0738	0.0092	-0.0913	-0.0764	-0.0097	88.80%
E23	0.0009	0.8298	0.1948***	-0.1349	-0.0603	-0.0872	0.1637***	85.38%	E46	-0.0028***	1.0371	0.1374***	-0.0224	-0.1312**	-0.1106	0.1079***	93.96%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional six-factor model (Fama and French, 2018) of equation (3). Panel B reports the results for the European equity funds. Additionally, SMB, HML, RMW, CMA and MOM represent the coefficients of the size, book-to-market, profitability, investment and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 13 - Performance estimates using the unconditional Fama and French (2018) six-factor model in Global at the individual fund level

Panel C: Global Equity Funds																	
Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
G1	-0.0028**	1.0080	0.2518***	-0.1524	0.0129	0.0512	-0.1270**	86.29%	G21	-0.0029***	1.1545	0.1984***	-0.0170	0.0755	-0.1025	-0.0316	91.43%
G2	-0.0012**	0.2325	0.0008	-0.0572	0.1275**	-0.0689	-0.0599*	58.26%	G22	-0.0025***	1.1061	0.0836	0.1303*	0.0208	-0.2168***	0.0257	90.98%
G3	-0.0022**	1.0228	0.1923**	0.1111	0.0641	-0.2257**	-0.1018	83.54%	G23	-0.0051***	1.1418	0.5383***	0.0210	0.1083	-0.2881	-0.0124	78.94%
G4	-0.0048***	1.0130	0.4145***	0.1221	0.0647	-0.3024*	-0.0373	84.84%	G24	-0.0013	0.9653	0.0869	-0.0537	0.0839	-0.1563	-0.0262	88.62%
G5	-0.0054***	1.1087	0.0449	0.1638	0.3405**	-0.0329	-0.1363**	83.14%	G25	-0.0037***	1.1220	0.0523	0.1038	0.0930	-0.0549	-0.0476	89.96%
G6	-0.0042***	1.0211	0.2658***	0.1528	0.1539*	-0.2760*	-0.0572	84.60%	G26	-0.0037**	0.9749	0.3271***	-0.0082	0.1820	-0.2569	0.0427	74.29%
G7	-0.0033***	1.0654	0.3491***	-0.2039**	0.0500	-0.1929	-0.0315	86.71%	G27	-0.0020**	1.0416	0.3138***	-0.2247**	0.0955	-0.0208	-0.0618	88.33%
G8	-0.0024***	1.1375	0.1911**	-0.0690	0.1422**	-0.2228**	0.0408	88.83%	G28	-0.0044***	1.0694	0.5693***	0.0117	-0.0654	-0.3791**	-0.1975***	82.56%
G9	-0.0021***	1.0917	0.0263	0.0548	0.0388	-0.0927	-0.0106	90.05%	G29	-0.0070***	1.1448	0.2863***	0.1045	0.0070	-0.2505	0.1409*	80.74%
G10	-0.0048***	0.8959	0.1898**	-0.1008	-0.0443	-0.1464	0.0526	82.21%	G30	-0.0010	0.8683	-0.3344***	-0.1444	0.2410*	0.3039	-0.0560	72.46%
G11	-0.0019*	1.0687	-0.1593	0.1774	0.2413**	-0.1848	-0.0747	83.77%	G31	-0.0029***	1.0593	0.0619	-0.0228	0.1211*	-0.0413	-0.0450	88.68%
G12	-0.0034***	1.1973	0.1492**	0.1033	0.0386	-0.1818	-0.0094	89.14%	G32	-0.0035***	1.1266	0.0993	0.0999	0.0900	-0.0953	-0.0740	90.23%
G13	-0.0026***	1.1198	0.0862	0.0240	0.0080	-0.0599	-0.0003	90.82%	G33	-0.0025*	0.9373	0.0803	0.2474**	0.2310*	-0.4607**	-0.1756**	80.15%
G14	-0.0015***	1.0706	0.0885	0.0813	0.0149	-0.1619	-0.0164	91.39%	G34	-0.0087	1.0902	2.0215***	0.3589	-0.6737	-0.8332	-0.2962	30.34%
G15	-0.0024**	1.1101	0.0541	0.2692***	0.0132	-0.0440	-0.1282*	86.04%	G35	-0.0050***	0.8379	0.1773***	-0.0090	0.0892	-0.1500	0.0072	89.39%
G16	-0.0024*	1.1612	0.3750***	0.0648	0.0864	-0.2916*	-0.1895**	83.41%	G36	-0.0022*	0.9951	0.3555***	-0.0102	-0.1188	-0.2658*	0.1138*	86.84%
G17	-0.0027***	1.1052	0.0721	0.1379**	0.0383	-0.1818**	-0.0060	92.09%	G37	-0.0034**	0.9132	0.2076***	-0.0429	0.3889***	-0.2915	-0.1469**	79.40%
G18	-0.0023***	1.0870	0.0779	0.1008*	0.0043	-0.1458*	-0.0080	92.01%	G38	-0.0014***	1.0735	0.0954	0.0978	0.0161	-0.1870	-0.0118	91.33%
G19	-0.0004	0.9462	-0.2526**	-0.0523	0.1732	0.0998	0.0571	70.87%	G39	-0.0042***	0.9040	0.3660***	-0.0089	0.2120**	-0.2941**	-0.0655	84.46%
G20	-0.0029***	1.1035	-0.0193	0.1663*	0.2999***	-0.2588**	-0.1103*	86.89%	G40	-0.0031**	0.9746	0.3424***	-0.0183	0.0284	-0.2345*	-0.0288	83.13%

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional six-factor model (Fama and French, 2018) of equation (3). Panel C reports the results for the global equity funds. Additionally, SMB, HML, RMW, CMA and MOM represent the coefficients of the size, book-to-market, profitability, investment and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 13 - Performance estimates using the unconditional Fama and French (2018) six-factor model in Global at the individual fund level (Continued)

Panel C: Global Equity Funds

Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2	Fund	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
G41	-0.0023*	1.1222	0.2912***	-0.0258	0.1434	-0.0682	-0.0736	85.67%	G62	-0.0018	1.0159	0.1962**	-0.0749	0.0252	-0.0973	-0.0078	84.69%
G42	-0.0047***	1.0336	0.3763***	-0.0318	0.0740	-0.1018	-0.0890	80.39%	G63	-0.0016	0.7829	0.4957***	-0.1342	-0.0586	-0.0426	-0.0273	76.35%
G43	-0.0015	0.7462	0.2633**	0.1779	0.1929	-0.4856**	-0.0281	56.64%	G64	-0.0037***	0.7818	0.1672**	0.2122*	-0.0374	-0.3136*	0.0833	78.03%
G44	-0.0048***	0.9544	-0.0012	0.1370	0.1630	-0.1201	0.0450	78.20%	G65	-0.0045***	1.0877	0.3802***	-0.0267	0.1041	-0.1548	-0.0858	83.10%
G45	-0.0023**	0.8924	-0.1554	0.1576	0.1605*	-0.0222	-0.1382	77.47%	G66	-0.0007	1.1062	0.5895***	-0.3111	-0.0438	-0.1874	0.2632**	70.30%
G46	-0.0049***	0.9691	0.2474***	-0.0072	0.1258	-0.1478	-0.1026	82.12%	G67	-0.0029**	1.1432	0.0146	0.2484***	0.0891	-0.1163	-0.0002	86.22%
G47	-0.0068***	0.9553	0.2003	0.2510	0.2061	-0.4364*	0.0490	67.79%	G68	-0.0006	1.0409	0.6700***	-0.0255	-0.0808	0.0206	-0.2031**	70.07%
G48	-0.0024**	0.9564	-0.0057	0.2126**	0.1148	-0.1958	-0.0018	90.10%	G69	-0.0026*	1.1721	0.1099	0.0876	0.2539*	-0.2056	-0.1154	75.50%
G49	-0.0027	0.9928	0.3629***	0.4298***	0.2841*	-0.4773**	-0.2001**	73.00%	G70	-0.0018*	0.9431	-0.0316	-0.1343	-0.0542	-0.0418	0.2060***	90.73%
G50	-0.0039**	1.0552	-0.0999	0.2418**	0.1885	-0.0243	-0.0596	82.83%	G71	-0.0039***	1.0623	0.1579**	0.1276	0.1013	-0.1492	-0.0296	89.20%
G51	-0.0051	0.7834	0.9649***	-0.1069	-0.0167	-0.1550	-0.3063	31.14%	G72	-0.0049***	1.0301	0.2035**	-0.1194	-0.0419	-0.0111	0.0658	87.44%
G52	-0.0042***	1.1875	0.4750***	0.3501***	0.2044**	-0.3858***	-0.2777***	86.17%	G73	-0.0004	1.0170	0.0856	-0.3323***	0.0031	0.2577**	0.0593	91.96%
G53	-0.0044***	0.9613	0.0676	0.3513***	0.1754	-0.4881***	-0.0565	84.48%	G74	-0.0022***	1.0351	0.0582*	-0.0870*	0.0809*	-0.0333	-0.0032	97.18%
G54	-0.0027***	1.0476	0.3315***	0.0809	0.0222	-0.2387*	-0.1290*	84.02%	G75	-0.0021**	0.9887	0.1014	-0.1435*	-0.0226	0.0932	0.0270	89.47%
G55	-0.0032**	1.1432	0.1866*	0.4103***	0.1157	-0.3599***	-0.1089*	82.69%	G76	-0.0027***	1.1157	0.2271***	0.0934	-0.0073	-0.3411**	-0.0086	93.35%
G56	-0.0045***	1.1361	0.2138***	-0.1493**	0.2187***	-0.1827**	0.0298	95.52%	G77	-0.0031***	1.0987	0.2089***	0.0608	0.0370	-0.0766	0.0005	90.74%
G57	-0.0040*	1.2190	0.7492***	-0.1008	0.2485	-0.2976	-0.0548	74.98%	G78	-0.0045***	1.0234	0.1794***	-0.0127	0.0332	-0.1258	-0.0018	94.77%
G58	-0.0064**	0.9980	0.6437***	-0.2026	-0.2265	-0.0548	0.2915**	64.97%	G79	-0.0032***	1.0688	0.1615***	-0.0293	0.0190	-0.1334*	0.0761**	96.01%
G59	-0.0028***	0.8388	-0.0304	0.1167	0.1587**	-0.1147	-0.0197	81.01%	G80	-0.0045***	0.9802	0.1836**	0.1479	-0.0643	-0.2664*	0.0200	82.82%
G60	-0.0047***	0.8748	0.3748***	0.1159	0.1848	-0.4816***	0.0203	73.61%	G81	-0.0061***	1.1102	0.6980***	-0.1606	-0.2212	-0.0587	0.4790***	74.99%
G61	-0.0015	1.0622	0.0441	0.1507**	0.0152	-0.1637*	-0.0347	89.65%									

This appendix presents estimates of performance and risk for each German mutual funds, using the unconditional six-factor model (Fama and French, 2018) of equation (3). Panel C reports the results for the global equity funds. Additionally, SMB, HML, RMW, CMA and MOM represent the coefficients of the size, book-to-market, profitability, investment and momentum factors, respectively. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors. All the values of the systematic risk (β_p) are statistically significant at the 1% level.

Appendix 14 - Performance estimates using the full conditional Carhart (1997) four-factor model in Germany at the individual fund level

Panel A: Domestic Equity Funds																
Fund	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16
α_p	-0.0012	-0.0009	0.0003	-0.0007	-0.0001	-0.0007	-0.0005	0.0012	-0.0011	0.0005	0.0011	-0.00002	0.0035*	-0.0005	-0.0011	-0.0005
α_{STR}	0.0019	-0.0115	0.0063	-0.0109	-0.0015	-0.0022	-0.0067	-0.0040	-0.0070	0.0030	-0.0036	-0.0056	0.0004	0.0054	-0.0086	-0.0024
α_{TS}	0.0060	0.0064	0.0167**	0.0089*	0.0083	0.0044	0.0060	-0.0028	0.0080	0.0058	0.0041	0.0002	0.0125	0.0048	0.0099*	0.0082
α_{DY}	0.0046	-0.0048	-0.0128**	-0.0048	-0.0004	-0.0039	-0.0041	0.0021	-0.0023	-0.0107***	-0.0044	-0.0022	-0.0177**	-0.0035	-0.0069	0.0008
β_p	0.9988***	0.9451***	0.8843***	0.9495***	0.9357***	0.9541***	0.9683***	0.9901***	0.9902***	1.0945***	1.0857***	1.1401***	0.8667***	1.0926***	0.9575***	0.9950***
$\beta_{\mathrm{STR*MKT}}$	-0.0040	0.0137	-0.6535***	-0.0480	-0.1762	-0.1607	-0.0717	0.2043*	-0.1251	-0.2774*	-0.1565	0.0419	-0.7252***	-0.0768	-0.0765	-0.0465
$\beta_{\mathrm{TS*MKT}}$	-0.2382	-0.1865	-0.3930***	-0.2197*	-0.3057**	-0.1976*	-0.1991	0.0683	-0.2461*	-0.3660***	-0.1711	-0.1336	-0.2958*	-0.2331	-0.3099**	-0.2368*
$\beta_{\mathrm{DY*MKT}}$	0.1335*	0.1813**	-0.0506	0.2087***	0.1224**	0.1359*	0.2037***	0.1792**	0.0890	0.0937	0.2094**	0.1594*	0.1040	0.2406***	0.1242*	0.0688
β_{SMB}	0.0753	0.2151***	0.3043***	0.1840***	0.0231	0.1479**	0.2065***	0.2614***	0.0793	0.2043***	0.1963**	0.2249***	0.2881**	0.0456	0.1516***	0.1324**
$\beta_{\mathrm{STR*}SMB}$	1.0058	1.2895*	0.7129	1.2541*	1.0216	0.8179*	1.2255*	0.9942**	0.8218	1.0939**	0.6715	1.5745**	1.1779**	0.9273	0.9200	0.9796
$\beta_{\mathrm{TS*}SMB}$	-0.5129	-0.5120	-0.5295	-0.5567	-0.6901*	-0.2754	-0.5713	-0.2487	-0.5389	-0.6632*	-0.4307	-0.4921	-0.5090	-0.6042	-0.5334	-0.5007
$\beta_{\mathrm{DY*}SMB}$	0.1666	0.3067*	-0.1613	0.3480*	0.1640	0.1331	0.3568**	0.1445	0.0697	0.4092**	0.2251*	0.3753**	0.8697***	0.3277**	0.2939*	0.1078
β_{HML}	-0.0325	-0.2088***	-0.2728***	-0.1553***	0.0052	-0.0570	-0.2307***	-0.1011**	-0.0591	-0.2150***	-0.1252**	-0.1516**	-0.2173***	-0.0580	-0.1355**	-0.0823
$\beta_{\mathrm{STR*}HML}$	-0.4049	-0.8353**	0.0177	-0.6709*	-0.4649	-0.4324	-0.6599*	-0.2875	-0.6070	-0.3999	-0.2175	-0.8979**	0.1545	-0.3631	-0.7443*	-0.5605
$\beta_{\mathrm{TS*}HML}$	0.3944	0.3590**	0.0070	0.3410**	0.4012**	0.3173*	0.3313*	0.2876*	0.3357	0.2589	0.2406	0.2595	0.0817	0.2100	0.3224*	0.2929
$\beta_{\mathrm{DY*}HML}$	0.2561	-0.0682	0.3326	-0.0588	0.3424	-0.0316	-0.0146	0.3802**	0.2402	-0.1552	-0.0139	-0.0289	-0.2902	-0.0619	-0.0388	0.2418
β_{MOM}	-0.0065	0.0558	0.1648***	0.0600	0.0755	-0.0191	0.1007**	-0.0566	0.0434	0.1711***	-0.0015	0.0392	0.0612	0.0389	0.0813**	0.0037
$\beta_{\mathrm{STR*}MOM}$	-0.4401	-0.2359	-0.4572	-0.3572	-0.2164	-0.2125	-0.3396	-0.7770***	-0.2251	-0.4029	-0.2631	-0.5849**	-0.8687**	-0.3551	-0.1014	-0.3486
$\beta_{\mathrm{TS*}MOM}$	0.2293	0.2716	0.2668	0.3379	0.2369	-0.0214	0.1792	-0.0949	0.1382	0.2735	0.0392	0.0989	0.4843*	0.2911*	0.2487	0.1538
$\beta_{\mathrm{DY*}MOM}$	-0.5597*	-0.4086	-0.5854***	-0.4372	-0.6484***	-0.2954	-0.6195**	-0.6082***	-0.4571*	-0.5080**	-0.2991	-0.5435***	-0.8019***	-0.3825**	-0.4296	-0.4944**
Adj. R^2	93.17%	92.87%	85.02%	92.87%	93.66%	95.10%	93.17%	94.33%	94.19%	94.36%	94.85%	94.96%	84.24%	95.42%	93.25%	94.46%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel A reports the results for the domestic equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 14 - Performance estimates using the full conditional Carhart (1997) four-factor model in Germany at the individual fund level (Continued)

Panel A: Domestic Equity Funds																
Fund	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32
α_p	-0.0016***	-0.0018	-0.0008	-0.0005	-0.0021***	-0.0009	0.0018	-0.0013	-0.0004	-0.0005	-0.0015	-0.0008	0.0045	-0.0009**	0.0026	-0.0021***
α_{STR}	-0.0034	0.0131	-0.0011	-0.0026	-0.0012	-0.0006	0.0082	-0.0038	-0.0064	-0.0039	-0.0092	-0.0004	0.0114	-0.0028	0.0232	0.0003
α_{TS}	-0.0002	-0.0035	0.0031	0.0002	-0.0006	0.0123*	0.0018	0.0001	0.0049	0.0048	0.0036	0.0028	0.0103	0.0008	0.0048	-0.0007
α_{DY}	-0.0042*	0.0062	-0.0007	0.0001	-0.0065***	-0.0100	0.0016	-0.0127***	0.0047	0.0012	-0.0059*	-0.0043*	-0.0169*	0.0028*	-0.0293***	-0.0008
β_p	0.9089***	0.7414***	1.0378***	0.9947***	0.9821***	0.9274***	1.0697***	0.9558***	0.9931***	0.9798***	1.0079***	0.9744***	0.7679***	0.9967***	0.8016***	1.0487***
$\beta_{\text{STR*MKT}}$	-0.0361	-0.1268	0.2582	0.0927**	0.0565	-0.1600	0.1827	-0.1299	0.0800	0.1289	-0.2628**	-0.1579**	0.1080	0.0444	-0.6294**	0.0033
$\beta_{\text{TS*MKT}}$	0.0502	-0.0276	-0.0569	0.0334	0.0030	-0.4090***	-0.0787	-0.0273	-0.1626	-0.1194	-0.0681	-0.0465	-0.1853	-0.0051	-0.2868	0.0002
$\beta_{\text{DY*MKT}}$	0.0573	0.0351	0.1384	0.0428	0.0815**	0.2397**	0.1822**	0.1675**	0.0916	0.1398*	-0.1110	-0.0157	-0.0363	-0.0299	0.1354	-0.0050
β_{SMB}	-0.0609	0.2121**	0.2959***	0.0366	0.0336	0.1604*	0.3272***	0.1216**	0.0511	0.0978	0.0466	0.0064	0.6633***	-0.0009	0.6143***	0.0620**
$\beta_{\text{STR*}SMB}$	0.2890	1.5293**	1.3075*	-0.0274	0.1919	0.9107	1.3122*	0.2972	1.0183	1.1176	-0.6270**	0.0368	-0.0003	-0.0326	-0.1883	-0.0150
$\beta_{\text{TS*}SMB}$	-0.0366	-0.2090	-0.2906	0.0589	0.1280	-0.3661	-0.2793	0.1484	-0.5229	-0.4902	-0.0249	-0.1043	0.1033	-0.0150	0.3130	0.1031
$\beta_{\text{DY*}SMB}$	-0.0890	0.1655	0.2589	0.1523***	0.1885***	0.2612	0.3270*	0.2742*	0.0818	0.1187	-0.2193	-0.0639	-0.2451	-0.0090	-0.4031	-0.0339
β_{HML}	0.0357	-0.0317	-0.1280*	-0.0412**	-0.0436***	-0.1340**	-0.1138	-0.1124***	-0.0036	0.0174	-0.0590*	0.0038	-0.2142**	-0.0219	-0.3069***	-0.0543**
$\beta_{\text{STR*}HML}$	-0.1209	-0.4523	-0.5643	-0.0871	-0.1368	-0.5554	-0.1680	-0.2308	-0.6451	-0.6144	0.0050	-0.0663	0.8040	-0.0581	0.7814	-0.0325
$\beta_{\text{TS*}HML}$	-0.1326	0.3187	0.2591	-0.0668	-0.1863***	0.2570	0.2994	-0.1504	0.3780	0.3431	0.0755	0.0380	0.1132	-0.0226	-0.2430	-0.1411***
$\beta_{\text{DY*}HML}$	-0.0281	0.1746	0.0022	-0.1308**	-0.1643***	0.0165	0.0654	-0.4397***	0.3154	0.3495	-0.0189	0.0541	0.2989	0.0006	0.0478	-0.0257
β_{MOM}	0.0054	-0.1483***	-0.1321**	0.0278*	-0.0036	0.0269	-0.1859***	0.0124	-0.0350	-0.0528	0.0504	0.0047	-0.2292**	0.0084	-0.0561	-0.0006
$\beta_{\text{STR*}MOM}$	-0.1664	-0.7678*	-0.5199	0.0679	-0.0384	-0.1391	-0.9558***	-0.0866	-0.2767	-0.5319**	0.3887**	-0.1092	-0.9620*	0.1081	-0.4577	-0.0119
$\beta_{\text{TS*}MOM}$	0.1940***	0.3411	0.0795	0.0469	0.0380	-0.0678	0.0847	0.0734	0.1571	0.1255	-0.0027	0.1115	-0.0496	0.0225	-0.0103	0.0598
$\beta_{\text{DY*}MOM}$	-0.0205	-0.5916*	-0.6210**	0.0238	-0.1823***	-0.6219***	-0.8469***	-0.0249	-0.4628*	-0.6526***	0.3379***	-0.0955	-0.4354	0.0410	-0.2296	0.0175
Adj. R^2	97.41%	78.56%	90.31%	99.20%	99.22%	90.15%	90.85%	96.64%	93.42%	93.01%	96.70%	98.45%	67.76%	99.29%	74.46%	98.93%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel A reports the results for the domestic equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 15 - Performance estimates using the full conditional Carhart (1997) four-factor model in Europe at the individual fund level

Panel B: European Equity Funds																
Fund	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16
α_p	-0.0027**	-0.0035***	0.0007	-0.0012	-0.0013*	-0.0021*	-0.0013	-0.0019***	0.0002	-0.0017	-0.0018*	-0.0024*	-0.0043***	-0.0004	-0.0038***	0.0002
α_{STR}	-0.0077	0.0035	-0.0031	-0.0093	0.0003	-0.0128	-0.0128	0.0067	0.0042	-0.0178*	-0.0036	0.0022	-0.0079	-0.0148	-0.0111	-0.0084
α_{TS}	-0.0103*	-0.0025	-0.0040	-0.0074	-0.0053	-0.0008	0.0083	-0.0001	-0.0106**	-0.0021	-0.0032	-0.0039	-0.0001	-0.0010	0.0029	-0.0049
α_{DY}	-0.0120***	-0.0016	-0.0009	-0.0075**	-0.0037	-0.0058**	-0.0120**	0.0028	-0.0008	-0.0084**	-0.0062**	-0.0062	-0.0071*	-0.0132***	-0.0087***	-0.0028
β_p	0.9886***	0.7913***	0.9159***	1.0539***	0.9816***	0.9836***	0.9109***	0.9840***	0.9652***	1.0684***	1.0367***	0.9699***	1.1575***	1.0581***	1.0626***	0.9377***
$\beta_{\mathrm{STR*MKT}}$	-0.4225	-0.0321	0.2379	-0.0682	-0.0373	-0.0414	0.2860	0.0889	0.1499	-0.0873	-0.3687**	-0.0089	-0.3145	-0.5376	-0.2177	0.0428
$\beta_{\mathrm{TS*MKT}}$	0.1965	-0.1548	-0.0762	-0.0074	0.0296	-0.1566	-0.5242***	0.1230	0.3607**	-0.2413	-0.1265	0.1474	-0.3301*	-0.2751	-0.2619	-0.0834
$\beta_{\mathrm{DY*MKT}}$	0.5169***	0.3709**	0.4293***	0.3233**	0.4225***	0.3261**	0.6087***	0.0325	0.4978***	-0.0110	0.2679**	0.1206	0.1974	0.2520	0.3070**	0.2237*
β_{SMB}	0.1778**	-0.0783	0.0187	0.3195***	0.1500**	0.0684	-0.0898	-0.0935**	0.0842	0.5963***	0.2779***	0.2305***	0.2712***	0.4788***	0.0939	0.2607***
$\beta_{\mathrm{STR*}SMB}$	-0.0619	-0.2705	0.5857	0.7622**	0.9303**	0.7494*	-1.7310***	0.0259	0.8989***	0.6493	0.4711	0.6437*	0.1595	0.1006	-0.0450	0.4100
$\beta_{\mathrm{TS*}SMB}$	-0.1880	-0.8333**	-0.7440**	-0.0411	-0.1198	-0.3727	0.2077	0.1342	-0.1005	-0.3062	-0.0673	0.0825	0.0865	0.0206	0.0710	-0.5955*
$\beta_{\mathrm{DY*}SMB}$	0.2590**	-0.2850**	0.0256	0.3341**	0.2111**	0.0748	0.6878***	-0.0618	0.0968	0.0442	0.2968**	0.0204	0.0220	0.4085**	0.4126***	0.0749
β_{HML}	-0.1844***	-0.0636	0.0356	-0.4775***	-0.0852**	-0.0351	-0.0014	0.0414*	-0.0095	-0.4761***	-0.3837***	-0.3288***	-0.3041***	-0.3281***	-0.1641***	-0.2701***
$\beta_{\mathrm{STR*}HML}$	0.0595	0.0568	-0.3563	-0.3817	-0.4019*	-0.2886	0.4165	0.0498	-0.1484	-0.5010	-0.2594	-0.1424	-0.1652	0.0473	0.0938	0.1233
$\beta_{\mathrm{TS*}HML}$	0.0525	0.4052**	0.4954*	-0.0340	0.1561	0.4632**	-0.0603	-0.1683*	0.1530	0.3113	0.0980	-0.1207	0.0936	0.0922	0.0947	0.5306***
$\beta_{\mathrm{DY*}HML}$	-0.1925	0.1902	0.0777	-0.0742	-0.0232	0.1294	-0.5939***	-0.0254	0.0575	0.1715	-0.0559	-0.1253	0.0389	-0.1004	-0.1453	0.0867
β_{MOM}	0.0636	0.1197**	0.0222	0.1842***	-0.0216	0.0613	0.0765	-0.0248	-0.0598	0.1085	0.1444**	0.0897*	0.1796***	0.1206	0.1435**	0.0608
$\beta_{\mathrm{STR*}MOM}$	-0.0920	-0.1290	-0.1121	-0.1374	-0.4868**	-0.2929	0.9384***	-0.1800	-0.6822***	-0.3197	-0.2990	-0.2081	-0.0367	-0.3843	0.0330	-0.3922
$\beta_{\mathrm{TS*}MOM}$	0.3706**	0.3358*	0.1473	-0.0778	0.0302	-0.0407	-0.2205	0.0398	0.0170	0.0402	-0.0299	0.1214	-0.2231	-0.0487	-0.1653	0.1431
$\beta_{\mathrm{DY*}MOM}$	-0.2021	-0.3855**	-0.3982*	-0.4911***	-0.5019***	-0.4945**	0.0026	0.0079	-0.4837***	-0.4144*	-0.4736**	-0.1882	-0.3615	-0.5746***	-0.3240*	-0.5340**
Adj. R^2	88.85%	82.54%	87.34%	91.77%	93.98%	91.77%	88.06%	97.34%	94.05%	86.54%	92.34%	87.34%	88.90%	87.43%	92.82%	90.25%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel B reports the results for the European equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 15 - Performance estimates using the full conditional Carhart (1997) four-factor model in Europe at the individual fund level (Continued)

Panel B: European Equity Funds															
Fund	E17	E18	E19	E20	E21	E22	E23	E24	E25	E26	E27	E28	E29	E30	E31
α_p	-0.0036**	-0.0028**	-0.0011	-0.0016	-0.0018	-0.0032**	0.0011	0.0023	-0.0033***	-0.0035***	-0.0019***	0.0016	-0.0001	-0.0011	-0.0024***
α_{STR}	-0.0152	-0.0118	0.0165	0.0051	-0.0172**	0.0042	-0.0086	-0.0081	-0.0059	-0.0117	0.0049	-0.0146	0.0182	0.0044	-0.0002
α_{TS}	0.0065	-0.0063	0.0036	0.0110	0.0049	-0.0079*	-0.0002	0.0038	-0.0017	0.0013	0.0014	-0.0124**	-0.0009	-0.0050	-0.0037
α_{DY}	-0.0065	-0.0070***	-0.0021	0.0015	-0.0024	-0.0053	-0.0049	-0.0144**	-0.0049**	-0.0073***	-0.0007	-0.0112***	-0.0005	-0.0013	-0.0040**
β_p	0.9399***	1.0427***	1.0466***	1.0924***	0.6980***	0.8664***	0.8111***	0.9598***	1.0213***	0.9977***	0.9730***	1.0424***	1.0936***	0.9543***	0.9610***
$\beta_{\mathrm{STR*MKT}}$	-0.1086	0.0894	-0.2840	0.1736	-0.2080	-0.0508	0.0072	-0.3396	0.0601	0.0528	-0.0721	0.2823	-0.1000	-0.0868	-0.1385
$\beta_{\mathrm{TS*MKT}}$	-0.4557***	-0.0896	-0.2311**	-0.4546*	-0.0120	0.0071	0.0049	0.0671	-0.0339	-0.0852	-0.1076	0.1966	-0.0773	0.0785	-0.0509
$\beta_{\mathrm{DY*MKT}}$	0.2126	0.3151***	0.1021	0.1958	0.1943	0.4873***	0.0519	0.0502	-0.0091	0.5717***	0.0358	0.5036***	0.3153*	0.2580***	0.0765
β_{SMB}	-0.0173	0.1472**	0.1955	0.2357**	0.1187*	0.1487*	0.1479	0.8977***	0.0595	0.0466	0.0663	0.3838***	0.2950***	0.1312***	0.0980***
$\beta_{\mathrm{STR*}SMB}$	-0.5737	0.3886	0.1471	0.8378	-0.3680	0.0716	0.8048**	-0.1968	0.1381	-0.2217	0.1455	1.1924*	1.4561**	-0.0724	-0.1066
$\beta_{\mathrm{TS*}SMB}$	-0.0278	0.0942	0.0952	-0.2918	0.7430***	-0.1318	-0.1430	0.2199	0.1554	0.1188	0.1323	-0.5314	-0.0378	0.0156	0.2794***
$\beta_{\mathrm{DY*}SMB}$	0.1010	0.4207***	0.1407	0.1681	0.5006***	0.1574	0.0599	-0.0815	-0.0204	0.3983***	0.1821*	0.3671*	0.3956*	0.0693	0.1874***
β_{HML}	-0.1859***	-0.2674***	-0.0345	-0.0268	-0.0384	-0.2088***	-0.1815***	-0.5435***	-0.0423*	-0.1220**	-0.0683*	-0.0564	-0.0747	-0.0432	-0.0840***
$\beta_{\mathrm{STR*}HML}$	-0.2998	-0.3940	0.5736*	0.2296	0.2520	0.0400	-0.3857**	0.0730	-0.0301	-0.1089	0.1410	-0.2201	0.0768	0.2214	0.0842
$\beta_{\mathrm{TS*}HML}$	-0.0099	0.1281	0.1046	0.6733*	-0.3596**	-0.0233	-0.0026	0.1288	-0.1198	0.0038	-0.0264	0.5318**	0.2598	0.0268	-0.2078***
$\beta_{\mathrm{DY*}HML}$	-0.3076*	-0.1813	-0.0557	0.1993	-0.4871***	-0.1992	0.0266	-0.0498	-0.0876	-0.3561**	-0.1422	0.2159	0.2415	0.0210	-0.1785***
β_{MOM}	0.2733***	0.2054***	-0.0952	-0.1152*	-0.0771*	0.0133	0.1604***	0.0070	0.0008	0.0759	-0.0090	-0.1377*	-0.0313	0.0202	0.0491**
$\beta_{\mathrm{STR*}MOM}$	0.2581	-0.0378	-0.1532	-0.7527*	0.2857	-0.1815	-0.2489	0.3428	0.0725	0.1369	0.1665	-0.4358	-1.1643**	-0.2926*	0.0467
$\beta_{\mathrm{TS*}MOM}$	-0.1616	-0.2493	-0.0829	-0.4060*	-0.3301**	0.0980	0.1611	-0.0193	0.0411	0.0488	0.0010	0.0519	-0.1667	0.0351	-0.0031
$\beta_{\mathrm{DY*}MOM}$	-0.2569	-0.4356**	-0.2140	-0.7602**	0.1861	-0.3316*	-0.3199*	0.0595	0.1462*	-0.1455	-0.0043	-0.6583***	-1.1532***	-0.1601	-0.0919*
Adj. R^2	87.00%	91.08%	90.67%	85.61%	85.89%	87.39%	85.67%	74.25%	96.65%	91.99%	94.38%	89.96%	88.84%	94.95%	97.21%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel B reports the results for the European equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 15 - Performance estimates using the full conditional Carhart (1997) four-factor model in Europe at the individual fund level (Continued)

Panel B: European Equity Funds															
Fund	E32	E33	E34	E35	E36	E37	E38	E39	E40	E41	E42	E43	E44	E45	E46
α_p	-0.0013	-0.0008	0.0003	-0.0012	-0.0018**	-0.0027*	-0.0022	-0.0018**	-0.0035***	0.0002	0.00005	-0.0033**	-0.0041*	-0.0011	-0.0022**
α_{STR}	0.0088	0.0031	-0.0040	-0.0077	-0.0040	0.0067	-0.0160	0.0036	0.0037	0.0076	-0.0075	-0.0180**	0.0160	-0.0065	0.0061
α_{TS}	0.0017	-0.0088**	-0.0066	0.0105	0.0005	0.0079	0.0121	-0.0020	0.0024	-0.0012	0.0033	0.0073	-0.0019	-0.0050	0.0011
α_{DY}	0.00004	-0.0042	-0.0075***	-0.0055	-0.0018	0.0020	0.0002	-0.0040*	-0.0011	-0.0040	-0.0099	-0.0015	-0.0100	-0.0022	-0.0029
β_p	0.9934***	0.9910***	0.9940***	0.9992***	0.9776***	1.0320***	1.0094***	0.9602***	1.0975***	0.8215***	0.7841***	0.7690***	0.9228***	0.9223***	1.0320***
$\beta_{\text{STR*MKT}}$	-0.3275	-0.0570	-0.1693	-0.0508	-0.1264	-0.1822	-0.0029	-0.0766	0.0206	-0.0523	0.2524	-0.2803	0.4486	-0.1893	0.2886
$\beta_{\text{TS*MKT}}$	-0.2155	0.1254	0.0184	-0.1207	-0.1014	-0.1565	-0.4275*	-0.1109	-0.2727**	-0.0315	-0.1514	-0.6801***	-0.2459	0.1403	-0.0099
$\beta_{\text{DY*MKT}}$	0.3104**	0.1077	0.3249***	0.4176**	0.0046	0.1944	-0.2809	0.2731***	0.0100	-0.0289	0.0089	-0.2983**	-0.2720	0.3108**	0.1931*
β_{SMB}	0.2505**	0.0949*	0.3339***	-0.0659	0.0266	-0.0250	0.2970***	0.2014***	0.0978*	0.0840	0.4661***	-0.0216	0.1850	0.0168	0.1023*
$\beta_{\text{STR*}SMB}$	0.5643	0.2992	0.4425	0.3821	-0.3410	0.3325	-0.5603	0.1701	-0.4272	0.4003	0.3881	-0.0622	-0.2105	0.3737	0.2751
$\beta_{\text{TS*}SMB}$	-0.6059*	0.3061	-0.3068	-0.1750	0.1770	-0.2411	0.5600	-0.0170	0.2981	-0.0592	0.5220	0.0750	-0.0251	-0.2514	0.2983
$\beta_{\text{DY*}SMB}$	0.1056	0.3037**	0.1140	0.3958*	0.0873	0.1913	0.2692	0.2824**	0.1318	-0.1603	0.2023	0.0971	0.3983	0.0523	0.2818**
β_{HML}	-0.1739***	-0.2186***	-0.1828***	0.1700**	-0.0618**	0.0061	-0.0904	-0.1454***	-0.1490***	-0.2091***	-0.2305***	0.0274	-0.2235***	-0.0126	-0.0961***
$\beta_{\text{STR*}HML}$	-0.0037	-0.0188	0.1193	0.1805	0.1543	0.0426	0.1197	0.2761	0.0199	0.1219	-0.4870	-0.2823	0.4355	-0.3598	0.0192
$\beta_{\text{TS*}HML}$	0.4434**	-0.2938**	0.3233**	0.1232	-0.1047	0.0311	-0.1273	0.0966	-0.1500	-0.0365	-0.0339	0.0268	0.1965	0.2770	-0.1938
$\beta_{\text{DY*}HML}$	0.2064	-0.2041**	0.1433	-0.2882	-0.1576*	-0.0681	-0.0388	-0.0917	-0.2240**	0.1194	-0.3920*	-0.1072	-0.3173	-0.0619	-0.2799**
β_{MOM}	-0.0392	0.0831**	-0.0383	-0.0267	0.0353	0.0115	0.0067	-0.0138	0.0916**	0.0861**	-0.1264	0.1172**	0.0657	-0.0014	0.0203
$\beta_{\text{STR*}MOM}$	-0.4591	-0.0952	-0.4992	0.0750	0.1335	-0.6054**	0.6717*	-0.3934*	0.2603	-0.2226	0.3187	0.6687***	0.0953	-0.2889	-0.1255
$\beta_{\text{TS*}MOM}$	0.2164	0.1058	0.0932	-0.1365	0.0182	-0.0463	-0.4020	-0.0872	0.0538	0.1289	-0.1221	-0.0080	-0.2964	0.1403	0.0154
$\beta_{\text{DY*}MOM}$	-0.4707**	-0.1716	-0.4602**	-0.2108	0.0581	-0.4704***	0.2147	-0.5087***	0.0131	-0.1820*	0.3585	0.1653	-0.2274	-0.3096**	-0.1344
Adj. R^2	89.69%	94.46%	91.12%	88.01%	96.24%	90.74%	80.03%	95.08%	94.79%	91.22%	64.12%	85.48%	70.95%	90.12%	93.89%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel B reports the results for the European equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 16 - Performance estimates using the full conditional Carhart (1997) four-factor model in Global at the individual fund level

Panel C: Global Equity Funds																	
Fund	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17
α_p	-0.0030**	-0.0009	-0.0008	-0.0044***	-0.0046***	-0.0032**	-0.0025**	-0.0013	-0.0017*	-0.0051***	-0.0011	-0.0028**	-0.0018**	-0.0010	-0.0019*	-0.0006	-0.0020**
α_{STR}	-0.0001	0.0072	-0.0143*	-0.0074	0.0072	-0.0049	-0.0079	-0.0094	0.0041	-0.0160**	0.0021	0.0004	-0.0058	0.0001	0.0011	0.0130	0.0018
α_{TS}	0.0032	-0.0028	-0.0118*	0.0013	0.0021	-0.0065	-0.0132***	-0.0046	-0.0066	-0.0083	-0.0093**	-0.0073*	-0.0065	-0.0060	-0.0126**	-0.0168***	-0.0096**
α_{DY}	-0.0032	-0.0004	-0.0064	-0.0034	-0.0021	-0.0104**	-0.0136***	-0.0064	-0.0089**	-0.0110**	-0.0002	-0.0120**	-0.0082**	-0.0068*	-0.0119***	-0.0114**	-0.0058
β_p	0.9827***	0.2352***	0.9432***	0.9654***	1.0019***	0.9167***	0.9696***	1.0540***	1.0127***	0.8752***	1.0008***	1.1238***	1.0351***	1.0166***	1.0094***	1.0597***	1.0466***
$\beta_{\text{STR*MKT}}$	0.2678	-0.0887	0.0879	-0.3499	0.0123	0.0705	0.2456	-0.1555	-0.2813*	0.4139	-0.1379	-0.1296	0.0756	-0.1132	-0.2770	-0.2023	-0.1245
$\beta_{\text{TS*MKT}}$	-0.3174*	0.2039**	0.4219**	-0.2604	-0.2349	0.1289	0.3599*	0.3446**	0.1791	0.1578	0.4715**	0.1356	0.2799*	0.2253	0.3414*	0.5370**	0.3409**
$\beta_{\text{DY*MKT}}$	0.2207*	0.0137	0.3175*	0.1057	0.4313**	0.4567***	0.5004***	0.3245**	0.3630***	0.0898	0.2797*	0.4297**	0.3312***	0.2598**	0.5070***	0.3940**	0.3042**
β_{SMB}	0.1697**	0.0795*	0.1881**	0.2421***	-0.0298	0.2043**	0.2921***	0.1837**	0.0376	0.1374	-0.0409	0.1206	0.0526	0.0728	0.0334	0.3531***	0.0749
$\beta_{\text{STR*}SMB}$	-0.3407	-0.0658	1.0941**	-0.0546	-0.5477	0.4823	0.6870**	0.9058*	0.9565**	0.6883**	1.1641**	0.4386	0.9873**	0.8019**	0.9070**	0.7339*	0.7343**
$\beta_{\text{TS*}SMB}$	0.2913	-0.0515	0.1386	0.2447	0.3240	-0.3879	-0.2418	-0.0641	-0.4588	0.1884	-0.5285	-0.2761	-0.3342	-0.4914	-0.1558	-0.2187	-0.2584
$\beta_{\text{DY*}SMB}$	0.1993	-0.0420	0.2707	0.5862**	0.4838**	0.3895**	0.0018	0.1056	-0.0881	0.2458	-0.4233	-0.0341	0.0186	-0.1391	-0.1749	0.2944	-0.0983
β_{HML}	-0.0995*	-0.0976***	-0.0016	0.0131	0.2366***	0.0098	-0.2853***	-0.1760***	-0.0218	-0.1998***	0.0508	-0.0131	-0.0038	-0.0222	0.2375***	-0.0954	0.0248
$\beta_{\text{STR*}HML}$	0.5376	0.3716**	-0.5735	-0.0239	0.7825**	0.0484	-0.4874*	-0.6636**	-0.2450	-0.4650*	-0.7363*	0.0701	-0.5460*	-0.2717	-0.4248	-0.1023	-0.3803
$\beta_{\text{TS*}HML}$	-0.4618**	0.0081	0.0398	-0.0950	-0.4271	0.1564	0.2890	0.0299	0.2821	-0.2151	0.0942	0.1261	0.2776	0.3071*	0.1168	0.4020	0.1867
$\beta_{\text{DY*}HML}$	-0.2000	-0.0724	0.0675	-0.2991	-0.2365	-0.1770	0.1195	0.1516	0.3807*	-0.3706**	0.4665*	0.2229	0.3369	0.3893**	0.4611**	0.0394	0.3310*
β_{MOM}	-0.0976*	-0.0541*	-0.1132*	-0.0452	0.0243	-0.0317	-0.0083	0.0696	-0.0041	0.0187	-0.0235	-0.0156	0.0193	-0.0326	-0.0863	-0.2172**	-0.0127
$\beta_{\text{STR*}MOM}$	0.2421	-0.1094	-0.4185	0.0709	0.1878	-0.1197	-0.0019	-0.5002	-0.5214*	0.5415*	-0.5404*	-0.5244	-0.2257	-0.2973	-0.3901	-0.4351	-0.3902*
$\beta_{\text{TS*}MOM}$	0.1361	0.0875	0.1480	-0.0236	0.1897	0.3947	0.3185	0.1741	0.1989	0.0344	0.2432	0.2966	0.1793	0.2532	0.2277	-0.0219	0.2463
$\beta_{\text{DY*}MOM}$	-0.0103	0.0759	-0.2957	0.0462	-0.0255	-0.2872	-0.2597	-0.3358**	-0.4451***	-0.0925	-0.2974	-0.3255	-0.3703*	-0.2590	-0.4364**	-0.3218	-0.2905*
Adj. R^2	87.80%	58.60%	83.76%	86.50%	84.54%	85.16%	88.39%	89.34%	91.48%	84.77%	86.67%	89.40%	91.63%	91.68%	87.88%	83.65%	92.77%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel C reports the results for the global equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 16 - Performance estimates using the full conditional Carhart (1997) four-factor model in Global at the individual fund level (Continued)

Panel C: Global Equity Funds																
Fund	G18	G19	G20	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33
α_p	-0.0018**	0.0011	-0.0020	-0.0022**	-0.0019**	-0.0041**	-0.0003	-0.0038***	-0.0028	-0.0013	-0.0027	-0.0060***	0.0011	-0.0026**	-0.0030***	-0.0021
α_{STR}	0.0001	-0.0038	0.0012	-0.0012	-0.0037	-0.0052	-0.0010	-0.0022	-0.0002	0.0007	-0.0112	-0.0118	0.0013	0.0021	-0.0014	-0.0042
α_{TS}	-0.0095**	-0.0247***	-0.0119**	-0.0073	-0.0105**	0.0078	-0.0048	0.0046	-0.0139*	-0.0026	-0.0111	0.0002	-0.0166**	-0.0071	0.0012	-0.0117
α_{DY}	-0.0067*	-0.0098	-0.0009	-0.0077	-0.0083**	-0.0061	-0.0059	0.0012	-0.0109*	-0.0041	-0.0105*	-0.0010	-0.0080	-0.0015	-0.0014	-0.0053
β_p	1.0228***	0.8245***	1.0010***	1.0698***	1.0272***	1.0846***	0.9142***	1.1052***	0.8869***	0.9371***	1.0233***	1.0865***	0.7176***	1.0084***	1.0794***	0.9168***
$\beta_{STR*MKT}$	-0.1971	-0.1537	-0.0593	0.0610	-0.0548	0.0735	0.1982	-0.1731	-0.0835	-0.0206	0.4929	-0.0693	0.1707	-0.4023**	0.0390	0.0835
β_{TS*MKT}	0.2907*	0.6113**	0.4359**	0.2063	0.3412**	-0.1404	0.1540	-0.0659	0.2103	0.0975	0.4120*	0.0338	0.4847**	0.1502	0.0297	0.2495
β_{DY*MKT}	0.3199**	0.4055**	0.4492**	0.3242**	0.3858**	0.1949	0.2211*	0.1334	0.2853	0.2641*	0.3463**	0.1261	0.4774***	0.0845	0.2322	0.1845
β_{SMB}	0.0505	-0.0577	-0.0076	0.1566*	0.0269	0.4673***	0.0953	0.0986	0.2766**	0.1908**	0.4440***	0.2305*	-0.1148	0.1086	0.1254*	0.0770
$\beta_{STR*SMB}$	0.6603*	1.5285**	0.4921	0.7194*	0.8037**	0.3296	1.1004**	0.0693	0.2236	0.3382	-0.1816	0.6642	1.1046**	0.5038	0.3241	-0.6120*
β_{TS*SMB}	-0.3093	-0.7876*	-0.4848	-0.3331	-0.3856	-0.0056	-0.1987	0.1602	-0.5779	-0.1158	0.5586	0.3204	-0.5052	-0.1816	0.1135	0.3738
β_{DY*SMB}	-0.0884	-0.3062	-0.1494	0.0831	-0.1044	0.7578**	0.1738	0.0297	0.3589	0.4362***	0.7053**	0.7750**	-0.0808	-0.0430	0.2811	0.1580
β_{HML}	0.0061	-0.0358	0.0420	-0.0581	0.0059	-0.1313	-0.1274**	0.0573	-0.1076	-0.1701***	-0.1888***	-0.0779	-0.0133	-0.0282	0.0277	0.0070
$\beta_{STR*HML}$	-0.3416	-0.1164	-0.3879	-0.4721*	-0.6064**	0.6293	-0.5197	0.1684	0.1116	-0.4576**	0.2718	0.0719	0.4538	-0.1441	0.1747	0.5250*
β_{TS*HML}	0.1454	0.3065	-0.0442	0.1715	0.2299	-0.1850	0.0478	-0.1360	0.4426	0.2201	-0.2120	-0.3226	0.1574	0.2418	-0.1391	-0.2236
β_{DY*HML}	0.3432*	0.7558***	0.2792	0.1601	0.3550*	-0.2180	0.0843	-0.0692	-0.2205	-0.0870	-0.5951**	-0.3877	0.5319**	0.3932*	-0.1235	-0.2573
β_{MOM}	-0.0096	0.1294	-0.0017	0.0062	0.0320	-0.0448	-0.0521	-0.0205	0.0779	0.0305	-0.2921***	0.0886	0.0779	0.0090	-0.0606	-0.1574
$\beta_{STR*MOM}$	-0.3585*	-1.0158**	-0.1598	-0.0890	-0.1977	-0.4799	-0.2893	-0.3243	0.2021	0.3401*	-0.0942	-0.3756	-1.0079***	-0.3922*	-0.3895	0.0635
β_{TS*MOM}	0.3170	0.6855**	0.6204***	0.2437	0.3312	0.3081	0.2711	-0.0742	0.4984	-0.0434	0.1438	-0.2008	0.2165	0.1177	0.0186	0.2425
β_{DY*MOM}	-0.2782*	-0.6116***	-0.2164	-0.3333*	-0.2784	-0.5021**	-0.2104	-0.2328*	-0.0410	-0.2513	0.0174	-0.4235**	-0.7280***	-0.3500**	-0.3736**	0.0654
Adj. R^2	92.67%	76.00%	88.15%	91.89%	91.71%	80.17%	88.51%	90.14%	73.83%	89.09%	83.90%	80.29%	75.48%	89.09%	90.74%	79.06%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel C reports the results for the global equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 16 - Performance estimates using the full conditional Carhart (1997) four-factor model in Global at the individual fund level (Continued)

Panel C: Global Equity Funds																
Fund	G34	G35	G36	G37	G38	G39	G40	G41	G42	G43	G44	G45	G46	G47	G48	G49
α_p	-0.0054	-0.0045***	-0.0029**	-0.0016	-0.0008	-0.0035**	-0.0026*	-0.0020	-0.0043***	-0.0017	-0.0052***	-0.0018	-0.0036***	-0.0060**	-0.0026**	-0.0027
α_{STR}	0.0154	-0.0046	0.0062	0.0010	-0.0015	-0.0099	-0.0120*	0.0021	-0.0143*	-0.0227	-0.00003	-0.0054	-0.0063	-0.0045	-0.0090	-0.0083
α_{TS}	-0.0075	0.0032	-0.0054	-0.0127**	-0.0064	-0.0096	-0.0107*	-0.0027	-0.0003	-0.0181*	0.0017	-0.0104*	-0.0032	-0.0076	-0.0011	-0.0026
α_{DY}	0.0191	-0.0022	-0.0134***	-0.0062	-0.0074**	-0.0047	-0.0112*	-0.0063	-0.0103	-0.0135*	-0.0038	-0.0030	-0.0088	-0.0099	-0.0018	-0.0059
β_p	1.1619***	0.8280***	1.0158***	0.7909***	1.0165***	0.8478***	0.8883***	1.0169***	0.9316***	0.7403***	0.9193***	0.8327***	0.8636***	0.8626***	0.9528***	0.9295***
$\beta_{\text{STR*MKT}}$	-0.1169	0.1447	-0.0810	0.1917	-0.0955	0.0505	-0.0112	-0.2832	0.1672	0.0407	-0.1223	0.0734	0.1647	-0.3289	0.1484	-0.1940
$\beta_{\text{TS*MKT}}$	0.0287	0.0257	-0.0018	0.4816**	0.2583*	0.2103	0.1407	-0.0727	-0.2069	0.4112	-0.2516	0.4688**	0.1685	0.4119	-0.1009	-0.0080
$\beta_{\text{DY*MKT}}$	-0.2353	0.0103	0.0170	0.5197***	0.2752**	0.1412	0.3404	0.3406*	0.4284*	0.0058	0.1425	0.2800**	0.4615***	0.3233	0.1201	0.0913
β_{SMB}	1.8610***	0.1085*	0.2844***	0.1672*	0.0827	0.3224***	0.2577***	0.1838*	0.2873***	0.2624*	0.0079	-0.0463	0.2343**	0.1714	0.0146	0.2068
$\beta_{\text{STR*}SMB}$	0.8304	-0.3820	0.2197	-0.4638	0.8650**	0.1749	0.5293	0.1687	0.6632	-0.0017	0.0410	0.8509**	0.6541	0.7100	0.2976	-0.3592
$\beta_{\text{TS*}SMB}$	-1.9894	0.2051	-0.2185	-0.3857	-0.5522	-0.1065	0.0106	-0.1889	-0.1467	-0.0527	-0.1888	0.0723	-0.1626	0.3966	0.2404	-0.0711
$\beta_{\text{DY*}SMB}$	0.0181	0.3801**	-0.0627	0.2444	-0.1317	0.1729	0.1889	0.3208*	0.3838*	-0.1313	0.3658**	-0.4764*	0.4618***	0.2496	0.1733	0.3593
β_{HML}	-0.1058	-0.0475	-0.1888***	-0.0990	-0.0223	-0.1230**	-0.1419**	-0.0203	-0.0588	-0.0624	0.0510	0.1431**	-0.0820	0.0413	0.1067**	0.2374**
$\beta_{\text{STR*}HML}$	-0.1976	0.3195	-0.3327	0.4535	-0.2892	0.0341	-0.1492	-0.0385	-0.3173	-0.3867	0.5552**	-0.4463	0.0087	-0.1737	-0.1575	0.3832
$\beta_{\text{TS*}HML}$	3.0816**	-0.1298	0.2035	0.3486	0.3557*	-0.0713	0.0662	-0.0099	0.0869	0.1755	-0.2350	-0.0612	0.1783	0.1505	-0.3067*	-0.0832
$\beta_{\text{DY*}HML}$	1.1847	-0.2808**	-0.1514	-0.0536	0.3967**	-0.0281	0.1373	-0.0009	-0.1665	-0.3039	-0.3244	0.5774**	-0.2147	0.3379	-0.2938*	0.0034
β_{MOM}	-0.8219**	0.0193	0.0067	-0.0025	-0.0344	-0.0221	-0.0161	0.0242	-0.0442	-0.0295	0.0772	-0.0579	-0.0746	0.0895	-0.0063	-0.1149
$\beta_{\text{STR*}MOM}$	-1.4846	0.2383	0.0763	0.2210	-0.3395	0.1276	-0.1235	0.1141	-0.0790	0.4315	-0.0326	-0.3995	-0.3360	-0.3638	0.0132	0.5193
$\beta_{\text{TS*}MOM}$	-0.1762	0.1352	0.0055	0.7100***	0.2951	0.3686	0.1106	0.2192	0.1701	0.2727	0.3787	0.0220	0.1640	-0.1411	0.2468	0.3544
$\beta_{\text{DY*}MOM}$	-0.0056	0.1141	-0.0746	0.0805	-0.2699	-0.0176	-0.3868	-0.3057	-0.4215	0.2813	-0.2341	-0.3448*	-0.4155**	-0.5484**	-0.0348	-0.0964
Adj. R^2	25.45%	90.92%	86.76%	81.32%	91.79%	82.75%	83.28%	86.03%	81.98%	55.54%	78.82%	80.25%	83.55%	66.54%	91.00%	71.00%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel C reports the results for the global equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 16 - Performance estimates using the full conditional Carhart (1997) four-factor model in Global at the individual fund level (Continued)

Panel C: Global Equity Funds																
Fund	G50	G51	G52	G53	G54	G55	G56	G57	G58	G59	G60	G61	G62	G63	G64	G65
α_p	-0.0024	-0.0023	-0.0023	-0.0035***	-0.0022*	-0.0018	-0.0043***	-0.0025	-0.0069***	-0.0015	-0.0032	-0.0011	-0.0003	-0.0010	-0.0043***	-0.0036**
α_{STR}	-0.0036	0.0063	-0.0116	-0.0104	-0.0109	-0.00002	-0.0004	0.0010	-0.0020	0.0032	-0.0242**	0.0022	-0.0045	-0.0113	-0.0082	-0.0135*
α_{TS}	-0.0075	-0.0051	-0.0131*	0.0023	-0.0125*	-0.0036	-0.0019	0.0172*	0.0153	-0.0085	-0.0101	-0.0070	-0.0088	0.0095	0.0007	-0.0064
α_{DY}	0.0014	0.0231	-0.0126**	-0.0030	-0.0140***	-0.0065	-0.0012	-0.0065	-0.0135*	-0.0024	-0.0129*	-0.0056	-0.0103**	-0.0037	-0.0046	-0.0127*
β_p	0.9738***	0.8087***	1.0416***	0.9353***	0.9581***	1.0366***	1.0917***	1.1037***	0.9691***	0.7760***	0.7644***	1.0041***	0.9218***	0.7940***	0.8195***	0.9603***
$\beta_{\text{STR*MKT}}$	0.3221	0.1890	0.1210	0.1336	0.1929	0.3703	0.0914	-0.2179	0.3901	0.0329	0.2193	-0.3613*	0.1616	0.0143	-0.1005	0.1348
$\beta_{\text{TS*MKT}}$	0.3314	0.4201	0.3491	0.1481	0.3051	0.2210	-0.1258	-0.3230	-0.7282**	0.3866*	0.3434	0.2457	0.5486***	-0.3908**	-0.1794	0.0710
$\beta_{\text{DY*MKT}}$	0.2695	-0.3284	0.4717**	0.2291	0.4662***	0.5949**	0.1085	0.3449	0.1234	0.2573**	0.4007*	0.2972	0.3194**	-0.0202	-0.0504	0.5275**
β_{SMB}	-0.0972	1.0465***	0.3413***	0.0217	0.2710***	0.1066	0.1743***	0.6639***	0.2689*	0.0338	0.2887**	0.0236	0.1868**	0.4506***	0.1936**	0.2803***
$\beta_{\text{STR*}SMB}$	0.2379	0.4795	1.1421***	0.0335	0.7022*	1.1840**	0.0179	0.5134	-1.7512**	0.8917**	0.8915**	0.4512	1.0625**	0.2760	0.8545*	0.5161
$\beta_{\text{TS*}SMB}$	0.1279	0.1948	0.1971	0.2005	-0.1299	0.3633	0.1096	0.4475	-0.0065	0.2288	0.1857	-0.3649	-0.2634	0.3645	-0.1178	-0.0680
$\beta_{\text{DY*}SMB}$	0.1067	0.4171	0.5606**	0.3382	-0.0514	0.4443**	0.3016**	1.0561***	0.9777**	0.2226	0.6394***	-0.1910	0.0547	0.5332**	0.2247	0.3397*
β_{HML}	0.2649***	-0.1040	0.2173***	0.0930*	-0.0540	0.2044***	-0.1966***	-0.2430**	-0.2166**	0.0556	-0.1027	0.0386	-0.1244**	-0.1257**	0.0155	-0.0756
$\beta_{\text{STR*}HML}$	0.2252	-0.2037	-0.5584*	0.0095	-0.3940	-0.5137	-0.2392	0.8065	1.1102*	-0.0712	-0.5931	-0.2164	-0.2883	0.1500	-0.1035	-0.2778
$\beta_{\text{TS*}HML}$	-0.1779	0.7975	-0.0024	-0.3026	0.1476	-0.4627	-0.1610	-0.2898	-0.1719	-0.2153	0.0891	0.2170	0.3488	-0.1844	0.2761	0.1104
$\beta_{\text{DY*}HML}$	0.1736	0.2504	0.0678	-0.1289	0.2033	-0.0818	-0.3052**	-0.4517	-0.9487**	0.0264	-0.2759	0.4468**	0.4975**	-0.4584**	-0.2120	-0.0701
β_{MOM}	0.0298	-0.4167**	-0.2347***	-0.0822	-0.1208*	-0.1234*	0.0895**	-0.0376	0.2616**	-0.0063	0.0302	-0.0299	0.0039	-0.1206*	-0.0420	-0.0207
$\beta_{\text{STR*}MOM}$	0.0847	-0.6647	-0.0215	-0.4089	-0.1418	-0.2985	0.1386	-0.5272	0.9721*	-0.3507	-0.2019	-0.4630*	-0.3477	-0.4300	-0.0751	-0.1329
$\beta_{\text{TS*}MOM}$	0.0341	-0.4217	0.0902	0.4611*	0.1793	0.0354	0.0568	-0.5322	-0.0291	0.0461	0.2168	0.2598	0.0999	-0.0705	0.1987	0.1511
$\beta_{\text{DY*}MOM}$	-0.0154	-0.0024	-0.3210	-0.1110	-0.3864*	-0.4712*	-0.0670	-0.6690**	0.0724	-0.2014	-0.3464	-0.3041*	-0.4905***	0.0829	-0.0672	-0.4090*
Adj. R^2	81.95%	28.05%	86.33%	84.58%	85.07%	83.32%	95.13%	76.31%	71.56%	80.71%	74.45%	90.17%	86.74%	78.67%	78.86%	84.18%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel C reports the results for the global equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.

Appendix 16 - Performance estimates using the full conditional Carhart (1997) four-factor model in Global at the individual fund level (Continued)

Panel C: Global Equity Funds																
Fund	G66	G67	G68	G69	G70	G71	G72	G73	G74	G75	G76	G77	G78	G79	G80	G81
α_p	-0.0015	-0.0030**	-0.0011	-0.0010	-0.0033***	-0.0038***	-0.0059***	0.0002	-0.0020***	-0.0015	-0.0025**	-0.0031**	-0.0044***	-0.0031***	-0.0039***	-0.0053**
α_{STR}	0.0044	0.0114	0.0068	0.0016	-0.0082	-0.0019	0.0150**	0.0079	0.0041	-0.0040	0.0017	-0.0021	-0.0070*	0.0005	-0.0110	0.0041
α_{TS}	0.0025	-0.0018	0.0140	-0.0020	-0.0053	-0.0005	0.0057	0.0001	0.0007	-0.0044	-0.0072	-0.0042	-0.0038	0.0037	-0.0030	-0.0181*
α_{DY}	-0.0111	-0.0106**	0.0025	-0.0041	-0.0071**	-0.0075*	-0.0030	0.0035	0.0007	-0.0016	-0.0071**	-0.0064	-0.0043	-0.0008	-0.0053	-0.0149*
β_p	1.1030***	1.0434***	1.0851***	1.0310***	0.9783***	0.9846***	1.0602***	0.9647***	1.0081***	0.9600***	1.0927***	1.0644***	0.9869***	1.0635***	0.9645***	1.0836***
$\beta_{\text{STR*MKT}}$	-0.3414	-0.3804	-0.0943	0.7777**	0.0412	-0.1247	-0.1265	0.1847	-0.0949	0.6011***	-0.1355	-0.1854	0.0073	0.0315	0.4271	0.3615
$\beta_{\text{TS*MKT}}$	-0.1991	-0.3001	-0.8414***	-0.0593	0.0042	-0.1960	-0.6123***	-0.1908	-0.1219*	-0.0802	0.2417*	-0.1033	0.0253	-0.1246	0.2143	-0.3070
$\beta_{\text{DY*MKT}}$	0.0391	0.5028***	-0.2035	0.5888***	-0.1985**	0.3228**	-0.0507	0.1342	0.1193**	0.1537	0.2235**	0.0998	0.0996	0.0275	0.2200	-0.0975
β_{SMB}	0.4758***	-0.1013	0.5693***	0.0669	-0.0396	0.0945	0.1362*	0.0384	0.0295	0.0610	0.2134***	0.1790**	0.1387**	0.1149**	0.1968**	0.6170***
$\beta_{\text{STR*}SMB}$	0.3079	0.2132	0.0760	0.6891	-0.3507	0.2730	-0.6010	-0.2542	-0.0122	-0.2229	0.7014**	0.2512	0.2713	0.0824	0.8309*	0.9719
$\beta_{\text{TS*}SMB}$	-0.2481	0.0573	0.5807	0.2787	-0.2773	0.0768	0.1544	-0.0703	0.0299	0.3235	0.1221	-0.0844	-0.0866	0.0751	-0.1461	0.3547
$\beta_{\text{DY*}SMB}$	-0.2279	0.0310	0.3040	0.7401***	-0.4323***	0.3319**	0.3255	0.3084*	0.2155**	0.4000**	0.0924	0.1609	0.0145	0.2372*	0.0831	0.8383**
β_{HML}	-0.3683***	0.2036***	0.0244	-0.0245	-0.1988***	0.0453	-0.1298**	-0.1522***	-0.0869***	-0.0742	-0.1156***	0.0289	-0.0724	-0.0984***	-0.0354	-0.2057**
$\beta_{\text{STR*}HML}$	-1.0688	-0.2001	0.2248	-0.0423	-0.0134	0.3541	0.7384**	0.0615	0.0092	0.4203	-0.3876	0.1114	-0.2557	-0.0500	-0.2033	0.0795
$\beta_{\text{TS*}HML}$	0.2002	-0.0931	-0.7842*	-0.5898*	-0.0052	-0.1615	-0.2210	-0.0108	-0.1337	-0.3471*	0.0971	0.0648	0.1326	-0.0993	0.2192	-0.1540
$\beta_{\text{DY*}HML}$	0.3660	0.2176	0.0525	-0.2252	0.2240*	-0.0160	-0.4524**	-0.1501	-0.2336***	-0.2668	0.0574	-0.0473	0.1122	-0.1685	0.1171	-0.2159
β_{MOM}	0.2396**	0.0657	-0.2811***	-0.0378	0.2155***	0.0054	0.0252	0.1271***	0.0218	0.0400	-0.0784*	0.0007	0.0159	0.0522	-0.0732	0.3201***
$\beta_{\text{STR*}MOM}$	-0.3553	-0.2822	-0.5408	-0.4777	0.2867	-0.1897	0.2558	0.0533	0.0460	0.1146	-0.3837**	-0.0191	-0.0136	-0.0529	-0.3966	-0.4146
$\beta_{\text{TS*}MOM}$	0.2794	-0.0669	-0.0544	0.1275	0.1542	0.0506	-0.0559	0.0094	0.0622	0.1816	0.0613	0.0759	-0.0141	-0.0145	0.2229	-0.1660
$\beta_{\text{DY*}MOM}$	-0.3716	-0.3865**	-0.2242	-0.8567***	-0.1349	-0.3996**	0.0404	-0.0805	0.0302	-0.0683	-0.3195***	-0.0970	-0.2170*	-0.0924	-0.3246*	-0.5671**
Adj. R^2	70.66%	88.18%	70.57%	78.10%	93.66%	90.47%	89.53%	92.28%	97.50%	90.64%	93.74%	90.25%	94.60%	95.60%	82.79%	76.61%

This appendix presents the conditional alphas, the coefficients estimates for the conditional alpha function, the conditional betas and the coefficients estimates for the conditional beta function for each German mutual funds, using the conditional Carhart (1997) four-factor model with time-varying alphas and betas of equation (5). Panel C reports the results for the global equity funds. Additionally, MKT, SMB, HML and MOM represent the coefficients of the excess market returns, size, book-to-market and momentum factors, respectively. The predetermined information variables are the short-term rate (STR), the term spread (TS) and the dividend yield (DY). All these variables are demeaned and lagged 1-month. Adj. R^2 is the adjusted coefficient of determination, expressed in percentage. The asterisks are used to represent statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroscedasticity and autocorrelation adjusted errors.