School of Finance

University of St.Gallen

Do Mutual Funds Outperform During Recessions? International (Counter-) Evidence

Christopher Fink
Katharina Raatz
Florian Weigert

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Do Mutual Funds Outperform During Recessions? International (Counter-) Evidence

Authors:
Christopher Fink[*], **Katharina Raatz**[†], **and Florian Weigert**[‡]

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Abstract

Recent academic research predicts that (i) equity mutual funds have a systematically better performance during periods of economic downturn and (ii) investors are willing to pay high fees for funds that provide recession insurance. In this paper, we test these hypotheses using international fund data from 16 different countries. Surprisingly, we obtain contrary results: Mutual funds underperform by a statistically significant -0.4% during months of economic downturn and funds with high recession alphas charge low fees to investors. We provide evidence that recession underperformance can be explained by fund managers' forced trading in an illiquid market environment.

JEL Classification: F30; G01; G11; G15; G23

Keywords: International Mutual Fund Performance; Mutual Funds; Recession

[*]Christopher Fink is from the Chair of Finance and CDSB, University of Mannheim; L9, 1-2, 68131 Mannheim, Germany; fink@uni-mannheim.de

[†]Katharina Raatz is from the University of Mannheim; L9, 1-2, 68131 Mannheim, Germany; K.Raatz@gmx.de

[‡]Florian Weigert is from the Swiss Institute of Banking and Finance, University of St. Gallen; Rosenbergstrasse 52, 9000 St. Gallen, Switzerland; florian.weigert@unisg.ch

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1 Introduction

Over the past few decades, the mutual fund industry worldwide has flourished as an investment vehicle for both retail and institutional investors. The number of mutual funds worldwide increased from about 50,200 in 1998 to about 73,000 in 2012. The assets managed grew from 9.6 trillion USD at the end of 1998 to 26.84 trillion USD at the end of 2012, with about 40% of the assets invested into equity mutual funds (see Investment Company Factbook (2013)).

While the global fund industry has gained importance as a whole, academic studies on the performance of mutual funds have mainly focused on the U.S. market. Among others, Malkiel (1995), Jensen (1968), and Fama and French (2010) show that actively managed U.S. equity mutual funds in general underperform the market, net of fees. However, unconditional performance measures may understate the value added by active mutual fund managers: Moskowitz (2000), Staal (2006) and Kosowski (2011) document that U.S. equity mutual fund managers perform significantly better during economic downturns than during economic upturns. So far, this empirical finding is not well understood: Is there a systematic outperformance of mutual funds during recessions? If so, do mutual fund managers outperform in recessions because they want to outperform or is it simply easier for them to outperform?

A first attempt to rationalize the answers to this puzzle is proposed by Glode (2011). He develops a model in which a fund manager can generate state-specific active fund returns. These conditional returns come at a disutility to the manager, as they require an effort to generate and their pay-off will be highest in states in which investors are willing to pay more for these returns. Hence, a fund manager exercises more effort in generating abnormal returns in times when the economy is performing badly because then the investors' marginal utility of consumption is large and investors are willing to pay high fund fees for this insurance. As a result, the theoretical model predicts that (i) *on aggregate* mutual funds outperform during economic downturns and (ii) *cross-sectionally* that – relative to other funds – funds with poor unconditional performance can charge high fees to investors because they earn abnormal state-specific returns during recessions.[1]

This paper empirically tests hypotheses (i) and (ii) using a worldwide dataset of equity mutual funds in 16 different countries for the sample period from 1980 to 2010.[2] To determine whether a country is in a bad economic condition, we use the recession indicators from the National Bureau of Economic Research (NBER) for the USA and recession indicators from the Economic Cycle Research Institute (ECRI) for the 15 remaining countries.

Our analysis reveals the following surprising results. First, we do not find evidence that mutual funds outperform during recessions. To the contrary, based on results of our pooled worldwide sample, mutual funds *underperform* by a statistically significant -0.4% in the months of economic downturn.[3] On a country level, we find (depending on the respective regression model) that mutual funds underperform during recessions in 11 (15) of the 16 countries with the underperformance being statistically significant at the 1% level.[4] Second, we do not find that funds with poor unconditional performance can charge high fees to investors because they offer recession insurance in the form of high

[1]Glode (2011) and Glode (2008) - in an earlier working paper version - give empirical support that U.S. mutual funds indeed have a systematically better performance when the economy is in a bad state and that - relative to other funds - funds with poor unconditional performance tend to charge high fees and generate highly countercyclical returns.

[2]The sample period for each country begins with the availability of country-specific mutual fund data in the Morningstar database.

[3]Recession performance of funds is based on the Carhart (1997) four-factor model based on country-specific market and accounting information. Our results remain stable when we compute alphas using alternative factor models or use regional market and accounting information (see Table 6).

[4]During our sample period from 1980 to 2010, we also find an underperformance of mutual funds during recessions for the U.S. This result is in contrast to earlier empirical findings of the literature. We reveal that the reason for the differences is the longer sample period applied in our study.

state-specific returns. Based on results of the pooled worldwide sample, we show that mutual funds in the quintile with the lowest unconditional performance charge the highest fees but also display the *lowest* recession performance. The difference in recession alphas between funds with the best unconditional performance and the worst unconditional performance is 1.07% per month and statistically significant at the 1% level.

We conduct robustness checks and additional analyses to shed light on the empirically documented underperformance of mutual funds during recessions. Our results remain stable when we compute fund alphas based on alternative asset pricing risk factors and use recession indicators for each country obtained from the Organisation for Economic Co-operation and Development (OECD). We also find that recession underperformance is not specific to the fund's investment style. In addition, we investigate whether investors react with high future inflows into funds with high recession performance. We do not find evidence that funds who show superior state-specific performance receive higher future inflows when controlling for unconditional performance.

How can one explain the *negative* performance of funds during recessions? A potential explanation is that mutual fund managers are more *active* during recessions - however, increased activity does not lead to state-specific outperformance, but in turn results in higher trading costs and finally worsens recession performance. Increased active management of mutual funds during recessions can occur as a result of two channels: First, fund managers may *voluntarily* deviate more strongly from the benchmark in order to outperform competitors based on compensation incentives (see, e.g., Massa and Patgiri (2009) and Huang, Sialm, and Zhang (2011)) and employment risk (Kempf, Ruenzi, and Thiele (2009)). Second, fund managers may be *forced* to be more active because investors tend to redeem their money from equity markets during periods of economic downturns (see, e.g., Longstaff (2004)). Hence, mutual funds are more likely to be engaged in asset fire sales in recessions than in non-recessions and have to liquidate their assets in a bad market environment characterized by high average trading costs (Coval and Stafford (2007)). Consistent with these ideas, our empirical results indicate that (i) average fund manager activity – measured by the tracking error, i.e., a fund's deviation from its benchmark – is higher in recessions than in non-recessions, (ii) aggregate flows into mutual funds are negative (positive) during recessions (non-recessions), and (iii) market illiquidity is higher in recessions than in non-recessions. Turning to performance implications, we find that during times of economic downturn, high tracking error funds underperform low tracking error funds by statistically significant -0.73% per month. This spread is magnified when we restrict our analysis to months with negative aggregate fund flows and months with high market illiquidity. In cross-country regressions, we find that the average tracking error as well as aggregate recession fund flows and market illiquidity are statistically significant explanatory variables for a country's average mutual fund recession performance.

Finally, as an additional out-of-sample check, we investigate the recession performance of hedge funds using data from the TASS database in the period from 1994 to 2010. To analyze whether forced trading is a main driver of fund underperformance during economic downturns, we compare the recession performance of hedge funds that employ lockup restrictions with the recession performance of hedge funds that do not employ lockup restrictions. We find compelling evidence that hedge funds that employ lockup restrictions display a better recession performance than their counterparts: the difference in recession performance controlling for common hedge fund risk factors is approximately 0.37% per month and is statistically significant at the 1% level. Hence, funds that are secured from forced trading by lockup restrictions show a significant better performance during periods of economic downturn than their unsecured counterparts.

The rest of the paper is organized as follows. Section 2 gives an overview of the related literature. In Section 3 we describe our dataset and explain the methodology of our analysis. Section 4 provides the main empirical results of our study. Finally, in Section 5, we conclude.

2 Literature Review

Our study is related to two strands of literature. First, we contribute to the literature investigating performance measurement of mutual funds in an international context. Ferreira, Keswani, Miguel, and Ramos (2013) investigate the determinants of the performance of equity mutual funds in 27 countries. They document that in most of the countries actively managed funds underperform passive investment strategies. Keswani, Ferreira, Miguel, and Ramos (2014) find significant performance persistence of equity mutual funds around the world and show that performance persistence is related to differences in mutual fund industry development across countries. Cremers, Ferreira, Matos, and Starks (2015) show that actively managed funds in many countries choose portfolios that track their stated benchmark index closely. This degree of 'closet indexing' of active funds is positively associated with fees as well as negatively related to performance and exists less in countries with a higher market share of passive index funds. Finally, Breloer, Scholz, and Wilkens (2014) find that a majority of international equity mutual funds exhibit significant exposure to country/sector momentum indicating that these factors matter for risk-adjusted fund performance evaluation.

Second, our paper contributes to the literature of time-varying performance measurement of mutual funds. Moskowitz (2000), Staal (2006), and Kosowski (2011) document that risk-adjusted performance of U.S. mutual funds is negatively correlated with the business cycle and that mutual fund alphas are 1-3.5% p.a. higher in recessions than in expansions. Lynch and Souza (2012) and Badrinath and Gubellini (2012) document that this counter-cyclical outperformance depends on the fund's specific investment style and that for many fund styles, conditional outperformance switches from counter-cyclical to pro-cyclical over time.

Glode (2011) is the first to rationalize the empirical finding of counter-cyclical outperformance of mutual funds in a theoretical framework and shows that previous unconditional performance measures seem to be misspecified. In his model, a skilled, active fund manager is able to generate returns that depend on the state of the economy. Assuming rational investors, the fund manager will generate outperformance during economic downturns as the pay-off will be highest in states in which investors are willing to pay more for these returns. Moreover, mutual funds that perform well during recessions can charge higher fees as they provide an insurance for investors when the economy is in a bad state. Hence, in this setup, mutual fund investing and negative unconditional expected fund returns can simultaneously arise.[5] Finally, in a related paper, Kacperczyk, van Nieuwerburg, and Veldkamp (2013) provide evidence that fund manager abilities are time-varying and change with the business cycle. In particular, skilled managers that pick stocks successfully in expansions also time the market well in recessions. Fund managers who exhibit this time-varying skill outperform the market by 50-90 basis points per year.

In this paper, we extend the literature by investigating the time-varying performance

[5]Besides the consumption-based argument put forward by Glode (2011), there exist different alternative explanations to rationalize recession outperformance. Kothari, Shu, and Wysocki (2009) argue that corporate managers delay disclosure of bad news relative to good news. Hence, during recessions, experienced investors, such as fund managers, could have an informational advantage over unexperienced retail investors and therefore earn higher returns. Other potential explanations include time-varying trading and liquidity costs during recessions and expansions (see e.g., Kosowski (2011)). Finally, time variation in risk exposures (e.g., time-varying market betas of mutual funds in recessions and expansions) without any active portfolio rebalancing can potentially explain outperformance during economic downturns.

of domestic equity mutual funds using a worldwide sample of 16 different countries. In particular, this paper is the first to empirically test on a global scale whether (i) mutual funds outperform during recessions and (ii) whether funds with poor unconditional performance can charge high fees to investors because they earn state-specific abnormal returns during recessions.

3 Data and Methodology

From the Morningstar mutual fund database, we retrieve data on all actively-managed open-end equity mutual funds domiciled in Australia, Austria, Canada, China, Denmark, France, Germany, India, Italy, Japan, Mexico, Norway, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, United Kingdom, and the USA.[6] The sample time period ranges from 1980 until 2010 with some countries having shorter time periods due to data availability. We narrow the data sample to only domestic equity mutual funds.[7]

As the mutual fund data is reported on a share class level, the multiple share classes are aggregated based on the fund's total net assets (TNA).[8] To have a sufficient number of observations in our regression analysis in Section 4, we delete countries that have less than 30 funds, which removes Austria from our sample. Furthermore, we drop all funds from the sample that do not go through at least one recession and have less than 12 months of observations.

To determine whether a country is in a poor or good economic condition, we use the recession indicators from the National Bureau of Economic Research (NBER) for the

[6]The selection of countries includes all continents and uses the United Nations Development Index (HDI) to select countries with higher financial education.

[7]Funds are identified by their classifications 'Global Category', 'Morningstar Category' and 'Investment Area'.

[8]As a robustness check, we perform our empirical analysis just based on the share class with the maximum TNA. Our main results remain unchanged.

USA and the recession indicators from the Economic Cycle Research Institute (ECRI) for the remaining countries.[9] We delete all countries that do not go through at least one recession or spent less than 5% of their sample time in a recession. This restriction removes Australia, China and India from our sample. All the other countries spend about 10% to 40% of their sample time in recessions.

We display summary statistics and data availability for all countries in Table 1. The average time a country spends in a recession is displayed in Figure 1.

[Insert Table 1 about here]

[Insert Figure 1 about here]

Table 1 shows that the highest number of domestic equity funds are located in the USA (3,692), followed by Japan (811), and South Korea (524). U.S. equity funds also have the highest average fund TNA with a mean value of 553m USD.

From Figure 1, we observe that Italy (41.9% of the time) and UK (41.6% of the time) spend most of their sample time in a recession. The least time in recessions is spent by South Korea (11.4%) and the USA (15.8%).

In Figure 2, we take a look at the percentage of countries that are in a recession at the same point in time.

[Insert Figure 2 about here]

The first subplot shows the development of recession clustering in all countries over time. We find that the number of worldwide recessions is high during the beginning of the

[9]ECRI does not provide recession indicators for Norway and Denmark. Instead we retrieve recession indicators for those countries from the OECD business cycle measure as in Christoffersen (2000) and Steigum (2004). We also use the OECD business cycle indicators for all countries in our sample as a robustness test in Section 4.3.1.

1980s, 1990s, 2000s, and in 2009, which can be related to worldwide economic downturns (oil price shock and restrictive monetary policy of the FED in the 1980s, banking crises at the beginning of the 1990s, the burst dot-com bubble in the beginning of the 2000s, and the financial crisis in 2009 following the collapse of the U.S. mortgage market). The subplots North America, Europe, Asia and rest of the world show the percentage of countries that are in a recession at the same point in time in a particular geographical region. Hence, one can infer that there are time periods in which recession periods in the different geographical regions do not overlap.

To get an impression of differences in unconditional mutual fund performance across countries, we provide average monthly fund returns for all countries in Figure 3.

[Insert Figure 3 about here]

Figure 3 shows that the highest average returns in percent per month are found in South Africa (1.18%) and Sweden (0.97%), whereas the lowest returns are found in Italy (-0.37%) and Japan (-0.21%). The average monthly return over all funds and all countries is 0.48%.

Performance Evaluation. In our empirical analysis in Section 4, we evaluate conditional mutual fund performance (in recessions) using the Carhart (1997) four factor model. We differentiate between two specifications.

Specification (1) estimates the Carhart (1997) model including a business cycle dummy (BC) variable to account for recession performance

$$r_{it} = \alpha + \beta_1 BC_t + \beta_2 RMRF_t + \beta_3 SMB_t + \beta_4 HML_t + \beta_5 MOM_t + \epsilon_{it}. \quad (1)$$

In specification (2), we additionally interact the asset pricing risk factors with the business cycle variable

$$\begin{aligned} r_{it} &= \alpha + \beta_1 BC_t + \beta_2 RMRF_t + \beta_3 RMRF_t \times BC_t + \beta_4 SMB_t + \beta_5 SMB_t \times BC_t \\ &\quad + \beta_6 HML_t + \beta_7 HML_t \times BC_t + \beta_8 MOM_t + \beta_9 MOM_t \times BC_t + \epsilon_{it}, \end{aligned} \tag{2}$$

where r_{it} is the monthly fund return in excess of the risk-free rate, $RMRF$ is the market factor, SMB is the size factor, HML is the value factor, and MOM is the momentum factor.

We use monthly factor returns and approximations for the risk-free rate from two different sources: Data for the USA is taken from Kenneth French's webpage; for the remaining countries we obtain data from the webpage of Sandy Lai.[10] As a robustness check in Section 4.3.1, we also verify our results using the individual factor returns obtained from Andrea Frazzini's webpage[11] and Stefano Marmi's webpage[12], as well as the international regional factor returns from the webpage of Kenneth French.[13] Kenneth French provides regional risk-free interest rates, market, size, and book-to-market factors for Europe, North America, Japan and Asia. We assign our sample countries to the different factors based on their geographical location. We also test the stability of our results by calculating own individual factor returns on the basis of domestic total return indices retrieved from Datastream.[14] The start dates for mutual fund data in Morningstar

[10]The dataset contains the four Carhart (1997) factors for all countries in our sample usually beginning in the 1980s. Data can be obtained from http://www.sandylai-research.com/html/research___data.html and is also described in Eun, Lai, de Roon, Zhang (2010) and Hau and Lai (2013).

[11]Data Library: http://www.econ.yale.edu/~af227/data_library.htm

[12]Data Library: http://homepage.sns.it/marmi/Data_Library.html

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

[14]We approximate the market portfolio using the broadest equity market index of the country and the risk-free rate by a domestic deposit rate. The SMB factor is calculated as the difference between the

and the different factor returns for all individual countries in our sample are displayed in Table 1.

4 Empirical Results

4.1 Aggregate Mutual Fund Performance During Recessions

4.1.1 Pooled Sample

We investigate the conditional performance of equity mutual funds during recessions in a worldwide sample of 16 different countries. As described above, we apply the Carhart (1997) four factor model to investigate risk-adjusted performance. If not otherwise specified, the return factors for the USA are obtained from Kenneth French's webpage and for the remaining countries from Sandy Lai's webpage. To identify recession periods in the respective country, we use the NBER indicators for the USA and the ECRI indicators for the remaining countries. Recession indicators are indicated by the BC variable, a dummy variable that takes on the value one if the country is in a recession and zero if not. Table 2 provides results of different panel regressions with fixed effects on the fund level for the worldwide sample of all funds in 16 countries.

[Insert Table 2 about here]

Regression (1) of Table 2 documents the results of a regression of monthly excess returns on the four Carhart (1997) factors. In line with previous research (see, e.g., Ferreira, Keswani, Miguel, and Ramos (2012), Ferreira, Keswani, Miguel, and Ramos (2013),

monthly returns of the small cap and large cap equity indices, and the HML factor is computed as the difference between the domestic value and growth indices. A disadvantage of using the domestic indices from Datastream is their short availability and that these indices are not appropriate for constructing the momentum factor.

and Cremers, Ferreira, Matos, and Starks (2015)), we document negative unconditional performance of mutual funds with an alpha of -0.0229% per month, which is statistically significantly different from zero at the one percent level. In addition, our results indicate that mutual funds display positive factor loadings on the market, SMB, and HML as well as a negative loading on momentum (MOM).

Regression (2) shows the results when we extend our model with the *BC* recession dummy. *BC* has a coefficient estimate of -0.402 and is statistically significant at the one percent level. Hence, on our worldwide sample, mutual funds *underperform* during times of recessions by -0.402% per month based on the Carhart (1997) four factor model. Regressions (3) and (4) re-estimate specification (1) in a subsample of recession and non-recession months, respectively. In line with the results of regression (2), we find that the alpha is negative during recession months and slightly positive in non-recession months.

Finally, in regression (5), we account for time-varying factor sensitivities by additionally including interaction terms of the business cycle dummy with the Carhart (1997) factors. The result of negative fund performance during recessions remains unchanged: mutual funds underperform during recession months by statistically significant -0.480%. In unreported tests we document that our results also remain unchanged if we evaluate mutual fund performance using the Fama and French (1993) three-factor model. In each case, we obtain a significantly negative impact of the recession dummy on aggregate mutual fund performance.

4.1.2 Country-Specific Analysis

We proceed to analyze country-specific risk-adjusted performance of mutual funds in recessions. Table 3 repeats regressions (2) and (5) of Table 2 separately for the 16 different countries in our sample.

[Insert Table 3 about here]

Panel A of Table 3 shows the results of country-specific regressions of excess returns on the Carhart (1997) factors and the *BC* recession dummy variable. Strikingly, we find that in 15 of the 16 countries the *BC* dummy has a negative impact on the performance of mutual funds and is statistically significantly different from zero at the one percent level. The most negative impact of recessions on the performance is found in South Africa (-2.181% per month), Switzerland (-1.391% per month), and Sweden (-1.209% per month). The only positive (but statistically insignificant) impact of *BC* is found in Germany with a tiny outperformance of 0.035% per month.

In Panel B, we redo the analysis of Panel A but also include the interaction terms of all Carhart (1997) factors with the *BC* variable. Our results remain qualitatively unchanged; we find significant outperformance of mutual funds during recessions only in Germany (0.189% per month) and Spain (0.344% per month), while in 11 of the 16 countries *BC* is negative at the one percent significance level. The most negative impact of recessions on the performance of mutual funds is found in South Africa (-2.274% per month), Sweden (-1.319% per month) and Norway (-0.988% per month). In untabulated results we also run regression specifications (3) and (4) of Table 2 for all individual countries in our sample. In line with our previous results, the alpha during recession periods is worse than the alpha in non-recessions in 12 of the 16 countries.

To summarize, we do not find evidence that mutual funds outperform during periods of economic downturn; instead we find strong evidence that mutual funds *underperform* during recessions. This result holds both for our pooled worldwide sample (as shown in Section 4.1) and the majority of individual countries.

Revisiting Fund Performance During Recessions in the USA. Panel A of Table 3 indicates that for the USA, BC is significantly negative at the one percent significance level. When interacting all Carhart (1997) factors with the BC variable in Panel B, we obtain a slightly positive impact of the recession dummy; however, the effect is not significantly different from zero. Both findings are not in line with the theoretical model of Glode (2011) and the empirical results displayed in Glode (2008).

To evaluate these differences in results, we replicate the sample of Glode (2008) using CRSP mutual fund data and identical data cleaning procedures for the USA (see Glode (2008), Table 1) in the time period from 1980 - 2005 (Glode (2008)'s sample period) and from 1980 - 2010 (our sample period). Results are displayed in Table 4.

[Insert Table 4 about here]

Regression (1) shows regression (3) of Table 3 in Glode (2008) with CRSP mutual fund data from 1980 - 2005. The impact of the recession dummy is positive and statistically significant at the one percent significance level indicating an average mutual funds' outperformance of 0.414% per month. In regressions (2) and (3), we replicate the empirical results of Glode (2008) for the identical time period (1980 - 2005) using data from CRSP and Morningstar, respectively. In both cases, we obtain similar results: The coefficient estimate for BC is positive and statistically significant at the one percent significance level. Then, in regressions (4) and (5), we expand the sample period until the year 2010, again using data from CRSP and Morningstar, respectively. Surprisingly, the extended sample period now delivers different results: For both datasets, we do not obtain a significant positive correlation between recessions and average mutual fund performance - instead, the relationship is insignificant for both datasets.

Our results show that differences in results for the USA between our study and Glode

(2008) can be attributed to the extended sample period from 1980 - 2010. Instead of finding support in favour of a positive relationship, we fail to do so and document no significant relationship between recessions and average mutual fund performance in the USA. Moreover, when we do not include interaction terms of the BC dummy with the Carhart (1997) factors, we find a negative relationship between recessions and mutual fund performance for the USA, see Panel A of Table 3.

4.2 Cross-Sectional Implications: Unconditional Performance, Fund Fees, and State Dependence

Glode (2011)'s theoretical model predicts that – relative to other funds – funds with poor unconditional performance can charge high fees because they exhibit more state dependence in realized performance, i.e., earn abnormal state-specific returns during recessions. Hence, we investigate whether state dependence in aggregate fund performance is mostly driven by funds with poor unconditional performance and whether insurance against bad states of the economy might partially explain the survival of some of the most poorly performing funds.[15]

Since Morningstar does not contain historical fund fee data, we use the last fund fee observation from the Morningstar Mutual Fund Database as of September, 2012 in our empirical analysis. It is important to note that this does not create a survivorship bias as the last fund fee observation is also stored for dead funds.

As in Sirri and Tufano (1998), Barber, Odean, and Zheng (2005) and Glode (2011), we compute the total fund fees as "the expense ratio plus the up-front load amortized

[15] Glode (2011) provides empirical evidence for this relationship in the USA for the time period from 1980 to 2005. He finds that the (unconditionally) worst performing funds charge the highest fees and display the best recession performance.

over a seven-year holding period (which is the average holding period for equity mutual funds)" (Sirri and Tufano (1998)). If there is a fee schedule for the up-front load, we use the starting fee for the lowest investment amount. We set negative expense ratios to zero.[16] Figure 4 plots the average total fund fees (in % of a fund's TNA) per country.

[Insert Figure 4 about here]

The highest average total fees in percent are found in Italy (2.65%) and France (2.58%) whereas the lowest average fees are found in Sweden (1.27%) and South Korea (1.38%).

In order to test the cross-sectional prediction on our worldwide dataset, we sort funds into quintile portfolios based on their average monthly unconditional performance according to the four-factor Carhart (1997) model. Then, we compute the average annual expense ratio, the average total annual fee and average monthly recession performance of the respective quintiles. To measure fund-specific recession performance, we use the BC coefficient in specification (1) estimated over the whole return series of each individual fund. Our results remain qualitatively the same if we use specification (2) instead. Panel A of Table 5 shows the results for the pooled worldwide sample.

[Insert Table 5 about here]

Consistent with previous results in the literature (see, e.g., Malkiel (1995) and Carhart (1997)), we find that there is a negative relationship between a fund's unconditional performance and a fund's fee. The quintile with the best (worst) unconditional performance charges average expense ratios of 1.47% p.a. (1.80% p.a.) as well as average total expenses of 2.39% p.a. (1.89% p.a.). Hence, the quintile with the lowest unconditional performance charges expense ratios (total fund fees) of 0.33% p.a. (0.50% p.a.) higher

[16] Fund fees are available for all countries in our sample except for Canada.

than the quintile of funds with the highest unconditional performance. The differences are statistical significant at the one percent level, respectively. More importantly for our research question, we find that funds in the quintile with the *lowest* unconditional performance also display the *lowest* recession performance. The difference in recession alphas between funds with the best unconditional performance and the worst unconditional performance is 1.07% per month and is statistically significant at the 1% level. Hence, we do not find evidence that funds with poor unconditional performance can charge high fees because they earn superior state-specific returns during recessions.

Panel B of Table 5 repeats the same analysis for the individual countries in our sample. We only report differences in the average unconditional alpha, average annual expense ratio, average total annual fee and average monthly recession performance between quintile portfolio 5 (funds with the best unconditional performance) and quintile portfolio 1 (funds with the worst unconditional performance). In all countries we find that funds with low unconditional performance also display *low* recession performance. The differences in recession alphas between funds with the best unconditional performance and the worst unconditional performance are positive and statistically significant at the 1% in all countries. They vary between 0.46% per month in Italy and 1.56% per month in the UK.

In summary, our results indicate that there is a negative relationship between a mutual fund's unconditional performance and its expense ratio (total fee). We do not find evidence that funds with poor unconditional performance can charge high fees because they earn abnormal state-specific returns. To the contrary, funds with poor unconditional performance also exhibit poor recession performance.[17]

[17] In Table A.1 of the Appendix, we investigate the relationship between a fund's recession performance and its fund fee. Consistent with the results of Table 5 we find that funds with superior recession performance tend to charge low expense ratios and low total fund fees.

4.3 Robustness and Additional Analyses

4.3.1 Risk Factors and Business Cycles

In this section we perform different robustness checks to confirm our main result of mutual funds' negative performance in recessions. In particular, we show that our results are stable if we use different asset pricing risk factors and alternative business cycle measures. Table 6 reports the results using the pooled worldwide sample.

[Insert Table 6 about here]

Risk Factors. Regression (1) repeats our baseline setup from Table 2 using the monthly factor returns from Sandy Lai. In regressions (2) and (3) we apply the asset pricing risk factors obtained from Andrea Frazzini and Stefano Marmi. In both cases, we obtain negative coefficient estimates for BC of -0.34 and -0.11, which are both statistically significant at the one percent level. As risk factors, regression (4) uses self-constructed individual factor returns which are based on domestic total return indices retrieved from Datastream. Our results are virtually unchanged. Finally, in regression (5), we verify our results using international regional factor returns from Kenneth French. Again, we obtain a negative coefficient estimate for BC of -0.33, which is statistically significant at the one percent level.

OECD business cycle measure. The business cycle measure is an important variable that determines the number of months a country spends in a recession. To gain robustness in our main findings, we repeat our investigation with an alternative business cycle measure obtained from the Organisation for Economic Co-operation and Development (OECD). Recession and expansion periods are signified by their deviation from a growth trend. The main reference for this trend is the industrial production of the respective countries.[18] Regression (6) shows the results when we categorize recessions based on the OECD business cylcle measure: Mutual funds show a statistically significant state-specific underperformance of -0.28% per month.

To conclude, we find that our main result of mutual funds' negative recession performance is stable if we use alternative asset pricing risk factors and business cycle measures. Detailed results of the robustness checks for the individual countries in our study are shown in Table A.2.

4.3.2 Fund Style Analysis

Badrinath and Gubellini (2012) find for the USA that funds with different investment styles display different state-specific performance. In particular, they argue that managers of small-cap and mid-cap growth equity funds are able to deliver recession outperformance but managers of value funds are not. We also test whether alternative styles of mutual funds differ in their recession performance based on our pooled worldwide dataset.[19] We run regression specification (2) for small/mid-cap/large as well as value/growth/income funds.

[Insert Table 7 about here]

Table 7 shows that all fund styles display a negative recession performance, as indicated by a negative coefficient estimate for the *BC* variable. Hence, we do not find that conditional performance during recessions can only be attributed to certain mutual fund

[18] The OECD indicator can be retrieved from the OECD database: http://www.oecd.org/std/leading-indicators/.

[19] The identification of fund styles is based on the Morningstar fields 'Broad Category', 'Global Category', and 'Morningstar Category'.

styles. Instead, negative performance during economic downturns seems to be a general phenomenon.

4.3.3 Recession Performance and Fund Flows

Glode (2011)'s model assumes that investors are willing to pay for high returns when the economy is in a bad state. If this is the case, one should see a positive impact of a fund's recession performance on future fund inflows controlling for a fund's unconditional performance.

Following Sirri and Tufano (1998), Guercio and Tkac (2002) and Ferreira, Keswani, Miguel, and Ramos (2013), we calculate fund i's flow in month t as

$$flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} \cdot (1 + r_{i,t})}{TNA_{i,t-1}}, \tag{3}$$

where $TNA_{i,t}$ and $r_{i,t}$ denote the fund total net asset value and raw return of fund i in month t.[20]

To test the idea that funds with a top performance during recessions receive additional inflows when controlling for unconditional performance, we perform portfolio doubls sorts. In a first step, in month t, we sort funds based on their unconditional Carhart (1997) four factor alphas over the past 60 months. Then, within each quintile, we sort funds based on their past recession alphas over the same time period. We analyze fund flows in month $t+1$ for these 25 portfolios.[21] Table 8 reports the results of the double sorts for the pooled worldwide sample.

[Insert Table 8 about here]

[20]To ensure that extreme values do not drive our results, we truncate outliers above -100% and 500% and winsorize fund flows at the bottom and top one percent level of the distribution.

[21]The results remain qualitatively the same if we reverse the order of the double sorts or if we sort based on past raw returns.

In line with the results of Sirri and Tufano (1998) and Ferreira, Keswani, Miguel, and Ramos (2013), we document a strong positive relationship between unconditional performance and future fund flows. Differences in monthly future fund flows between the unconditionally best and worst performing funds are positive in all (conditionally-sorted) quintiles with spreads ranging from 0.46% to 3.70% with an average spread of 1.55%. In contrast to the idea that investors particularly value outperformance during recessions, we do not observe higher inflows to funds with high recession alphas. Our results indicate that the differences in future fund flows between the conditionally best and worst performing funds are negative in four of the five (unconditionally-sorted) quintiles. The average spread between the conditionally best and worst performing funds amounts to -0.38%. Hence, our results based on portfolio double sorts do not support the idea that investors value a fund's recession performance in addition to a fund's unconditional performance when investing in mutual funds.

In Table A.3 of the Appendix, we also report results of univariate portfolio sorts based on unconditional performance and future fund flows as well as conditional performance and future fund flows. Again, we observe a positive, statistically significant relationship between unconditional Carhart (1997) four factor alphas and future fund flows. However, this does not prevail in the conditional performance sort: we do not find a statistically significant relationship between a fund's recession performance and future fund flows.

4.4 Explaining Fund Underperformance During Recessions

How can one explain the negative performance of mutual funds during recessions? In this section, we provide empirical evidence that is consistent with the notion that mutual fund managers are (forced to be) more active during recessions - however, more activeness does not lead to state-specific outperformance, but results in higher trading costs and recession underperformance.

4.4.1 Fund Manager Activity, Aggregate Flows, and Market Illiquidity

To measure fund manager activity over the business cycle, we investigate mutual funds' *tracking errors* in recessions and non-recessions. Funds with high tracking errors deviate considerably from a given passive benchmark (i.e., usually the domestic market return) and are considered to be active with regard to stock selection and/or market timing.[22]

We compute the tracking error of mutual fund i as the square root of the second moment of the difference between r_i and the main domestic stock market index return r_m in the respective country:

$$TE_i = \sqrt{E(r_i - r_m)^2}. \tag{4}$$

Panel A of Table 9 reports equal-weighted averages of mutual funds' tracking errors in recessions and non-recessions for the pooled sample and individual countries.

[Insert Table 9 about here]

We empirically find that, overall, the average tracking error during recessions is 4.16, whereas it is 3.41 in non-recessions. The difference of 0.74 is statistically significant at the one percent level and also economically significant. In addition, we find that in 15 of the 16 countries, mutual funds show a tracking error that is higher during recessions than in non-recessions.

[22] Alternative measures of activeness include a mutual fund's active share (see Cremers and Petajisto (2009)) and the turnover measure. Since we do not obtain individual equity portfolio holdings nor time-varying fund turnover from the Morningstar database, we stick with the tracking error as our measure of fund manager activeness.

Why are mutual fund managers more active during recessions? We identify that increased active management of mutual fund managers during recessions can occur as a result of two channels. First, fund managers may voluntarily deviate more strongly from the benchmark. They may attempt to outperform competitors based on compensation incentives (see, e.g., Massa and Patgiri (2009) and Huang, Sialm, and Zhang (2011)) or employment risk (Kempf, Ruenzi, and Thiele (2009)). Second, fund managers may be forced to be more active because, during periods of economic downturns, investors tend to redeem their money from equity markets (see, e.g., Longstaff (2004)). Hence, mutual funds are more likely to be engaged in asset fire sales in recessions than in non-recessions and must liquidate their assets in a bad market environment characterized by high illiquidity and high average trading costs.

We report the level of aggregate flows (computed as the mean of equal-weighted individual fund flows per month, averaged over the time series) into domestic equity mutual funds for recessions and non-recessions in Panel B of Table 9. Aggregate flows into equity mutual funds are found to be positive 1.61% in non-recessions, whereas they are negative -0.09% in recessions. The difference between aggregate flows in recessions and non-recessions based on the worldwide sample amounts to -1.70% and is statistically significant at the one percent level. In addition, we find that aggregate fund flows into mutual funds during recessions are negative in 10 of 16 countries – hence, it is likely that fund managers are forced to trade because investors redeem money during months of economic downturn.[23]

Finally, we provide evidence that periods of economic downturn coincide with periods of stock market illiquidity. To do so, we calculate a time-varying market-wide illiquidity

[23]Note that fund flows out of mutual funds frequently lead to an immediate trading pressure for fund managers. In constrast, inflows can be held as cash and do not require a direct investment.

index based on individual stock return data for each country in our sample.[24] We proceed in the following way: We measure the illiquidity of stock i by computing the frequency of its daily zero returns in non-recessions and recessions (see Lesmond, Ogden, and Trzcinka (1999)). Then, we compute the equal-weigted average of individual stock illiquidity (per country) over all shares and in non-recessions and recessions as a measure of aggregate state-specific market-wide illiquidity. Panel C of Table 9 reports the average market illiquidity in recessions and non-recessions for the pooled sample and individual countries. We document that, overall, average market illiquidity during recessions is 0.26, whereas it is 0.22 in non-recessions. The difference of 0.04 is statstically significant at the one percent level. We find that in 13 of the 16 countries, market illiquidity is higher in recessions than in non-recessions.

To summarize, this section provides evidence that (i) mutual fund managers are more active during recessions than in non-recessions, (ii) aggregate flows into mutual funds are negative during recessions and positive during non-recessions, and (iii) market illiquidity is higher in recessions than in non-recessions.

4.4.2 Fund Manager Activity and Recession Performance

In order to investigate the relationship between fund manager activity and state-specific performance, we sort funds into quintiles based on their tracking error during recessions and investigate conditional alphas based on the Carhart (1997) four factor model. Table 10 reports the results.

[24]We obtain daily stock return data for the USA from CRSP and for the remaining 15 countries in our sample from datastream. To circumvent survivorship we include all common stocks (both dead and alive) that are listed on the major stock exchanges in each country. Following Chui, Titman, and Wei (2010), very small and/or illiquid stocks are excluded. A daily return is treated as missing if the market capitalization of the stock is below the fifth percentile of all stocks within a given country on any day. In addition, to retain a stock in a given month, the stock must have at least 5 daily returns different from zero. Our final sample of individual stocks consists of 28,469 individual stocks from 16 different countries during the time period from January 1980 to December 2010.

[Insert Table 10 about here]

We document that mutual funds with a high tracking error perform worse than low tracking error mutual funds during recessions.[25] Conditional alphas are -0.73% lower for high tracking error funds than for low tracking error funds. Moreover, high tracking error funds underperform low tracking error funds in 10 of 16 countries during recessions. To investigate whether recession underperformance of funds is magnified by the likelihood of forced trading and high market illiquidity, we restrict our analysis to (i) months with aggregate fund flows below zero (below -1%, below -2%) and (ii) months in the top 20% quantile (10% quantile, 5% quantile) of market illiquidity per country.[26] Indeed, we observe that high tracking error funds underperform low tracking error funds by (i) -1.34% (-1.57%, -1.95%) when we restrict our analysis to months with negative aggregate fund flows and (ii) -1.27% (-1.32%, -1.81%) when we restrict our analysis to months with high market illiquidity per country. Hence, our results are consistent with the notion that forced active trading of mutual funds plays a crucial role to explain mutual fund underperformance during recessions.

We also investigate the determinants of mutual fund performance in a multivariate regression framework. Table 11 reports the results.

[Insert Table 11 about here]

Models (1)-(3) display the results of univariate regressions of country i's average mutual fund recession performance in month t on country i's average mutual fund reccession tracking error (TE), average aggregate recession fund flows (FF), and market illiquidity

[25] This result is in contrast to our results based on unconditional performance. Untabulated results show that the relationship between a fund's tracking error and unconditional performance is significantly positive (at the one percent level). This result is in line with Huij and Jeroen (2011).

[26] Again, we measure market illiquidity in month t using the equal-weighted average of individual stock illiquidity computed as in Lesmond, Ogden, and Trzcinka (1999).

(MI) in the same month. We find that both TE and MI have a positive impact on average mutual fund recession performance, while FF displays a negative impact. In regression (4) we use TE, FF and MI as regressors – again, we find that all independent variables remain statistically significant at least at the 10% level. Finally, in regression (5), we add different country characteristics such as GDP per capita, the number of listed domestic stocks, mutual fund assets per GPD per capita, the number of mutual fund companies per country, and a country's home bias as explanatory variables to our model.[27] Controlling for these additional variables, we still find that both TE and MI have a statistically significant impact on a country's average mutual fund recession performance.[28]

To summarize, we provide empirical evidence that mutual fund underperformance during recessions is driven by increased activeness of mutual fund managers. During months of economic downturn funds with high tracking error underperform funds with low tracking error. The underperformance is magnified in months where fund managers are likely to be engaged in asset fire sales and confronted with high market illiquidity.

4.4.3 Hedge Fund Performance During Recessions

As an additional out-of-sample analysis, we investigate the recession performance of hedge funds. We obtain hedge fund returns and characteristics from the TASS database in the time period from 1994 until 2010. We use multiple standard filters for our sample selection: First, a fund is required to have at least 24 monthly return observations.

[27]We obtain data for GDP per capita, the number of listed domestic stocks, mutual fund assets per GPD per capita from Datastream and data for mutual fund assets per GPD per capita, the number of mutual fund companies per country from Morningstar. Data for a country's home bias is obtained from Chan, Covrig, and Ng (2005) which is based on all mutual fund holdings in a respective country in the years 1999 and 2000. It signifies how much the mutual fund holdings of country i in the domestic market deviate from its holdings in the world market portfolio. Higher relative domestic holdings indicate a more pronounced home bias.

[28]We also find that mutual fund performance is lower in countries that show a stronger home bias and higher in countries with a larger number of mutual funds.

Second, we filter out funds denoted in a currency other than US dollars. Third, we exclude funds of hedge funds. Finally, we eliminate the first 12 months of each fund's return series to avoid backfilling bias. This filtering process leaves us with a final sample of 6,145 hedge funds. TASS classifies hedge funds into the following ten style categories: Convertible Arbitrage, Dedicated Short Bias, Emerging Markets, Equity Market Neutral, Event Driven, Global Macro, Long/Short Equity Hedge, Managed Futures, and Multi-Strategy. Table A.4 in the Appendix shows summary statistics of monthly hedge fund returns in excess of the risk-free rate.

To investigate whether forced trading is a main driver of fund underperformance during economic downturns, we compare the recession performance of hedge funds that employ lockup periods with the recession performance of hedge funds that do not employ lockup periods. The lockup period quantifies the minimum amount of time that an investor is required to keep his money invested in the fund.[29] We hypothesize that funds employing this share restriction to investors outperform their counterparts because they are secured from forced trading in a market environment characterized by high trading costs.

We perform regressions similar to regressions (2) and (5) in Table 2 with the pooled sample of hedge funds instead of mutual funds. To control for hedge fund specific risk factors, we use the seven factor model of Fung and Hsieh (2004). The seven factors comprise a market factor (i.e., the S&P 500 monthly total return, Market), a size factor calculated from the spread between the monthly return of the Russell 2000 and the S&P 500 index (SMB), the monthly change in the 10-year treasury yield (Δ Term), as well as the monthly change in yields between Moody's Baa yield and the 10-year

[29] In our sample of hedge funds, the average lockup period amounts to three months. Out of the 6,145 hedge funds in our sample, 2,635 funds do employ a lockup period and 3,510 funds do not.

treasury constant maturity yield (Δ Credit). In addition, three trend-following factors for bonds, foreign-exchange markets, and commodities are included (PTFSBD, PTFSFX, PTFSCOM).[30] Since the majority of hedge funds is domiciled in the USA, we use the NBER indicator for US recessions to determine the state of the economic condition. Panel A of Table 12 reports the results.

[Insert Table 12 about here]

Models (1) and (2) document the results of regressions of monthly excess returns on the seven hedge fund risk factors and the BC recession dummy for the subsamples of hedge funds that employ / do not employ lockup restrictions. Our results indicate that hedge funds that do not employ lockup restrictions underperform by statistically significant -0.299% during recession months. In contrast, we observe that hedge funds employing lockup restrictions do not underperform; instead they show a significant outperformance of 0.077% per month. In models (3) and (4) we additionally account for time-varying factor sensitivities by including interaction terms of the business cycle dummy with the Fung and Hsieh (2004) risk factors. Our results remain stable: Hedge funds that do not employ lockup restrictions underperform during recession months by statistically significant -0.304%, whereas hedge funds employing lockup restrictions show a significant outperformance of 0.069% per month.

Panel B of Table 12 repeats the analysis for the subsamples of different hedge fund trading strategies. We only display the results on the coefficient estimate of BC; (time-varying) risk factors are included in the regressions but surpressed in the table. In eight out of the ten hedge fund trading strategies we find that hedge funds that do not employ lockup restrictions underperform hedge funds that do employ lockup restrictions. Hence,

[30]The trend-following factors are obtained from David Hsieh's webpage: https://faculty.fuqua.duke.edu/∼dah7/HFRFData.htm.

our result of a positive impact of lockup restrictions on recession performance is stable both for the pooled sample of overall hedge fund returns as well as for the majority of different hedge fund styles.

5 Conclusion

Recent academic research (e.g., Glode (2011)) predicts that mutual funds outperform during times of economic downturn and that funds with high performance during recessions can charge high fees to investors. Our paper is the first to test these hypotheses empirically applying a worldwide sample of domestic equity mutual funds.

Using mutual fund data from 16 different countries in the sample period from 1980 to 2010 and applying recession indicators from the NBER, ECRI and OECD as measures of economic downturn as well as factor data from six different factor data sets, our analysis reveals the following results: First, we are not able to find evidence that mutual funds outperform during recessions; in contrast, our results indicate that mutual funds underperform by statistically significant -0.4% in months of economic downturn worldwide. Second, we show that mutual funds in the quintile with lowest unconditional performance charge the highest fees but also display the lowest recession performance. The difference in recession alphas between funds with the best unconditional performance and the worst unconditional performance is 1.07% per month and statistically significant at the 1% level.

We provide empirical evidence that increased activity of mutual fund managers can explain the negative performance of funds during recessions. For this purpose, we document that average fund manager activity is higher in recessions than in non-recessions, aggregate flows into mutual funds are negative (positive) during recessions (non-recessions), and market illiquidity is higher in recessions than in non-recessions. Turning to performance implications, we find that during times of economic downturn, high tracking error funds underperform low tracking error funds by statistically significant -0.73% per month. Moreover, we find that this underperformance is magnified in months with negative aggregate fund flows and high market illiquidity.

Finally – to analyze whether forced trading is a main driver of fund underperformance during economic downturns – we compare the recession performance of hedge funds that employ lockup periods with the recession performance of hedge funds that do not employ lockup periods. As hypothesized, we find that funds that are secured from forced trading by lockup restrictions show a significant better performance during economic downturns than their unsecured counterparts.

Appendix

Table A.1: Recession Performance and Fund Fees
This table shows the total fund fees (Panel A) and fund expense ratios (Panel B) sorted according to their recession fund performance in 14 countries and for the pooled sample. The total fund fees are calculated as described in Section 3 and presented in %. Canada and Japan are missing from the list of countries, as there not enough observations for the fund fees. Statistical significance at the ten, five and one-percent level is indicated by *,**, and ***, respectively. T-statistics are displayed in parentheses.

Panel A: Total Fund Fees sorted on Recession Performance

	Q1	Q2	Q3	Q4	Q5	Q5-Q1	Q5-Q1 t-value
ALL	2.05	2.06	2.14	2.05	1.97	-0.08	-1.14
Denmark	1.59	1.83	1.72	1.13	1.32	-0.27	-0.78
France	2.62	2.91	2.56	3.37	2.46	-0.15	-0.59
Germany	2.63	2.35	2.24	2.36	2.90	0.27	0.93
Italy	2.56	3.32	2.67	2.81	2.92	0.36	1.07
Mexiko	2.38	2.30	2.07	2.12	2.48	0.09	0.13
Norway	1.58	1.66	1.61	1.47	1.38	-0.21	-0.74
South Africa	1.90	1.84	1.81	2.03	1.92	0.01	0.10
South Korea	1.53	1.26	1.54	1.39	1.34	-0.19*	-1.93
Spain	2.19	2.16	2.12	1.82	1.78	-0.41*	-2.50
Sweden	1.99	0.88	1.02	1.31	1.06	-0.92*	-2.17
Switzerland	1.78	1.94	1.44	1.50	2.04	0.26	1.09
Taiwan	2.03	1.99	1.87	1.95	2.00	-0.03	-0.53
UK	2.08	2.03	1.65	1.77	1.84	-0.24**	-2.20
USA	2.28	2.04	2.09	2.04	2.15	-0.13	-0.88

Panel B: Expense Ratio sorted on Recession Performance

	Q1	Q2	Q3	Q4	Q5	Q5-Q1	Q5-Q1 t-value
ALL	1.65	1.29	1.32	1.31	1.44	-0.21***	-3.97
Denmark	1.35	1.59	1.47	0.95	1.12	-0.23	-0.67
France	2.16	2.54	2.16	2.98	2.06	-0.10	-0.41
Germany	2.02	1.65	1.57	1.80	2.11	0.09	0.34
Italy	2.21	2.93	2.45	2.50	2.65	0.44	1.50
Mexiko	2.38	2.30	2.07	2.12	2.48	0.09	0.13
Norway	1.36	1.48	1.38	1.33	1.28	-0.08	-0.29
South Africa	1.36	1.44	1.39	1.57	1.50	0.14	1.02
South Korea	1.71	1.50	1.73	2.14	1.61	-0.10	-1.06
Spain	2.18	2.05	2.09	1.78	1.72	-0.46***	-2.71
Sweden	1.79	0.81	0.90	1.04	0.88	-0.92**	-2.17
Switzerland	1.30	1.52	1.01	0.97	1.57	0.27	1.28
Taiwan	1.78	1.76	1.65	1.73	1.76	-0.02	-0.54
UK	1.57	1.50	1.24	1.32	1.34	-0.23***	-2.65
USA	1.33	1.12	1.23	1.20	1.36	0.03	0.46

Table A.2: Overview: Factor Set Results

This table summarizes the recession coefficients of all factor set regressions. All regressions are panel fixed effect regressions (on the fund level) for the pooled sample and the individual countries. Panel A reports the results of the Frazzini, Individual, Lai and Marmi factor sets whereas Panel B displays the factor set results of the regional factors. The dependent variable in all regressions is the TNA-weighed monthly fund return (excess over risk-free rate) as calculated in Section 3 for 16 countries. The independent variables are the Carhart (1997) factors (Market, SMB, HML, MOM) per country, from the respective factor dataset as listed in the table, and a business cycle variable (BC) based on the countries' respective business cycle measure (NBER, ECRI,OECD). The *conditional* specification displays the recession coefficients of the following regressions: (1) fund performance regressed on the Carhart Factors and the business cycle variable (*dummy*), (2) fund performance regressed on the Carhart Factors and the business cycle variables as well as their interactions (*interactions*). Furthermore, in subsamples of recession and non-recession periods, the fund returns are regressed on the Carhart Factors (*recession*, *non-recession*). Statistical significance at the ten, five and one-percent level is indicated by *,**, and ***, respectively.

Panel A: Overview Results Factor Sets - Country Factors

Factor Set	BC-Variable	Specification	Alpha	Pooled	Canada	Denmark	France	Germany	Italy	Japan	Mexico	Norway	South Africa	South Korea	Spain	Sweden	Switzerland	Taiwan	UK	USA
Frazzini	NBER/ECRI	Conditional	BC-Dummy	-0.38***	-0.41***	-0.63***	-0.81***	-0.39***	-1.04***	-0.41***		-0.79***			0.01	-1.6***	-1.44***		0.38***	-0.08***
			Interactions	-0.34***	-0.43***	-0.66***	-0.84***	-0.45***	-1.1***	-0.01		-0.8***			0.32***	-1.34***	-1.14***		0.55***	0.00
			Non-Recession	-0.03***	-0.03***	0.25***	0.15***	0.14***	-0.04	-0.23***		0.6***			-0.45***	0.51***	-0.01		-0.23***	-0.04***
			Recession	-0.38***	-0.53***	-0.42***	-0.73***	-0.31***	-1.1***	-0.21***		-0.21***			-0.1***	-1.05***	-1.12***		0.35***	-0.03***
	OECD	Conditional	BC-Dummy	-0.28***	0.08***	-0.84***	-1.02***	-0.89***	-0.49***	-0.22***		-0.31***			-0.22***	-0.84***	-0.88***		-0.79***	0.01
			Interactions	-0.23***	0.01	-0.69***	-0.85***	-0.8***	-0.44***	0.21***		-0.17***			0.01	-0.87***	-0.65***		-0.85***	0.02**
			Non-Recession	-0.04***	-0.11***	0.39***	0.17***	0.25***	-0.2***	-0.32***		0.24***			-0.29***	0.59***	-0.09***		0.51***	-0.04***
			Recession	-0.38***	-0.1***	-0.28***	-0.66***	-0.51***	-0.57***	-0.09***		0.07***			-0.29***	-0.31***	-0.7***		-0.34***	-0.03***
Individual	NBER/ECRI	Conditional	BC-Dummy	-0.16***	-0.3***	0.31***	0.15***	-0.06	-0.08*	-0.3***	-0.16	0.3***	-0.63***	-0.03	0.09***	-0.25**	-0.07	-1.18***	0.00	-0.09***
			Interactions	-0.11***	-0.29***	0.21*	0.02	0.03	-0.07	-0.31***	-0.16	0.35***	-0.62***	-0.13***	0.06**	-0.34***	-0.06	-1.04***	0.00	-0.01
			Non-Recession	-0.01***	-0.04***	-0.12***	-0.26***	-0.09***	-0.04***	0.12***	0.12*	0.03	0.23***	0.1***	-0.17***	0.05	-0.08***	0.31***	-0.12***	-0.03***
			Recession	-0.11***	-0.35***	0.08	-0.24***	-0.04	-0.07***	-0.18***	-0.06	0.36***	-0.39***	-0.04	-0.09***	-0.33***	-0.16***	-0.76***	-0.11***	-0.03***
	OECD	Conditional	BC-Dummy	-0.06***	-0.01	0.24***	-0.17***	-0.24***	0.09***	-0.01	-0.03	0.39***	-0.28***	-0.31***	-0.05*	0.01	-0.09**		0.1***	0.00
			Interactions	-0.06***	-0.03	0.22***	-0.17***	-0.3***	0.1***	-0.04**	-0.02	0.33***	-0.33***	-0.31***	-0.05*	0.01	-0.08*		0.05	0.02*
			Non-Recession	-0.02***	-0.1***	-0.09***	-0.11***	-0.03	-0.1***	0.05***	0.04	0.03	0.2***	0.14***	-0.15***	-0.01	-0.08***		-0.01	-0.04***
			Recession	-0.11***	-0.13***	0.14***	-0.28***	-0.29***	0.00	0.01	0.01	0.36***	-0.14***	-0.2***	-0.2***	0.00	-0.17***		0.02*	-0.03***
Lai	NBER/ECRI	Conditional	BC-Dummy	-0.4***	-0.64***	-0.88***	-0.65***	0.03	-1.15***	-0.25***	-0.61***	-1.27***	-2.18***	-0.6***	-0.33***	-1.17***	-1.39***	-0.14**	-0.13***	-0.08***
			Interactions	-0.48***	-0.63***	-0.18	-0.12**	0.19**	-0.93***	-0.22***	-0.98***	-0.99***	-2.27***	-2.95***	0.34***	-1.3***	-0.44***	-0.27***	0.06	0.00
			Non-Recession	0.02***	-0.01	0.21***	0.2***	-0.07**	0.02	-0.26***	0.26***	0.7***	1.01***	0.14***	-0.72***	0.3***	0.14***	0.15***	0.06**	-0.04***
			Recession	-0.47***	-0.69***	0.04	0.07**	0.13*	-0.83***	-0.45***	-0.71***	-0.29***	-1.34***	-2.83***	-0.38***	-1.05***	-0.29***	-0.17***	0.17***	-0.03***
	OECD	Conditional	BC-Dummy	-0.32***	0.08***	-0.78***	-1.09***	-0.48***	-0.37***	-0.25***	-0.9***	-0.84***	-0.99***	0.44***	-0.31***	-0.9***	-1.01***		-0.93***	0.01
			Interactions	-0.28***	0.14***	-0.12	-0.53***	-0.31***	-0.03	0.01	-1.24***	-0.64***	-0.92***	0.71***	0.17***	-1.18***	-0.23***		-0.99***	0.02**
			Non-Recession	0.01**	-0.15***	0.19***	0.24***	0.07	-0.27***	-0.3***	0.36***	0.62***	0.5***	-0.21***	-0.52***	0.52***	-0.04		0.52***	-0.04***
			Recession	-0.48***	-0.02***	0.09**	-0.28***	-0.21***	-0.26***	-0.28***	-0.86***	-0.01	-0.46***	0.45***	-0.35***	-0.69***	-0.27***		-0.48***	-0.03***
Marmi	NBER/ECRI	Conditional	BC-Dummy	-0.14***	-0.17***		0.04	-0.39***	-0.04	-0.3***				-0.34***		-0.4***	-0.09*		0.09***	-0.09***
			Interactions	-0.11***	-0.31***		-0.1***	-0.62***	0.00	-0.27***				-0.38***		-0.38**	-0.01		0.15***	0.00
			Non-Recession	-0.08***	-0.24***		-0.27***	-0.05**	-0.16***	-0.04***				-0.11***		0.12**	-0.18***		-0.07***	-0.04***
			Recession	-0.19***	-0.56***		-0.36***	-0.6***	-0.14***	-0.3***				-0.59***		-0.31***	-0.21***		0.08***	-0.03***
	OECD	Conditional	BC-Dummy	-0.1***	-0.29***		-0.04*	0.05	-0.11**	-0.17***				-0.39***		0.28**	-0.12***		-0.01	0.00
			Interactions	-0.09***	-0.3***		-0.07***	0.2***	-0.07*	-0.13***				-0.35***		0.47***	-0.07*		0.2***	0.02***
			Non-Recession	-0.09***	-0.16***		-0.3***	-0.32***	-0.14***	-0.1***				-0.05***		-0.02	-0.17***		-0.13***	-0.04***
			Recession	-0.19***	-0.46***		-0.36***	-0.07**	-0.19***	-0.22***				-0.4***		0.42***	-0.26***		0.07***	-0.02***

Table A.2: Overview Factor Set Results (ctd.)

Panel B: Overview Results Factor Sets - Regional Factors

Factor Set	BC-Variable	Specification	Alpha	Pooled	Canada	Denmark	France	Germany	Italy	Japan	Mexico	Norway	South Africa	South Korea	Spain	Sweden	Switzerland	Taiwan	UK	USA
Regional	**NBER/ECRI**	**Conditional**	**BC-Dummy**	-0.28***	-0.44***	-1.19***	-0.34***	0.22***	-0.46***	-0.44***	-0.76***	-1.11***	-0.82***	-0.9***	-0.13***	-1.59***	-1.07***	-1.42***	0.29***	-0.03**
			Interactions	-0.22***	-0.3***	-1.15***	-0.36***	0.66***	-0.56***	-0.17***	-0.9***	-1.14***	-0.78***	-1.21***	-0.13***	-1.88***	-1.06***	-1.63***	0.3***	-0.05***
			Non-Recession	0.00	0.15***	0.42***	-0.05***	0.14***	-0.22***	-0.21***	1.16***	1.08***	1.08***	0.36***	-0.11***	0.88***	0.25***	-0.61***	0.08***	-0.09***
			Recession	-0.23***	-0.15***	-0.76***	-0.43***	0.81***	-0.81***	-0.35***	0.22***	-0.07	0.27***	-0.71***	-0.23***	-1.03***	-0.81***	-2.25***	0.46***	-0.14***
	OECD	**Conditional**	**BC-Dummy**	-0.22***	-0.24***	-0.91***	-0.81***	-0.58***	0.08	-0.19***	-0.25	-0.6***	-0.57***	-0.17***	0.18***	-1.12***	-0.68***		-0.62***	0.04***
			Interactions	-0.2***	-0.15***	-0.89***	-0.7***	-0.66***	0.13	0.13***	-0.37**	-0.48***	-0.48***	-0.25***	0.28***	-1.39***	-0.66***		-0.75***	0.02
			Non-Recession	0.01**	0.2***	0.64***	0.26***	0.4***	-0.61***	-0.35***	1.12***	0.73***	1.07***	0.38***	-0.29***	1.23***	0.21***		0.66***	-0.1***
			Recession	-0.21***	0.04***	-0.24***	-0.43***	-0.28***	-0.42***	-0.22***	0.7***	0.26***	0.55***	0.14***	-0.02	-0.22***	-0.45***		-0.07***	-0.1***
Regional (Momentum)	**NBER/ECRI**	**Conditional**	**BC-Dummy**	-0.3***	-0.22***	-1.53***	-0.4***	0.23***	-1.02***	-0.46***	-1.05***	-1.2***	-0.23***	-0.89***	-0.32***	-1.81***	-1.38***	-1.39***	0.07*	-0.01
			Interactions	-0.33***	-0.21***	-1.51***	-0.19***	0.87***	-0.86***	-0.22***	-1.15***	-0.8***	-0.95***	-1.37***	-0.13**	-2.12***	-1.49***	-2.28***	0.5***	-0.03***
			Non-Recession	-0.02***	0.1***	0.8***	0.05***	0.19***	-0.2***	-0.16***	1.11***	0.75***	0.77***	0.32***	-0.09*	0.98***	0.24***	-0.45***	-0.28***	-0.1***
			Recession	-0.35***	-0.08***	-0.75***	-0.18***	1.06***	-1.12***	-0.34***	-0.05	-0.05	-0.22**	-1.03***	-0.21***	-1.15***	-1.24***	-2.77***	0.27***	-0.13***
	OECD	**Conditional**	**BC-Dummy**	-0.22***	-0.07***	-1.02***	-0.93***	-0.91***	-0.35**	-0.16***	-0.4**	-0.65***	-0.05	-0.19***	-0.03	-1.66***	-0.98***		-0.94***	0.05***
			Interactions	-0.18***	0.04	-0.71***	-0.58***	-0.57***	-0.25	0.12***	-0.2	0.11	0.15***	-0.09***	-0.06	-1.48***	-0.83***		-1.02***	0.02**
			Non-Recession	-0.02***	0.1***	0.52***	0.09***	0.18***	-0.58***	-0.35***	1.12***	0.21***	0.57***	0.37***	0.00	0.71***	0.15***		0.61***	-0.1***
			Recession	-0.33***	0.13***	-0.16***	-0.47***	-0.34***	-0.74***	-0.21***	0.89***	0.33***	0.69***	0.26***	-0.06***	-0.76***	-0.65***		-0.4***	-0.1***

Table A.3: (Recession) Performance and Fund Flows
This table report results of univariate portfolio sorts based on unconditional performance in month t and future fund flows in month $t+1$ (Panel A) as well as conditional performance in month t and future fund flows in month $t+1$ (Panel B) for 16 countries and the pooled sample. The fund flows are calculated as described in Section 3. Statistical significance at the ten, five and one-percent level is indicated by *,**, and ***, respectively.

Panel A: Fund Flows sorted on Unconditional Performance

	Q1	Q2	Q3	Q4	Q5	Q5-Q1	T-stat
ALL	0.016	0.021	0.018	0.021	0.031	0.014***	7.57
Canada	0.050	0.030	0.025	0.016	0.046	-0.004	-0.42
Denmark	0.017	0.007	0.001	-0.003	0.003	-0.014	-0.99
France	0.010	0.012	0.008	0.007	0.025	0.016	1.29
Germany	-0.001	0.006	-0.004	-0.002	0.021	0.022**	2.07
Italy	0.012	0.005	0.006	0.002	-0.013	-0.026**	-2.15
Japan	0.008	-0.001	0.008	0.016	0.021	0.013**	2.13
Mexiko	0.018	0.026	0.029	0.019	0.030	0.012	0.68
Norway	0.051	-0.004	0.010	0.022	0.033	-0.019	-0.64
South Africa	0.017	0.025	0.009	0.010	0.011	-0.005	-0.79
South Korea	0.011	0.017	0.024	0.031	0.052	0.041***	5.17
Spain	0.017	-0.003	-0.002	-0.006	0.010	-0.007	-0.67
Sweden	0.032	0.040	0.041	0.019	0.011	-0.021	-1.16
Switzerland	0.011	0.005	0.001	0.018	0.026	0.015	1.37
Taiwan	-0.013	-0.005	-0.006	0.000	-0.001	0.012***	2.43
UK	-0.007	-0.005	0.001	0.001	0.023	0.031***	3.95
USA	0.026	0.030	0.022	0.025	0.035	0.009***	3.28

Panel B: Fund Flows sorted on Conditional Performance

	Q1	Q2	Q3	Q4	Q5	Q5-Q1	T-stat
ALL	0.021	0.022	0.023	0.018	0.022	0.001	0.61
Canada	0.042	0.031	0.040	0.029	0.051	0.009	0.89
Denmark	0.011	0.008	-0.003	0.002	0.004	-0.008	-0.96
France	0.010	0.015	0.012	0.012	0.000	-0.010	-1.30
Germany	-0.001	0.007	0.003	0.007	-0.002	0.000	-0.02
Italy	0.002	-0.006	0.015	-0.003	0.011	0.009	0.64
Japan	0.019	0.013	0.002	-0.001	0.007	-0.012*	-1.72
Mexiko	0.024	0.021	0.025	0.024	0.026	0.002	0.10
Norway	0.037	0.016	0.025	0.011	0.037	0.001	0.03
South Africa	0.009	0.021	0.008	0.014	0.023	0.014	1.53
South Korea	0.027	0.037	0.035	-0.017	0.021	-0.006	-0.67
Spain	0.008	0.000	-0.007	-0.002	0.017	0.009	0.82
Sweden	0.027	0.031	0.022	0.014	0.040	0.013	0.70
Switzerland	0.003	-0.002	0.005	0.029	0.026	0.023**	2.01
Taiwan	-0.011	-0.002	-0.006	-0.004	-0.004	0.007	1.47
UK	-0.007	-0.005	-0.003	0.001	0.024	0.031***	3.83
USA	0.031	0.028	0.026	0.020	0.029	-0.002	-0.66

Table A.4: Summary Statistics: Hedge Fund Returns
This table shows summary statistics of monthly excess hedge fund returns of the TASS data sample with corresponding hedge fund styles in the time period from 1994 until 2010.

Strategy	Category	Funds	Average Monthly Excess Return	Mean Monthly Excess Return	Standard Deviation Excess Return
1-10	All	6,145	0.58%	0.47%	3.63%
1	Convertible Arbitrage	220	0.41%	0.54%	2.75%
2	Dedicated Short Bias	45	-0.06%	-0.62%	5.47%
3	Emerging Markets	694	0.76%	0.78%	5.23%
4	Equity Market Neutral	400	0.49%	0.48%	2.60%
5	Event Driven	621	0.56%	0.75%	3.10%
6	Fixed Income Arbitrage	235	0.37%	0.41%	2.71%
7	Global Macro	467	0.53%	0.46%	3.78%
8	Long/Short Equity	2190	0.82%	0.82%	4.29%
9	Managed Futures	690	0.46%	0.39%	5.13%
10	Multi-Strategy	583	0.52%	0.70%	3.12%

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Figures and Tables

Figure 1: Mutual Funds in Recessions (per Country)
The figure displays the percentage of months a country spends in a recession during its sample period.

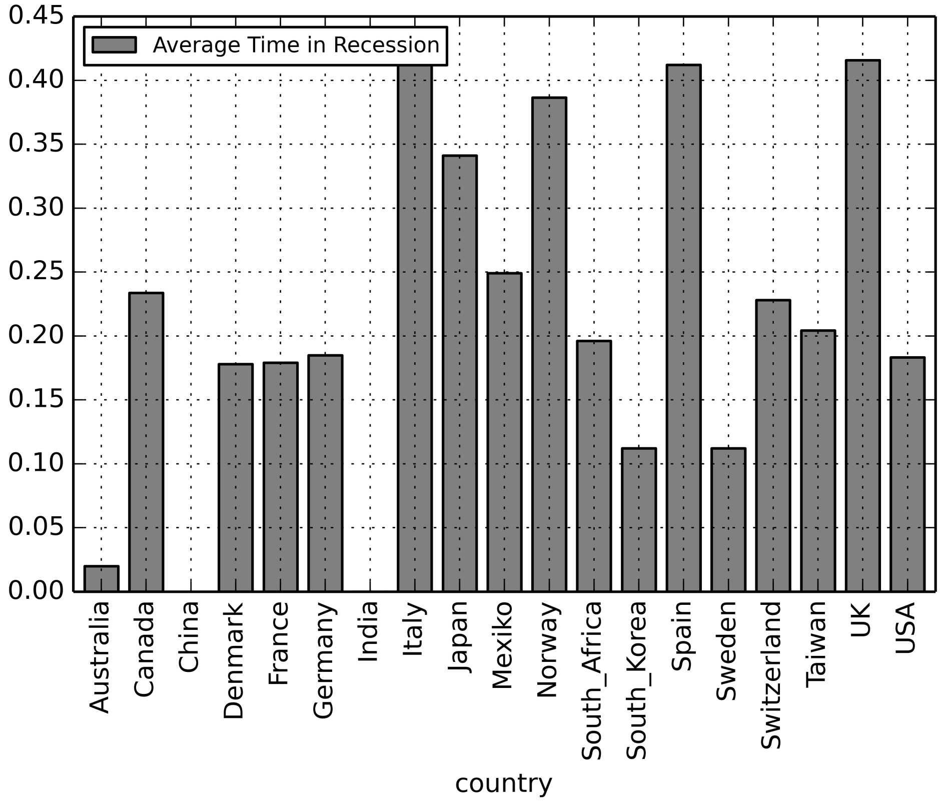

Figure 2: Time Series of Recession Clustering
The figure displays the clustering of recessions in the sample period. The panel 'All Countries' shows the percentage of all sample countries that are in a recession. The panels 'North America', 'Europe', 'Asia', and 'Rest of the World' display the value of one if at least one country was in a recession in a certain month. North America includes: USA, Canada, Mexico; Europe includes: Denmark, France, Germany, Italy, Norway, Spain, Sweden, Switzerland, UK; Asia includes: Japan, South Korea; Rest of the World includes: South Africa, Australia.

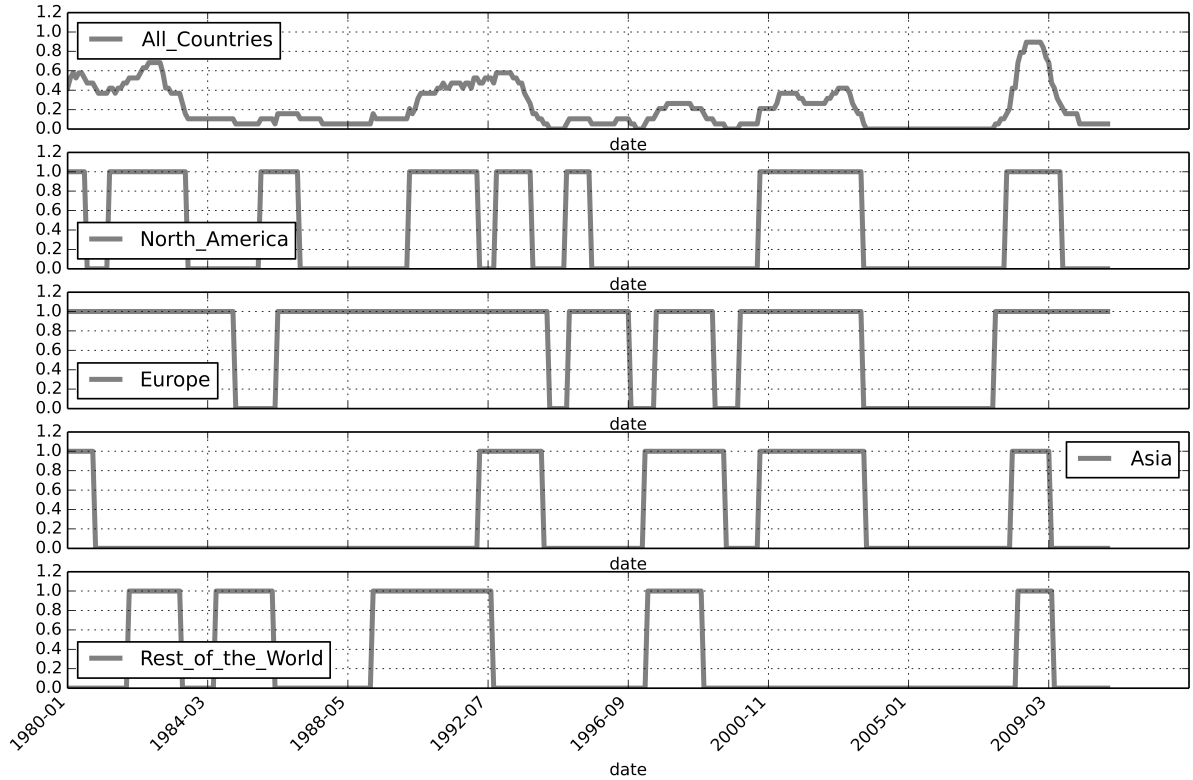

Figure 3: Average Returns of Funds per Country
The figure displays the average monthly returns (in %) of funds in the sample time period per country.

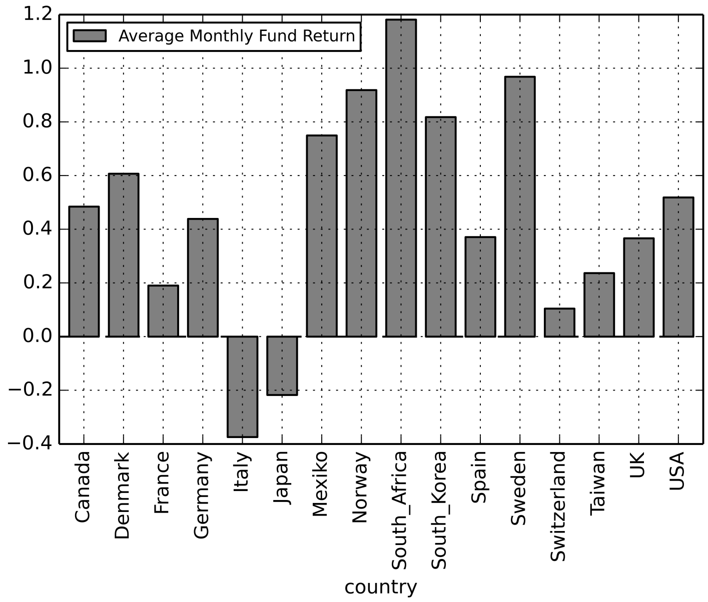

Figure 4: Total Expenses
The figure displays the total expenses (in % of a fund's TNA) in the sample time period per country. Following Sirri and Tufano (1998), total expenses are computed as "the expense ratio plus the up-frond load amortized over a seven-year holding period". No fund fee data is available for Canada.

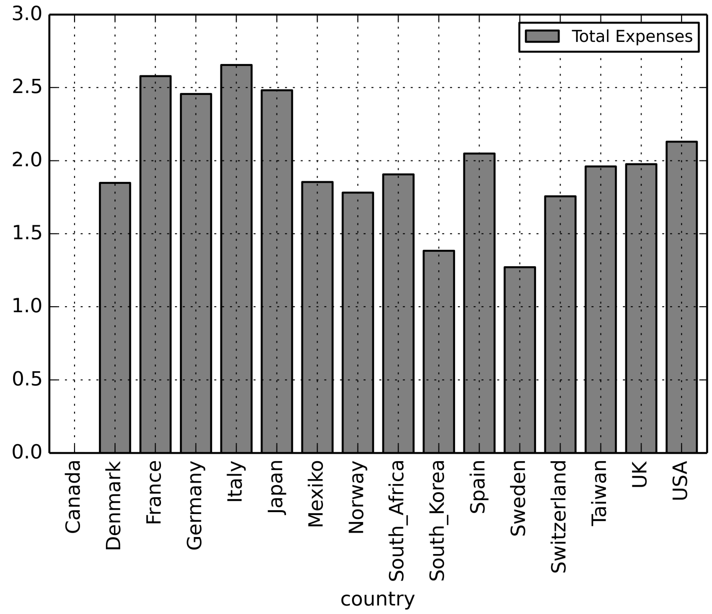

Table 1: Data Availability

This table provides summary statistics and reports the time horizon over which the mutual fund data and factor data is available. The number of funds states the number of mutual funds (per fund) per country (after filtering, see Section 3). Australia, Austria, China and India drop out of the sample because the number of funds in the respective country or the number of recession observations is not sufficient. The mean fund TNA displays the average total net assets per fund. Fund Data (Start / End) shows the start / end time points of the mutual fund return data. The columns Individual-, Regional-, Frazzini-, Marmi- and Lai factors report the starting point of the factor data sets for the respective countries. All factor sets end in December 2010.

Country	Number of Funds (ID)	Number of Observations	Mean Fund TNA (in local currency)	Fund Data (Start)	Fund Data (End)	Individual Factors (Start)	Regional Fama-French Factors (Start)	Frazini Factors (Start)	Marmi Factors (Start)	Lai Factors (Start)
Australia	-	-	-	1980-01	2010-12	2001-01	1990-11	1990-07	1988-07	1981-07
Austria	-	-	-	1986-07	2010-12	2001-02	1991-07	1991-07	-	1991-07
Canada	432	54,185	264m	1980-01	2010-12	2001-02	1990-11	1990-07	1990-07	1981-07
China	-	-	-	2002-07	2010-12	2001-01	1993-01	-	1998-07	1996-07
Denmark	39	5,765	566m	1980-01	2010-12	2001-02	1990-11	1990-07	-	1989-07
France	299	34,906	159m	1980-04	2010-12	2001-02	1990-11	1990-07	1988-07	1981-07
Germany	113	9,131	311m	1990-11	2010-12	2001-02	1990-11	1990-07	1988-07	1981-07
India	-	-	-	1986-10	2010-12	1997-01	1993-01	-	1993-07	1993-07
Italy	75	5,566	145m	1984-11	2010-12	2001-02	1990-11	1990-07	1988-07	1988-07
Japan	811	104,495	14.9bn	1980-01	2010-12	2001-02	1994-11	1990-07	1988-07	1981-07
Mexico	49	3,262	314m	1980-01	2010-12	1996-06	1993-02	-	-	1993-07
Norway	61	7,049	774m	1981-03	2010-12	2001-02	1993-01	1990-07	-	1990-07
South Africa	173	13,826	408m	1980-01	2010-12	1994-06	1993-01	-	-	1993-01
South Korea	524	42,600	69.4bn	1996-02	2010-12	1997-01	1992-02	-	1992-07	1989-07
Spain	139	11,463	53m	1990-10	2010-12	2001-02	1990-11	1990-07	-	1989-07
Sweden	108	4,655	2.1bn	1985-01	2010-12	2001-02	1990-11	1990-07	1988-07	1988-07
Switzerland	169	13,675	267m	1980-01	2010-12	2001-02	1990-11	1990-07	1988-07	1988-07
Taiwan	182	20,553	1.7bn	1986-02	2010-12	1997-01	1990-11	-	-	1994-07
UK	458	23,417	117m	1980-01	2010-12	2001-02	1990-11	1990-07	1988-07	1981-07
USA	3,692	469,523	553m	1980-01	2010-12	1980-01	1980-01	1990-07	1988-07	1981-07

Table 2: Fund Performance in Recessions - Pooled Results
This table shows the results of panel fixed effect regressions (on the fund level) of unconditional and conditional mutual fund performance for our pooled sample of 16 countries. The dependent variable is the TNA-weighed monthly fund return (excess over risk-free rate) as calculated in Section 3. The independent variables are the Carhart (1997) factors per country from the Lai factor dataset as described in Section 3, and a business cycle variable (BC) based on the countries respective business cycle measure (NBER, ECRI). Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

	(1) Unconditional Performance	(2) Performance and BC	(3) Recessions Subsample	(4) No Recessions Subsample	(5) Conditional Performance and Interactions
BC		-0.402***			-0.480***
		(0.00996)			(0.0106)
Market	0.789***	0.783***	0.686***	0.798***	0.797***
	(0.00307)	(0.00312)	(0.00414)	(0.00316)	(0.00314)
Market × BC					-0.110***
					(0.00300)
SMB	0.180***	0.181***	0.0686***	0.186***	0.187***
	(0.00484)	(0.00485)	(0.00693)	(0.00497)	(0.00497)
SMB × BC					-0.127***
					(0.00646)
HML	0.00918**	0.00721	-0.0177***	0.0138***	0.0137***
	(0.00443)	(0.00442)	(0.00549)	(0.00469)	(0.00468)
HML × BC					-0.0242***
					(0.00465)
MOM	-0.0218***	-0.0247***	-0.156***	0.0213***	0.0208***
	(0.00195)	(0.00197)	(0.00291)	(0.00261)	(0.00260)
MOM × BC					-0.172***
					(0.00379)
Constant	-0.0229***	0.0647***	-0.466***	0.0220***	0.0211***
	(0.00239)	(0.00367)	(0.00725)	(0.00383)	(0.00371)
Observations	757,859	757,859	156,112	601,747	757,859
R-squared	0.668	0.669	0.725	0.629	0.673
Number of funds	7,321	7,321	7,287	7,298	7,321

Table 3: Fund Performance in Recessions - Individual Countries

This table summarizes results from panel fixed effect regressions (on the fund level) in 16 different countries. The dependent variable is the TNA-weighed monthly fund return (excess over risk-free rate) as calculated in Section 3 for 16 countries. The independent variables are the Carhart (1997) factors per country, obtained from the Lai factor dataset as described in Section 3, and a business cycle variable (BC) based on the countries respective business cycle measure (NBER, ECRI). In Panel A, fund performance is regressed on the Carhart factors and a business cycle variable. In Panel B, fund performance is regressed on the Carhart factors and the business cycle variable as well as their interactions. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

Panel A: Mutual Fund Performance and the Business Cycle

	(1) Canada	(2) Denmark	(3) France	(4) Germany	(5) Italy	(6) Japan	(7) Mexiko	(8) Norway	(9) South_Africa	(10) South_Korea	(11) Spain	(12) Sweden	(13) Switzerland	(14) Taiwan	(15) UK	(16) USA
BC	-0.638***	-0.880***	-0.655***	0.0352	-1.154***	-0.247***	-0.607***	-1.266***	-2.181***	-0.603***	-0.325***	-1.209***	-1.391***	-0.141**	-0.130***	-0.0849***
	(0.0413)	(0.0998)	(0.0465)	(0.0863)	(0.0732)	(0.0243)	(0.165)	(0.0817)	(0.104)	(0.0373)	(0.0351)	(0.188)	(0.0736)	(0.0584)	(0.0366)	(0.00944)
Market	0.532***	0.608***	0.573***	0.610***	0.578***	0.796***	0.592***	0.635***	0.231***	0.633***	0.588***	0.592***	0.500***	0.888***	0.509***	0.993***
	(0.00714)	(0.00764)	(0.00862)	(0.0125)	(0.0187)	(0.00695)	(0.0209)	(0.0120)	(0.00857)	(0.00446)	(0.00846)	(0.00850)	(0.0103)	(0.00566)	(0.00882)	(0.00292)
SMB	0.101***	-0.301***	-0.0339	-0.0230	-0.244***	0.0576***	-0.111***	-0.147***	-0.480***	0.0962***	-0.0608***	-0.0808*	-0.397***	0.505***	-0.372***	0.176***
	(0.0124)	(0.0361)	(0.0300)	(0.0490)	(0.0413)	(0.0116)	(0.0304)	(0.0389)	(0.0277)	(0.00789)	(0.0180)	(0.0418)	(0.0299)	(0.0128)	(0.0220)	(0.00674)
HML	0.0624***	-0.104***	-0.114***	0.159***	-0.0207	-0.0268*	0.157***	0.0755***	-0.338***	-0.0868***	-0.183***	0.0307	0.00863	-0.243***	-0.104***	0.0673***
	(0.00961)	(0.0155)	(0.0161)	(0.0184)	(0.0202)	(0.0143)	(0.0167)	(0.0150)	(0.0215)	(0.00732)	(0.00735)	(0.0516)	(0.0207)	(0.00765)	(0.0136)	(0.00639)
MOM	-0.0191***	-0.153***	-0.223***	-0.139***	-0.103***	-0.0430***	-0.203***	-0.0756***	0.0334***	0.158***	-0.0509***	-0.0523***	-0.0772***	0.154***	-0.300***	0.00357*
	(0.00452)	(0.0113)	(0.00970)	(0.0105)	(0.0260)	(0.00730)	(0.0395)	(0.00868)	(0.0103)	(0.00462)	(0.00829)	(0.00956)	(0.00869)	(0.00623)	(0.00925)	(0.00209)
Constant	0.0205	0.332***	0.308***	0.00669	0.323***	-0.193***	0.482***	0.707***	1.108***	0.243***	-0.000707	0.323***	0.351***	0.154***	0.470***	-0.0278***
	(0.0127)	(0.0402)	(0.0153)	(0.0334)	(0.0451)	(0.00896)	(0.0580)	(0.0417)	(0.0210)	(0.0109)	(0.0218)	(0.0422)	(0.0274)	(0.0132)	(0.0166)	(0.00325)
Observations	49,799	4,971	31,756	8,095	4,920	96,332	2,727	6,046	11,866	36,550	10,222	3,743	11,809	18,554	19,286	441,210
R-squared	0.627	0.702	0.571	0.713	0.755	0.569	0.700	0.769	0.553	0.767	0.772	0.776	0.555	0.784	0.712	0.756
Number of funds	432	39	299	113	75	811	49	61	173	524	139	108	169	182	458	3,692

Panel B: Mutual Fund Performance and the Business Cycle with Interactions

	(1) Canada	(2) Denmark	(3) France	(4) Germany	(5) Italy	(6) Japan	(7) Mexiko	(8) Norway	(9) South_Africa	(10) South_Korea	(11) Spain	(12) Sweden	(13) Switzerland	(14) Taiwan	(15) UK	(16) USA
BC	-0.635***	-0.174	-0.123**	0.189**	-0.927***	-0.217***	-0.979***	-0.988***	-2.274***	-2.947***	0.344***	-1.319***	-0.442***	-0.269***	0.0585	0.00451
	(0.0462)	(0.117)	(0.0494)	(0.0909)	(0.0560)	(0.0264)	(0.158)	(0.0736)	(0.0891)	(0.126)	(0.0581)	(0.147)	(0.0654)	(0.0651)	(0.0409)	(0.00905)
Market	0.531***	0.644***	0.650***	0.655***	0.602***	0.803***	0.575***	0.502***	0.224***	0.658***	0.551***	0.605***	0.401***	0.894***	0.688***	0.986***
	(0.00823)	(0.00892)	(0.0109)	(0.0150)	(0.0184)	(0.00713)	(0.0212)	(0.0132)	(0.00834)	(0.00424)	(0.0314)	(0.00932)	(0.00728)	(0.00570)	(0.00826)	(0.00280)
Market*BC	0.00542	-0.103***	-0.404***	-0.282***	-0.251***	-0.177***	-0.127***	0.0263*	-0.0935***	-0.677***	-0.112***	-0.158***	-0.128***	-0.0662***	-0.383***	0.0527***
	(0.00712)	(0.0161)	(0.0145)	(0.0239)	(0.0201)	(0.00922)	(0.0183)	(0.0138)	(0.0110)	(0.0251)	(0.0284)	(0.0317)	(0.0204)	(0.00884)	(0.00996)	(0.00273)
SMB	0.140***	-0.350***	0.0452	0.00949	-0.210***	0.211***	-0.0446	-0.128***	-0.448***	0.0990***	-0.178***	-0.0221	-0.492***	0.505***	-0.101***	0.180***
	(0.0129)	(0.0322)	(0.0323)	(0.0413)	(0.0442)	(0.0112)	(0.0318)	(0.0240)	(0.0250)	(0.00764)	(0.0270)	(0.0459)	(0.0362)	(0.0137)	(0.0260)	(0.00685)
SMB*BC	-0.246***	0.282***	-0.274***	-0.0494	-0.173***	-0.471***	-0.487***	-0.158***	-0.410***	-0.877***	-0.0331	-0.354***	0.306***	-0.0456**	-0.519***	-0.0235***
	(0.0211)	(0.0454)	(0.0277)	(0.0577)	(0.0473)	(0.0108)	(0.0571)	(0.0334)	(0.0321)	(0.0290)	(0.0244)	(0.0503)	(0.0551)	(0.0176)	(0.0257)	(0.00482)
HML	0.0993***	-0.0731***	-0.133***	0.142***	-0.0942***	0.0443***	0.198***	0.199***	-0.336***	-0.0733***	-0.188***	0.187***	0.133***	-0.233***	-0.137***	0.0945***
	(0.0102)	(0.0149)	(0.0162)	(0.0192)	(0.0257)	(0.0145)	(0.0250)	(0.0118)	(0.0162)	(0.00763)	(0.0113)	(0.0325)	(0.0257)	(0.00771)	(0.0233)	(0.00682)
HML*BC	-0.251***	-0.202***	0.0303	0.0986***	0.0884***	-0.105***	0.200***	-0.438***	-0.0507	-0.164***	0.134***	-1.112***	-0.288***	-0.0683***	-0.0533**	-0.143***
	(0.0147)	(0.0288)	(0.0247)	(0.0299)	(0.0298)	(0.0155)	(0.0453)	(0.0266)	(0.0400)	(0.0297)	(0.0136)	(0.0716)	(0.0271)	(0.00974)	(0.0232)	(0.00446)
MOM	-0.0277***	-0.112***	-0.132***	-0.0333***	0.170***	0.0821***	0.0647*	0.225***	0.118***	0.190***	0.465***	-0.0508***	0.268***	0.168***	0.0961***	0.0162***
	(0.00540)	(0.0105)	(0.00950)	(0.0114)	(0.0338)	(0.00872)	(0.0337)	(0.0159)	(0.0185)	(0.00499)	(0.0692)	(0.0118)	(0.0123)	(0.00651)	(0.0297)	(0.00287)
MOM*BC	-0.00484	-0.174***	-0.582***	-0.383***	-0.573***	-0.407***	-0.757***	-0.505***	-0.239***	-1.041***	-0.709***	-0.219***	-0.910***	-0.105***	-0.597***	-0.0162***
	(0.00800)	(0.0275)	(0.0218)	(0.0312)	(0.0393)	(0.0105)	(0.0517)	(0.0203)	(0.0423)	(0.0457)	(0.0715)	(0.0394)	(0.0389)	(0.0129)	(0.0318)	(0.00308)
Constant	-0.0149	0.209***	0.197***	-0.0722**	0.0441	-0.247***	0.258***	0.699***	0.993***	0.145***	-0.724***	0.290***	0.148***	0.138***	0.0850***	-0.0424***
	(0.0135)	(0.0384)	(0.0132)	(0.0323)	(0.0365)	(0.00973)	(0.0535)	(0.0365)	(0.0364)	(0.0108)	(0.0532)	(0.0408)	(0.0276)	(0.0129)	(0.0294)	(0.00347)
Observations	49,799	4,971	31,756	8,095	4,920	96,332	2,727	6,046	11,866	36,550	10,222	3,743	11,809	18,554	19,286	441,210
R-squared	0.632	0.713	0.601	0.726	0.785	0.597	0.723	0.803	0.561	0.803	0.823	0.798	0.650	0.785	0.737	0.757
Number of funds	432	39	299	113	75	811	49	61	173	524	139	108	169	182	458	3,692

Table 4: USA - Comparison of Results

This table summarizes results from panel fixed effect regressions (on the fund level) in the USA. In all regressions the excess fund return is regressed on the four U.S. Carhart factors from Kenneth Frenchs website and a business cycle variable (BC) based on the NBER business cycle measure as well as their interactions. Regression (1) is directly taken from the results of Glode (2008). Regressions (2) and (4) are replications of the Glode (2008) results with data from the CRSP database in the time period from 1980 - 2005 and from 1980 - 2010, respectively. Regressions (3) and (5) repeat the same regressions with Morningstar mutual fund data. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

	(1) Glode (2008) 1980-2005	(2) CRSP 1980-2005	(3) Morningstar 1980-2005	(4) CRSP 1980-2010	(5) Morningstar 1980-2010
BC	0.414***	0.000973***	0.0704***	-9.12e-05	0.00451
	(0.078)	(0.000198)	(0.0159)	(0.000113)	(0.00905)
Market	0.994***	0.985***	1.000***	0.974***	0.986***
	(0.004)	(0.00436)	(0.00310)	(0.00390)	(0.00280)
Market*BC	0.028	-0.0340***	-0.0621***	0.0470***	0.0527***
	(0.020)	(0.00851)	(0.00872)	(0.00321)	(0.00273)
SMB	0.207***	0.187***	0.187***	0.181***	0.180***
	(0.009)	(0.00767)	(0.00724)	(0.00734)	(0.00685)
SMB*BC	-0.114***	-0.0318***	-0.0366***	-0.0381***	-0.0235***
	(0.017)	(0.00744)	(0.00647)	(0.00570)	(0.00482)
HML	0.050***	0.0867***	0.126***	0.0623***	0.0945***
	(0.009)	(0.00953)	(0.00802)	(0.00836)	(0.00682)
HML*BC	-0.034	-0.0950***	-0.0745***	-0.147***	-0.143***
	(0.032)	(0.00853)	(0.00664)	(0.00587)	(0.00446)
MOM	0.037***	0.0106***	0.0112***	0.0140***	0.0162***
	(0.005)	(0.00350)	(0.00325)	(0.00313)	(0.00287)
MOM*BC	-0.076***	-0.0682***	-0.0944***	-0.0250***	-0.0162***
	(0.016)	(0.0108)	(0.00990)	(0.00335)	(0.00308)
Constant	-0.367***	-0.000672***	-0.0755***	-0.000384***	-0.0424***
	(0.019)	(5.54e-05)	(0.00520)	(3.98e-05)	(0.00347)
Observations	82.081	273.632	285.765	393.124	441,210
R-squared	0.74	0.661	0.680	0.723	0.757
Number of funds	3,260	2.444	3.128	2.678	3,692

Table 5: Cross-Sectional Implications
This table displays the results of univariate portfolio sorts based on average monthly unconditional alphas according to the four-factor Carhart (1997) model. We display equal-weighted averages of unconditional alphas (% per month), fund expense ratios (% of TNA), total fund fees (% of TNA) and recession alphas (% per month) for each of the quintile portfolios. Panel A displays the results based on the pooled worldwide sample and Panel B shows the results for individual countries. We only report differences in the average unconditional alpha, average annual expense ratio, average total annual fee and average monthly recession performance between quintile portfolio 5 (funds with the best unconditional performance) and quintile portfolio 1 (funds with the worst unconditional performance). Canada and Japan are missing from the list of countries because there not enough observations for fund fees. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. T-statistics are displayed in parentheses.

Panel A: Pooled Sample

Qunitile	Unconditional Alpha (% per month)	Expenses (% of TNA)	Total Fee (% of TNA)	Recession Alpha (% per month)
Q1	-0.63	1.80	2.39	-0.54
Q2	-0.19	1.46	2.20	-0.17
Q3	-0.04	1.22	2.00	-0.04
Q4	0.10	1.32	1.98	0.10
Q5	0.53	1.47	1.89	0.52
Q5 - Q1	1.16***	-0.33***	-0.49***	1.07***
	(97.36)	(-3.38)	(-3.00)	(6.07)

Panel B: Individual Countries

Qunitile	Unconditional Alpha (% per month)	Expenses (% of TNA)	Total Fee (% of TNA)	Recession Alpha (% per month)
Denmark	0.95***	-0.34	-0.33	1.19***
Q5 - Q1	(8.84)	(-0.63)	(-0.59)	(5.39)
France	1.15***	-0.62	-0.67*	1.34***
Q5 - Q1	(21.58)	(-1.56)	(-1.73)	(7.27)
Germany	1.32***	-0.03	0.00	1.46***
Q5 - Q1	(12.95)	(-0.12)	(-0.01)	(7.51)
Italy	0.91***	0.63	0.50	0.46***
Q5 - Q1	(11.35)	(1.66)	(1.22)	(4.70)
Mexico	0.95***	1.46**	1.46**	0.53***
Q5 - Q1	(9.31)	(2.32)	(2.32)	(2.61)
Norway	0.73***	0.13	0.16	0.74***
Q5 - Q1	(8.29)	(0.50)	(0.55)	(5.27)
South Africa	1.49***	-0.01	0.19	0.52***
Q5 - Q1	(30.29)	(-0.08)	(1.30)	(5.15)
South Korea	1.07***	-0.68***	-0.01	1.11***
Q5 - Q1	(31.48)	(-8.35)	(-0.13)	(6.10)
Spain	0.97***	-0.51***	-0.44***	0.63***
Q5 - Q1	(13.51)	(-2.59)	(-2.37)	(5.15)
Sweden	1.73***	0.01	0.31	1.00***
Q5 - Q1	(21.19)	(0.01)	(0.57)	(6.77)
Switzerland	0.91***	-0.43*	-0.54**	0.76***
Q5 - Q1	(13.90)	(-1.91)	(-2.16)	(7.18)
Taiwan	1.25***	-0.05	-0.02	1.21***
Q5 - Q1	(13.52)	(-0.82)	(-0.30)	(7.92)
UK	1.43***	-0.26***	-0.30***	1.56***
Q5 - Q1	(29.13)	(-2.64)	(-2.49)	(7.16)
USA	0.73***	-0.46***	-0.46*	0.68***
Q5 - Q1	(58.37)	(-4.35)	(-1.88)	(8.77)

Table 6: Risk Factors and Business Cycles
This table summarizes results from various panel fixed effects regressions (on the fund level). In all regressions the excess fund return is regressed on the Carhart (1997) factors and a business cycle variable (BC) based on the countries respective business cycle measure (NBER, ECRI, OECD) as well as their interactions. Regressions (1) and (6) are based on the Carhart (1997) factors of the Lai factor dataset, whereas regressions (2), (3), (4) and (5) are based on the Frazzini, Marmi, individual and regional factor datasets as described in Section 3. Regressions (1)-(5) use the NBER and ECRI business cycle measure, whereas regression (6) uses the OECD business cycle measure. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

	(1) Lai Factor-Set	(2) Frazzini Factor-Set	(3) Marmi Factor-Set	(4) Individual Factor-Set	(5) Regional Factor-Set	(6) OECD Recession
BC	-0.480***	-0.340***	-0.113***	-0.109***	-0.333***	-0.283***
	(0.0106)	(0.0102)	(0.00944)	(0.00864)	(0.00969)	(0.00923)
Market	0.797***	0.854***	0.972***	0.945***	0.851***	0.787***
	(0.00314)	(0.00336)	(0.00247)	(0.00216)	(0.00280)	(0.00319)
Market*BC	-0.110***	-0.0921***	-0.00490*	0.0263***	-0.0862***	-0.0359***
	(0.00299)	(0.00295)	(0.00281)	(0.00213)	(0.00259)	(0.00192)
SMB	0.187***	0.189***	0.151***	0.199***	0.198***	0.185***
	(0.00497)	(0.00583)	(0.00474)	(0.00499)	(0.00574)	(0.00517)
SMB*BC	-0.127***	-0.168***	-0.0438***	-0.0209***	-0.119***	-0.0413***
	(0.00646)	(0.00644)	(0.00518)	(0.00472)	(0.00700)	(0.00337)
HML	0.0137***	0.0417***	0.0792***	0.0507***	0.0470***	0.0426***
	(0.00468)	(0.00488)	(0.00474)	(0.00508)	(0.00528)	(0.00419)
HML*BC	-0.0242***	-0.100***	-0.0475***	-0.0715***	-0.182***	-0.00907**
	(0.00465)	(0.00378)	(0.00445)	(0.00435)	(0.00487)	(0.00425)
MOM	0.0208***	0.00658***	0.0467***		0.0318***	0.0467***
	(0.00260)	(0.00212)	(0.00232)		(0.00259)	(0.00309)
MOM*BC	-0.172***	-0.139***	-0.0240***		-0.152***	-0.124***
	(0.00379)	(0.00305)	(0.00289)		(0.00375)	(0.00334)
Constant	0.0211***	-0.0299***	-0.0835***	-0.00544**	-0.0238***	0.0373***
	(0.00371)	(0.00352)	(0.00310)	(0.00260)	(0.00330)	(0.00467)
Observations	757,859	686,410	691,281	705,744	738,459	754,803
R-squared	0.673	0.685	0.760	0.782	0.639	0.668
Number of fund_id	7,321	6,393	6,678	7,321	7,321	7,524

Table 7: Fund Style
This table shows the recession performance for different fund styles (small / large / mid / value / growth / income / other). All regressions are panel fixed effects regressions (on the fund level) with a specification as outlined in equation (2). The dependent variable is the TNA-weighed monthly fund return (excess over risk-free rate) as calculated in Section 3, pooled over 16 countries. The independent variables are the Carhart (1997) factors per country, calculated as described in Section 3, and a business cycle variable (BC) based on the countries respective business cycle measures (NBER, ECRI) as well as their interactions. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

	(1) small	(2) large	(3) mid	(4) value	(5) growth	(7) income	(8) other
BC	-0.321***	-0.313***	-0.398***	-0.204***	-0.141***	-0.524***	-0.461***
	(0.0330)	(0.0125)	(0.0317)	(0.0284)	(0.0187)	(0.0453)	(0.0265)
Market	0.884***	0.775***	0.866***	0.860***	0.947***	0.664***	0.624***
	(0.00791)	(0.00396)	(0.00876)	(0.00840)	(0.00595)	(0.0194)	(0.00642)
Market*BC	-0.0272***	-0.112***	-0.0316***	-0.0288***	-0.0267***	-0.135***	-0.229***
	(0.00781)	(0.00388)	(0.00828)	(0.00760)	(0.00541)	(0.0144)	(0.00773)
SMB	0.596***	0.0118***	0.377***	0.154***	0.261***	-0.0355***	-0.191***
	(0.00901)	(0.00375)	(0.00912)	(0.0112)	(0.00919)	(0.00823)	(0.0154)
SMB*BC	-0.100***	-0.144***	-0.138***	-0.00325	-0.153***	-0.0687***	-0.196***
	(0.0144)	(0.00723)	(0.0149)	(0.0135)	(0.0113)	(0.0231)	(0.0167)
HML	0.0318**	-0.0135**	-0.0440***	0.369***	-0.128***	0.162***	-0.0479***
	(0.0142)	(0.00533)	(0.0126)	(0.00887)	(0.00779)	(0.0140)	(0.00884)
HML*BC	-0.0189*	-0.0105**	-0.0899***	-0.117***	-0.104***	0.00406	-0.107***
	(0.0103)	(0.00544)	(0.0104)	(0.0108)	(0.00682)	(0.0162)	(0.0162)
MOM	0.0583***	0.0159***	0.0623***	-0.0782***	0.0830***	-0.0643***	0.0130
	(0.00616)	(0.00311)	(0.00711)	(0.00407)	(0.00417)	(0.00750)	(0.00791)
MOM*BC	-0.145***	-0.166***	-0.167***	-0.000467	-0.145***	-0.0600***	-0.375***
	(0.00825)	(0.00515)	(0.00951)	(0.00632)	(0.00562)	(0.0116)	(0.00920)
Constant	0.0176*	0.00291	0.106***	-0.0137	-0.0423***	0.0611***	0.0475***
	(0.00970)	(0.00361)	(0.00838)	(0.00985)	(0.00574)	(0.0176)	(0.0113)
Observations	137,458	396,677	120,102	118,480	261,320	31,220	65,642
R-squared	0.700	0.725	0.699	0.762	0.718	0.683	0.729
Number of fund_id	1,325	3,773	1,182	1,085	2,174	325	796

Table 8: Fund Flows

This table shows dependent portfolio double sorts based on unconditional and conditional Carhart (1997) four factor alphas of mutual funds based on the pooled sample in month t. In a first step, in month t, we sort funds based on their unconditional Carhart (1997) four factor alphas over the past 60 months. Then, within each quintile, we sort funds based on their recession alphas over the same time period. We analyze fund flows in month $t+1$ for these 25 portfolios. Fund flows in month $t+1$ for the 25 portfolios are calculated as described in Section 3. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. T-statistics are displayed in parentheses.

	Portfolio Double Sorts						
Conditional	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q5-Q1**	**Average**
Unconditional							
Q1	1.74%	0.92%	2.11%	1.03%	0.49%	-1.26%***	-
						(-2.58)	
Q2	1.82%	2.66%	2.37%	1.83%	1.20%	-0.62%*	-
						(-1.87)	
Q3	1.95%	2.40%	1.92%	1.84%	1.18%	-0.78%**	-
						(-1.97)	
Q4	1.81%	2.60%	2.84%	1.95%	1.37%	-0.44%	-
						(-0.98)	
Q5	2.98%	2.02%	2.57%	2.27%	4.19%	1.22%***	-
						(3.07)	
Q5-Q1	1.23%***	1.11%***	0.46%	1.25%**	3.70%***	-	1.55%
	(4.34)	(3.36)	(1.16)	(2.32)	(6.61)		
Average	-	-	-	-	-	-0.38%	-

Table 9: Tracking Errors, Aggregate Fund Flows, and Market Illiquidity
Panel A of this table reports the results of equal-weighted averages of mutual funds' tracking errors in recessions and non-recessions. Panel B reports aggregate fund flows into mutual funds in recessions and non-recessions. Panel C reports average market illiquidity in recessions and non-recessions. We compute market illiquidity based on equal-weighted individual stock illiquidity using the Lesmond, Ogden, and Trzcinka (1999) measure. In each panel we also report differences with corresponding t-statistics. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively.

Panel A: Tracking Errors

Country	Recession Tracking Error	Non-Recession Tracking Error	Difference	T-statistics
All	4.16	3.41	0.74***	20.89
Canada	5.85	4.30	1.55***	16.41
Denmark	4.89	3.70	1.19***	7.08
France	5.45	4.50	0.96***	8.45
Germany	5.57	4.22	1.35***	6.48
Italy	4.23	3.94	0.29**	2.18
Japan	4.09	3.91	0.19***	2.70
Mexiko	6.78	4.58	2.20***	5.59
Norway	4.51	4.55	-0.04	-0.27
South Africa	9.18	6.26	2.92***	21.62
South Korea	9.10	5.35	3.75***	41.08
Spain	5.15	4.07	1.09***	8.08
Sweden	5.76	4.36	1.40***	7.95
Switzerland	5.46	4.00	1.46***	6.59
Taiwan	5.09	4.84	0.25**	2.39
UK	4.46	3.74	0.73***	9.71
USA	2.61	2.45	0.17***	4.83

Panel B: Aggregate Fund Flows

Country	Recession Aggregate Flows	Non-Recession Aggregate Flows	Difference	T-statistics
All	-0.09%	1.61%	-1.70%***	-8.25
Canada	0.43%	2.10%	-1.67%**	-2.14
Denmark	-0.38%	1.07%	-1.45%***	-7.13
France	-0.64%	1.37%	-2.01%***	-6.14
Germany	0.04%	0.76%	-0.72%	-1.45
Italy	-1.09%	0.92%	-2.01%***	-5.19
Japan	0.09%	0.94%	-0.85%**	-2.04
Mexiko	-0.45%	1.68%	-2.13%**	-2.31
Norway	0.76%	2.24%	-1.48%***	-9.01
South Africa	-1.28%	1.03%	-2.31%***	-7.45
South Korea	1.68%	1.65%	0.03%	0.05
Spain	-0.56%	0.83%	-1.39%***	-8.62
Sweden	-0.18%	0.76%	-0.92%	-0.52
Switzerland	-0.73%	0.93%	-1.66%***	-8.12
Taiwan	-0.43%	0.30%	-0.73%	-0.65
UK	0.03%	0.95%	-0.92%***	-10.89
USA	0.26%	1.79%	-1.53%***	-8.33

Table 9: Tracking Errors, Aggregate Fund Flows, and Market Illiquidity (continued)

Panel C: Market Illiquidity

Country	Recession Market Illiquidity	Non-Recession Market Illiquidity	Difference	T-statistics
All	0.26	0.22	0.04***	6.13
Canada	0.31	0.27	0.04***	6.21
Denmark	0.34	0.35	0.01	1.01
France	0.25	0.19	0.06***	7.24
Germany	0.27	0.21	0.06***	5.89
Italy	0.18	0.18	-0.00	-0.54
Japan	0.18	0.16	0.02***	4.67
Mexiko	0.29	0.23	0.07***	5.22
Norway	0.31	0.29	0.02***	3.61
South Africa	0.36	0.26	0.10***	9.45
South Korea	0.13	0.11	-0.01	-1.22
Spain	0.22	0.16	0.06***	7.71
Sweden	0.24	0.24	0.00	0.83
Switzerland	0.27	0.24	0.03***	5.11
Taiwan	0.12	0.11	-0.01**	2.11
UK	0.32	0.25	0.07***	10.12
USA	0.27	0.23	0.04***	4.13

Table 10: Explaining Mutual Fund Underperformance: Portfolio Sorts
This table reports the results of univariate portfolio sorts. We sort funds in quintiles according to their tracking error in recessions. Then we report the average conditional Carhart (1997) four factor alpha for each of the quintile portfolios. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively.

Recession Performance of Tracking Error Fund Portfolios

	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q5-Q1**	**Q5-Q1 t-value**
Canada	-0.21%	-0.22%	-0.33%	-0.19%	-0.11%	0.10%	0.56
Denmark	-0.14%	0.01%	-0.29%	-1.03%	-1.35%	-1.21%***	-6.78
France	-0.05%	-0.69%	-0.75%	-0.77%	-0.71%	-0.66%***	-4.11
Germany	-0.31%	-0.61%	-1.01%	-0.65%	-0.34%	-0.03%	-0.45
Italy	-0.04%	-0.38%	-0.43%	-0.35%	-0.41%	-0.37%***	-4.11
Japan	0.06%	-0.56%	-0.58%	-0.51%	-0.76%	-0.82%***	-6.90
Mexiko	-0.33%	-0.25%	-0.33%	-0.20%	0.14%	0.47%*	1.89
Norway	-0.45%	-0.32%	-0.25%	-0.36%	-0.37%	0.08%	0.99
South Africa	-0.42%	-0.53%	-0.44%	-0.47%	-1.21%	-0.79%***	-5.48
South Korea	-0.47%	-0.53%	-1.31%	-1.38%	-1.16%	-0.69%***	-3.17
Spain	-0.27%	-0.75%	-0.14%	-0.17%	-0.16%	0.11%	1.21
Sweden	-0.76%	-0.95%	-0.78%	-0.85%	-0.50%	0.26%***	3.67
Switzerland	-0.26%	-0.41%	-0.54%	-0.62%	-0.41%	-0.15%**	-2.34
Taiwan	-0.42%	-0.27%	-0.17%	-0.28%	-0.37%	0.05%	0.55
UK	0.21%	0.37%	0.07%	-0.21%	-0.51%	-0.72%***	-5.89
USA	0.34%	0.32%	-0.11%	-0.34%	-0.42%	-0.76%***	-7.81
ALL	0.12%	-0.21%	0.43%	-0.34%	-0.61%	-0.73%***	-5.74
ALL, Flows < 0%	0.09%	-0.13%	0.32%	-0.27%	-1.25%	-1.34%***	-4.89
ALL, Flows < -1%	0.08%	-0.17%	0.51%	-0.39%	-1.49%	-1.57%***	-4.12
ALL, Flows < -2%	0.19%	-0.11%	0.23%	-0.14%	-1.76%	-1.95%***	-3.00
ALL, Top 20% Illiq	0.13%	-0.15%	0.01%	-0.23%	-1.14%	-1.27%***	-3.64
ALL, Top 10% Illiq	0.09%	-0.11%	0.12%	-0.32%	-1.43%	-1.32%***	-3.81
ALL, Top 5% Illiq	0.21%	-0.16%	0.02%	-0.18%	-1.60%	-1.81%***	-3.24

Table 11: Explaining Mutual Fund Underperformance: Regression Analysis
This table reports the results of country i's average mutual fund recession performance in month t on country i's average mutual fund reccession tracking error (TE), average aggregate recession fund flows (FF), market illiquidity (MI), and different country characteristics measured in month t. As country characteristics we use GDP per capita, the number of listed domestic stocks, mutual fund assets per GPD per capita, the number of mutual fund companies per country, and a country's home bias to our model. Statistical significance at the ten, five and one percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by country) are in parentheses.

	(1) Recession Performance	(2) Recession Performance	(3) Recession Performance	(4) Recession Performance	(5) Recession Performance
TE	-0.01659**			-0.01969**	-0.01254*
	(0.00847)			(0.00803)	(0.00697)
FF		0.3623*		0.2398*	0.1253
		(0.2035)		(0.1402)	(0.1228)
MI			-0.8661***	-0.8198***	-0.7697***
			(0.2446)	(0.2732)	(0.2097)
GDP					0.053
					(0.099)
No. of Stocks					-0.0003
					(0.0007)
Mutual Fund Assets					-0.0002
					(0.0005)
No. of MF Companies					0.0008*
					(0.00045)
Home Bias					-0.3452*
					(0.1967)
Constant	0.1969	-0.6690***	0.3063	0.2567	0.7676***
	(0.4817)	(0.1470)	(0.4452)	(0.4152)	(0.2152)
Observations	1097	1097	1097	1097	1097
R-squared	0.101	0.094	0.104	0.175	0.311

Table 12: Hedge Funds

Panel A: This table shows the results of panel fixed regressions (on the fund level) of conditional hedge fund performance for funds that employ / do not employ lockup restrictions in the period from 1994 - 2010. The dependent variable is the monthly hedge fund return (excess over risk-free rate) from the TASS database. The independent variables are the Fung and Hsieh (2004) factors and the NBER US business cycle indicator (BC) as well as their interactions. Statistical significance at the ten, five and one-percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

	(1) Lockup Performance and BC	(2) No Lockup Performance and BC	(3) Lockup Performance with Interactions	(4) No Lockup Performance with Interactions
BC	-0.299***	0.077***	-0.304***	0.069***
	(0.0283)	(0.0247)	(0.0270)	(0.0210)
Market	0.321***	0.277***	0.343***	0.291***
	(0.00743)	(0.00632)	(0.00839)	(0.00702)
Market*BC			-0.0213**	-0.00850
			(0.00946)	(0.00871)
SMB	0.182***	0.140***	0.219***	0.168***
	(0.00678)	(0.00509)	(0.00774)	(0.00572)
SMB*BC			-0.256***	-0.224***
			(0.0120)	(0.00946)
Δ Term	-0.0532***	-0.0158***	0.00635	0.0311***
	(0.00668)	(0.00540)	(0.00613)	(0.00530)
Δ Term*BC			-0.0963***	-0.0886***
			(0.0166)	(0.0138)
Δ Credit	0.212***	0.208***	0.184***	0.211***
	(0.00898)	(0.00714)	(0.00993)	(0.00821)
Δ Credit*BC			0.0236*	-0.0345***
			(0.0123)	(0.0103)
PTFSBD	0.00185**	0.00539***	0.00185**	0.00539***
	(0.000884)	(0.000848)	(0.000884)	(0.000848)
PTFSBD*BC			-0.00462*	0.000135
			(0.00236)	(0.00203)
PTFSFX	0.00734***	0.00878***	0.00734***	0.00878***
	(0.000587)	(0.000580)	(0.000587)	(0.000580)
PTFSFX*BC			-0.0133***	-0.0236***
			(0.00164)	(0.00136)
PTFSCOM	0.00681***	0.0123***	0.00681***	0.0123***
	(0.000882)	(0.000836)	(0.000882)	(0.000836)
PTFSCOM*BC			-0.00226	0.00218
			(0.00204)	(0.00191)
Constant	0.630***	0.550***	0.630***	0.550***
	(0.00695)	(0.00588)	(0.00695)	(0.00588)
Observations	193,891	278,271	193,891	278,271
R-squared	0.107	0.074	0.109	0.076

Table 12: Hedge Funds (continued)

Panel B: This table shows the results of panel fixed regressions (on the fund level) of conditional hedge fund performance for funds that employ / do not employ lockup restrictions for different hedge fund styles in the period from 1994 - 2010. The dependent variable is the monthly hedge fund return (excess over risk-free rate) from the TASS database. The independent variables are the Fung and Hsieh (2004) factors and the NBER US business cycle indicator (BC) as well as their interactions. We only display the results on the coefficient estimate on BC; (time-varying) risk factors are included in the regressions but surpressed in the table. Statistical significance at the ten, five and one-percent level is indicated by *,**, and ***, respectively. Clustered robust standard errors (by fund) are in parentheses.

Coefficient Estimate on BC

	(1) Lockup Performance and BC	(2) No Lockup Performance and BC	(3) Lockup Performance with Interactions	(4) No Lockup Performance with Interactions
Convertible Arbitrage	-0.112***	0.002	-0.115***	0.006
	(0.0246)	(0.0045)	(0.0276)	(0.0056)
Dedicated Short Bias	0.134**	0.077*	0.110**	0.054*
	(0.0572)	(0.0411)	(0.0511)	(0.0282)
Emerging Markets	-0.354***	-0.004	-0.367***	0.009
	(0.0431)	(0.00325)	(0.0478)	(0.00428)
Equity Market Neutral	-0.254***	0.091***	-0.231***	0.120***
	(0.0266)	(0.0210)	(0.0275)	(0.0310)
Event Driven	-0.267***	-0.053***	-0.213***	-0.071***
	(0.0309)	(0.0177)	(0.0278)	(0.0199)
Fixed Income Arbitrage	0.056***	0.011*	0.121***	0.031**
	(0.00991)	(0.00594)	(0.0167)	(0.0154)
Global Macro	-0.312***	0.089***	-0.345***	0.064***
	(0.0298)	(0.0211)	(0.0326)	(0.0153)
Long/Short Equity	-0.412***	0.089***	-0.398***	0.021*
	(0.0363)	(0.0174)	(0.0425)	(0.0116)
Managed Futures	0.054**	0.012	0.045***	0.033**
	(0.0233)	(0.0083)	(0.0072)	(0.0157)
Multi-Strategy	-0.511***	-0.045**	-0.523***	-0.145***
	(0.0456)	(0.0211)	(0.0439)	(0.0423)