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Risk-Return Trade-Off for European Stock Markets

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Risk-Return Trade-Off for European Stock Markets *

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Risk-Return Trade-Off for European Stock Markets

Abstract: This paper adopts dynamic factor models with macro-finance predictors to test the intertemporal risk-return relation for 13 European stock markets. We identify country specific, euro area, and global macro-finance factors to determine the conditional risk and return. Empirically, the risk-return trade-off is generally negative. However, a Markov switching model documents that there is time-variation in this trade-off that is linked to the state of the economy.

Keywords: Risk-return trade-off; Dynamic factor model; Macro-finance predictors; European stock markets; Markov switching model

JEL Classifications: C22; G11; G12; G17

1 Introduction

The risk-return trade-off is fundamental to many areas within financial economics such as optimal portfolio choice and risk analysis. Initially, finance theory postulates a positive risk-return relation, both across assets and over time. For instance, the Intertemporal Capital Asset Pricing Model (ICAPM) of Merton (1973) suggests that the conditional expected excess return on the stock market should vary positively with the market's conditional volatility. However, the literature testing the intertemporal risk-return trade-off documents that the relation is unstable and varies substantially over time; for recent contributions see, Ghysels, Santa-Clara, and Valkanov (2005), Ludvigson and Ng (2007), and Brandt and Wang (2010), among others.

To explain the mixed results, earlier work by Abel (1988), Backus and Gregory (1993), and Gennotte and Marsh (1993) propose models in which a negative risk-return relation is theoretically plausible. For example, Backus and Gregory (1993), using a dynamic asset-pricing model, examine the relation in a series of numerical examples and show that it can be of virtually any shape; a negative risk-return relation is possible when the autocorrelation of variables that describe the state of the economy is positive.

Another theoretical framework that can generate a negative relation between first and second moments of returns is the model considered by Whitelaw (2000). He assumes that consumption growth follows a regime-switching process and shows that such a structure can generate time-varying as well as negative relation between expected returns and volatility.[1] Thus, since theory supports both positive and negative risk-return trade-off across time,

[1] From an empirical point of view, there are several studies that document a negative relation; for example, Campbell (1987), Breen, Glosten, and Jagannathan (1989), Nelson (1991), Glosten, Jagannathan, and Runkle (1993), Whitelaw (2000), Harvey (2001), and Brandt and Kang (2004).

the intertemporal relationship is primarily an empirical question.

We investigate the risk-return relation for 13 European stock markets, mainly old EU member states. So far, little attention has been given to Europe as most studies focus on the US stock market. Extending the US results to a European setting is a worthy exercise, given the importance of these countries and the process of integration of European financial markets.

From a methodological point of view, our work is related to Stock and Watson (2002) who adopt dynamic factor models to summarize the information from a large number of economic variables by a relatively small number of estimated factors. Ludvigson and Ng (2007) use a dynamic factor approach to determine the risk-return relation for the US stock market. A similar approach is used by Goyal and Welch (2008) and Christiansen, Schmeling, and Schrimpf (2012) to predict asset returns and volatilities.

In line with this approach, we estimate the conditional return and conditional variance of excess stock market returns using factor-augmented models. The factors are obtained as follows. First, we estimate country specific factors using a data set of macro-finance variables for each country separately. Second, we use euro area macro-finance variables to identify euro area factors. Third, we extract US factors from a US data base of macro-finance variables. We estimate the linear risk-return trade-off using the conditional return and conditional variance. Additionally, we take into account the effects from skewness and kurtosis risk in the risk-return relation.

Furthermore, we allow the state of the economy to have an effect on the relation by considering a time-varying risk-return trade-off regression. Initially, the coefficients of the model are allowed to depend on the business cycle indicator. More advanced, we allow for time variation by estimating the risk-return trade-off in a Markov switching framework. This analysis is in line with the conditional ICAPM where the state of the economy approximating investment opportunities is also important in asset pricing, cf. Merton (1973), Guo and Whitelaw (2006), Lustig and Verdelhan (2012), and Nyberg (2012).

The empirical findings are as follows. We use monthly data from 1986 to 2012. It is important to account for country specific, euro area, as well as global macro-finance factors when determining the conditional return and risk. Empirically, the risk-return trade-off is generally negative. We also find evidence of time-variation in the risk-return trade-off across the states of the economy. However, when we only consider time-variation induced by the business cycle indicator there are not signs of time-variation. Therefore, we conclude that the states of the economy with respect to the risk-return trade-off are not characterized by the business cycle alone.

The structure of the remaining part of the paper is as follows. We introduce the data in Section 2 after which we explain the econometric framework in Section 3. The empirical results are found in Section 4 followed by the conclusion in Section 5. Various additional tables are delegated to the Appendix.

2 Data

We focus on the stock markets of 13 European economies, namely Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Spain, Switzerland, and the UK. The data frequency is monthly with the sample covering the period from $1986M02$ to $2012M05$ for most countries. The sample period begins later for Austria ($1991M8$), Finland ($1987M3$), Greece ($1994M3$), and Spain ($1992M2$).

2.1 Realized Volatility

We use realized volatility to model return volatility, motivated by recent findings in the volatility modeling literature. Andersen, Bollerslev, Diebold, and Labys (2003) argue that realized volatility is free of tightly parametric functional form assumptions and provide a consistent estimate of ex-post return variability. To calculate the monthly realized volatility we use daily observations. The log-returns are obtained from the DataStream total return local currency stock indices. We use the 3-month interbank rates as risk free rates. These are calculated into daily rates by the money market convention (i.e. by dividing the yearly rate by 360). We calculate the end-of-month realized volatility for month t from daily excess returns, $y_{\tau t}$.

$$Vol_t = \sqrt{\sum_{\tau=1}^{n_t} y_{\tau t}^2} \tag{1}$$

where n_t is the number of days in month t and τ indicates the particular day of that month ($\tau = 1, .., n_t$).

2.2 Common Factors

We use a large number of explanatory variables to extract the common factors. The sample contains a number of country-specific variables for each country; Austria 110, Belgium 134, Denmark 130, Finland 134, France 152, Germany 147, Greece 125, Ireland 96, Italy 95, the Netherlands 146, Spain 155, Switzerland 152, and the UK 127. We also obtain aggregate data for the euro area (179 variables) and for the US (174 variables) to construct euro area (regional) and US (global) factors, respectively. The series are selected to represent major categories of macro-finance time series: foreign sector, output and income, sales, orders, purchases, employment, labour cost, money, prices, exchange rates, confidence indicators, stock market indices, and interest rates and spreads. The variables are transformed to be stationary (taking logs and differences where appropriate) and standardized. Further details about the data are available in the Appendix. The choice of series is similar to Stock and Watson (2002) and others.

3 Econometric Methodology

3.1 Conditional Return and Conditional Risk

We estimate the conditional return and conditional volatility of excess stock market returns. The first stage of the modelling procedure is to estimate the common factors. Let X_t^{loc} denote a large vector $(N_{loc} \times 1)$ of country-specific macro-finance variables, X_t^{Eur} is a large vector $(N_{Eur} \times 1)$ of euro area macro-finance variables, and X_t^{US} is a large vector $(N_{US} \times 1)$ of US macro-finance variables. The macro-finance variables are related to the unobserved common factors according to

$$X_t^j = \Lambda^j F_t^j + e_t^j, \text{ for } j = loc, Eur, US \tag{2}$$

where Λ^j is an $N_j \times r_j$ matrix of factor loadings and F_t^j describes the r_j dimensional vector of unobserved common factors, where $r_j << N_j$. The $N_j \times 1$ vector e_t^j denotes the purely idiosyncratic errors that are allowed to be serially correlated and weakly correlated across indicators.[2] The above equation reflects the fact that the elements of F_t^j, which in general are correlated, represent pervasive forces that drive the common dynamics of X_t^j.

[2]This cross-correlation must vanish as N goes to infinity. See Stock and Watson (2002) for a formal discussion of the required restrictions on the cross-correlation of the idiosyncratic errors.

It is in principle not restrictive to assume that X_t^j depends only on the current values of the factors, as F_t^j can always capture arbitrary lags of some fundamental factors.

We follow Stock and Watson (2002) and Ludvigson and Ng (2007) and split the analysis in two stages. At the first stage, we retrieve the principal component estimates, $\widehat{F}_t^j$. To determine the composition of $\widehat{F}_t^j$, we also use the squared factors $(\widehat{F}_{i,t}^j)^2$ $(i = 1, ..., r_j)$. The dimension of the common factor space, r_j, is selected using the BIC criterion with the maximum order for r_j being set to 6.

Let y_t denote the excess stock market log-returns at month t.[3] At the second stage, we predict the excess stock market return using a linear factor augmented regression

$$\widehat{y}_t = \alpha^{\mathbf{y}} + \beta_1^{\prime\mathbf{y}} \widehat{F}_{t-1}^{loc} + \beta_2^{\prime\mathbf{y}} \left(\widehat{F}_{t-1}^{loc}\right) \circ \left(\widehat{F}_{t-1}^{loc}\right) + \gamma_1^{\prime\mathbf{y}} \widehat{F}_{t-1}^{Eur} + \gamma_2^{\prime\mathbf{y}} \left(\widehat{F}_{t-1}^{Eur}\right) \circ \left(\widehat{F}_{t-1}^{Eur}\right) \tag{3}$$
$$+ \delta_1^{\prime\mathbf{y}} \widehat{F}_{t-1}^{US} + \delta_2^{\prime\mathbf{y}} \left(\widehat{F}_{t-1}^{US}\right) \circ \left(\widehat{F}_{t-1}^{US}\right) + \phi^{\mathbf{y}} y_{t-1} + \theta^{y} X_t$$

where the symbol $\circ$ indicates the Hadamard product. X_t includes a set of conditioning variables, namely the term spread and the dividend yield for the return equation and the VIX volatility index for the volatility equation. The link between stock returns and dividend yields is well established among academics and practitioners. The fact that the term spread tracks time-varying term premia in stock returns is first pointed by Fama and French (1989). Guo and Whitelaw (2006) show that implied volatility (as measured by VIX) is a very good predictor of the realized volatility of stock returns.

[3] With a slight misuse of notation letting y_t denote monthly values in place of daily ones.

The conditional volatility is estimated using a similar linear projection based upon the following factor augmented model by simply replacing $\widehat{y}_t$ with $\widehat{Vol}_t$ and the parameters are changed accordingly.

In the empirical analysis we select parsimonious specifications for eq. (3) by following a general-to-specific search (deleting the least significant regressor and re-estimating the regressions each time). The reported models are selected using the BIC and retaining only variables that are significant at the 1% level of significance. We investigate the effects of using no factors ($\beta_1^i = \beta_2^i = \gamma_1^i = \gamma_2^i = \delta_1^i = \delta_2^i = 0$), only local factors ($\gamma_1^i = \gamma_2^i = \delta_1^i = \delta_2^i = 0$), only local and euro area factors ($\delta_1^i = \delta_2^i = 0$), and all factors simultaneously for the risk-return relation ($i = y, v$ where y is the return regression and v is the volatility regression).

3.2 Risk-Return Regressions

We consider the following linear risk-return relationship where the current conditional return is explained by its own lag and the current and lagged values of the conditional volatility. This is similar to Ludvigson and Ng (2007). The linear risk-return regression reads:

$$\widehat{y}_t = c_0 + c_1\widehat{y}_{t-1} + c_2\widehat{Vol}_t + c_3\widehat{Vol}_{t-1} + e_t \tag{4}$$

Subsequently, we address the issue of time-variation in the risk-return relationship. Time-varying risk-return trade-off can arise in many different settings such as when aggregate relative risk aversion (approximated by the volatility coefficients) is countercyclical (e.g., Campbell and Cochrane (1999)), or when investment opportunities (the hedge component) are time-varying (Guo, Wang, and Yang (2013)), or during recessions as argued by Lustig and Verdelhan (2012). Following this line of research, we allow the coefficients of the risk-return relation in eq. (4) to depend on a business cycle indicator that equals one when the country is in recession (REC_t), and zero otherwise.[4] The recession indicator risk-return trade-off regression becomes

$$\begin{aligned} \widehat{y}_t = {} & c_0 + c_1\widehat{y}_{t-1} + c_2\widehat{Vol}_t + c_3\widehat{Vol}_{t-1} \\ & + c_4 REC_t + c_5 REC_t\widehat{y}_{t-1} + c_6 REC_t\widehat{Vol}_t + c_7 REC_t\widehat{Vol}_{t-1} + e_t \end{aligned} \tag{5}$$

Lastly, we use the Markov switching model to describe the risk-return relationship.[5] The intuition is that the relationship can switch between two states such as the normal and the unusual state. So, this is another way to uncover the time-variation in the risk-return trade-off than by using the recession indicator. The Markov switching model has the advantage that it does not *a priori* choose a state variable (e.g. the recession indicator). Instead, the regime classification in this model is probabilistic and determined by the data. To uncover this property, we let s_t denote an unobservable state variable, which follows a first order Markov chain with transition probabilities

$$\begin{aligned} prob(s_t = 1|s_{t-1} = 1) = p_{11} \\ prob(s_t = 2|s_{t-1} = 2) = p_{22} \end{aligned} \tag{6}$$

that determine the persistence of each state. The first state is the most common, $p_{11} > p_{22}$. The Markov switching risk-return trade-off regression is

[4] The business cycle data are taken from the Economic Cycle Research Institute (ECRI) following Schrimpf and Wang (2010).

[5] For more details on the Markov switching method and its popularity in the finance literature, cf. e.g. Guidolin (2011).

then given by

$$\widehat{y}_t = c_0^{s_t} + c_1^{s_t}\widehat{y}_{t-1} + c_2^{s_t}\widehat{Vol}_t + c_3^{s_t}\widehat{Vol}_{t-1} + e_t \tag{7}$$

where the parameters are constant but different in the two states,

$$c_i^{s_t} = \begin{cases} c_i^1 & \text{for} \quad s_t = 1 \\ c_i^2 & \text{for} \quad s_t = 2 \end{cases}, i = 0, ..., 3 \tag{8}$$

The residual follows a conditional normal distribution and its variance is state dependent: $e_t \sim N\left(0, \sigma_{s_t}^2\right)$ where

$$\sigma_{s_t}^2 = \begin{cases} \sigma_1^2 & \text{for} \quad s_t = 1 \\ \sigma_2^2 & \text{for} \quad s_t = 2 \end{cases}. \tag{9}$$

The regime classification measure (RCM) of Ang and Bekaert (2002) is a way to assess the quality of the model's performance:

$$RCM = 100 \times \frac{4}{T}\sum_{t=1}^{T}\xi_{t/T}^1\xi_{t/T}^2 \tag{10}$$

where $\xi_{t/T}^j = prob(s_t = j|\widehat{y}_1, ..., \widehat{y}_T; \widehat{\theta})$ for $j = 1, 2$ is the smoothed state probability. That is, the sample average of the products of the smoothed state probabilities. A perfect model will be associated with a RCM close to 0, while a model that cannot distinguish between regimes at all will have a RCM close to 100.

Since the variables in the risk-return regressions stem from the first-step regressions in eq. (3), the standard errors are obtained by bootstrapping. $1,000$ samples are built by drawing with replacement.

4 Empirical Findings

4.1 Factor Estimation

First, we estimate a relatively large number of factors (10) for each country, the euro area, and the US. Second, we choose the most important factors using the Bai and Ng (2002) criterion. The number of factors that sufficiently describe the data set is 6 for all countries. The first factor explains the largest fraction of the total variation in the panel of data (which varies from 25% for Greece to 60% for Ireland), cf. Table $A1$ in the Appendix. The first six factors account for more than 81% of the variability in the data set of each country. Although there is variability in the persistence of the estimated factors as documented by the first order autocorrelation coefficient for each factor, it is generally positive. These characteristics are similar to Ludvigson and Ng (2007).

4.2 Conditional Return and Conditional Risk

Table 1 displays the conditional return results for three countries, namely Germany, Spain, and the UK, while Table $A2$ (in the Appendix) displays the results for the rest of the countries. We focus our attention on Germany as the largest euro area economy, Spain as the representative country from the troubled South, and the UK as the largest country outside the euro. We report results for the conditional return regression from eq. (3) using three specifications: with local factors, with local and euro area factors, and with local, euro area, and global factors. As we move from restricted to unrestricted regressions, there is generally an improvement in fit with the included regressors being similar which indicates that our specification method is robust. For Germany, local factors are important determinants of the estimated excess returns along with a number of US factors and the term spread. As local and euro area factors may be highly correlated for Germany, this result is not unexpected. Excess returns for Spain are predicted mainly by local and euro area factors along with a US squared term. On the other hand, the UK is rather affected by the US factors coupled with some squared local factors. The explanatory power of the factors is generally high with the adjusted R^2 statistic being large for all countries except for the UK.[6]

Tables 2 and $A3$ show the factors that contain significant information about the conditional volatility according to the volatility version of eq. (3). As in the case of conditional returns, local and US factors along with their squared terms are important predictors for future conditional volatility of Germany, while in the case of Spain local and euro area are the most important determinants of volatility. As for the UK, the conditional volatility is generally predicted by US and US squared factors along with a single euro area factor. The VIX is an important determinant of conditional volatility for all countries. This finding corroborates the US results in Guo and Whitelaw (2006). The explanatory power of the factors for the volatility is fairly large with adjusted R^2 values ranging from 47% to 69%. The explanatory power is much larger in the volatility equation than in the return equation, except for Germany where it is of about the same size. This finding is not unexpected since first moments of returns are generally more difficult to estimate than second moments, cf. Merton (1980). The conditional volatility is standardized for the remaining analysis.

[6]Typically, the US studies find very modest R^2 values of less than 5% when conditioning on a few predetermined instruments (e.g., dividend yield, term spread).

4.3 Benchmark Risk-Return Results

Tables 3 and $A4$ display the results of the linear risk-return trade-off from eq. (4) as it appears when the return and volatility are projected upon the different sets of factors. In general, the explanatory power increases when more common macro-finance factors are accounted for. Similarly, the lowest explanatory power arises when considering the raw returns and raw risk. The results clearly show that it is of vast importance to condition the returns and risk upon the common macro-finance factors before investigating the risk-return trade-off.

Onwards, we use the risk-return regressions based upon the global factors. The explanatory power of the risk-return trade-off equation differs across the European stock markets. It is largest for Austria, Belgium, Germany, and Switzerland with adjusted R^2 values higher than 40%, followed by Denmark, Spain, Greece, the Netherlands, Ireland, the UK, France, and Italy with adjusted R^2 values higher than 27%. Finland is very different, with a low explanatory power. For comparison, Ludvigson and Ng (2007) find an R^2 value for the US of 41%.

The autoregressive dynamics have a positive sign which is most reasonable at a monthly frequency. Further, the current conditional volatility generally has a negative effect upon the conditional return with the lagged conditional volatility having a positive effect. Summing up the coefficients for the contemporaneous and lagged volatility the overall relation, although negative, is in line with some versions of the Ludvigson and Ng (2007) model. The negative risk-return relation is in accordance with parts of the previous literature, cf. Abel (1988), Backus and Gregory (1993), Gennotte and Marsh (1993), and Whitelaw (2000).

The sign of the effects is opposite to that of the US stock market documented in Ludvigson and Ng (2007). In contrast, our results for the US obtained in the same way as for the European stock markets (Table A4) are qualitatively identical to the European results. So, with the risk and return cleaned for macro-finance effects as we do here, we find that the risk-return trade-off remains negative as for the raw risk and returns. One obvious reason for the differences to Ludvigson and Ng (2007) is that we use monthly data while they use quarterly.

4.4 Time-Varying Risk-Return Trade-Off

Tables 4 and $A5$ show the results from estimating the recession indicator risk-return regression in eq. (5). Generally, the risk-return trade-off for the European stock markets is not significantly different between recessions and expansions. We report the Wald test of the joint significance of the recession indicator terms. In the vast majority of cases, the recession indicator terms do not pass the joint significance test. Thus, overall, we can conclude that any time-variation in the risk-return trade-off is not caused solely by the business cycle. This in contrast to the US findings in Lustig and Verdelhan (2012), and Nyberg (2012).

Tables 5 and $A6$ show the results from estimating the Markov switching risk-return trade-off model from eq. (7). We find evidence of two well distinguished states as the RCM's are small (from 9 to 43). We denote the persistent state 1 the normal state, while state 2 is the unusual state. State 1 applies between 53% and 87% of the time. The explanatory power of the Markov switching regressions is high (R^2 is above 33% for all countries) and very large for some countries, e.g. Germany (R^2 of 64%). For all countries, the explanatory power of the Markov switching model is larger than for the linear model. Thus, in order to reveal the time-variation in the risk-return trade-off it is important to use more information than just the current state of the business cycle.

As expected, in state 1, the risk-return trade-off is similar to that in the simple linear model. The contemporaneous conditional volatility has a negative effect upon the conditional return, while the coefficient of lagged conditional volatility is positive. The effect from the lagged return itself is positive. On the other hand, in state 2 the effect from the contemporaneous volatility is still negative but the effect is less strong than in state 1. The effect from the lagged volatility is unaltered positive. The time-varying risk-return relation uncovered using the Markov switching model is in accordance with the state of the economy being positively autocorrelated, cf. Backus and Gregory (1993).

Figure 1 shows the smoothed state probabilities for each of the countries as well as their recession periods. The figure stresses that the business cycles are not one-to-one related to the state. The time-variation uncovered using the Markov switching model but not using the recession indicator variable specification implies that the time variation is not caused by the business cycle itself. Rather, the state of the economy depends on more than the business cycle indicator. Lustig and Verdelhan (2012) and Nyberg (2012) find that the Sharpe ratios are higher in recessions that in expansions. Our results are in continuation of this. We find that in the unusual state the risk-return trade-off is less strong (less negative) implying higher Sharpe ratio than in the normal state.

4.5 Skewness and Kurtosis Effects

As a novel feature, we allow for the realized skewness, Sk_t, and realized kurtosis, Ku_t, as additional risk measures. The realized skewness and realized kurtosis are calculated correspondingly to the realized volatility in eq. (1). The conditional skewness and kurtosis regressions (upon the common macro-finance factors) are shown in Tables $A4$ and $A5$. Here, the explanatory power is much lower than for the return and volatility regressions. In fact, the explanatory power is so low that we choose to use the unconditional realized skewness and kurtosis onwards, although the results are robust to using the conditional skewness and kurtosis.

The extended risk-return relation is obtained by adding the contemporaneous and lagged skewness and kurtosis to the linear risk-return regression:

$$\begin{aligned}\widehat{y}_t = c_0 + c_1\widehat{y}_{t-1} + c_2\widehat{Vol}_t + c_3\widehat{Vol}_{t-1} \\ + c_4 Sk_t + c_5 Sk_{t-1} + c_6 Ku_t + c_7 Ku_{t-1} + e_t\end{aligned} \tag{11}$$

The results in Tables 3 and $A6$ show that skewness and kurtosis are not overly influential. In fact, they are only significant for a very limited number of countries. So, for the risk-return trade-off for European stock markets higher order risk measures are not of importance.

5 Conclusion

In this paper we contribute to the risk-return trade-off literature in many ways. We broaden the existing literature by analyzing 13 large European stock markets instead of merely considering the US stock market. We construct conditional returns and conditional risk measures using factors that are based upon a large number of macro-finance variables. We consider the effect of using local, regional, and global factors and show that it is important to account for all macro-finance factors. We show that there is a strong relation between conditional returns and conditional volatilities. We add two new conditional risk measures, namely the skewness and kurtosis. Yet, empirically these risk measures are not overly important for the risk-return trade-off. The risk-return trade-off is negative across countries. Further, we find time-variation in this trade-off which is linked to the state of the economy although the state of the economy is not directly linked to the business cycle. The risk-return trade-off is weaker (less negative) in the unusual state.

Our findings have important implications for international risk analysis and portfolio construction. As economic conditions change rapidly in recent years and play an important role in the risk-return trade-off of European markets, investors should take this into account when constructing portfolios.

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A Appendix

Additional Tables

Table 1: Return Regressions

	Germany			Spain			UK		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.008	0.007	0.006	0.003	-0.025	0.005	0.009	0.009	0.035
Local Factor 1	-0.147			-0.707			0.211	0.211	
Local Factor 2	-0.244	-0.253	-0.187	0.401					
Local Factor 3						-0.421			
Local Factor 4	-0.419	-0.407	-0.361				-0.214	-0.214	
Local Factor 5	-0.210	-0.181	-0.112	-0.237		-0.223			
Local Factor 6	-0.919	-0.933	-0.978	-0.298		-0.343			
Euro Factor 1									
Euro Factor 2									
Euro Factor 3						-0.305			
Euro Factor 4					0.612	0.569			
Euro Factor 5					-0.247	-0.312			
Euro Factor 6		-0.124	-0.141		-0.697	-0.617			
US Factor 1						-0.733			-0.304
US Factor 2			0.165			0.200			
US Factor 3									-0.315
US Factor 4						0.200			
US Factor 6			-0.248						
$(\text{Local Factor 2})^2$							-13.343	-13.343	
$(\text{Local Factor 4})^2$							-3.490	-3.490	-4.286
$(\text{Local Factor 6})^2$	-1.625	-1.547	-1.314		-2.599				
$(\text{Euro Factor 5})^2$						-3.044			
$(\text{US Factor 3})^2$			-3.155						
$(\text{US Factor 4})^2$			2.178			1.678			
Term Spread	-0.006	-0.006	-0.006						
Dividend Yield					0.011				-0.008
y_{t-1}	-0.106		-0.122		-0.259				
BIC	-6.64	-6.67	-6.71	-5.71	-6.01	-6.07	-6.14	-6.14	-6.11
R^2	0.66	0.66	0.70	0.10	0.41	0.43	0.06	0.06	0.09

Notes: The table shows the coefficients from the return regression in eq. (3). The models are selected according to BIC. All coefficients are significant at the 1% level. For the remaining countries the results are available in the Appendix.

Table 2: Volatility Regressions

	Germany			Spain			UK		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.022	0.018	0.020	0.015	0.018	0.015	0.009	0.010	0.014
Local Factor 1		0.050	0.083				-0.087		
Local Factor 2		-0.070	-0.095	-0.127					
Local Factor 3	0.058							-1.659	
Local Factor 4	0.057							1.594	
Local Factor 5									
Local Factor 6	0.148	0.145	0.173		0.065	0.074	-0.065		
Euro Factor 1					0.075	0.081			
Euro Factor 2									
Euro Factor 4					-0.163	-0.152			
Euro Factor 6					0.152	0.153			-0.053
US Factor 1			-0.171						
US Factor 2									-0.110
US Factor 6			0.079						
$(\text{Local Factor 1})^2$	1.107	1.421							
$(\text{Local Factor 2})^2$							6.134		
$(\text{Local Factor 3})^2$			0.711				-1.255		-1.53
$(\text{Local Factor 4})^2$		1.220	1.250				1.214		1.559
$(\text{Local Factor 6})^2$	2.289	2.245	2.315	1.778	1.272	1.597			
$(\text{Euro Factor 2})^2$		-1.082	-0.945		1.015	1.169		1.105	0.728
$(\text{Euro Factor 4})^2$					1.368	1.691			
$(\text{US Factor 1})^2$			-4.402			-12.442			-2.979
$(\text{US Factor 3})^2$			2.073						1.389
VIX	0.143	0.150	0.149	0.100	0.082	0.109	0.078	0.067	0.069
RV_{t-1}				0.278	0.209	0.184	0.394	0.409	0.276
BIC	-8.08	-8.10	-8.12	-7.85	-8.00	-8.03	-8.00	-7.94	-7.95
R^2	0.64	0.66	0.69	0.49	0.61	0.63	0.47	0.48	0.52

Notes: The table shows the coefficients from the volatility regression in eq. (3). The models are selected according to BIC. All coefficients are significant at the 1% level. For the remaining countries the results are available in the Appendix.

Table 3: Linear Risk-Return Regressions Using Different Factors

Germany	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.02	0.01	0.02	0.02
Ret(-1)	-0.01	0.08	0.09	0.09
Vol	-0.43 ***	-0.91 ***	-0.43 ***	-0.45 ***
Vol(-1)	0.25 ***	0.57 ***	0.27 ***	0.29 ***
Adj R^2	0.28	0.43	0.44	0.43

Spain	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.03 ***	0.01 ***	0.03 ***	0.03 ***
Ret(-1)	-0.06	0.33 ***	-0.04	0.15 **
Vol	-1.51 ***	-0.48 ***	-1.50 ***	-1.46 ***
Vol(-1)	1.01 ***	0.26 ***	0.93 **	0.96 ***
Adj R^2	0.12	0.30	0.35	0.36

UK	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.04	0.14 *	0.14 *	-0.01
Ret(-1)	-0.03	0.39 ***	0.39 ***	0.51 ***
Vol	-0.13 **	-0.46 ***	-0.48 ***	-0.28 ***
Vol(-1)	0.10 *	0.27 ***	0.26 ***	0.35 ***
Adj R^2	0.03	0.23	0.24	0.32

Notes: The table shows the results from the regressions in eq. (4) using various restrictions on the factors in eq. (2). */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors). For the remaining countries the results are available in the Appendix.

Table 4: Recession Indicator Risk-Return Trade-Off Regressions

	Germany	Spain	UK
Cons	0.03	0.03 ***	-0.02
Ret(-1)	0.15 **	-0.06	0.48 ***
Vol	-1.06 ***	-1.29 ***	-0.43 ***
Vol(-1)	0.75 ***	0.75 ***	0.41 ***
Rec	-0.08	0.00	-0.02
Rec*Ret(-1)	-0.19 *	0.04	0.10
Rec*Vol	0.33 ***	-0.43 *	0.39 **
Rec*Vol(-1)	-0.38 ***	0.42 **	-0.23 **
Adj-R^2	0.44	0.36	0.33
Joint Rec Test	3.45 **	2.16 *	2.29 *

Notes: The table shows the results from risk-return regressions with recession indicators in eq. (5) based upon the global factors. */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors). For the remaining countries the results are available in the Appendix.

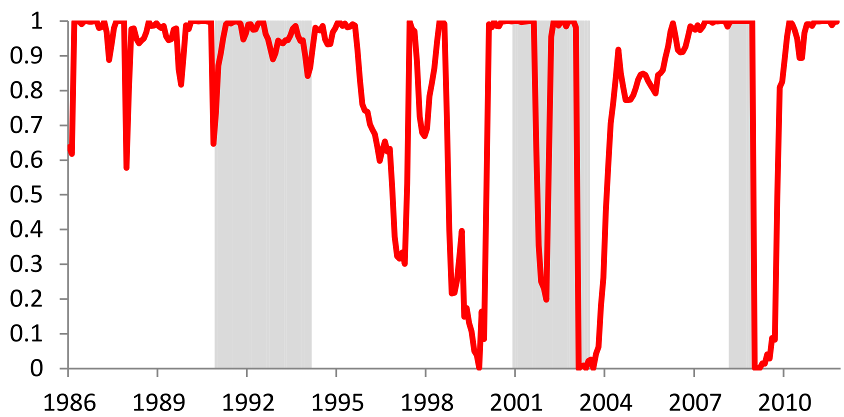
Table 5: Regime-Switching Risk-Return Regressions

	Germany	Spain	UK
Regime 1			
Cons	0.04 ***	-0.40 ***	0.00
Ret(-1)	0.03	-0.14 *	0.61 ***
Vol	-2.05 ***	-1.26 ***	-0.24 ***
Vol(-1)	1.17 ***	0.45 ***	0.28 ***
100σ	0.09 ***	0.27 ***	0.00 ***
Regime 2			
Cons	0.00	0.46 ***	-0.01
Ret(-1)	-0.38 ***	-0.19	0.42 ***
Vol	0.80	-0.77 ***	-0.10
Vol(-1)	0.16	0.41 ***	0.21 **
100σ	0.08 ***	0.65 ***	0.02 ***
p11	0.96 ***	0.87 ***	0.95 ***
p22	0.83 ***	0.81 ***	0.92 ***
p(s(t)=1)	0.81	0.59	0.58
E(Duration regime 1)	25.5	7.69	18.4
E(Duration regime 2)	6.0	5.26	13.1
Adj R^2	0.64	0.64	0.33
RCM	26.6	43.60	36.5

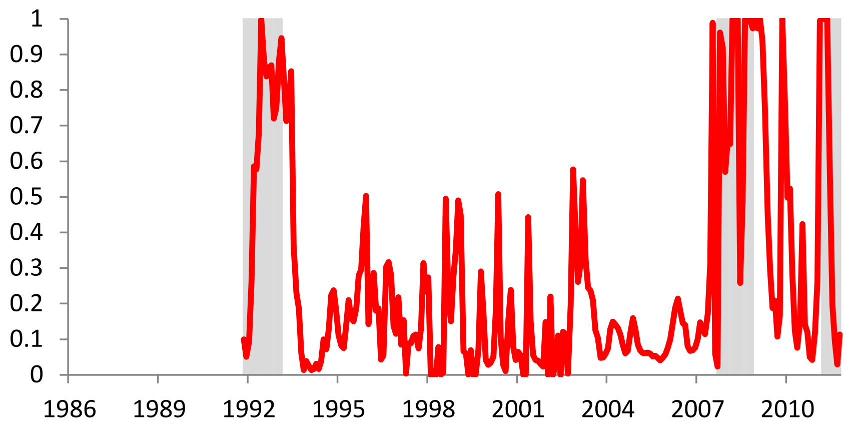
Notes: The table shows the results from the Markov switching risk-return regressions in eq. (7) based upon the global factors. */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors). For the remaining countries the results are available in the Appendix.

Figure 1: Smoothed Probability of State 2

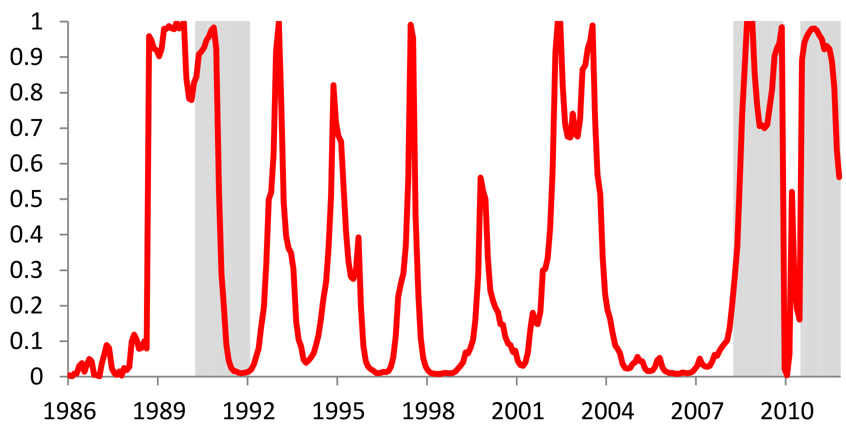
Germany



Spain



UK



Notes: The figures show the smoothed state 2 probabilities. Recession periods are marked by grey-shading. For the remaining countries the results are available in the Appendix.

Table 6: Risk-Return Regressions Including Skewness and Kurtosis

	Germany	Spain	UK
Cons	0.051	0.035 ***	-0.004
Ret(-1)	0.089	-0.037	0.509 ***
Vol	-0.923 ***	-1.512 ***	-0.282 **
Vol(-1)	0.588 ***	0.946 ***	0.346 ***
Sk	0.123	-0.003	0.045
Sk(-1)	-0.094	0.001	-0.007
Ku	0.021	-0.002	0.038
Ku(-1)	-0.033	0.002	-0.036
Adj-R^2	0.43	0.35	0.32

Notes: The table shows the results from risk-return regressions with skewness and kurtosis based upon the global factors. */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors). For the remaining countries the results are available in the Appendix.

Table A1: Summary Statistics for Factors

i	Austria AR1	Austria %Acc	Belgium AR1	Belgium %Acc	Denmark AR1	Denmark %Acc	Finland AR1	Finland %Acc	France AR1	France %Acc	Germany AR1	Germany %Acc
1	0.43	0.36	0.44	0.39	0.41	0.33	0.35	0.40	0.20	0.38	0.37	0.32
2	0.24	0.53	0.25	0.55	0.54	0.55	0.62	0.56	0.74	0.54	0.48	0.46
3	0.45	0.64	-0.11	0.64	-0.25	0.64	0.05	0.64	0.13	0.62	0.11	0.57
4	0.28	0.71	-0.03	0.71	-0.12	0.71	-0.19	0.71	0.13	0.69	-0.03	0.66
5	0.17	0.78	-0.08	0.78	-0.23	0.77	-0.16	0.77	-0.18	0.76	0.43	0.74
6	0.00	0.83	-0.02	0.83	0.06	0.82	0.00	0.83	-0.07	0.82	0.00	0.81

i	Greece AR1	Greece %Acc	Ireland AR1	Ireland %Acc	Italy AR1	Italy %Acc	Netherlands AR1	Netherlands %Acc	Spain AR1	Spain %Acc	Switzerland AR1	Switzerland %Acc
1	0.45	0.25	-0.04	0.60	0.12	0.27	0.38	0.46	0.28	0.38	0.80	0.33
2	-0.09	0.42	0.33	0.67	0.11	0.44	0.57	0.62	0.32	0.51	0.38	0.50
3	0.15	0.55	-0.55	0.74	0.08	0.58	0.19	0.68	-0.25	0.62	0.28	0.61
4	0.02	0.65	-0.04	0.79	0.07	0.67	-0.09	0.74	0.02	0.70	0.32	0.70
5	0.19	0.74	-0.41	0.84	0.07	0.75	-0.07	0.80	0.03	0.77	0.04	0.77
6	-0.31	0.81	-0.29	0.87	0.19	0.81	-0.01	0.84	-0.10	0.82	0.14	0.82

i	UK AR1	UK %Acc	Euro AR1	Euro %Acc	US AR1	US %Acc
1	0.18	0.32	0.22	0.40	0.43	0.30
2	0.61	0.53	0.87	0.55	0.64	0.48
3	0.82	0.66	0.10	0.66	0.03	0.61
4	-0.09	0.75	0.21	0.74	0.80	0.71
5	0.43	0.80	0.03	0.80	0.22	0.78
6	0.07	0.84	-0.10	0.85	0.17	0.83

Notes: The table shows the summary statistics for the factors where AR1 is the first order autocorrelation coefficient and %Acc is the accumulated fraction of total variation in the data explained by factors.

Table A2: Return Regressions

	Austria			Belgium			Denmark		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.009	-0.014	-0.013	-0.004	-0.005	-0.016	0.008	0.003	-0.006
Local Factor 1							0.340		
Local Factor 2	-0.391								
Local Factor 3							-0.788	-0.530	-0.603
Local Factor 4				0.404			-0.260		
Local Factor 5									
Local Factor 6		-0.248	-0.262		0.207	0.152	0.322	0.296	0.285
Euro Factor 1		-0.264							
Euro Factor 2		0.200	-0.328		-0.173				
Euro Factor 3					-0.304	-0.358			
Euro Factor 4		-0.236			0.277	0.360		0.359	0.430
Euro Factor 5		-0.455	-0.340		-0.363	-0.361			
Euro Factor 6			-0.395		-0.386	-0.339		-0.508	-0.509
US Factor 1						-0.737			
US Factor 2									
US Factor 3									
US Factor 4									
US Factor 5									
US Factor 6			0.155						
$(\text{Local Factor 2})^2$						-1.987			
$(\text{Local Factor 3})^2$							-2.504	-3.379	-3.202
$(\text{Local Factor 4})^2$									
$(\text{Local Factor 6})^2$	-4.239	-2.936	-3.312						
$(\text{Euro Factor 1})^2$									
$(\text{Euro Factor 2})^2$		-1.677	-1.634		-1.656				
$(\text{Euro Factor 3})^2$									4.202
$(\text{Euro Factor 4})^2$					-2.838				
$(\text{Euro Factor 5})^2$		-2.017							
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 3})^2$									
$(\text{US Factor 4})^2$									
$(\text{US Factor 5})^2$									1.797
Term Spread				0.006			0.005	0.010	0.009
Dividend Yield		0.015	0.013		0.005	0.007			
y_{t-1}							-0.708	-0.461	-0.515
BIC	-5.82	-5.89	-5.91	-6.02	-6.22	-6.25	-5.92	-6.13	-6.12
R^2	0.13	0.30	0.29	0.08	0.35	0.36	0.21	0.36	0.38

	Finland			France			Greece		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	-0.006	-0.007	-0.032	0.007	0.007	0.031	-0.016	-0.049	-0.038
Local Factor 1							0.748		
Local Factor 2		0.401	0.396	-0.334	-0.334		-0.743		
Local Factor 3				-0.267	-0.267	-0.206	-0.853		
Local Factor 4	0.714	0.361	0.345	0.546	0.546	0.542			
Local Factor 5	0.394	0.256	0.253	-0.407	-0.407	-0.394	0.458		
Local Factor 6	0.192			-0.509	-0.509	-0.495		0.234	0.300
Euro Factor 1									-0.424
Euro Factor 2			-0.226					-0.545	-0.450
Euro Factor 3								0.577	
Euro Factor 4		0.558	0.494						0.583
Euro Factor 5								-0.488	-0.668
Euro Factor 6		-0.806	-0.828					-0.764	-0.786
US Factor 1						-0.624			
US Factor 2						0.561			
US Factor 3			-0.276			-0.315			
US Factor 4									
US Factor 5									
US Factor 6									0.319
$(\text{Local Factor 2})^2$								4.915	5.222
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$				-2.426	-2.426	-2.108			
$(\text{Local Factor 6})^2$									
$(\text{Euro Factor 1})^2$									
$(\text{Euro Factor 2})^2$									
$(\text{Euro Factor 3})^2$									
$(\text{Euro Factor 4})^2$								-11.082	-13.139
$(\text{Euro Factor 5})^2$		-2.941	-3.353					-2.833	
$(\text{Euro Factor 6})^2$								5.522	4.511
$(\text{US Factor 3})^2$									
$(\text{US Factor 4})^2$									
$(\text{US Factor 5})^2$									
Term Spread	0.008	0.013	0.144			0.005	-0.003	-0.003	
Dividend Yield			0.011			-0.010	0.022	0.021	0.014
y_{t-1}				-0.271	-0.271	-0.538	-0.406		
BIC	-5.04	-5.17	-5.14	-6.09	-6.09	-6.18	-4.83	-5.19	-5.21
R^2	0.17	0.31	0.33	0.38	0.38	0.47	0.18	0.48	0.49

	Ireland			Italy			Netherlands		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.001	0.002	0.002	0.014	-0.011	-0.016	0.009	-0.018	0.008
Local Factor 1					-0.299				
Local Factor 2				0.206			-0.207		
Local Factor 3	-0.374			-0.297	-0.221	-0.410			
Local Factor 4							-0.264	-0.180	
Local Factor 5							0.160		
Local Factor 6	0.192			-0.204	-0.330	-0.265		-0.188	-0.176
Euro Factor 1					-0.870				
Euro Factor 2		-0.139						-0.213	
Euro Factor 3		-0.413	-0.427					-0.235	-0.313
Euro Factor 4		0.419	0.470					0.466	0.503
Euro Factor 5		-0.347	-0.378					-0.493	-0.420
Euro Factor 6		-0.498	-0.491					-0.491	-0.572
US Factor 1									-0.840
US Factor 2						0.334			
US Factor 3						-0.437			
US Factor 4									
US Factor 5						-0.210			
US Factor 6									
$(\text{Local Factor 2})^2$		8.221	6.968	5.372	6.594	5.194			
$(\text{Local Factor 3})^2$		-2.720	-3.314			2.941			
$(\text{Local Factor 4})^2$		4.468	4.472						
$(\text{Local Factor 6})^2$	1.496	1.618	1.451				-2.410	-1.810	-2.016
$(\text{Euro Factor 1})^2$						8.262			
$(\text{Euro Factor 2})^2$						-3.308			
$(\text{Euro Factor 3})^2$									
$(\text{Euro Factor 4})^2$						1.507			
$(\text{Euro Factor 5})^2$		-2.901	-3.610						
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 3})^2$			2.104						
$(\text{US Factor 4})^2$									
$(\text{US Factor 5})^2$									
Term Spread									
Dividend Yield				-0.008	-0.008	-0.009		0.008	
y_{t-1}					-0.126	-0.248			
BIC	-5.54	-5.77	-5.77	-5.48	-5.61	-5.49	-5.81	-6.18	-6.21
R^2	0.10	0.37	0.37	0.10	0.15	0.20	0.09	0.44	0.43

	Switzerland		
	Local	Euro	Global
constant	0.037	0.040	0.039
Local Factor 1			
Local Factor 2	0.268	0.329	
Local Factor 3			
Local Factor 4			
Local Factor 5			
Local Factor 6			
Euro Factor 1			
Euro Factor 2			
Euro Factor 3			
Euro Factor 4			
Euro Factor 5			
Euro Factor 6		-0.163	
US Factor 1			-0.373
US Factor 2			
US Factor 3			-0.347
US Factor 4			
US Factor 5			-0.147
US Factor 6			
$(\text{Local Factor 2})^2$			
$(\text{Local Factor 3})^2$			
$(\text{Local Factor 4})^2$	-2.907	-3.082	-3.870
$(\text{Local Factor 6})^2$			
$(\text{Euro Factor 1})^2$		5.0313	
$(\text{Euro Factor 2})^2$		-2.121	-1.434
$(\text{Euro Factor 3})^2$			
$(\text{Euro Factor 4})^2$		1.107	
$(\text{Euro Factor 5})^2$			
$(\text{Euro Factor 6})^2$			
$(\text{US Factor 3})^2$			
$(\text{US Factor 4})^2$			
$(\text{US Factor 5})^2$			
Term Spread			
Dividend Yield	-0.015	-0.0178	-0.014
y_{t-1}			
BIC	-6.07	-6.07	-6.13
R^2	0.07	0.13	0.16

Notes: The table shows the coefficients from the return regression in eq. (3). The models are selected according to BIC. All coefficients are significant at the 1% level.

Table A3: Volatility Regressions

	Austria			Belgium			Denmark		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.010	0.016	0.021	0.005	0.009	0.006	0.021	0.018	0.018
Local Factor 1		-0.132	-0.127	-0.170					
Local Factor 2									
Local Factor 3					-0.143	-0.112	0.078		
Local Factor 4							-0.087	-0.085	-0.078
Local Factor 5									
Local Factor 6		0.099	0.102		-0.099	-0.099			
Euro Factor 1					0.094	0.109			
Euro Factor 2			0.061		0.053				
Euro Factor 3			0.094		0.085	0.117		0.077	0.112
Euro Factor 4					-0.115	-0.132		-0.099	-0.098
Euro Factor 5		0.067	0.078		0.098	0.103			
Euro Factor 6		0.109	0.093		0.101	0.092		0.101	0.094
US Factor 1			0.223						0.250
US Factor 2									
US Factor 3									
US Factor 5									
US Factor 6			-0.120			-0.059			-0.058
$(\text{Local Factor 1})^2$				-2.547	-2.921	-3.206			
$(\text{Local Factor 2})^2$	2.833	2.287	2.067						
$(\text{Local Factor 3})^2$				-1.780	-2.275	-2.047	2.331	2.579	2.554
$(\text{Local Factor 4})^2$							2.086		1.908
$(\text{Local Factor 5})^2$									
$(\text{Local Factor 6})^2$	1.245	0.971	0.986						
$(\text{Euro Factor 2})^2$		0.796	1.005		0.658	0.880			
$(\text{Euro Factor 3})^2$									
$(\text{Euro Factor 4})^2$					1.480	1.525			
$(\text{Euro Factor 5})^3$								0.679	
$(\text{Euro Factor 6})^2$								1.251	1.138
$(\text{US Factor 1})^2$									
$(\text{US Factor 3})^2$			1.193						1.109
$(\text{US Factor 5})^2$			0.890						
$(\text{US Factor 6})^2$			-0.663						
VIX				0.088	0.069	0.081	0.085	0.093	0.080
RV_{t-1}	0.412	0.472	0.281	0.475	0.409	0.386			
BIC	-7.95	-7.96	-8.00	-7.92	-8.01	-8.01	-8.02	-8.06	-8.08
R^2	0.59	0.63	0.70	0.52	0.63	0.64	0.53	0.57	0.61

	Finland			France			Greece		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.018	0.015	0.026	0.015	0.014	0.019	0.043	0.063	0.064
Local Factor 1					0.059				
Local Factor 2				0.053					
Local Factor 3									
Local Factor 4	-0.109			-0.140	-0.147	-0.130			
Local Factor 5	0.094	0.107	0.124		0.051	0.086		-0.107	-0.114
Local Factor 6				0.122	0.121	0.153	-0.091	-0.127	-0.127
Euro Factor 1								0.163	0.209
Euro Factor 2			0.107					-0.124	-0.107
Euro Factor 3		0.145							
Euro Factor 4		-0.172	-0.131					-0.193	-0.223
Euro Factor 5								0.207	0.248
Euro Factor 6		0.088	0.122						-0.176
US Factor 1									
US Factor 2						-0.116			
US Factor 3			0.129						
US Factor 5						-0.113			
US Factor 6			0.095			-0.055			
$(\text{Local Factor 1})^2$								1.534	1.569
$(\text{Local Factor 2})^2$	-1.994	-2.281	-1.874	0.976	1.053				
$(\text{Local Factor 3})^2$							1.876	2.451	2.669
$(\text{Local Factor 4})^2$				1.604	1.559	1.397			
$(\text{Local Factor 5})^2$				0.676	0.685	0.565			
$(\text{Local Factor 6})^2$								1.035	0.991
$(\text{Euro Factor 2})^2$									
$(\text{Euro Factor 3})^2$		-1.261			-0.579				
$(\text{Euro Factor 4})^2$									2.621
$(\text{Euro Factor 5})^3$									
$(\text{Euro Factor 6})^2$		1.698							
$(\text{US Factor 1})^2$						-2.590			
$(\text{US Factor 3})^2$						2.023			
$(\text{US Factor 5})^2$									
$(\text{US Factor 6})^2$									
VIX	0.120	0.133	0.110	0.085	0.090	0.086	0.130	0.088	0.092
RV_{t-1}	0.615	0.593	0.565	0.246	0.260	0.176	0.300	0.247	0.169
BIC	-7.21	-7.23	-7.23	-7.96	-7.94	-8.00	-7.07	-7.052	-7.10
R^2	0.62	0.66	0.66	0.57	0.58	0.61	0.46	0.55	0.60

	Ireland			Italy			Netherlands		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.011	0.014	0.016	0.019	0.019	0.029	0.005	0.018	0.018
Local Factor 1				0.098			0.130		
Local Factor 2					0.098				
Local Factor 3				0.080	0.080	0.093			
Local Factor 4					1.558				
Local Factor 5		-0.096	-0.112				-0.057		
Local Factor 6								0.079	0.079
Euro Factor 1		0.078	0.100					0.081	0.081
Euro Factor 2									
Euro Factor 3		0.097	0.144					0.103	0.103
Euro Factor 4		-0.119	-0.111					-0.143	-0.143
Euro Factor 5		0.108	0.105					0.151	0.151
Euro Factor 6		0.098	0.096					0.098	0.098
US Factor 1									
US Factor 2						-0.095			
US Factor 3									
US Factor 5									
US Factor 6			-0.092						
$(\text{Local Factor 1})^2$							3.555		
$(\text{Local Factor 2})^2$							0.843		
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$				1.558		1.610	-1.521		
$(\text{Local Factor 5})^2$		0.863	0.916						
$(\text{Local Factor 6})^2$									
$(\text{Euro Factor 2})^2$			0.697					1.241	1.241
$(\text{Euro Factor 3})^2$									
$(\text{Euro Factor 4})^2$									
$(\text{Euro Factor 5})^3$									
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 1})^2$									
$(\text{US Factor 3})^2$			0.966			1.887			
$(\text{US Factor 5})^2$									
$(\text{US Factor 6})^2$									
VIX	0.068	0.070	0.067	0.058	0.058		0.101	0.075	0.075
RV_{t-1}	0.506	0.407	0.293	0.398	0.398	0.388	0.429	0.423	0.423
BIC	-7.47	-7.485	-7.50	-7.56	-7.56	-7.59	-7.86	-7.98	-7.98
R^2	0.43	0.51	0.54	0.40	0.40	0.42	0.64	0.71	0.71

	Switzerland		
	Local	Euro	Global
constant	0.006	0.012	0.017
Local Factor 1			
Local Factor 2			
Local Factor 3			
Local Factor 4			
Local Factor 5	-0.066		
Local Factor 6			
Euro Factor 1			
Euro Factor 2			
Euro Factor 3			
Euro Factor 4			
Euro Factor 5			
Euro Factor 6			
US Factor 1			
US Factor 2			-0.158
US Factor 3			
US Factor 5			
US Factor 6			
$(\text{Local Factor 1})^2$	1.767	1.780	
$(\text{Local Factor 2})^2$			
$(\text{Local Factor 3})^2$	-1.281	-2.180	-1.702
$(\text{Local Factor 4})^2$	1.179	1.442	1.108
$(\text{Local Factor 5})^2$			
$(\text{Local Factor 6})^2$			
$(\text{Euro Factor 2})^2$		1.039	
$(\text{Euro Factor 3})^2$			
$(\text{Euro Factor 4})^2$			
$(\text{Euro Factor 5})^3$			
$(\text{Euro Factor 6})^2$			
$(\text{US Factor 1})^2$			
$(\text{US Factor 3})^2$			2.468
$(\text{US Factor 5})^2$			
$(\text{US Factor 6})^2$			
VIX	0.114	0.084	0.102
RV_{t-1}	0.218	0.221	
BIC	-7.67	-7.76	-7.78
R^2	0.37	0.37	0.43

Notes: The table shows the coefficients from the volatility regression in eq. (3). The models are selected according to BIC. All coefficients are significant at the 1% level.

Table 4A: Linear Risk-Return Regressions Using Different Factors

Austria	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.02 ***	0.01 ***	0.01 **	0.02 ***
Ret(-1)	0.12	0.19 ***	0.30 ***	0.28 ***
Vol	-1.19 ***	-0.65 ***	-1.25 ***	-1.32 ***
Vol(-1)	0.67 ***	0.39 ***	0.96 ***	0.97 ***
Adj R^2	0.15	0.30	0.44	0.49

Belgium	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.03 ***	0.04 ***	0.02 ***	0.01 **
Ret(-1)	0.00	-0.03	0.32 ***	0.33 ***
Vol	-1.60 ***	-0.82 ***	-1.27 ***	-1.11 ***
Vol(-1)	0.95 ***	0.01	0.91 ***	0.83 ***
Adj R^2	0.17	0.37	0.49	0.40

Denmark	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.03 ***..	0.04 ***	0.03 ***	0.03 ***..
Ret(-1)	0.12 *	-0.03	0.13 **	0.12 *
Vol	-1.42 ***	-0.82 ***	-1.40 ***	-1.42 ***
Vol(-1)	0.78 ***	0.01	0.74 ***	0.78 ***
Adj R^2	0.39	0.37	0.42	0.39

Finland	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.01	0.01	0.01	0.00
Ret(-1)	0.25 ***	0.32 ***	0.32 ***	0.35 ***
Vol	0.06	-0.01	-0.39 ***	-0.28 ***
Vol(-1)	-0.10	-0.04	0.31 **	0.29 **
Adj R^2	0.05	0.10	0.13	0.14

France	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.04	0.03	0.01	0.03
Ret(-1)	-0.02	0.23 ***	0.28 ***	0.24 ***
Vol	-0.24 **	-0.23 ***	-0.64 ***	-0.23 ***
Vol(-1)	0.12 **	0.16 ***	0.48 ***	0.15 ***
Adj R^2	0.10	0.31	0.33	0.30

Greece	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.05 ***	0.03 ***	0.04 ***	0.04 ***
Ret(-1)	0.06	0.13 **	0.12 **	0.10
Vol	-1.77 ***	-0.63 ***	-1.41 ***	-1.66 ***
Vol(-1)	0.96 **	0.04	0.75 ***	0.95 ***
Adj R^2	0.16	0.23	0.25	0.34

Netherlands	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.03 ***	0.02 ***	0.02 ***	0.02 ***
Ret(-1)	-0.08	0.11	0.21 ***	0.16 ***
Vol	-1.72 ***	-0.37 ***	-1.26 ***	-1.19 ***
Vol(-1)	1.21 ***	0.09	0.95 ***	0.88 ***
Adj R^2	0.21	0.25	0.37	0.33

Italy	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.00	0.00	-0.09	-0.09
Ret(-1)	0.01	0.43 ***	0.42 ***	0.43 ***
Vol	-0.13 **	-0.46 ***	-0.88 ***	-0.90 ***
Vol(-1)	0.12 **	0.40 ***	0.82 ***	0.80 ***
Adj R^2	0.01	0.27	0.25	0.27

Ireland	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.04 ***	0.02 ***	0.03 ***	0.03 ***
Ret(-1)	0.06	0.25 ***	0.28 ***	0.23 ***
Vol	-1.58 ***	-0.45 ***	-1.30 ***	-1.28 ***
Vol(-1)	0.90 ***	0.18 ***	0.81 ***	0.81 ***
Adj R^2	0.17	0.22	0.39	0.33

Switzerland	Raw Data	Local Factors	Euro Factors	Global Factors
Cons	0.05 **	0.01 **	0.02 ***	0.01
Ret(-1)	0.05	0.69 ***	0.52 ***	0.47 ***
Vol	-0.13 **	0.00	-0.06 ***	-0.51 ***
Vol(-1)	0.06	0.00	0.03 ***	0.36 ***
Adj R^2	0.05	0.28	0.41	0.43

US	Raw Data			US Factors
Cons	0.07 ***			0.06 ***
Ret(-1)	-0.06			-0.01
Vol	-1.82 ***			-1.60 ***
Vol(-1)	0.51 ***			0.39 ***
Adj R^2	0.33			0.36

Notes: The table shows the results from the regressions in eq. (4) using various restrictions on the factors in eq. (2). */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors).

Table A5: Recession Indicator Risk-Return Regressions

	Austria	Belgium	Denmark	Finland	France
Cons	0.02 ***	0.02 ***	0.05 ***	0.01	0.04
Ret(-1)	0.20 *	0.27 ***	0.13 *	0.33 ***	0.29 ***
Vol	-1.28 ***	-1.32 ***	-1.78 ***	-0.41 ***	-0.69 ***
Vol(-1)	0.77 ***	0.84 ***	0.76 ***	0.31 **	0.56 ***
Rec	-0.02 **	-0.01	-0.03 **	-0.01	-0.22
Rec*Ret(-1)	0.14	0.18	-0.09	-0.01	-0.10
Rec*Vol	-0.05	0.14	0.69 ***	0.15	0.17
Rec*Vol(-1)	0.34 **	0.11	-0.16	-0.03	-0.23
Adj-R^2	0.50	0.49	0.44	0.12	0.33
Joint Rec Test	1.05	1.13	6.30 ***	0.08	0.67

	Greece	Ireland	Italy	Netherlands	Switzerland
Cons	0.04 ***	0.03 ***	0.04	0.02 ***	0.02
Ret(-1)	0.07	0.28 ***	0.45 ***	0.11 *	0.53 ***
Vol	-1.64 ***	-1.39 ***	-0.44 ***	-1.08 ***	-0.54 ***
Vol(-1)	0.93 ***	0.87 ***	0.39 ***	0.88 ***	0.44 ***
Rec	-0.01	-0.01	-0.28 **	0.00	-0.05
Rec*Ret(-1)	0.12	0.02	-0.09	0.14	-0.14
Rec*Vol	-0.29	0.42 **	-0.10	-0.25	0.06
Rec*Vol(-1)	0.37 **	-0.31 *	0.13	0.10	-0.14
Adj-R^2	0.29	0.39	0.27	0.33	0.42
Joint Rec Test	0.47	1.53	0.38	0.89	0.72

Notes: The table shows the results from risk-return regressions with recession indicators in eq. (5) based upon the global factors. */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors).

Table A6: Regime-Switching Risk-Return Regressions

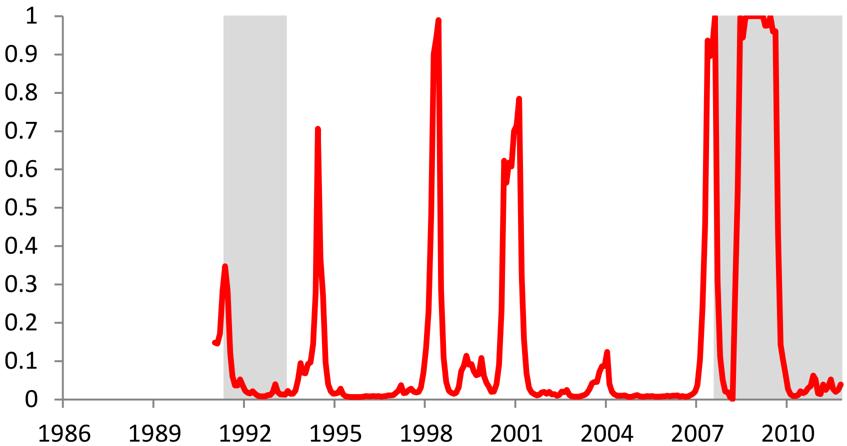
	Austria	Belgium	Denmark	Finland	France
Regime 1					
Cons	-0.09 **	0.25 ***	-0.37 ***	-0.24 ***	0.02 **
Ret(-1)	0.08	0.14 *	-0.01	0.24 ***	0.16 **
Vol	-1.12 ***	-0.98 ***	-1.12 ***	-0.41 ***	-1.11 ***
Vol(-1)	0.57 ***	0.64 ***	0.42 ***	0.26 **	0.72 ***
100σ	0.25 ***	0.41 ***	0.30 ***	0.61 ***	0.14 ***
Regime 2					
Cons	0.12	-0.43 ***	0.45 ***	0.88 ***	0.01
Ret(-1)	0.35 **	0.11	-0.10	0.04	0.44 ***
Vol	-0.42 *	-0.89 ***	-0.68 ***	0.51	-1.34 ***
Vol(-1)	0.42 *	0.26 *	0.18 *	-0.19	1.26 ***
100σ	1.45 ***	0.41 ***	0.56 ***	0.63 ***	0.03 ***
p11	0.97 ***	0.98 ***	0.93 ***	0.94 ***	0.98 ***
p22	0.82 ***	0.96 ***	0.92 ***	0.82 ***	0.97 ***
p(s(t)=1)	0.87	0.67	0.53	0.75	0.54
E(Duration regime 1)	36.33	50.00	14.29	16.67	44.3
E(Duration regime 2)	5.56	25.00	12.50	5.56	38.0
Adj R^2	0.58	0.61	0.63	0.45	0.36
RCM	19.50	23.10	33.60	32.74	16.4

	Greece	Netherlands	Ireland	Italy	Switzerland
Regime 1					
Cons	-0.16 **	-0.24 ***	-0.35 ***	0.01 **	0.02 ***
Ret(-1)	0.26 ***	0.05	0.17 **	0.46 ***	0.14 *
Vol	-1.03 ***	-1.03 ***	-0.94 ***	-0.46 ***	-0.80 ***
Vol(-1)	0.64 ***	0.58 ***	0.37 ***	0.21 ***	0.17 *
100σ	0.32 ***	0.44 ***	0.37 ***	0.02 ***	0.02 ***
Regime 2					
Cons	0.44	1.29 ***	0.56 ***	0.02	0.02
Ret(-1)	-0.14	-0.53 ***	-0.04	-0.12	0.14 ***
Vol	-0.52 **	-0.68 ***	-0.56 ***	-0.67 ***	-0.38 ***
Vol(-1)	0.16	0.15	0.19	0.56 ***	0.25 ***
100σ	0.97 ***	0.26 ***	0.47 ***	0.02 ***	0.01 ***
p11	0.97 ***	0.96 ***	0.90 ***	0.95 ***	0.95 ***
p22	0.91 ***	0.86 ***	0.85 ***	0.90 ***	0.93 ***
p(s(t)=1)	0.75	0.78	0.60	0.69	0.60
E(Duration regime 1)	33.33	25.00	9.86	21.9	21.6
E(Duration regime 2)	11.11	7.14	6.67	9.7	14.3
Adj R^2	0.56	0.64	0.67	0.63	0.66
RCM	25.50	9.12	40.20	21.8	20.9

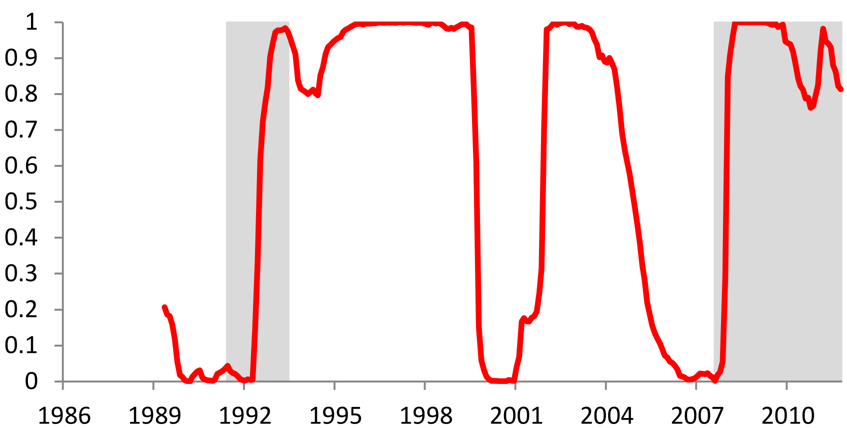
Notes: The table shows the results from the Markov switching risk-return regressions in eq. (7) based upon the global factors. */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors).

Figure A1: Smoothed Probability of State 2

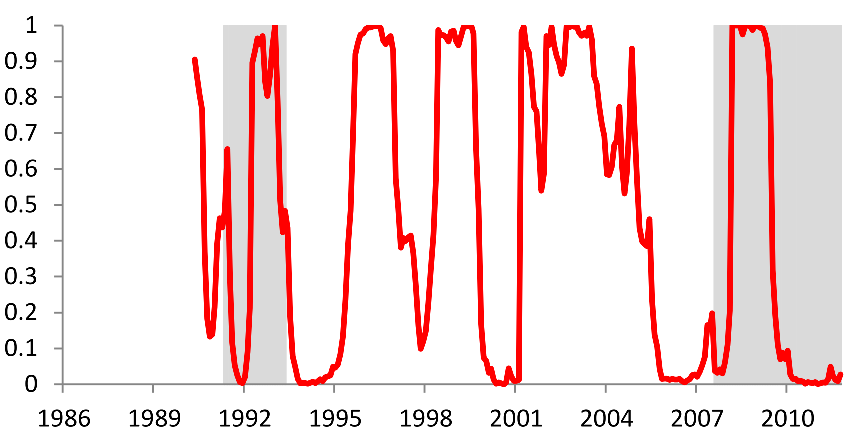
Austria



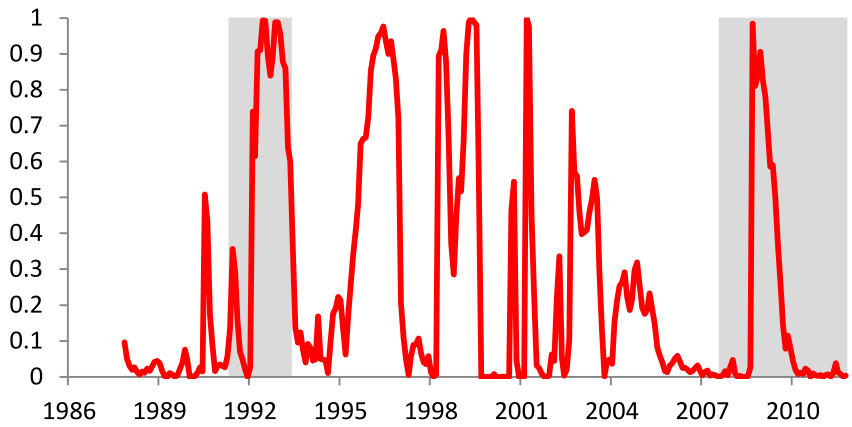
Belgium



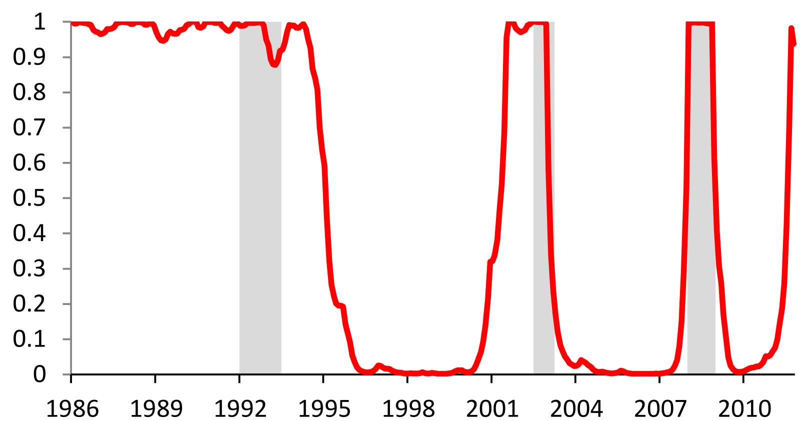
Denmark



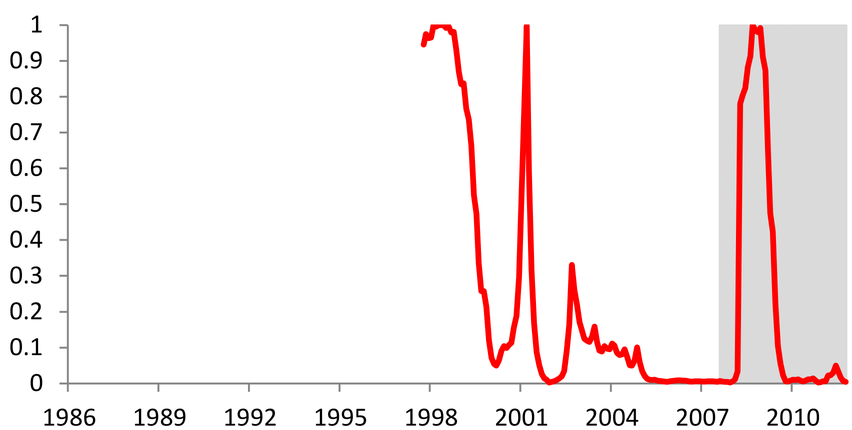
Finland



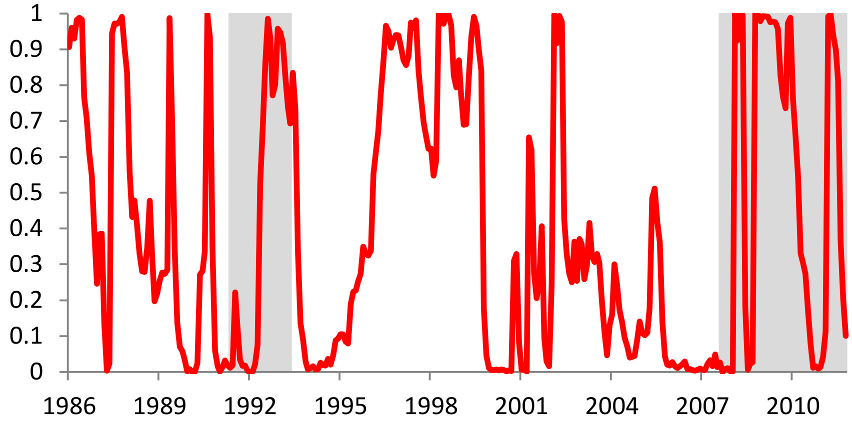
France



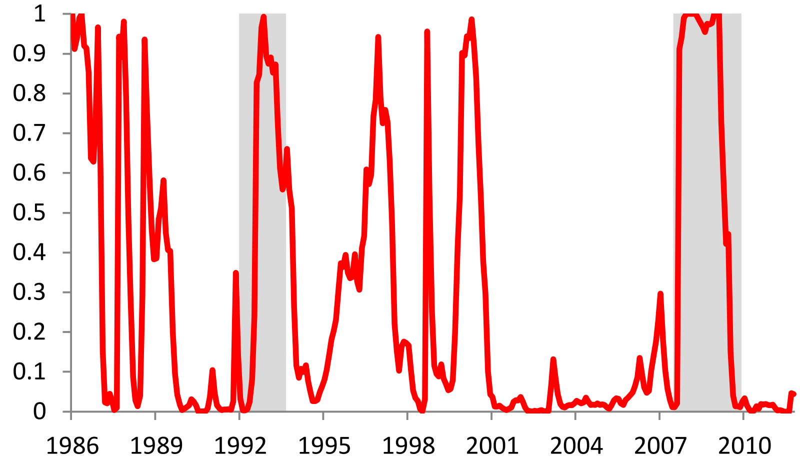
Greece



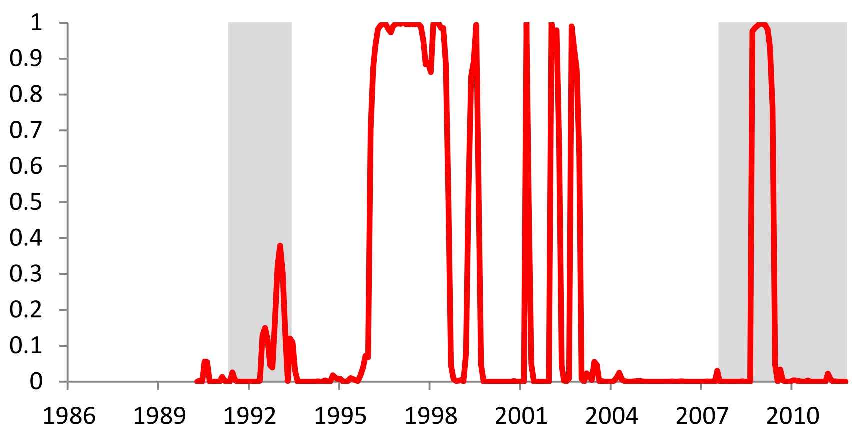
Ireland



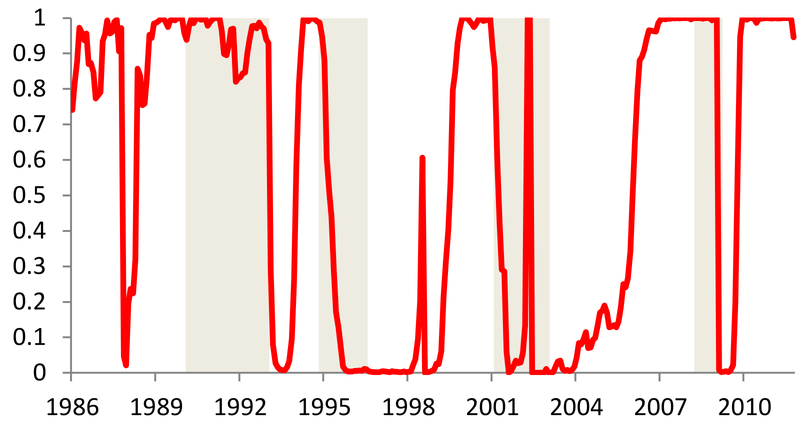
Italy



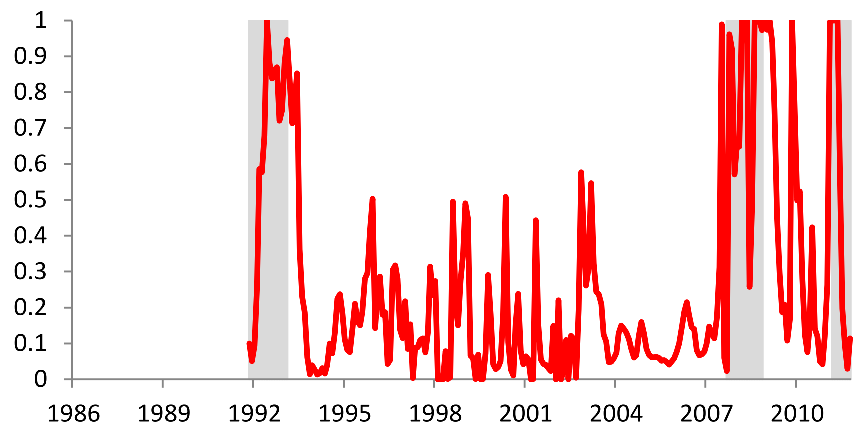
Netherlands



Switzerland



Spain



Notes: The figures show the smoothed state 2 probabilities. Recession periods are marked by grey-shading.

Table A7: Skewness Regressions

	Austria			Belgium			Denmark		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	-0.110	-0.110	-0.151	-0.271	-0.082	-0.082	-0.321	0.234	-0.139
Local Factor 1									
Local Factor 2				4.783	4.026	4.026			
Local Factor 6	2.613	2.613	2.261	-1.804	-2.229	-2.229			
Euro Factor 1					2.531	2.531			
Euro Factor 4									
Euro Factor 5								2.144	
Euro Factor 6								-3.131	-3.173
US Factor 1									
US Factor 2									
US Factor 3									
US Factor 4									
US Factor 5			-2.606						
US Factor 6									
$(\text{Local Factor 1})^2$							38.035		
$(\text{Local Factor 2})^2$				55.716	48.265	48.265			
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$									
$(\text{Local Factor 5})^2$									
$(\text{Local Factor 6})^2$									
$(\text{Euro Factor 1})^2$									
$(\text{Euro Factor 3})^2$									
$(\text{Euro Factor 4})^2$									
$(\text{Euro Factor 5})^2$									
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 1})^2$									
$(\text{US Factor 3})^2$									
$(\text{US Factor 4})^2$									
$(\text{US Factor 5})^2$			29.720						
$(\text{US Factor 6})^2$									28.326
Term Spread									
Dividend Yield								-0.325	
VIX				0.878			1.065	0.928	
Sk_{t-1}									
BIC	-1.01	-1.01	-1.00	-0.88	-0.88	-0.88	-0.91	-0.90	-0.93
R^2	0.03	0.03	0.06	0.10	0.11	0.11	0.04	0.08	0.06

	France			Finland			Germany		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	-0.020	-0.020	-0.020	-0.072	-0.070	-0.069	-0.176	-0.176	-0.176
Local Factor 1									
Local Factor 2									
Local Factor 6									
Euro Factor 1									
Euro Factor 4									
Euro Factor 5					1.823				
Euro Factor 6									
US Factor 1									
US Factor 2									
US Factor 3									
US Factor 4						1.562			
US Factor 5									
US Factor 6									
$(\text{Local Factor } 1)^2$	26.125	26.125	26.125						
$(\text{Local Factor } 2)^2$							26.186	26.186	26.186
$(\text{Local Factor } 3)^2$									
$(\text{Local Factor } 4)^2$	-26.485	-26.485	-26.485						
$(\text{Local Factor } 5)^2$									
$(\text{Local Factor } 6)^2$							24.046	24.046	24.046
$(\text{Euro Factor } 1)^2$									
$(\text{Euro Factor } 3)^2$									
$(\text{Euro Factor } 4)^2$									
$(\text{Euro Factor } 5)^2$									
$(\text{Euro Factor } 6)^2$									
$(\text{US Factor } 1)^2$									
$(\text{US Factor } 3)^2$									
$(\text{US Factor } 4)^2$									
$(\text{US Factor } 5)^2$									
$(\text{US Factor } 6)^2$									
Term Spread									
Dividend Yield									
VIX									
Sk_{t-1}									
BIC	-1.22	-1.22	-1.22		-0.78	-0.78	1.14	1.14	-1.14
R^2	0.03	0.03	0.03		0.01	0.01	0.05	0.05	0.05

	Greece			Ireland			Italy		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	0.091	0.091	0.117	-0.074	-0.499	-0.499	0.015	-0.044	0.147
Local Factor 1									
Local Factor 2									
Local Factor 6									
Euro Factor 1									
Euro Factor 4								-1.249	-1.283
Euro Factor 5					-3.170	-3.170			
Euro Factor 6									
US Factor 1									
US Factor 2			2.552						-2.243
US Factor 3									-2.891
US Factor 4									
US Factor 5									
US Factor 6									
$(\text{Local Factor 1})^2$	-28.888	-28.888	-27.956	101.985					
$(\text{Local Factor 2})^2$									
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$									
$(\text{Local Factor 5})^2$									
$(\text{Local Factor 6})^2$									
$(\text{Euro Factor 1})^2$									
$(\text{Euro Factor 3})^2$									
$(\text{Euro Factor 4})^2$					43.015	43.015			
$(\text{Euro Factor 5})^2$			-26.989						
$(\text{Euro Factor 6})^2$					51.565	51.565			
$(\text{US Factor 1})^2$									
$(\text{US Factor 3})^2$									
$(\text{US Factor 4})^2$									
$(\text{US Factor 5})^2$									
$(\text{US Factor 6})^2$									
Term Spread									
Dividend Yield					0.118	0.118	-0.047		-0.061
VIX									
Sk_{t-1}	0.227	0.227	0.234						
BIC	-0.98	-0.98	-0.96	-0.66	-0.68	-0.68	-1.10	-1.10	-1.08
R^2	0.08	0.08	0.12	0.02	0.09	0.09	0.01	0.01	0.04

	Netherlands			Spain			Switzerland		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	-0.288	-0.288	-0.140	-0.196	-0.147	0.024	-0.413	-0.413	-0.243
Local Factor 1									1.966
Local Factor 2									
Local Factor 6									
Euro Factor 1			2.357						
Euro Factor 4									
Euro Factor 5									
Euro Factor 6									
US Factor 1									118.996
US Factor 2									
US Factor 3									
US Factor 4									
US Factor 5									
US Factor 6									
$(\text{Local Factor 1})^2$									
$(\text{Local Factor 2})^2$									
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$									
$(\text{Local Factor 5})^2$			23.712				32.307	32.307	
$(\text{Local Factor 6})^2$									
$(\text{Euro Factor 1})^2$						55.509			
$(\text{Euro Factor 3})^2$					-54.978	-59.908			
$(\text{Euro Factor 4})^2$									
$(\text{Euro Factor 5})^2$									
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 1})^2$									118.996
$(\text{US Factor 3})^2$			17.775						
$(\text{US Factor 4})^2$									47.364
$(\text{US Factor 5})^2$									-24.996
$(\text{US Factor 6})^2$						32.084			
Term Spread						-0.075			
Dividend Yield				0.049	0.057				0.051
VIX							1.003	1.003	
Sk_{t-1}	1.037	1.037							
BIC	-1.29	-1.29	-1.28	-1.16	-1.15	-1.14	-1.14	-1.14	-1.11
R^2	0.03	0.03	0.06	0.02	0.03	0.06	0.03	0.03	0.05

	UK		
	Local	Euro	Global
constant	-0.063	-0.063	-0.066
Local Factor 1			
Local Factor 2	4.925	4.925	4.423
Local Factor 6			
Euro Factor 1			
Euro Factor 4			
Euro Factor 5			
Euro Factor 6			
US Factor 1			
US Factor 2			
US Factor 3			
US Factor 4			-1.800
US Factor 5			1.747
US Factor 6			-1.578
$(\text{Local Factor } 1)^2$			
$(\text{Local Factor } 2)^2$			
$(\text{Local Factor } 3)^2$			
$(\text{Local Factor } 4)^2$			
$(\text{Local Factor } 5)^2$			
$(\text{Local Factor } 6)^2$			
$(\text{Euro Factor } 1)^2$			
$(\text{Euro Factor } 3)^2$			
$(\text{Euro Factor } 4)^2$			
$(\text{Euro Factor } 5)^2$			
$(\text{Euro Factor } 6)^2$			
$(\text{US Factor } 1)^2$			
$(\text{US Factor } 3)^2$			
$(\text{US Factor } 4)^2$			
$(\text{US Factor } 5)^2$			
$(\text{US Factor } 6)^2$			
Term Spread			
Dividend Yield			
VIX			
Sk_{t-1}			
BIC	-1.23	-1.23	-1.22
R^2	0.02	0.02	0.05

Notes: The table shows the coefficients from the skewness regression in eq. (3). The models are selected according to BIC. All coefficients are significant at the 1% level.

Table A8: Kurtosis Regressions

	Austria			Belgium			Denmark		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	3.274	3.274	3.274	3.606	3.256	3.594	2.944	2.944	2.920
Local Factor 1				-20.044	-19.920	-19.307			
Local Factor 2									
Local Factor 5									
Euro Factor 2									
Euro Factor 3									
Euro Factor 4									
Euro Factor 5									
Euro Factor 6									
US Factor 1									
US Factor 4									
US Factor 5						4.151			
US Factor 6									
$(\text{Local Factor 2})^2$							289.020	289.020	285.468
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$									
$(\text{Local Factor 5})^2$									
$(\text{Local Factor 6})^2$				62.560					
$(\text{Euro Factor 1})^2$					113.734	93.196			
$(\text{Euro Factor 2})^2$					-38.012				
$(\text{Euro Factor 5})^2$									55.126
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 2})^2$									
$(\text{US Factor 3})^2$									-49.772
VIX				-2.214		-2.114			
Term Spread	-0.166	-0.166	-0.166	-0.172	-0.198	-0.209			
Dividend Yield									
BIC	0.44	0.44	0.44	0.59	0.58	0.59	0.56	0.56	0.58
R^2	0.02	0.02	0.02	0.11	0.12	0.13	0.04	0.04	0.07

	France			Finland			Germany		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	3.057	3.057	3.057	3.230			3.155	3.222	3.222
Local Factor 1									
Local Factor 2								-5.516	-5.516
Local Factor 5								6.322	6.322
Euro Factor 2									
Euro Factor 3					6.238	6.238			
Euro Factor 4									
Euro Factor 5									
Euro Factor 6									
US Factor 1									
US Factor 4									
US Factor 5									
US Factor 6									
$(\text{Local Factor 2})^2$									
$(\text{Local Factor 3})^2$									
$(\text{Local Factor 4})^2$				-115.192	-118.759	-118.759			
$(\text{Local Factor 5})^2$									
$(\text{Local Factor 6})^2$	-44.514	-44.514	-44.514						
$(\text{Euro Factor 1})^2$									
$(\text{Euro Factor 2})^2$								-65.770	-65.770
$(\text{Euro Factor 5})^2$									
$(\text{Euro Factor 6})^2$									
$(\text{US Factor 2})^2$									
$(\text{US Factor 3})^2$									
VIX									
Term Spread	-0.122	-0.122	-0.122				-0.184	-0.187	-0.187
Dividend Yield									
BIC	0.13	0.13	0.13	0.87	0.86	0.86	0.59	0.60	0.60
R^2	0.02	0.02	0.02	0.01	0.04	0.04	0.03	0.06	0.06

	Greece			Ireland			Italy		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	3.305	2.464	2.464	3.373	3.380	3.169	2.905	2.904	2.904
Local Factor 1							-6.372	-6.380	-6.380
Local Factor 2									
Local Factor 5				4.716	5.214	6.061			
Euro Factor 2						-4.299			
Euro Factor 3									
Euro Factor 4								2.873	2.873
Euro Factor 5		-5.075	-5.075		-4.482	-7.385			
Euro Factor 6		6.410	6.410						
US Factor 1									
US Factor 4									
US Factor 5									
US Factor 6									
$(\text{Local Factor 2})^2$									
$(\text{Local Factor 3})^2$	-65.612	-59.951	-59.951						
$(\text{Local Factor 4})^2$									
$(\text{Local Factor 5})^2$							64.57	66.221	66.221
$(\text{Local Factor 6})^2$									
$(\text{Euro Factor 1})^2$									
$(\text{Euro Factor 2})^2$									
$(\text{Euro Factor 5})^2$									
$(\text{Euro Factor 6})^2$						73.961			
$(\text{US Factor 2})^2$						47.367			
$(\text{US Factor 3})^2$									
VIX	2.695	3.237	3.237						
Term Spread				-0.076	-0.084	-0.087			
Dividend Yield	-0.244								
BIC	0.42	0.42	0.42	0.98	0.99	1.01	0.40	0.40	0.40
R^2	0.05	0.07	0.07	0.03	0.05	0.08	0.03	0.04	0.04

	Netherlands			Spain			Switzerland		
	Local	Euro	Global	Local	Euro	Global	Local	Euro	Global
constant	2.346	2.346	2.982	2.867	2.867	2.867	2.894	2.894	2.974
Local Factor 1									
Local Factor 2									
Local Factor 5									
Euro Factor 2									
Euro Factor 3									
Euro Factor 4									
Euro Factor 5			3.436						
Euro Factor 6									
US Factor 1									-8.642
US Factor 4									
US Factor 5									
US Factor 6			-2.869						
(Local Factor 2)^2									
(Local Factor 3)^2									
(Local Factor 4)^2									
(Local Factor 5)^2							57.967	57.967	
(Local Factor 6)^2									
(Euro Factor 1)^2									
(Euro Factor 2)^2									
(Euro Factor 5)^2									
(Euro Factor 6)^2									
(US Factor 2)^2									
(US Factor 3)^2									
VIX									
Term Spread			-0.123						
Dividend Yield	0.159	0.159							
BIC	-0.04	-0.04	-0.02	0.01	0.01	0.01	0.52	0.52	0.52
R^2	0.03	0.03	0.05	0.02	0.02	0.02	0.01	0.01	0.02

	UK		
	Local	Euro	Global
constant	2.705	2.701	2.673
Local Factor 1			
Local Factor 2			
Local Factor 5			
Euro Factor 2			
Euro Factor 3			
Euro Factor 4			
Euro Factor 5			
Euro Factor 6			
US Factor 1			-5.266
US Factor 4			3.213
US Factor 5			
US Factor 6			
$(\text{Local Factor 2})^2$			
$(\text{Local Factor 3})^2$	-50.955		-53.038
$(\text{Local Factor 4})^2$			
$(\text{Local Factor 5})^2$			
$(\text{Local Factor 6})^2$	75.538	47.627	85.053
$(\text{Euro Factor 1})^2$			
$(\text{Euro Factor 2})^2$			
$(\text{Euro Factor 5})^2$			
$(\text{Euro Factor 6})^2$			
$(\text{US Factor 2})^2$			
$(\text{US Factor 3})^2$			
VIX			
Term Spread			
Dividend Yield			
BIC	-0.10	-0.11	-0.09
R^2	0.04	0.03	0.06

Notes: The table shows the coefficients from the kurtosis regression in eq. (3). The models are selected according to BIC. All coefficients are significant at the 1% level.

Table A9: Risk-Return Regressions Including Skewness and Kurtosis

	Austria	Belgium	Denmark	Finland	France
Cons	0.016 ***	0.019 ***	0.034 ***	0.016 *	0.03
Ret(-1)	0.296 ***	0.325 ***	0.150 **	0.327 ***	0.28 ***
Vol	-1.335 ***	-1.274 ***	-1.394 ***	-0.369 **	-0.64 ***
Vol(-1)	0.994 ***	0.911 ***	0.771 ***	0.276 *	0.48 ***
Sk	0.003 *	0.003 *	-0.003	0.006	-0.07
Sk(-1)	-0.004	-0.001	-0.002	0.002	0.05
Ku	-0.001	-0.001 **	0.001	0.000	-0.06
Ku(-1)	0.001	0.001	-0.002	-0.002	0.06
Adj-R^2	0.50	0.43	0.42	0.13	0.33

	Greece	Ireland	Italy	Netherlands	Switzerland
Cons	0.073 ***	0.020 **	-0.05	0.015 *	0.02
Ret(-1)	0.077	0.266 ***	0.43 ***	0.169 **	0.48 ***
Vol	-1.544 ***	-1.328 ***	-0.46 ***	-1.186 ***	-0.51 ***
Vol(-1)	0.935 ***	0.831 ***	0.40 ***	0.899 ***	0.38 ***
Sk	-0.002	0.006 **	0.09	-0.002	0.10
Sk(-1)	0.002	0.002	0.01	-0.005	-0.21 ***
Ku	-0.007 **	0.001	0.01	0.002	0.02
Ku(-1)	-0.006 *	0.002	0.01	-0.002	-0.02
Adj-R^2	0.32	0.40	0.26	0.33	0.43

Notes: The table shows the results from risk-return regressions with skewness and kurtosis based upon the global factors. */**/*** indicates that the parameter is significant at the 10%/5%/1% level (based on bootstrapped errors).