

Fama – French Three Factor Regression on European Stock Markets – Before and After EMU

Master Thesis

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I. Introduction

In our research we want to see if Fama-French three factor model has still the power to explain the average returns on European Stock Markets over the period of June 1990 to May 2011 to see if it is practical to use this test while making investment decisions in European stock markets. This period is a very important one, as it includes the European Monetary Union (EMU) period and the integration period before the actual time that euro started to be used.

In order to be part of EMU, European Union countries had to satisfy the Maastricht criteria, creating a convergence of inflation and long-term interest rates toward German levels. Naturally the question of European Stock Market Integration has risen afterwards.

After all researches that has been done over the European markets, the hypothesis that single currency has changed the market movements in European area cannot be rejected. Thus, we desire to compare the results before and after periods of third stage of the European Monetary Union, in order to see if there are any negative or positive effects of EMU over the power of Fama-French model in European stock markets. We will do tests on 10 EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, and Spain) and for 3 non-EMU but EU countries (Denmark, Sweden, Switzerland) for the controlling purposes, for the time period 1990 to 2011. Luxembourg and Portugal do not have sufficient data, thus these countries are omitted in our research.

Two different models of Fama-French three factor are used in this thesis:

Country Specific Model – Using country specific factors for each country we investigated the success of Fama-French model over 13 European countries for 21 years and our results suggest that Fama-French model is fairly good over Europe markets, though it can be improved get better results to make it more practical to use is for investment decisions.

Eurozone Model – Using ten Eurozone countries we created Eurozone factors to see if there was any convergence between Eurozone countries and then we applied the test to 3 non Eurozone European Union countries to see if it is a general convergence over Europe or not. Our results suggest that there is an undeniable convergence within Eurozone market and as the controlling countries do not follow those movements mostly, we cannot conclude that currency change is not one of the possible reasons of integration.

In the second section of thesis we the literature research is given. In the third section the data gathering process and methodology of the models are explained. In the fourth section, summary statistics of data is given. In the fifth section, results of Fama-French tests are presented. Sixth section covers our conclusions and possible further research steps. The references are listed in the seventh section and eighth section covers the appendix.

II. Background Research

The capital asset pricing model (CAPM) of William Sharpe (1964) and John Lintner (1965) is considered as the starting point of asset pricing theory in literature. It is still one of the most used models in applications, like estimating the cost of capital and evaluating the performance of managed portfolios. The model was using market beta as the main risk factor of portfolio returns:

$$E(R_i) = E(R_f) + [E(R_m) - E(R_f)]\beta_{im} , \quad i = 1, \dots, N$$

$$\text{(Market Beta)} \quad \beta_{im} = \frac{\text{cov}(R_i, R_m)}{\sigma^2(R_m)}$$

Fama, MacBeth (1973) suggested estimating month-by-month cross-section regressions of monthly cross-section regressions of monthly returns on betas, instead of estimating a single cross-section of average monthly returns on betas to improve the model. However, consequent tests showed that although there is a positive relation between beta and average return, the relation was too flat, saying that CAPM was a poor model in asset pricing.

The searches for an appropriate way to calculate expected returns with the past data continued. Banz (1981) looked for a relation between average returns and firm sizes for the common stocks listed on NYSE for a long time period, from 1926 to 1975. The evidence from this study suggested that CAPM was not satisfying for the prediction of the expected returns but instead of looking betas, using the market capitalizations of the stock was doing a better job. According to the results smaller firms had higher risk adjusted returns on average. However the relation was neither linear nor logarithmic, which suggested that market size was not enough as a single factor. Basu (1983) tested the combined effects of E/P and size over the returns on the common stocks of NYSE for the years 1963 to 1980. The results stated that high E/P firms have higher returns than low E/P firms. Rosenberg, Reid, and Lanstein (1985) implemented a test to 1400 largest stocks from Compustat for the years 1980 to 1984 and found a positive book-to-price (B/P) relation over the average returns. Afterwards Bhandari (1988) exposed the positive relation between average returns and leverage.

Fama, French (1992) claimed that all those variables like size, E/P, leverage and book-to-market equity are scaled versions of a firm's stock price and applied the cross-section of expected stock return tests to the U.S. stock market in 1963-1990 period and gathered positive results. As a continuation of this research, in 1993 Fama, French paper, they presented the SML and HML portfolios in order to mimic the risk factors of size and BE/ME. Combining effects of excess market return, the three factors captures most of the cross-section of the average stock returns in 1963-1990 period in the U.S. stock market. The results of this research were accepted as a breakthrough for the calculation of expected stock returns for the U.S. stock market.

The results of Fama-French three factor model started to be tested internationally. Arshanapalli, Coggin, Doukas (1998) enhances used the Fama-French model in eighteen equity markets where ten were European markets for the period 1975 to 1995. Their findings suggest that Fama-French three factor model is not limited to the U.S. stock market and the stock returns in the international data is largely explained by the book-to-market and size effects. Griffin (2002) points out that domestic version of three factor model has better results than the global version depending on the results from U.S., Canada, Japan and the U.K. and according to their results they recommend the Fama-French test for performance measurements, and risk analysis. Al-Mwalla, and Karasneh (2011) uses the model in Amman Stock Exchange over the period 1999 to 2010. Their results show that size and book-to-market factor perform well in explaining the returns also in emerging markets like the Amman Stock Exchange. Moerman (2005) found out that Fama-French model's performance has increased in Europe Stock Markets after testing in on 11 euro-zone countries over the period 1991-2001. However, Moerman's study also confirms the results of Griffin (2002) as the country specific three factor model outperforms the general European based three-factor model.

Frankel and Rose (1997) suggest that there was an undeniable convergence in Europe, resulted by the pre-conditions of EMU, the actual one currency period and the reduced trade barriers. Rouwenhorst (1999) investigates the country effects and the industry effect on the returns in 12 European countries for the period

from 1978 to 1998 using monthly returns of individual stocks. The results of the cross-sectional regressions support that in the second half the country effects were smaller for the second half of the period signaling the convergence in European Stock Markets after the EMU. Fratzscher (2002) built a tri-variate GARCH model with time-varying coefficients on 13 European equity markets. The results have important evidence on the high integration over the European Stock Markets in the second half of the 1990's which was mostly explained by the EMU. Kim, Moshirian, and Wu (2005) examine the effects of the EMU on the dynamic process of stock market integration over the period 1989 to 2003 with the help of a bivariate EGARCH framework with time-varying conditional correlations. They conclude that there was both intra-regional and inter-regional stock market integration and it has increased after the official one currency launch. Hardouvelis, Malliaropulos, and Priestley (2006) investigate whether there was an actual integration over Europe after the EMU using the sample from 11 Euro-zone countries plus the U.K., they suggested that there was convergence in market risks both in world and Europe level and they could not reject the effects on one currency system over the Europe Stock Markets since the U.K. results did not show an increase in stock market integration. Lane, and Walti (2006) present a quantitative analysis using both volume and price based indicators to investigate the impact of Euro-zone on the European financial integration and conclude that the integration is not ignorable, but they also highlight that one-currency might not be the only reason. Bartram, Taylor, and Wang (2007) apply a time-varying copula model to understand the euro impact on 17 European countries during 1994-2003 periods and find evidence that especially in large equity markets like Germany, Italy, France and Netherlands the market convergence is highly increased after the introduction of EMU.

III. Methodology - Data

The explanatory variables we need in the time-series regressions to test the power of Fama-French three factor model over Europe Stock Markets are the returns on a market portfolio of stocks and mimicking portfolios for the size, and book-to-market factors. We gathered the data for the regression test for 12 EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, and Spain) and for 3 non-EMU but EU countries (Denmark, Sweden, Switzerland) for the controlling purposes. All the equities traded in the major stock exchanges in each country for the time period 1990 to 2011 are used: Vienna Stock Exchange (SE) for Austria, Euronext Brussels for Belgium, Copenhagen SE for Denmark, Helsinki SE for Finland, Euronext Paris for France, Berliner Börse for Germany, Athens SE for Greece, Irish SE for Ireland, Borsa Italiana for Italy, Euronext Amsterdam for Netherlands, Madrid SE for Spain, Stockholm SE for Sweden, and SIX Swiss Exchange for Switzerland.

Data – For each country we gathered all the equity total return indices included in the major stock exchange of each country for the 1st day of month for every month starting from June 1990 till June 2011 using the Thomson Reuters Datastream database. The total return index in Datastream is calculated as:

$$RI_t = RI_{t-1} * \frac{P_t + D_t}{P_{t-1}}$$

Where:

- RI_t = return index on day t
- RI_{t-1} = return index on previous day
- P_t = price on day t
- P_{t-1} = price on previous day
- D_t = dividend payment associated with ex-date t

To calculate the return on month t of each stock, we simply divide the total return index of 1st day of month t+1 to the total return index of 1st day of month t.

For the size and book-to-market variables, we gather the yearly market value and market value to book values of the stock for the period from 1989 to 2009 using Thomson Reuters Datastream database. Market values on Datastream are the share prices multiplied by the number of ordinary shares in issue, which is the desired data for Fama-French three factor model. The market value to book value is defined as the market value of the ordinary common equity divided by the balance sheet value of the ordinary common equity in the company. Dividing 1 to the market value to book value simply gives us the desired book-to-market ratio.

To be included in the tests, a firm must have market value and book-to-market value for December of year t-1 and monthly return values from June of year t to May of year t+1.

Six Portfolios – As it was done in Fama, French (1993), we formed six portfolios formed from sorts of stocks on ME and BE/ME for each country. In the year end of each year t-1 from 1990 to 2010, all the stocks are ranked on size (market capitalization). The median of each country has taken as the break point for the size portfolios of small and big (S and B). Similarly, the year-end book-to-market values of year t-1 from 1990 to 2010, of all stocks are ranked for each country separately and the top 30% and the bottom %30 were used as break points for the three portfolios of book-to-market factor, high(H), medium(M), and low(L). The equities with negative book-to-market values are omitted in the construction of three BE/ME and two ME groups as it was done in Fama-French (1993) Finally the six portfolios (S/L, S/M, S/H, B/L, B/M, B/H) are constructed from the intersection of the two ME and the three BE/ME groups. Monthly value weighted returns on the six portfolios are calculated from June of year t to May of t+1, and the portfolios are reformed in June of t+1.

$R_{SL} = \frac{\sum_i R_i * ME_i}{\sum_i ME_i}$ where, i's are the stocks that are both small in size and low in BE/ME. The other five portfolio returns are calculated similarly.

Size – The SMB (small minus big) portfolio, which is used to mimic the risk factor in returns related to size, is the difference, for each month, between the simple average of returns on the three small-stock portfolios (S/L, S/M, and S/H) and the simple average of the returns on the tree big-stock portfolios (B/L, B/M, and B/H).

$$R_{SMB} = \left(\frac{R_{SL} + R_{SM} + R_{SH}}{3} \right) - \left(\frac{R_{BL} + R_{BM} + R_{BH}}{3} \right)$$

BE/ME – The HML (high minus low) portfolio, which is used to mimic the risk factor in returns related to BE/ME, is defined the same way. HML is the difference, for each month, between the simple average of the returns on the two high BE/ME portfolios (S/H and B/H) and the average of the returns on the two low BE/ME portfolios (S/L and B/L).

$$R_{HML} = \left(\frac{R_{SH} + R_{BH}}{2} \right) - \left(\frac{R_{SL} + R_{BL}}{2} \right)$$

Correlations between SMB and HML Portfolios

<u>Austria</u>	<u>Belgium</u>	<u>Finland</u>	<u>France</u>	<u>Germany</u>	<u>Greece</u>	<u>Ireland</u>
-0.5542	-0.0794	0.1927	-0.3201	-0.2659	0.0619	-0.2635
<u>Italy</u>	<u>Netherlands</u>	<u>Spain</u>	<u>Denmark</u>	<u>Sweden</u>	<u>Switzerland</u>	
-0.1680	-0.0930	0.0925	0.1761	-0.1090	-0.3929	

Correlations between size and BE/ME mimicking portfolios for the June 1990 to May 2011 are listed above for each country. The correlations are generally low except for Austria. Thus, our SMB portfolios seems to provide a measure of size premium relatively free of BE/ME effects and similar for the HML portfolios.

Market Portfolio – The proxy for the market portfolio is also designed as it was done in Fama-French (1993). The market factor in stock returns is the excess market return $R_m - R_f$, where R_m is the value-weighted return portfolio of the stocks in the six ME and BE/ME portfolios, plus the negative BE/ME stocks that are excluded from the six portfolios, and R_f is the one-month national offered interest rate for every country: Austria Vibor 1 Month, Belgium Interbank 1 Month, Denmark Euro-Krone 1 Month, Finland Interbank Fixing 1 Month, France Interbank 1 Month, Germany Euro-Mark 1 Month, Greece Interbank 1 Month, Ireland Interbank 1 Month, Italy Euro-Lire 1 Month, Netherland Euro-Guilder 1 Month, Spain Interbank 1 Month, Sweden Interbank 1 Month, and Switzerland Euro-Franc 1 Month.

Euro-zone factor – The Eurozone factor is created to investigate the convergence of each country to currency zone market. 10 Euro-zone countries combined compose the Eurozone market. For the risk-free rate we used Euribor starting from 1999 and Germany Euro-Mark 1 Month for earlier period as Germany national rates were used as a benchmark constructing Eurozone. 6 portfolios formed in the similar way of country specific way to calculate the market, SMB and HML Eurozone factors.

The Model – In this research, as mentioned before Fama-French three factor test is used. In the first part we used country specific factors to see the power of the test over each country:

$$R_i - R_f = a_i + b_i(R_m - R_f)_{country} + s_iSMB_{country} + h_iHML_{country} + \epsilon_i$$

In the second part we used the Eurozone factors in each country to measure the convergence of each country to one currency zone:

$$R_i - R_f = a_i + b_i(R_m - R_f)_{eurozone} + s_iSMB_{eurozone} + h_iHML_{eurozone} + \epsilon_i$$

To measure the performance of our formed market portfolios, we correlated each market's monthly returns with the benchmark stock market indices' monthly returns: ATX for Austria, BEL20 for Belgium, OMX Helsinki 25 for Finland, CAC 40 for France, DAX for Germany, Athex 20 for Greece, ISEQ 20 for Ireland, FTSE MIB for Italy, AEX for Netherlands, IBEX 35 for Spain, OMX Copenhagen 20 for Denmark, OMX Stockholm 30 for Sweden, SMI for Switzerland and S&P Europe for Eurozone.

Correlations between market portfolios and benchmark stock market indices						
<u>Austria</u>	<u>Belgium</u>	<u>Finland</u>	<u>France</u>	<u>Germany</u>	<u>Greece</u>	<u>Ireland</u>
0.9349	0.9256	0.9303	0.9515	0.9442	0.9662	0.8110
<u>Italy</u>	<u>Netherlands</u>	<u>Spain</u>	<u>Denmark</u>	<u>Sweden</u>	<u>Switzerland</u>	<u>Eurozone</u>
0.9018	0.9486	0.9496	0.9091	0.9657	0.9524	0.9547

All the markets are correlated more than 90% with their benchmark indices except for Ireland and since it is also 0.81, we feel confident about the performances of our formed market portfolios.

IV. Summary Statistics

Table I
Summary Statistics for Explanatory Returns

Fama – French Three Factor Regression on European Stock Markets – Before and After EMU

The average of returns of the six size portfolios, two mimicking portfolios and the excess returns of the market portfolios are listed with the standard deviations and the t-values for each country. Panel A shows the results for the whole period, Panel B shows the results for the first sub period and finally Panel C shows the results for the second sub period.

* For three countries R_f data for earlier months were missing, thus the analysis for those countries started according to their data: Austria starts from June 1991, Greece starts from May 1994, Spain starts from December 1991, and Sweden starts from March 1991.

Panel A: June 1990 – May 2011										
		$R_M - R_F$	SMB	HML	SL	SM	SH	BL	BM	BH
Europe	Ave	0.46	-0.12	0.53	-0.05	0.47	0.70	0.30	0.57	0.62
	Std	5.67	2.96	2.75	5.94	4.95	4.80	5.66	5.72	6.30
	t(Ave)	1.30	-0.64	3.08	-0.13	1.52	2.31	0.84	1.57	1.56
Austria*	Ave	0.25	0.03	0.08	0.49	0.50	0.07	-0.14	0.68	0.43
	Std	6.46	4.93	5.25	7.48	6.39	7.53	6.71	7.47	8.43
	t(Ave)	0.61	0.09	0.23	1.00	1.22	0.14	-0.33	1.42	0.79
Belgium	Ave	0.38	-0.12	0.55	0.32	0.28	0.66	0.28	0.28	1.04
	Std	6.04	3.96	3.99	5.54	5.30	4.66	5.81	7.04	8.25
	t(Ave)	1.01	-0.47	2.18	0.91	0.84	2.24	0.78	0.64	2.00
Finland	Ave	0.73	-0.09	-0.20	0.37	0.69	0.80	1.05	0.85	0.22
	Std	9.34	5.15	6.99	8.20	6.89	8.22	11.17	8.32	8.28
	t(Ave)	1.25	-0.27	-0.45	0.72	1.59	1.54	1.49	1.62	0.42
France	Ave	0.45	0.13	0.27	0.31	0.79	0.75	0.38	0.59	0.48
	Std	5.53	4.64	4.59	7.58	8.36	4.58	5.56	5.89	7.23
	t(Ave)	1.29	0.46	0.93	0.66	1.50	2.61	1.10	1.59	1.06
Germany	Ave	0.25	-0.46	0.87	-0.41	-0.12	0.41	0.01	0.34	0.92
	Std	5.96	4.17	4.68	7.31	6.11	5.99	6.81	5.82	8.53
	t(Ave)	0.67	-1.77	2.93	-0.89	-0.31	1.07	0.02	0.91	1.71
Greece*	Ave	0.05	0.16	0.96	0.18	0.17	0.92	-0.29	0.17	0.90
	Std	9.07	8.02	5.54	13.19	12.55	14.28	9.55	10.26	11.78
	t(Ave)	0.08	0.28	2.49	0.19	0.19	0.92	-0.43	0.24	1.09
Ireland	Ave	0.55	-0.03	-0.48	0.89	0.54	0.34	0.67	0.92	0.27
	Std	9.01	7.19	8.60	12.85	6.97	7.52	9.80	9.60	12.77
	t(Ave)	0.97	-0.06	-0.88	1.10	1.24	0.72	1.09	1.52	0.33
Italy	Ave	0.24	-0.30	0.41	-0.52	0.01	0.38	0.27	0.32	0.19
	Std	6.74	3.44	3.78	7.64	6.64	7.95	6.61	7.47	8.12
	t(Ave)	0.55	-1.40	1.74	-1.08	0.02	0.76	0.64	0.68	0.38
Netherlands	Ave	0.50	-0.14	0.38	0.32	0.51	0.60	0.35	0.67	0.82
	Std	5.76	3.68	4.30	8.15	5.79	5.55	5.10	7.30	7.07
	t(Ave)	1.37	-0.59	1.39	0.62	1.40	1.73	1.09	1.46	1.85
Spain*	Ave	0.59	-0.25	0.23	0.41	0.66	0.44	0.54	0.75	0.98
	Std	6.06	4.07	3.91	7.07	6.21	6.85	6.41	6.38	7.44
	t(Ave)	1.48	-0.94	0.91	0.89	1.63	0.98	1.28	1.80	2.00
Denmark	Ave	0.33	-0.17	0.57	-0.36	0.25	0.70	0.39	0.23	0.48
	Std	4.60	3.77	3.90	6.62	4.40	4.82	4.61	5.52	6.89
	t(Ave)	1.14	-0.72	2.34	-0.86	0.90	2.31	1.35	0.66	1.11
Sweden*	Ave	0.73	-0.26	0.33	0.29	0.74	0.63	0.59	0.95	0.91
	Std	6.53	3.69	4.77	6.80	6.01	5.94	7.51	6.62	7.06
	t(Ave)	1.74	-1.10	1.08	0.67	1.91	1.65	1.22	2.22	2.01
Switzerland	Ave	0.72	-0.25	0.28	0.75	0.63	0.69	0.60	1.01	1.22
	Std	4.15	3.50	2.64	4.70	3.70	3.38	3.98	5.49	6.37
	t(Ave)	2.75	-1.15	1.69	2.53	2.70	3.26	2.40	2.92	3.04

Panel B: June 1990 – May 1999										
		$R_M - R_F$	SMB	HML	SL	SM	SH	BL	BM	BH
Europe	Ave	0.68	-0.29	0.47	0.05	0.58	0.64	0.54	0.72	0.89
	Std	4.81	2.72	2.08	4.33	4.55	4.72	4.54	5.10	5.59

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	t(Ave)	1.47	-1.12	2.34	0.11	1.32	1.41	1.23	1.46	1.65
Austria*	Ave	-0.30	-0.51	0.26	-0.61	-0.21	-0.99	-0.76	0.33	0.14
	Std	6.01	4.24	3.96	6.00	6.27	6.79	6.68	6.70	6.80
	t(Ave)	-0.49	-1.17	0.65	-1.00	-0.33	-1.42	-1.11	0.48	0.20
Belgium	Ave	0.74	-0.22	0.14	0.79	0.59	0.43	0.58	0.69	1.22
	Std	4.71	3.05	3.37	5.55	5.72	4.89	5.77	5.04	5.23
	t(Ave)	1.63	-0.76	0.42	1.49	1.08	0.91	1.04	1.43	2.42
Finland	Ave	1.09	-0.33	-1.06	0.16	0.70	0.49	2.03	0.73	-0.42
	Std	8.63	5.12	5.97	7.78	7.74	8.83	10.43	9.37	9.16
	t(Ave)	1.31	-0.66	-1.85	0.22	0.93	0.58	2.02	0.81	-0.48
France	Ave	0.52	-0.48	0.40	-0.22	0.00	0.44	0.49	0.56	0.62
	Std	5.14	3.51	2.43	5.09	4.17	3.96	5.13	5.44	6.45
	t(Ave)	1.04	-1.42	1.72	-0.45	0.00	1.17	0.99	1.07	1.01
Germany	Ave	0.42	-0.58	0.27	-0.11	-0.44	0.04	0.28	0.27	0.68
	Std	4.97	3.03	2.31	4.46	4.18	5.03	5.68	5.17	4.99
	t(Ave)	0.88	-1.97	1.23	-0.25	-1.09	0.08	0.51	0.53	1.41
Greece*	Ave	1.83	0.06	1.39	2.94	1.86	3.09	1.24	2.61	3.86
	Std	9.91	8.42	6.18	12.17	11.31	13.43	10.06	11.64	13.15
	t(Ave)	1.45	0.05	1.75	1.89	1.28	1.80	0.96	1.75	2.29
Ireland	Ave	0.77	-0.05	0.15	-0.05	0.58	1.10	0.78	1.07	-0.06
	Std	5.85	4.18	4.51	7.37	6.40	6.21	5.81	6.58	7.70
	t(Ave)	1.37	-0.13	0.36	-0.07	0.94	1.84	1.39	1.70	-0.09
Italy	Ave	0.31	-0.60	0.39	-0.62	-0.08	0.08	0.33	0.46	0.40
	Std	7.52	3.61	4.14	6.83	7.66	10.03	7.17	8.64	8.93
	t(Ave)	0.43	-1.74	0.97	-0.95	-0.11	0.08	0.47	0.55	0.47
Netherlands	Ave	1.04	-0.54	-0.34	0.60	0.24	0.35	1.05	1.13	0.62
	Std	4.55	2.88	3.29	5.74	4.46	4.14	4.61	5.13	4.92
	t(Ave)	2.37	-1.94	-1.07	1.08	0.56	0.87	2.37	2.29	1.31
Spain*	Ave	1.28	-0.50	-0.21	1.03	0.94	0.52	1.28	1.34	1.37
	Std	6.38	3.99	4.18	7.62	6.98	7.97	7.24	6.39	6.97
	t(Ave)	1.90	-1.18	-0.47	1.28	1.27	0.62	1.67	1.98	1.86
Denmark	Ave	0.04	0.17	0.47	-0.28	0.08	0.65	0.06	-0.20	0.08
	Std	4.21	3.59	2.75	3.99	3.63	3.94	4.40	5.38	4.38
	t(Ave)	0.10	0.48	1.78	-0.72	0.23	1.70	0.15	-0.38	0.19
Sweden*	Ave	1.06	-0.72	0.24	0.27	0.53	0.53	1.02	1.30	1.05
	Std	6.65	4.02	4.48	5.18	6.46	7.03	6.89	7.50	8.39
	t(Ave)	1.59	-1.78	0.53	0.52	0.82	0.76	1.47	1.72	1.24
Switzerland	Ave	1.11	-0.78	0.06	0.54	0.43	0.35	0.93	1.50	1.24
	Std	4.57	3.36	2.20	4.52	3.88	3.98	4.33	5.94	6.53
	t(Ave)	2.51	-2.42	0.29	1.24	1.16	0.92	2.23	2.63	1.97

Panel C: June 1999 – May 2011

		R_M-R_F	SMB	HML	SL	SM	SH	BL	BM	BH
Europe	Ave	0.30	0.01	0.58	-0.09	0.44	0.76	0.10	0.43	0.40
	Std	6.25	3.14	3.16	6.91	5.24	4.86	6.37	6.14	6.77
	t(Ave)	0.58	0.04	2.20	-0.16	1.00	1.87	0.20	0.84	0.72
Austria	Ave	0.62	0.38	-0.05	1.24	1.06	0.75	0.22	0.88	0.59
	Std	6.73	5.33	5.97	8.24	6.49	7.91	6.73	7.95	9.36
	t(Ave)	1.11	0.87	-0.09	1.80	1.96	1.14	0.38	1.32	0.75
Belgium	Ave	0.12	-0.04	0.86	-0.07	0.05	0.79	0.04	-0.05	0.87
	Std	6.88	4.54	4.39	5.52	4.96	4.49	5.83	8.21	9.93
	t(Ave)	0.21	-0.10	2.34	-0.16	0.12	2.11	0.09	-0.08	1.05
Finland	Ave	0.47	0.09	0.45	0.55	0.73	1.00	0.33	0.96	0.64
	Std	9.85	5.18	7.62	8.49	6.20	7.73	11.63	7.45	7.57
	t(Ave)	0.57	0.22	0.71	0.77	1.42	1.56	0.34	1.54	1.02
France	Ave	0.40	0.59	0.17	0.72	1.40	1.01	0.30	0.59	0.38

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	Std	5.82	5.29	5.71	8.97	10.39	4.98	5.86	6.20	7.75
	t(Ave)	0.83	1.35	0.36	0.96	1.61	2.42	0.62	1.15	0.59
Germany	Ave	0.12	-0.38	1.31	-0.64	0.12	0.68	-0.24	0.36	1.10
	Std	6.62	4.86	5.83	8.85	7.21	6.61	7.55	6.26	10.41
	t(Ave)	0.22	-0.94	2.69	-0.87	0.19	1.23	-0.38	0.68	1.27
Greece	Ave	-0.71	0.20	0.78	-0.64	-0.31	0.33	-0.88	-0.78	-0.17
	Std	8.62	7.87	5.26	14.08	13.27	15.07	9.27	9.49	11.15
	t(Ave)	-0.98	0.31	1.78	-0.54	-0.28	0.27	-1.14	-0.99	-0.18
Ireland	Ave	0.38	-0.01	-0.95	1.60	0.51	-0.27	0.53	0.72	0.45
	Std	10.81	8.82	10.69	15.70	7.36	8.33	11.95	11.37	15.52
	t(Ave)	0.42	-0.01	-1.07	1.22	0.83	-0.39	0.54	0.76	0.35
Italy	Ave	0.18	-0.08	0.43	-0.45	0.05	0.58	0.20	0.18	0.03
	Std	6.11	3.30	3.49	8.19	5.77	5.95	6.16	6.47	7.47
	t(Ave)	0.35	-0.28	1.48	-0.67	0.10	1.17	0.40	0.33	0.05
Netherlands	Ave	0.09	0.16	0.91	0.11	0.70	0.81	-0.18	0.30	0.94
	Std	6.51	4.16	4.87	9.55	6.60	6.39	5.38	8.55	8.33
	t(Ave)	0.17	0.47	2.26	0.14	1.27	1.53	-0.40	0.42	1.35
Spain	Ave	0.16	-0.09	0.51	0.02	0.49	0.38	0.06	0.38	0.74
	Std	5.84	4.13	3.72	6.68	5.68	6.07	5.80	6.35	7.70
	t(Ave)	0.32	-0.27	1.63	0.04	1.02	0.76	0.13	0.72	1.16
Denmark	Ave	0.55	-0.42	0.65	-0.40	0.43	0.77	0.62	0.54	0.80
	Std	4.87	3.89	4.59	8.04	4.93	5.39	4.75	5.60	8.26
	t(Ave)	1.35	-1.31	1.71	-0.59	1.04	1.71	1.58	1.16	1.16
Sweden	Ave	0.50	0.02	0.46	0.32	0.88	0.70	0.27	0.68	0.79
	Std	6.47	3.55	4.99	7.72	5.68	5.06	7.89	5.94	5.99
	t(Ave)	0.93	0.08	1.10	0.50	1.85	1.67	0.42	1.38	1.57
Switzerland	Ave	0.43	0.14	0.45	0.91	0.78	0.95	0.36	0.64	1.21
	Std	3.78	3.56	2.93	4.84	3.57	2.85	3.69	5.12	6.27
	t(Ave)	1.36	0.48	1.83	2.25	2.62	4.01	1.16	1.50	2.31

The average value of the market premiums, $R_m - R_f$, for the the full 21-year sample period varies from 0.05 percent per month to 0.73 percent per month with the average 0.445. Just like the results of Fama-French (2000) the European market also has a premium for the last 21 years. When we compare the two sub periods, it is seen that the average returns in Europe become from 0.76 percent per month to 0.26 percent per month, thus the European market returns are decreasing in 2000's.

The average HML returns are all positive except for Finland (-0.2 percent per month with t-statistics -0.45) and Ireland (-0.48 percent per month with t-statistic -0.88), differing from 0.08 percent per month to 0.96 percent per month for the full period and for the second period the returns increase for HML portfolios unlike the excess market returns. These positive returns confirm the premium of high BE/ME stock returns over low BE/ME stock returns suggested by Fama-French on the European stock markets for the last 21-year period. With the exception of Greece the HML returns have increased in the EMU period, suggesting the importance of BE/ME effect has got stronger after one currency in Europe.

Similar to the Fama-French (2000) results, we can say that in general the value premium for large stocks are lower than the value premium for small stocks except for Austria, France and Greece which have positive average returns on SMB portfolios in full period. Besides, except for Denmark, SMB returns have increased in the second period, thus it can be said that the size effect has increased after the release of euro in Europe.

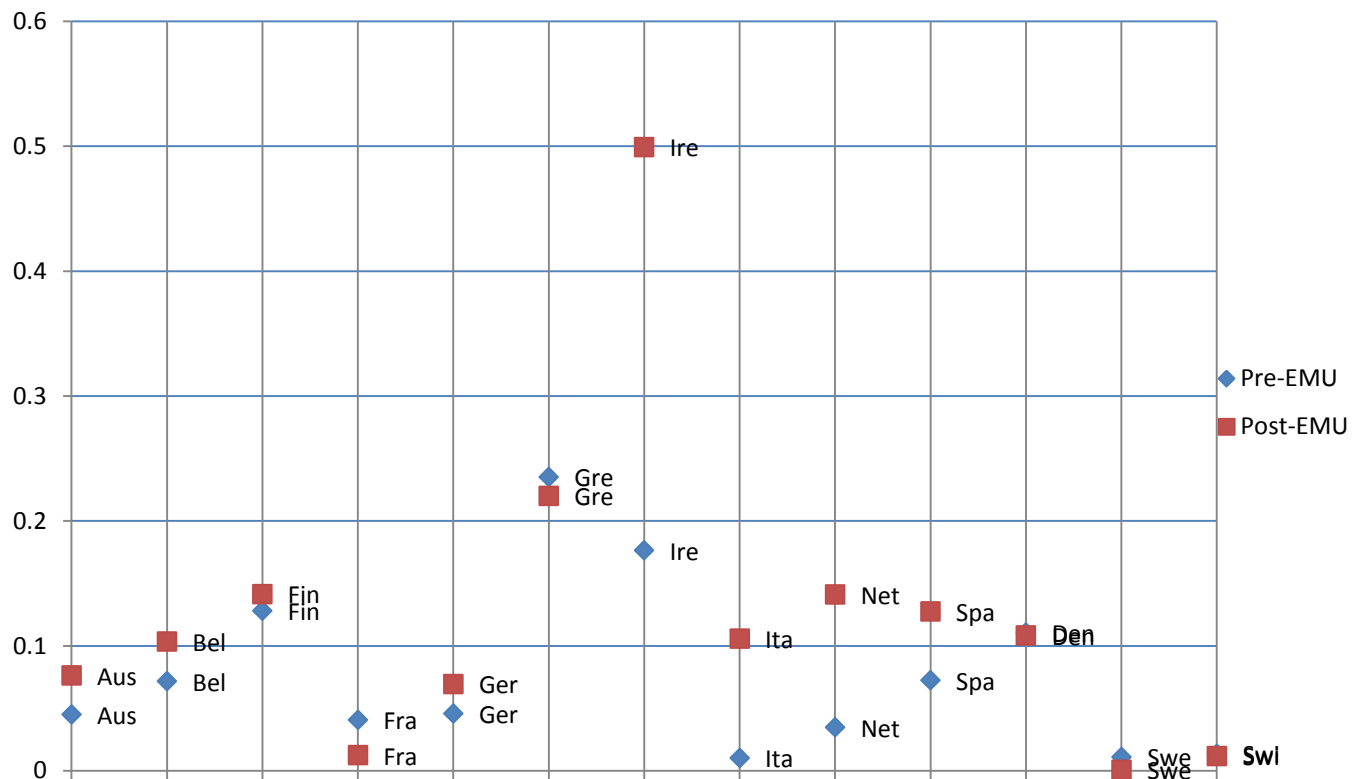
The three non-Eurozone European countries; Denmark, Sweden, and Switzerland do not seem to have extremely different results the ten Eurozone countries.

V. Fama-French Tests

Before going into detailed results, we wanted to look at the big picture of the results. The average of 6 portfolio intercepts are calculated for both tests, ie. the country specific tests and Eurozone tests, for both sub periods. When the two graphs are compared, it can be said that there is an ignorable integration within the Euro-zone countries after converging into one currency, but since there are some exceptional countries whose intercepts do not get closer to zero in the second period, we cannot say Eurozone is fully integrated yet.

Graph I

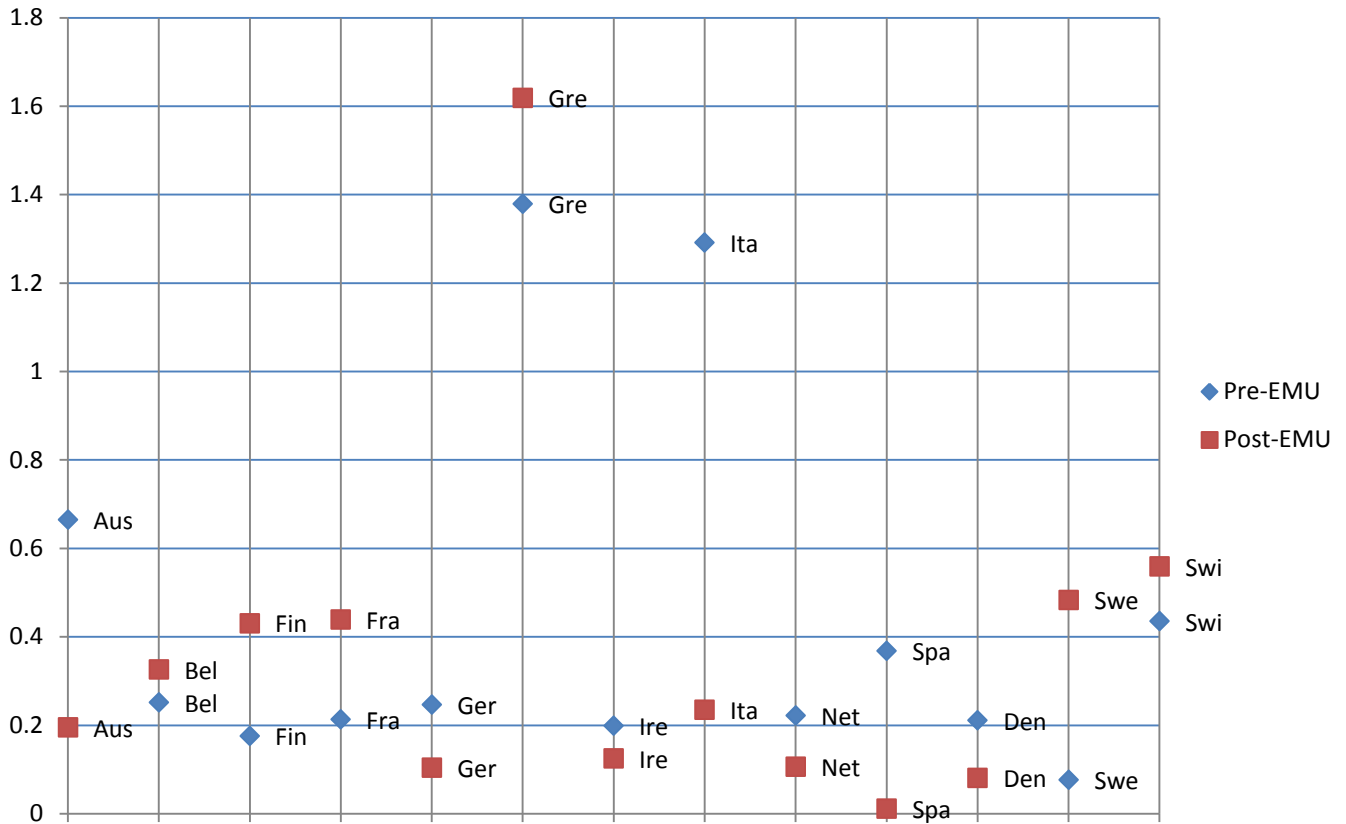
The average of absolute values of 6-portfolio intercepts in country specific Fama-French tests:



In first glance, looking at the average intercepts of each country, ignoring Greece and Ireland, it can be said that Fama-French has a fairly good performance in explaining the pricing in European stock markets. Especially, for Austria, Belgium, France, Germany, Italy, Netherlands, Spain, Sweden and Switzerland the average intercept for whole period lies between 0 and 0.1 suggesting the Fama-French is good for use for these countries in general. If we compare the two periods, in general intercepts seem to move away from 0 in post-EMU period when country specific factors are used.

Graph II

The average of absolute values of 6-portfolio intercepts in Eurozone Fama-French tests:



When we look at the average intercepts using Eurozone factor, Fama-French test does not seem to be working well as the intercepts generally away from zero. However, if we compare two sub period results, it is seen that the average of intercepts of more than half of the Eurozone countries, Austria, Germany, Ireland, Italy, Netherlands, and Spain converges to zero in the post-EMU period, suggesting that these countries had movements converging the Eurozone after one-currency release, where two out of three non-Eurozone European countries diverges from the Eurozone area in the second period. The detailed results of each country will be cover one by one in the next table.

Table II

Three-Factor Regressions for Portfolios Formed on Size and BE/ME

$$(1) \quad R_i - R_f = a_i + b_i(R_m - R_f)_{Country} + s_iSMB_{Country} + h_iHML_{Country} + \epsilon_i$$

$$(2) \quad R_i - R_f = a_i + b_i(R_m - R_f)_{Eurozone} + s_iSMB_{Eurozone} + h_iHML_{Eurozone} + \epsilon_i$$

The coefficients of the regression, t-statistics and the R^2 value are listed for every country in different panels.

Panel A1 : Austria		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1991 - May 2011	SL	0.03	1.15	1.09	-0.34	0.13	25.96	18.75	-7.24	0.79
	SM	0.27	0.86	0.74	0.10	1.2	22.67	14.82	2.39	0.72
	SH	-0.22	1.04	1.01	0.72	-1.44	40.2	29.99	26.19	0.92
	BL	-0.18	0.95	-0.11	-0.22	-1.34	41.21	-3.77	-8.9	0.89
	BM	0.19	1.03	-0.01	-0.02	1.44	44.69	-0.3	-0.77	0.91
	BH	0.07	1.06	-0.04	0.72	0.26	23.7	-0.69	14.92	0.82

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June 1991 – May 1999	SL	0.12	0.98	0.72	-0.22	0.34	16.09	7.71	-2.79	0.73
	SM	-0.04	0.98	0.86	0.29	-0.13	19.83	11.3	4.57	0.83
	SH	0.05	1.04	1.03	0.69	0.29	30.63	19.74	15.59	0.94
June 1999 – May 2011	BL	-0.02	0.99	-0.12	-0.19	-0.15	35.49	-2.82	-5.33	0.94
	BM	0.12	1.08	0.15	0.05	0.56	28.43	2.59	1.08	0.91
	BH	0.04	0.93	-0.42	0.90	0.1	13.65	-4.05	10.12	0.83
Panel A2 : Austria										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R²
June 1991 – May 2011	SL	-0.66	0.92	0.96	0.12	-1.35	9.31	5.18	0.67	0.26
	SM	-0.15	0.80	0.85	0.31	-0.44	11.63	6.63	2.56	0.36
	SH	-0.46	1.05	0.96	0.52	-1.07	12.02	5.9	3.42	0.38
June 1991 – May 1999	BL	-0.65	0.83	0.38	0.38	-2.06	12.96	3.21	3.38	0.43
	BM	-0.32	0.92	0.22	0.58	-1.04	14.82	1.9	5.3	0.53
	BH	-0.24	1.22	0.49	0.93	-0.51	12.75	2.73	5.56	0.45
June 1991 – May 1999	SL	-1.18	0.92	0.51	-0.55	-2.13	6.16	2.22	-2.07	0.28
	SM	-0.91	1.12	1.00	-0.62	-1.75	7.93	4.58	-2.48	0.39
	SH	-0.40	1.22	1.09	-1.04	-0.67	7.54	4.35	-3.61	0.37
June 1991 – May 2011	BL	-0.86	1.19	0.46	-0.72	-1.95	10.02	2.5	-3.39	0.54
	BM	-0.75	1.29	0.45	-0.76	-1.63	10.37	2.33	-3.45	0.56
	BH	0.11	1.40	0.62	-0.18	0.15	7.16	2.07	-0.53	0.38
June 1991 – May 2011	SL	-0.34	1.01	1.24	0.36	-0.47	7.56	4.81	1.52	0.28
	SM	0.38	0.81	0.88	0.53	0.9	10.17	5.77	3.83	0.41
	SH	-0.38	1.19	1.05	1.04	-0.69	11.6	5.33	5.8	0.49
June 1991 – May 2011	BL	-0.49	0.83	0.47	0.64	-1.22	11	3.24	4.84	0.47
	BM	0.03	0.96	0.25	0.93	0.09	14.48	1.96	8.06	0.64
	BH	-0.38	1.29	0.53	1.27	-0.63	11.31	2.43	6.4	0.51

Austria – The intercepts for the Austria market are not close to zero in general, and getting further than zero in country specific model in the second period as they get closer to zero in Eurozone model in the second period. The R²'s are lower in the Europe model as expected. As the factors get more generalized the idiosyncratic risk gets higher for the specific markets. The size effect almost remains the same for the both sub periods and has more power over the small stocks with significant t-values in country model. If we check Eurozone model it is obvious that size factor gains a lot more importance within the model, yet the effect does not seem to change during time. BE/ME effect is more solid for the value stocks (high BE/ME stocks) for both periods in the country model and like size factor, BE/ME factors power increases in the Eurozone model. Also in Eurozone model BE/ME values increase in absolute values in the second period suggesting that BE/ME factor gains importance over Austria in the general Eurozone market. The market effect is the most important one in Austria market in the country model for both periods. Although it is still the most important factor in Eurozone model, other two factors gain more power when Austria is tested with Eurozone factors especially in the second period.

Panel B1 : Belgium										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R²
	SL	0.19	1.02	0.99	-0.27	1.07	27.01	16.73	-6	0.75

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June 1990 - May 2011	SM	-0.04	1.03	0.83	0.05	-0.3	32.18	16.66	1.35	0.81
	SH	0.22	0.86	1.03	0.42	1.76	31.89	24.65	13.14	0.82
June 1990 - May 1999	BL	0.24	0.82	-0.09	-0.51	1.5	23.96	-1.71	-12.5	0.82
	BM	-0.08	1.09	0.08	-0.08	-0.43	25.86	1.21	-1.6	0.81
	BH	0.21	0.99	-0.14	0.79	1.01	22.3	-1.96	14.98	0.85
June 1999 - May 2011	SL	0.41	0.94	1.08	-0.53	1.92	19.59	14.62	-8.25	0.84
	SM	-0.08	1.15	0.82	0.06	-0.36	21.87	10.11	0.84	0.82
	SH	-0.11	0.94	0.93	0.42	-0.61	22.75	14.71	7.61	0.85
	BL	-0.12	0.99	-0.19	-0.56	-0.59	21.76	-2.65	-9.17	0.87
	BM	-0.07	1.05	0.06	0.01	-0.56	37.57	1.33	0.16	0.94
	BH	0.41	0.99	-0.04	0.50	2.07	22.65	-0.65	8.63	0.85
Panel B2 : Belgium										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R²
June 1990 - May 2011	SL	-0.08	0.79	0.57	0.18	-0.32	15.98	6.03	1.99	0.50
	SM	-0.20	0.80	0.57	0.34	-0.88	17.82	6.64	4.1	0.56
	SH	0.23	0.65	0.50	0.35	1.06	15.29	6.19	4.53	0.49
	BL	-0.17	0.68	0.02	0.27	-0.62	12.18	0.15	2.68	0.43
	BM	-0.46	0.97	0.02	0.56	-1.65	17.56	0.17	5.52	0.62
	BH	0.10	1.10	0.30	0.89	0.26	15.3	2.23	6.8	0.54
June 1990 - May 1999	SL	0.47	0.96	0.76	-0.23	1.21	10.23	4.8	-1.19	0.50
	SM	0.19	1.02	0.56	-0.26	0.49	10.96	3.61	-1.37	0.54
	SH	0.01	0.88	0.56	-0.03	0.03	11.63	4.35	-0.21	0.58
	BL	0.14	0.84	0.17	-0.19	0.33	7.88	0.92	-0.85	0.40
	BM	0.19	0.87	-0.01	-0.20	0.65	12.17	-0.11	-1.38	0.65
	BH	0.50	0.80	-0.09	0.29	1.64	10.8	-0.76	1.93	0.65
June 1999 - May 2011	SL	-0.43	0.76	0.51	0.26	-1.33	12.54	4.33	2.5	0.53
	SM	-0.46	0.77	0.62	0.46	-1.81	16.11	6.81	5.58	0.64
	SH	0.42	0.58	0.49	0.38	1.49	10.96	4.82	4.15	0.45
	BL	-0.35	0.66	-0.03	0.38	-0.97	9.61	-0.22	3.17	0.46
	BM	-0.90	1.13	0.12	0.92	-2.2	14.82	0.81	6.88	0.66
	BH	-0.24	1.34	0.61	1.27	-0.42	12.71	3	6.92	0.56

Belgium – For the country model, half of the intercepts are close to zero and do not seem to change in between the two sub-periods. The market factor is the most powerful effect, almost 1 for all the portfolios with high t-values, and the power of market factor is not affected in between two periods. Size effect is more solid in the small stocks as expected regarding the original Fama-French results, with the values of 1 on average and t-values above than 10. BE/ME factor is effective on both low and high BE/ME stocks, it has negative effect on growth stocks and positive on value stocks. Only on BH portfolio the BE/ME effect has increased in the second period, other than that both size and BE/ME effects remains in the same level for both periods.

For the Eurozone model, intercepts get further away from zero in the second period, thus Belgium has not converged to Eurozone in the EMU period. BE/ME seems to be heightened in the big stocks in this model, the rest of the results are pretty much the same with the country model.

Panel C1 : Finland										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	-0.12	0.75	0.99	-0.16	-0.42	19.31	15.05	-3.44	0.68
	SM	0.27	0.75	0.82	0.28	1.11	23.84	15.23	7.66	0.70
	SH	0.30	0.99	0.86	0.76	1.82	45.12	23.28	29.73	0.90
	BL	0.23	1.00	-0.18	-0.33	1.37	45.18	-4.71	-12.71	0.94
	BM	0.41	0.72	-0.10	0.46	1.27	16.82	-1.45	9.24	0.62
	BH	-0.19	0.76	-0.05	0.76	-0.79	23.69	-0.96	20.03	0.78
June 1990 – May 1999	SL	-0.85	0.88	0.96	-0.35	-2.18	16.81	10.9	-5.41	0.74
	SM	0.18	0.93	0.88	0.20	0.53	19.85	11.16	3.45	0.79
	SH	0.28	1.04	0.94	0.58	1.03	28.73	15.26	12.93	0.90
	BL	0.33	1.02	-0.21	-0.49	1.14	25.9	-3.12	-10.03	0.92
	BM	0.07	0.97	0.18	0.33	0.16	15.56	1.69	4.24	0.75
	BH	-0.79	0.86	-0.18	0.59	-2.4	19.37	-2.44	10.84	0.87
June 1999 – May 2011	SL	0.14	0.71	1.07	-0.10	0.34	12.69	11.77	-1.55	0.68
	SM	0.19	0.65	0.80	0.26	0.63	15.24	11.6	5.24	0.65
	SH	0.09	1.00	0.87	0.86	0.48	38.87	20.82	28.82	0.92
	BL	-0.07	1.04	-0.09	-0.23	-0.39	42.46	-2.36	-7.95	0.97
	BM	0.52	0.57	-0.26	0.42	1.23	9.79	-2.77	6.31	0.55
	BH	-0.02	0.75	0.10	0.82	-0.07	16.79	1.33	15.98	0.74
Panel C2 : Finland										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.19	0.80	0.67	-0.20	0.41	8.77	3.84	-1.2	0.24
	SM	0.28	0.90	0.75	0.15	0.83	13.33	5.82	1.24	0.41
	SH	0.17	1.07	0.89	0.45	0.41	13.27	5.78	3.1	0.41
	BL	0.79	1.21	-0.24	-0.62	1.48	11.47	-1.2	-3.23	0.45
	BM	0.05	1.05	0.38	0.67	0.13	13.26	2.52	4.68	0.45
	BH	-0.62	1.00	0.26	0.76	-1.53	12.54	1.69	5.26	0.43
June 1990 – May 1999	SL	-0.35	0.73	0.55	0.38	-0.49	4.3	1.94	1.1	0.17
	SM	-0.07	1.09	1.08	0.74	-0.13	7.98	4.7	2.63	0.46
	SH	-0.20	1.14	1.29	0.66	-0.29	6.74	4.57	1.9	0.36
	BL	1.07	1.41	0.51	0.33	1.3	7.15	1.54	0.82	0.37
	BM	-0.17	1.24	0.83	0.64	-0.23	6.94	2.76	1.76	0.37
	BH	-1.33	1.27	0.57	0.46	-1.89	7.45	2.01	1.31	0.40
June 1999 – May 2011	SL	0.52	0.76	0.67	-0.40	0.85	6.61	3.05	-2	0.29
	SM	0.57	0.71	0.49	-0.18	1.44	9.59	3.42	-1.36	0.44
	SH	0.52	1.00	0.62	0.34	1.08	11.01	3.55	2.16	0.47
	BL	0.66	0.96	-0.76	-1.09	0.99	7.71	-3.19	-5.02	0.56
	BM	0.31	0.95	0.11	0.60	0.73	11.76	0.71	4.24	0.55
	BH	0.00	0.89	0.07	0.74	0.01	10.37	0.43	4.95	0.49

Finland – For the country model, intercepts are a lot higher than Austria and Finland suggesting that Fama-French model is not the best model to predict the expected returns in this country. Other results are almost same as Austria and Belgium result: Market factor is the strongest, size factor has more power over small stocks and BE/ME factor has more power over growth and value stocks but with different signs.

For the Eurozone model, it is seen that big stocks tend to converge Eurozone in the second period where it is not the case for the small ones. The special effects of size and BE/ME factor over specific stocks disappear in this model for the first period yet both have some power over all the stocks, but in the second period size factor has more power over small stock and BE/ME factor has more power over growth and value stocks.

Panel D1 : France										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	-0.13	1.09	0.76	-0.56	-0.66	28.13	15.3	-12.05	0.84
	SM	-0.14	1.23	1.66	0.60	-0.57	24.55	25.97	10.03	0.78
	SH	0.18	0.81	0.60	0.47	1.43	31.68	18.45	15.49	0.81
	BL	0.07	0.91	-0.06	-0.32	0.88	55.49	-3	-16.55	0.95
	BM	0.08	1.03	-0.01	0.19	0.84	54.33	-0.59	8.37	0.94
	BH	-0.24	1.19	0.10	0.65	-1.56	38.81	2.48	17.54	0.89
June 1990 – May 1999	SL	-0.22	1.21	1.13	-0.20	-1.45	31.88	19.92	-3.16	0.91
	SM	-0.12	1.00	1.02	0.23	-0.83	28.33	19.24	3.97	0.88
	SH	0.21	0.96	0.95	0.48	2.13	38.06	25.02	11.3	0.93
	BL	0.18	0.96	-0.01	-0.49	1.67	34.65	-0.28	-10.55	0.95
	BM	-0.06	1.00	-0.07	0.16	-0.6	41.73	-1.94	3.99	0.97
	BH	-0.25	1.20	0.17	0.84	-1.45	27.99	2.69	11.63	0.93
June 1999 – May 2011	SL	0.00	1.08	0.65	-0.63	0	19.13	9.69	-10.48	0.83
	SM	-0.32	1.26	1.83	0.69	-0.8	17.06	20.85	8.77	0.79
	SH	0.29	0.78	0.51	0.45	1.45	21.64	11.94	11.64	0.78
	BL	0.04	0.90	-0.07	-0.30	0.35	43.35	-2.7	-13.69	0.95
	BM	0.17	1.03	0.00	0.20	1.13	37.59	-0.13	6.68	0.92
	BH	-0.25	1.20	0.07	0.61	-1.04	27.61	1.41	13.24	0.87
Panel D2 : France										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	0.24	1.06	1.03	-0.55	0.75	16.75	8.55	-4.77	0.57
	SM	0.54	0.86	0.89	-0.07	1.16	9.36	5.07	-0.43	0.26
	SH	0.34	0.77	0.75	0.27	2.07	23.52	12	4.53	0.69
	BL	0.14	0.84	-0.03	-0.29	0.87	25.65	-0.55	-4.78	0.79
	BM	0.11	0.93	-0.14	0.05	0.81	33.61	-2.62	1.03	0.86
	BH	-0.37	1.14	0.01	0.61	-1.78	27.92	0.11	8.25	0.80
June 1990 – May 1999	SL	-0.64	0.94	0.75	0.01	-2	12.15	5.81	0.04	0.60
	SM	-0.29	0.84	0.84	-0.08	-1.3	15.9	9.43	-0.74	0.72
	SH	0.13	0.74	0.67	0.03	0.53	12.6	6.81	0.23	0.62
	BL	-0.06	0.92	-0.14	-0.25	-0.25	15.19	-1.38	-1.99	0.76
	BM	-0.16	0.99	-0.17	0.00	-0.77	19.1	-1.95	0.02	0.84
	BH	-0.26	1.14	0.05	0.26	-0.81	14.83	0.39	1.64	0.75
June 1999 – May 2011	SL	0.80	1.06	1.14	-0.72	1.61	11.34	6.32	-4.43	0.58
	SM	1.15	0.87	0.90	-0.07	1.45	5.82	3.12	-0.26	0.20
	SH	0.51	0.82	0.81	0.38	2.3	19.85	10.19	5.26	0.73
	BL	0.27	0.79	0.02	-0.34	1.24	19.58	0.23	-4.88	0.81
	BM	0.32	0.91	-0.12	0.04	1.72	26.26	-1.86	0.64	0.88
	BH	-0.41	1.18	0.02	0.75	-1.55	23.7	0.18	8.64	0.84

France – In the country model the average of intercepts are a little closer to zero in the second period and overall intercept values are better compared to Finland yet not good enough as they are around value of 0.2. Three main factors act almost the same role like the previous countries and like the original Fama-French results. Market factor is strongest over all the portfolios, size effect is more solid over small stocks, and BE/ME effect is strong over low and high BE/ME values, yet in France BE/ME effect is also solid over medium BE/ME ratio stocks.

For the Eurozone model, the average of intercepts is lower for the first period, rejecting the conversion to Eurozone hypothesis. Only BE/ME effect gets stronger for the small stocks in the second period and rest of the results draw the same picture.

Panel E1 : Germany										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.03	1.10	0.97	-0.30	0.14	31.96	18.01	-6.87	0.84
	SM	-0.10	1.01	1.00	0.22	-0.7	39.12	24.6	6.53	0.87
	SH	0.10	1.02	0.94	0.56	1.03	55.09	32.64	23.52	0.93
	BL	0.05	1.05	-0.07	-0.39	0.44	48.47	-2.06	-14.05	0.92
	BM	0.00	0.94	0.03	0.12	0.04	50.94	0.88	5.24	0.93
	BH	-0.03	1.13	-0.04	0.74	-0.11	28.69	-0.7	14.54	0.84
June 1990 – May 1999	SL	0.19	0.90	1.00	-0.37	1.02	21.1	14.3	-4.62	0.82
	SM	-0.33	0.90	0.88	0.07	-2.19	26.2	15.75	1.15	0.87
	SH	0.00	1.09	0.94	0.45	0	35.36	18.63	7.87	0.93
	BL	-0.09	1.02	-0.16	-0.56	-0.55	27.33	-2.6	-8.04	0.91
	BM	-0.15	1.03	0.08	0.10	-1.27	38.51	1.84	1.98	0.95
	BH	0.10	0.83	-0.10	0.62	0.51	18.11	-1.32	7.22	0.83
June 1999 – May 2011	SL	-0.02	1.18	0.95	-0.31	-0.08	25.34	13.04	-5.34	0.85
	SM	0.06	1.06	1.04	0.24	0.29	30.13	18.87	5.66	0.87
	SH	0.17	0.99	0.96	0.58	1.16	42.8	26.45	20.34	0.93
	BL	0.14	1.07	-0.03	-0.36	0.81	39.42	-0.66	-10.87	0.93
	BM	0.12	0.90	0.01	0.12	0.81	37.08	0.28	3.99	0.92
	BH	-0.05	1.26	-0.03	0.76	-0.16	23.7	-0.39	11.6	0.86
Panel E2 : Germany										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	-0.26	0.98	1.02	-0.91	-0.92	17.53	9.53	-8.87	0.64
	SM	-0.19	0.91	0.77	-0.49	-0.83	19.81	8.72	-5.79	0.65
	SH	0.12	1.00	0.75	-0.16	0.58	24.34	9.59	-2.13	0.71
	BL	-0.09	0.98	0.04	-0.66	-0.41	23.42	0.48	-8.7	0.77
	BM	-0.04	0.93	-0.06	-0.12	-0.25	32.3	-1.07	-2.3	0.85
	BH	0.27	1.27	0.19	0.16	0.84	19.68	1.56	1.35	0.65
June 1990 – May 1999	SL	-0.32	0.86	0.79	-0.29	-1.17	12.87	7.01	-2.09	0.61
	SM	-0.66	0.86	0.63	-0.39	-2.86	15.6	6.82	-3.43	0.69
	SH	-0.30	1.05	0.65	-0.37	-1.16	16.56	6.07	-2.89	0.72
	BL	-0.15	1.03	-0.20	-0.71	-0.54	15.62	-1.8	-5.24	0.76
	BM	-0.25	1.01	-0.14	-0.45	-1.3	21.83	-1.86	-4.76	0.86
	BH	0.20	0.90	0.03	-0.26	0.71	13.31	0.26	-1.85	0.68
June 1999 – May 2011	SL	-0.31	0.97	1.11	-1.09	-0.7	11.72	6.95	-7.59	0.66
	SM	0.12	0.93	0.83	-0.51	0.33	13.38	6.18	-4.18	0.64
	SH	0.43	1.00	0.82	-0.10	1.43	17.73	7.51	-1.06	0.72
	BL	-0.09	0.96	0.18	-0.68	-0.31	16.92	1.63	-6.81	0.78
	BM	0.13	0.93	0.01	-0.03	0.63	24.71	0.18	-0.5	0.86
	BH	0.35	1.52	0.33	0.51	0.71	16.44	1.86	3.14	0.69

Germany – In the country model the intercepts tend to get a little further than zero in the second period and the values are fairly closer to zero compared to previous countries suggesting Fama-French is somewhat successful for Germany. Three main factor results are as expected, market factor is strongest, size factor is more powerful over small stocks and BE/ME factor has more effect over growth and value stocks.

For the Eurozone model, intercepts converge to zero suggesting a possible integration with the Eurozone market in the EMU period. The HML factor is almost ignorable only for BM portfolio in the second period other than that, market factor still is the strongest, size factor has more power over small stocks and BE/ME factor has some undeniable power over all the stocks in both periods.

Panel F1 : Greece										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.13	1.02	1.08	-0.18	0.46	32.54	30.8	-3.49	0.91
	SM	-0.35	1.00	0.88	0.34	-1.49	38.68	30.49	7.92	0.93
	SH	-0.01	1.06	0.99	0.75	-0.07	56.74	47.18	24.17	0.97
	BL	-0.18	1.04	-0.03	-0.16	-1.21	63.37	-1.68	-5.91	0.95
	BM	-0.01	1.04	-0.07	0.15	-0.05	36.38	-2.12	3.24	0.87
	BH	-0.04	1.00	0.06	0.91	-0.13	32.36	1.71	17.92	0.89
June 1990 – May 1999	SL	1.10	1.06	1.13	-0.12	1.76	15.49	14.23	-1.2	0.85
	SM	-0.46	1.01	0.84	0.29	-0.96	19.53	13.89	3.74	0.90
	SH	0.06	1.04	1.05	0.77	0.19	30.65	26.51	14.89	0.97
	BL	-0.27	1.00	-0.05	-0.23	-1.06	35.46	-1.59	-5.41	0.96
	BM	0.21	1.09	0.03	0.29	0.49	23.68	0.61	4.17	0.93
	BH	0.77	1.02	0.04	0.88	1.26	15.3	0.47	8.64	0.88
June 1999 – May 2011	SL	-0.33	0.99	1.08	-0.23	-1.11	27.87	27.83	-3.99	0.93
	SM	-0.33	0.98	0.91	0.36	-1.21	30.87	26.36	7.1	0.94
	SH	0.00	1.09	0.96	0.73	-0.01	45.67	36.78	19.04	0.97
	BL	-0.09	1.06	-0.04	-0.11	-0.48	50.83	-1.54	-3.27	0.95
	BM	-0.16	1.02	-0.10	0.06	-0.5	27.83	-2.51	0.95	0.85
	BH	-0.42	0.96	0.08	0.93	-1.37	26.85	2.14	15.93	0.89
Panel F2 : Greece										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	-0.71	1.46	2.41	0.47	-0.93	9.69	8.47	1.8	0.34
	SM	-0.84	1.50	2.19	0.62	-1.18	10.73	8.31	2.54	0.37
	SH	-0.35	1.74	2.63	0.92	-0.44	11.09	8.89	3.36	0.40
	BL	-1.28	1.44	1.49	0.56	-2.8	15.91	8.77	3.55	0.55
	BM	-0.88	1.38	1.42	0.71	-1.6	12.77	6.98	3.77	0.44
	BH	-0.13	1.45	1.92	0.66	-0.19	11.09	7.8	2.91	0.38
June 1990 – May 1999	SL	2.02	1.70	2.85	-0.64	1.52	4.74	5.27	-1.03	0.32
	SM	0.94	1.58	2.36	-0.67	0.74	4.59	4.55	-1.12	0.28
	SH	1.97	1.89	3.07	-0.58	1.34	4.75	5.11	-0.84	0.32
	BL	-0.24	1.92	2.19	-0.45	-0.25	7.35	5.56	-0.98	0.48
	BM	1.08	2.14	2.47	-0.76	0.93	6.82	5.21	-1.39	0.43
	BH	2.50	2.27	3.69	-0.61	2.03	6.82	7.37	-1.05	0.50
June 1999 – May 2011	SL	-1.89	1.49	2.31	0.73	-2.06	8.64	6.94	2.43	0.36
	SM	-1.61	1.59	2.17	0.95	-1.9	10.05	7.11	3.45	0.42
	SH	-1.34	1.83	2.51	1.30	-1.45	10.54	7.52	4.3	0.45
	BL	-1.79	1.40	1.32	0.72	-3.64	15.28	7.45	4.48	0.62
	BM	-1.81	1.32	1.17	0.93	-3.23	12.54	5.78	5.09	0.52
	BH	-1.29	1.36	1.40	0.87	-1.79	10.13	5.4	3.69	0.41

Greece – In the country model, intercepts are pretty far from zero for two sub-periods, pointing the deficiency of the three factor model over Greece. As usual the market factor is the strongest, Size factor is powerful over small stocks and HML factor's effect gets higher as the BE/ME ratio increases.

For the Eurozone model, the average of intercepts getting further from zero in the second period and since the intercepts are all above the value of 1 in absolute values suggesting the Eurozone factors are not appropriate for Greece and the integration with the Eurozone hypothesis should be rejected. The main three factors give the general results obtained before.

Panel G1 : Ireland										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.21	1.13	1.43	-0.21	0.45	17.43	16.5	-3.44	0.67
	SM	0.29	0.76	0.68	0.31	1.08	20.03	13.41	8.69	0.62
	SH	0.14	0.88	0.89	0.55	0.69	31.09	23.47	20.46	0.81
	BL	0.06	0.76	-0.35	-0.40	0.22	21.29	-7.37	-11.94	0.83
	BM	0.46	1.01	0.17	0.19	1.63	25.69	3.22	5.27	0.78
	BH	0.13	1.00	0.18	0.85	0.28	15.69	2.13	14.22	0.68
June 1990 – May 1999	SL	-0.69	1.00	1.33	-0.42	-1.69	12.55	11.9	-4.53	0.68
	SM	-0.19	1.00	0.81	0.24	-0.53	14.48	8.33	2.98	0.68
	SH	0.35	0.89	0.86	0.71	1.56	20.58	14.1	14.15	0.86
	BL	0.13	0.85	-0.23	-0.15	0.63	20.88	-3.99	-3.11	0.86
	BM	0.24	1.09	-0.02	-0.06	1.46	33.4	-0.44	-1.53	0.93
	BH	-0.90	0.96	0.25	0.73	-2.23	12.12	2.21	8.03	0.71
June 1999 – May 2011	SL	1.02	1.19	1.50	-0.14	1.36	13.19	12.51	-1.77	0.68
	SM	0.54	0.70	0.64	0.30	1.4	14.87	10.26	7	0.61
	SH	-0.06	0.87	0.88	0.51	-0.2	22.82	17.52	14.98	0.80
	BL	-0.11	0.71	-0.42	-0.46	-0.27	14.2	-6.36	-10.18	0.83
	BM	0.64	1.02	0.23	0.24	1.37	17.94	3.06	4.72	0.76
	BH	0.96	1.03	0.20	0.88	1.3	11.52	1.68	10.89	0.68
Panel G2 : Ireland										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.60	1.14	1.76	-0.06	0.82	7.88	6.37	-0.23	0.22
	SM	-0.09	0.83	0.92	0.67	-0.24	11.87	6.86	5.21	0.38
	SH	-0.19	0.88	1.06	0.47	-0.48	11.27	7.11	3.33	0.34
	BL	0.21	1.09	-0.08	-0.11	0.44	11.44	-0.44	-0.61	0.41
	BM	0.24	1.17	0.20	0.30	0.52	12.62	1.13	1.76	0.43
	BH	-0.23	1.10	0.12	0.66	-2.84	68.71	3.86	22.59	0.96
June 1990 – May 1999	SL	-0.09	0.71	1.09	-0.26	-0.13	4.39	4.02	-0.78	0.17
	SM	0.30	0.95	1.24	-0.01	0.62	8.05	6.28	-0.03	0.41
	SH	0.89	0.73	1.23	0.17	1.76	5.91	5.97	0.67	0.32
	BL	0.23	0.88	0.19	0.01	0.55	8.56	1.1	0.04	0.46
	BM	0.48	1.04	0.33	-0.03	1.03	9.2	1.76	-0.15	0.48
	BH	-0.63	1.03	0.91	0.28	-1.01	6.86	3.61	0.92	0.34
June 1999 – May 2011	SL	1.02	1.41	2.17	0.22	0.87	6.42	5.13	0.58	0.24
	SM	-0.26	0.86	0.79	0.88	-0.53	9.34	4.47	5.49	0.39
	SH	-0.93	0.99	1.01	0.68	-1.66	9.44	4.97	3.71	0.38
	BL	0.26	1.19	-0.24	-0.04	0.34	8.12	-0.86	-0.15	0.42
	BM	0.13	1.28	0.16	0.50	0.17	9.23	0.59	2.05	0.42
	BH	-0.96	1.51	0.35	1.75	-0.89	7.43	0.89	4.94	0.33

Ireland – In the country model the average of intercepts diverges from zero in the second period suggesting the country specific factors losing their power over Ireland market in EMU period. The main three factors give the same general results of earlier countries

In the Eurozone model, although the intercepts are far away from zero, the averages converge to zero in the second period, supporting the Eurozone convergence of Ireland after release of one currency. Market effect is the strongest as expected in both periods, size effect is solid overall but losing its power over big stocks in the second period, and HML factor gains power overall in the second period yet it is still more effective over value stocks.

Panel H1 : Italy										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	-0.25	1.07	1.12	-0.44	-1.55	42.29	22.95	-9.82	0.89
	SM	-0.10	0.92	0.79	0.31	-0.83	50.13	22.38	9.65	0.92
	SH	0.14	1.01	1.04	0.76	1.86	84.77	45.14	36.48	0.98
	BL	0.13	0.98	-0.05	-0.25	1.44	72.03	-1.79	-10.42	0.96
	BM	-0.06	0.99	-0.04	0.33	-0.43	43.48	-1	8.25	0.91
	BH	-0.27	1.04	0.03	0.55	-1.68	41.46	0.71	12.7	0.90
June 1990 – May 1999	SL	-0.14	0.94	1.12	-0.26	-0.72	28.21	19.15	-4.39	0.91
	SM	0.04	0.93	0.84	0.23	0.24	29.92	15.34	4.23	0.94
	SH	0.07	1.06	1.03	0.77	0.63	57.47	31.98	23.97	0.99
	BL	0.05	0.99	-0.08	-0.22	0.5	61	-2.82	-7.6	0.98
	BM	0.08	1.07	0.06	0.20	0.47	35.61	1.16	3.82	0.96
	BH	-0.16	0.87	0.01	0.76	-0.8	25.51	0.13	12.72	0.95
June 1999 – May 2011	SL	-0.35	1.15	1.05	-0.50	-1.49	29.16	13.49	-6.89	0.89
	SM	-0.19	0.93	0.78	0.37	-1.26	36.26	15.45	7.83	0.90
	SH	0.22	0.96	1.02	0.70	2.18	56.14	30.13	22.33	0.96
	BL	0.18	0.95	-0.05	-0.30	1.37	41.89	-1.03	-7.18	0.93
	BM	-0.12	0.96	-0.09	0.36	-0.54	26.04	-1.24	5.29	0.84
	BH	-0.38	1.14	-0.01	0.51	-1.75	30.63	-0.13	7.47	0.88
Panel H2 : Italy										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	-0.94	1.11	0.70	-0.02	-2.78	16.59	5.5	-0.12	0.53
	SM	-0.72	1.07	0.78	0.61	-2.88	21.59	8.3	6.79	0.66
	SH	-0.55	1.12	0.80	0.96	-1.58	16.28	6.13	7.64	0.54
	BL	-0.22	0.97	0.18	0.12	-0.86	19	1.88	1.25	0.63
	BM	-0.67	1.12	0.27	0.94	-2.5	21.23	2.7	9.81	0.70
	BH	-0.76	1.24	0.40	0.80	-2.55	21.04	3.5	7.44	0.67
June 1990 – May 1999	SL	-1.61	0.85	0.89	1.42	-3.74	8.22	5.07	6.67	0.60
	SM	-1.35	1.01	0.86	1.78	-3.29	10.18	5.16	8.74	0.71
	SH	-1.69	1.16	0.87	2.62	-3.1	8.84	3.91	9.71	0.70
	BL	-0.82	0.98	0.12	1.09	-1.9	9.42	0.69	5.12	0.63
	BM	-1.08	1.19	0.34	1.77	-2.44	11.17	1.89	8.07	0.73
	BH	-1.20	1.13	0.46	2.05	-2.5	9.76	2.34	8.64	0.71
June 1999 – May 2011	SL	-0.49	1.04	0.46	-0.46	-1.13	12.78	2.93	-3.26	0.62
	SM	-0.32	0.94	0.62	0.17	-1.34	21.01	7.25	2.24	0.77
	SH	0.19	0.87	0.59	0.27	0.58	14.27	5.08	2.53	0.60
	BL	0.13	0.84	0.12	-0.28	0.51	16.93	1.28	-3.26	0.75
	BM	-0.41	0.96	0.15	0.57	-1.43	18.01	1.43	6.12	0.74
	BH	-0.51	1.13	0.24	0.36	-1.61	18.8	2.11	3.45	0.75

Italy – The country model can be accepted as a good model for Italy looking at the first period intercept values, however the model loses its power in the second period. As in general market factor is the strongest over all

the stocks, size factor is stronger over small stocks and the power of HML factor increases parallel to the BE/ME ratio. One currency does not seem to affect the strength of the three factors in the country model.

Unlike country model, in Eurozone model the average of intercepts converge to zero in the second period, providing an evidence for integration of Italy with the Eurozone after 1999. Market factor is strongest, the effects of SMB factor is solid over all stocks in both portfolios but higher for the small stocks with a decrease in the second period. HML factor's effect over the stocks seems to get weaker in the second period.

Panel I1 : Netherlands										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.06	1.13	1.16	-0.37	0.29	29.34	18.39	-7.09	0.83
	SM	0.08	0.92	0.95	0.27	0.6	36.95	23.11	7.8	0.86
	SH	0.09	0.90	0.96	0.54	0.87	48.74	31.74	21.35	0.92
	BL	0.10	0.75	-0.06	-0.36	0.88	35.24	-1.63	-12.21	0.87
	BM	0.05	1.21	-0.02	0.05	0.35	47.4	-0.57	1.39	0.91
	BH	0.08	0.99	0.15	0.74	0.33	23.56	2.13	12.89	0.73
June 1990 - May 1999	SL	0.00	1.07	1.20	-0.37	0.02	27.99	19.79	-7.25	0.92
	SM	-0.18	0.93	0.89	0.20	-0.95	21.75	13.18	3.48	0.83
	SH	0.07	0.88	0.91	0.43	0.46	25.68	16.68	9.47	0.87
	BL	-0.02	0.81	-0.11	-0.50	-0.13	22.59	-1.97	-10.41	0.89
	BM	0.00	1.07	-0.07	0.06	0	31.66	-1.22	1.34	0.92
	BH	-0.08	1.00	0.18	0.70	-0.46	23.37	2.7	12.21	0.86
June 1999 - May 2011	SL	0.18	1.15	1.13	-0.39	0.51	20.61	12.02	-4.93	0.81
	SM	0.21	0.92	0.96	0.28	1.05	28.99	18	6.33	0.87
	SH	0.03	0.90	0.99	0.58	0.19	40.59	26.37	18.47	0.93
	BL	0.04	0.73	-0.02	-0.29	0.21	27.62	-0.43	-7.92	0.86
	BM	0.20	1.25	-0.03	0.02	0.89	36.56	-0.54	0.51	0.91
	BH	0.19	0.98	0.13	0.74	0.49	16.18	1.25	8.65	0.70
Panel I2 : Netherlands										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.17	1.19	0.75	-0.59	0.53	18.77	6.15	-5.08	0.63
	SM	0.07	0.94	0.69	0.16	0.33	21.54	8.31	1.97	0.65
	SH	0.18	0.84	0.60	0.20	0.76	18.17	6.83	2.36	0.57
	BL	0.01	0.73	0.05	0.02	0.03	18.42	0.62	0.33	0.63
	BM	0.15	1.13	-0.01	-0.02	0.69	25.72	-0.13	-0.22	0.78
	BH	0.36	0.94	-0.10	0.02	1.25	16.39	-0.94	0.24	0.60
June 1990 - May 1999	SL	0.15	1.09	0.66	-0.20	0.42	12.91	4.68	-1.17	0.62
	SM	-0.14	0.81	0.66	0.06	-0.5	11.84	5.75	0.4	0.59
	SH	0.02	0.66	0.43	0.01	0.06	9.04	3.46	0.05	0.45
	BL	0.62	0.81	-0.05	-0.28	2.38	12.98	-0.43	-2.17	0.68
	BM	0.61	0.88	-0.15	-0.26	2.17	12.89	-1.34	-1.88	0.69
	BH	0.08	0.69	0.01	0.16	0.23	8.03	0.08	0.89	0.47
June 1999 - May 2011	SL	0.15	1.20	0.76	-0.69	0.29	12.78	4.23	-4.23	0.63
	SM	0.24	1.02	0.72	0.26	0.76	17.16	6.25	2.51	0.68
	SH	0.28	0.97	0.73	0.36	0.86	15.55	6.07	3.35	0.63
	BL	-0.45	0.73	0.14	0.11	-1.6	13.72	1.36	1.14	0.62
	BM	-0.19	1.30	0.11	0.21	-0.62	22.86	1.02	2.11	0.83
	BH	0.61	1.05	-0.18	0.10	1.45	13.41	-1.19	0.72	0.66

Netherlands – The average of intercepts are pretty close to zero in the first period for country model yet getting further in the second period, pointing that the Netherlands market is changing. Market factor is the most powerful one in Netherlands, size is solid over small stocks and BE/ME factor is stronger over value and growth stocks.

In the Eurozone factor the intercepts tend to converge zero in the second period. Market factor and size factor act like general in Netherlands market for Eurozone model. However HML factor is almost ignorable for small stocks where it has solid effect on small stocks in the EMU period.

Panel J1 : Spain										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	0.12	1.01	0.94	-0.30	0.66	31.25	19.34	-6.19	0.84
	SM	0.30	0.89	0.92	0.29	1.82	31.65	21.77	6.88	0.84
	SH	-0.05	1.02	0.99	0.61	-0.47	52.03	33.71	20.62	0.94
	BL	0.02	0.98	-0.04	-0.30	0.17	45.92	-1.38	-9.49	0.91
	BM	0.15	0.98	0.00	0.11	0.98	37.4	-0.13	2.92	0.87
	BH	0.20	0.97	-0.10	0.79	0.93	26.52	-1.82	14.4	0.81
June 1990 – May 1999	SL	0.18	0.93	0.85	-0.41	0.56	18.19	10.61	-5.23	0.85
	SM	0.26	0.92	0.87	0.30	0.93	20.56	12.44	4.37	0.86
	SH	-0.23	1.09	1.02	0.63	-1.22	36.88	21.95	14.04	0.95
	BL	-0.14	1.07	-0.02	-0.23	-0.78	37.79	-0.44	-5.41	0.95
	BM	0.09	0.97	-0.05	0.03	0.46	32.7	-1.04	0.56	0.93
	BH	0.27	0.91	-0.19	0.73	0.72	15.38	-2.02	8.14	0.76
June 1999 – May 2011	SL	0.07	1.08	1.03	-0.22	0.32	25.31	16.89	-3.57	0.83
	SM	0.29	0.88	0.94	0.30	1.4	22.96	17.15	5.36	0.81
	SH	0.02	0.97	0.95	0.60	0.15	36.23	24.72	15.25	0.92
	BL	0.10	0.91	-0.10	-0.34	0.58	29.95	-2.24	-7.62	0.89
	BM	0.14	0.99	0.04	0.19	0.64	24.24	0.65	3.16	0.83
	BH	0.15	1.03	-0.01	0.83	0.56	21.25	-0.18	11.7	0.84
Panel J2 : Spain										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	-0.34	0.91	0.57	0.44	-0.94	12.34	4.17	3.42	0.41
	SM	-0.13	0.90	0.71	0.54	-0.44	15.29	6.42	5.2	0.51
	SH	-0.44	1.00	0.76	0.59	-1.37	15.55	6.28	5.23	0.52
	BL	0.02	0.88	0.06	-0.04	0.09	15.59	0.55	-0.36	0.58
	BM	0.00	0.91	-0.08	0.34	0	18.62	-0.91	4.03	0.68
	BH	0.32	0.99	0.23	0.12	0.9	13.95	1.71	0.99	0.50
June 1990 – May 1999	SL	-0.45	1.27	0.55	0.36	-0.76	7.81	2.22	1.25	0.50
	SM	-0.57	1.21	0.84	0.69	-1.14	8.77	4.03	2.85	0.57
	SH	-1.17	1.43	0.94	0.59	-2.04	9.12	3.94	2.13	0.57
	BL	-0.29	1.21	0.01	0.44	-0.64	9.71	0.03	2.01	0.67
	BM	-0.01	1.08	0.01	0.29	-0.02	9.63	0.04	1.47	0.66
	BH	0.29	0.72	0.15	0.62	0.44	4.01	0.56	1.95	0.27
June 1999 – May 2011	SL	-0.40	0.79	0.64	0.33	-0.89	9.24	3.9	2.21	0.37
	SM	0.04	0.77	0.66	0.36	0.12	11.86	5.26	3.2	0.49
	SH	-0.12	0.85	0.71	0.42	-0.33	12.6	5.49	3.59	0.52
	BL	0.06	0.69	0.08	-0.34	0.21	12.06	0.74	-3.38	0.62
	BM	-0.04	0.85	-0.10	0.30	-0.13	15.06	-0.94	3.01	0.69
	BH	0.39	1.03	0.19	0.05	0.96	13.56	1.27	0.41	0.62

Spain – As most of the Eurozone countries, Spain's average of intercepts get further than zero in country model after the release of Euro. Market factor again is the most powerful one, and size factor is effective over small stocks in both periods. BE/ME factor's effect is seen more solid over value and growth stocks in the first period, but after 1999 HML's power over all stocks seem to be enhanced.

In the Eurozone model the second period intercepts are closer to zero, underlining the convergence of Spain to Eurozone after monetary integration. HML factor seem to lose its power a little after one currency but other than that all the factors have the general results over the stocks.

Panel K1 : Denmark										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	-0.48	1.20	1.12	-0.15	-2.08	22.02	16.52	-2.55	0.71
	SM	-0.06	0.86	0.84	0.31	-0.45	25.49	20.17	8.25	0.75
	SH	0.17	0.98	0.99	0.65	1.93	46.29	37.73	28.18	0.92
	BL	0.23	0.89	-0.08	-0.25	2.63	42.16	-3.16	-11.02	0.91
	BM	-0.19	1.04	-0.01	0.12	-1.06	24.7	-0.18	2.65	0.75
	BH	-0.41	1.11	0.05	0.94	-1.87	20.96	0.72	16.12	0.75
June 1990 – May 1999	SL	-0.28	0.98	1.03	-0.44	-1.58	17.7	15.98	-6.71	0.79
	SM	-0.17	0.99	0.97	0.10	-1.16	21.98	18.37	1.96	0.83
	SH	0.12	1.02	0.94	0.70	1.25	34.11	26.82	19.77	0.94
	BL	0.16	0.92	-0.10	-0.25	1.24	22.89	-2.12	-5.31	0.91
	BM	-0.25	1.20	0.05	-0.01	-1.19	18.73	0.71	-0.09	0.84
	BH	-0.24	0.87	-0.01	0.62	-1.31	15.26	-0.09	9.22	0.81
June 1999 – May 2011	SL	-0.61	1.31	1.14	-0.07	-1.66	16.64	11.06	-0.77	0.71
	SM	0.05	0.82	0.84	0.35	0.25	17.9	14	7.19	0.74
	SH	0.23	0.95	1.03	0.65	1.72	33.09	27.41	21.13	0.91
	BL	0.30	0.87	-0.06	-0.25	2.49	34	-1.85	-9.13	0.91
	BM	-0.08	0.98	0.03	0.16	-0.31	17.47	0.37	2.7	0.70
	BH	-0.54	1.23	0.05	1.03	-1.55	16.47	0.48	12.82	0.75
Panel K2 : Denmark										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	-0.73	0.78	0.91	0.23	-2.1	11.34	6.94	1.81	0.34
	SM	-0.10	0.50	0.65	0.36	-0.42	11.1	7.55	4.35	0.35
	SH	0.34	0.51	0.57	0.37	1.28	9.75	5.77	3.87	0.28
	BL	0.09	0.67	0.19	0.04	0.45	17.47	2.66	0.54	0.58
	BM	-0.30	0.71	0.37	0.46	-1.11	13.37	3.68	4.72	0.44
	BH	-0.12	0.75	0.44	0.59	-0.34	10.25	3.2	4.48	0.32
June 1990 – May 1999	SL	-0.35	0.41	0.62	-0.06	-0.98	4.81	4.32	-0.34	0.20
	SM	-0.01	0.45	0.73	-0.02	-0.02	6.37	6.13	-0.11	0.33
	SH	0.54	0.32	0.51	0.07	1.49	3.7	3.44	0.41	0.13
	BL	-0.43	0.64	0.12	0.21	-1.39	8.45	0.92	1.35	0.48
	BM	-0.75	0.70	0.23	0.30	-1.79	6.95	1.35	1.46	0.38
	BH	-0.27	0.54	0.25	0.12	-0.74	6.15	1.66	0.65	0.29
June 1999 – May 2011	SL	-1.04	1.02	1.12	0.53	-1.99	10.36	5.95	3.08	0.42
	SM	-0.11	0.58	0.64	0.54	-0.35	9.47	5.44	5.01	0.39
	SH	0.20	0.64	0.65	0.58	0.57	9.57	4.98	4.92	0.39
	BL	0.45	0.66	0.21	-0.02	1.88	14.55	2.43	-0.29	0.65
	BM	0.03	0.73	0.46	0.51	0.07	11.24	3.63	4.5	0.48
	BH	-0.01	0.92	0.60	0.88	-0.02	8.65	2.94	4.75	0.36

Denmark – Unlike most Eurozone countries Denmark's average intercept does not change its distance from zero from one period to the other in the country model. Though, the intercepts are still far from zero. The main three factors give the similar results like the majority.

In Euro model Denmark does signals a convergence to Eurozone although it is not a Eurozone country interestingly. The average of intercepts moves from 0.21 to 0.08 in the second period. Market factor is not as bold as it is in general for small stocks in the first period with an average of around 0.4 but gets strengthen in the second period. Size factor acts normal, more powerful over small stocks. HML factor's influence increases in the second period for Denmark when it is tested with Eurozone factors.

Panel L1 : Sweden										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	-0.10	1.00	1.04	-0.20	-0.8	45.5	27.05	-7.18	0.92
	SM	0.13	0.99	0.93	0.36	1.09	47.07	25.13	13.44	0.90
	SH	-0.03	0.99	1.00	0.60	-0.43	71.17	41.05	34.06	0.96
	BL	0.00	1.01	-0.01	-0.45	-0.04	56.66	-0.21	-19.75	0.96
	BM	0.07	0.96	-0.06	0.46	0.55	42.82	-1.62	16.05	0.91
	BH	-0.07	1.02	0.04	0.75	-0.55	45.59	0.95	26.38	0.92
June 1990 – May 1999	SL	-0.11	0.92	0.85	-0.12	-0.56	23.99	12.99	-2.69	0.86
	SM	0.01	1.03	0.91	0.33	0.04	23.65	12.22	6.25	0.88
	SH	0.07	1.03	1.07	0.65	0.47	35.57	21.63	18.6	0.96
	BL	0.00	1.04	0.05	-0.35	0.01	34.63	0.97	-9.67	0.95
	BM	0.15	1.00	-0.06	0.34	0.64	22.92	-0.78	6.33	0.91
	BH	-0.18	0.93	-0.17	0.87	-0.78	21	-2.2	16.21	0.93
June 1999 – May 2011	SL	-0.15	1.03	1.14	-0.18	-0.95	33.23	21.45	-4.47	0.94
	SM	0.19	0.98	0.97	0.37	1.39	37.38	21.6	10.79	0.92
	SH	-0.04	0.94	0.91	0.52	-0.45	59.84	33.84	24.96	0.96
	BL	0.09	0.93	-0.13	-0.58	0.7	38.41	-3.08	-18.03	0.97
	BM	-0.06	1.00	0.04	0.57	-0.41	35.08	0.87	15	0.91
	BH	-0.03	1.02	0.10	0.72	-0.21	37.41	2.23	19.91	0.92
Panel L2 : Sweden										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 – May 2011	SL	0.17	0.89	0.62	-0.53	0.52	13.89	5.16	-4.73	0.50
	SM	0.39	0.81	0.56	-0.08	1.32	13.49	4.99	-0.73	0.44
	SH	0.27	0.78	0.48	-0.03	0.89	12.79	4.2	-0.3	0.42
	BL	0.43	0.97	0.11	-0.66	1.36	15.15	0.9	-5.85	0.59
	BM	0.23	0.94	0.09	0.35	0.82	16.62	0.83	3.52	0.59
	BH	0.16	0.96	0.17	0.42	0.49	14.64	1.41	3.63	0.52
June 1990 – May 1999	SL	-0.37	0.77	0.52	0.14	-0.84	6.37	2.79	0.66	0.33
	SM	-0.15	0.94	0.70	0.02	-0.27	6.05	2.91	0.09	0.29
	SH	-0.06	0.98	0.70	-0.21	-0.1	5.64	2.6	-0.68	0.24
	BL	-0.05	1.06	0.27	0.29	-0.1	7.22	1.21	1.11	0.44
	BM	0.20	1.23	0.29	0.06	0.35	7.87	1.2	0.2	0.46
	BH	-0.01	1.31	0.50	-0.03	-0.02	6.92	1.7	-0.1	0.37
June 1999 – May 2011	SL	0.47	0.86	0.60	-0.74	1.09	10.63	3.83	-5.25	0.58
	SM	0.74	0.75	0.48	-0.17	2.35	12.71	4.25	-1.61	0.58
	SH	0.50	0.72	0.39	-0.05	1.95	14.99	4.19	-0.54	0.65
	BL	0.65	0.82	-0.06	-1.05	1.89	12.59	-0.47	-9.31	0.74
	BM	0.24	0.86	0.03	0.34	0.95	18.01	0.36	4.1	0.75
	BH	0.29	0.88	0.07	0.45	1.13	18.16	0.75	5.3	0.75

Sweden – Sweden's average of intercept remains almost in the same place in both periods, since it is a non-Eurozone country it is not surprising. The three main factors' results are same with general results and do not get affected with the release of Euro.

As a controlling country, Sweden's average of intercepts move further than zero in the EMU period, suggesting that the possible integration is not all over European Union countries. Size factor's power seems to drop in 2000's for big stocks but it is still considerably powerful over small stocks. Unlike SMB, HML factor is more powerful in the second period, especially over growth and value stocks. Market is still the strongest factor in both periods.

Panel M1 : Switzerland										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.13	1.23	1.11	0.05	0.82	24.18	16.91	0.78	0.71
	SM	-0.03	1.06	0.99	0.53	-0.37	36.77	26.35	13.77	0.85
	SH	0.04	0.99	0.95	0.67	0.68	57.44	42.87	29.25	0.94
	BL	-0.03	0.95	0.00	-0.16	-0.64	58.57	-0.02	-7.55	0.96
	BM	0.11	1.14	-0.10	0.21	0.79	26.94	-1.91	3.65	0.85
	BH	0.06	1.19	0.16	1.22	0.39	23.65	2.41	18.06	0.84
June 1990 – May 1999	SL	0.07	1.08	0.93	0.12	0.27	16.25	9.98	1.09	0.71
	SM	0.03	0.97	0.89	0.55	0.23	29.62	19.54	9.79	0.91
	SH	-0.05	1.03	0.98	0.59	-0.73	51.2	34.8	16.96	0.97
	BL	-0.11	0.96	0.00	-0.28	-1.2	37.67	0.09	-6.26	0.95
	BM	0.14	1.10	-0.16	0.28	0.73	20.74	-2.14	3.06	0.89
	BH	0.01	1.01	-0.04	1.26	0.04	16.82	-0.53	12.11	0.89
June 1999 – May 2011	SL	0.08	1.39	1.28	0.11	0.36	17.57	13.46	1.17	0.72
	SM	-0.15	1.18	1.10	0.58	-1.05	24.4	18.82	10.66	0.81
	SH	0.10	0.96	0.93	0.69	1.22	33.57	27.05	21.3	0.89
	BL	-0.01	0.97	0.01	-0.12	-0.11	46.43	0.4	-4.9	0.97
	BM	0.07	1.16	-0.06	0.20	0.33	16.75	-0.76	2.49	0.81
	BH	-0.02	1.40	0.36	1.30	-0.1	17.18	3.7	14.09	0.82
Panel M2 : Switzerland										
		a	b	s	h	t(a)	t(b)	t(s)	t(h)	R ²
June 1990 - May 2011	SL	0.51	0.58	0.55	0.06	2.14	12.33	6.06	0.69	0.37
	SM	0.44	0.50	0.48	0.02	2.5	14.23	7.14	0.32	0.45
	SH	0.47	0.40	0.45	0.18	2.63	11.48	6.69	2.84	0.34
	BL	0.36	0.47	-0.04	0.04	1.91	12.7	-0.63	0.53	0.47
	BM	0.54	0.73	-0.02	0.25	2.3	15.66	-0.21	2.91	0.56
	BH	0.63	0.83	0.08	0.41	2.2	14.56	0.76	3.95	0.51
June 1990 – May 1999	SL	0.17	0.73	0.66	0.13	0.55	9.45	5.06	0.85	0.49
	SM	0.19	0.68	0.53	-0.14	0.71	10.55	4.88	-1.03	0.52
	SH	0.09	0.72	0.64	-0.07	0.33	11.35	5.99	-0.57	0.56
	BL	0.63	0.68	0.08	-0.29	2.02	9.16	0.67	-1.89	0.48
	BM	0.93	0.89	-0.03	-0.09	2.24	8.92	-0.19	-0.44	0.50
	BH	0.60	0.95	0.02	-0.01	1.28	8.38	0.11	-0.03	0.47
June 1999 – May 2011	SL	0.78	0.50	0.46	-0.05	2.28	7.75	3.76	-0.41	0.32
	SM	0.65	0.43	0.45	-0.01	2.82	9.85	5.41	-0.15	0.43
	SH	0.80	0.27	0.34	0.12	3.75	6.75	4.41	1.74	0.24
	BL	0.20	0.40	-0.09	0.06	0.9	9.64	-1.15	0.84	0.50
	BM	0.26	0.69	0.02	0.30	0.99	13.9	0.25	3.46	0.64

BH	0.67	0.82	0.15	0.51	1.87	12.27	1.16	4.36	0.56
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Switzerland – Switzerland's results are same as Denmark for the country model as another non-Eurozone European Union country. The power of the test does not change between two decades and the factors give expected results.

In the Eurozone model, the average of intercepts fall further than zero in the second period but interestingly the test has better performance on small stocks in the first period and on big stocks in the second period. Eurozone market factor loses its power over time for Switzerland, suggesting Switzerland stock market is diverging from Eurozone markets. Size has still some influence over small stocks in full period and HML has some little power in some portfolios.

VI. Conclusion

In this thesis, we wanted to test the Fama-French three factor model's power to explain the expected returns over European stock markets in order to understand if this test is practical in daily use while giving financial decisions in European markets. As a second part of thesis, Fama-French test is used to look for some evidence of integration in the Eurozone countries after monetary integration.

The Fama – French three factor model can be accepted as a fairly good model over European countries looking at country specific model results. 11 countries out of 13 have average of intercepts less than 0.15 where more than half of them are below 0.10. Only in Greece and Ireland the test fails to be successful.

Looking at the Eurozone model, we cannot reject the hypothesis of conversion within the Eurozone countries after monetary integration, since the test results get better in EMU period for 7 countries out of 10 Eurozone countries. Besides, we cannot argue that it might be some general integration over European Union countries that does not originate from single currency as 2 out 3 controlling countries get worse results in the EMU period using Eurozone factor, suggesting they were getting apart from Eurozone Market movements.

Still we are aware that intercepts in our country models were not that satisfying, as a further research the model can be improved to get better results in European stock markets in several ways: Either adding a fourth factor like momentum for instance or adjusting the break points while forming the 3 BE/ME portfolios. Moreover the reasons behind the outlying countries like Greece, Ireland and Denmark can be investigated.

VII. References

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VIII. Appendix

Table A.1: Detailed Summary Statistics for Austria

Years	Number of Stocks in Portfolios						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1991-1992	2	10	6	9	4	5	36
1992-1993	5	10	6	8	7	6	42
1993-1994	5	11	9	10	9	6	50
1994-1995	5	10	9	9	10	5	48
1995-1996	4	6	10	8	9	2	39
1996-1997	5	9	7	8	8	6	43
1997-1998	6	12	11	11	12	6	58
1998-1999	4	8	13	11	12	2	50
1999-2000	3	8	7	7	7	3	36
2000-2001	5	4	9	6	10	2	37
2001-2002	5	8	8	7	10	4	42
2002-2003	7	6	8	5	11	4	43
2003-2004	8	6	9	5	13	4	48
2004-2005	4	8	10	9	10	3	46
2005-2006	9	5	11	7	14	3	50
2006-2007	7	8	10	7	12	5	50
2007-2008	8	7	11	8	15	4	54
2008-2009	9	12	6	7	10	10	54
2009-2010	6	10	9	9	12	5	51
2010-2011	8	11	8	8	10	8	53

Years	Mean ME of Portfolios (in millions of €)						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1991-1992	23.82	36.94	26.17	262.28	190.00	221.94	133.45
1992-1993	41.71	52.09	16.55	559.79	952.45	319.97	330.81
1993-1994	70.60	58.69	17.44	492.87	454.05	245.13	232.83
1994-1995	23.92	45.70	67.22	743.87	512.29	256.09	297.50
1995-1996	54.92	51.99	41.55	306.37	362.91	239.31	183.15
1996-1997	61.83	81.39	68.38	946.32	474.30	466.31	364.72
1997-1998	68.03	43.97	37.64	588.44	494.15	225.41	260.43
1998-1999	29.42	64.20	40.99	721.59	517.03	179.20	313.29
1999-2000	143.49	61.18	72.50	1089.33	722.61	605.45	445.92
2000-2001	40.94	98.11	97.11	865.38	1156.53	863.96	543.04
2001-2002	93.59	57.16	68.06	765.39	882.19	412.11	411.85
2002-2003	47.01	95.57	57.05	775.55	1030.55	653.30	460.41
2003-2004	91.16	53.70	62.13	975.18	784.26	686.37	413.37
2004-2005	45.98	48.60	54.00	1117.27	666.59	587.22	429.97
2005-2006	30.10	26.65	27.28	1085.79	686.32	435.88	385.14
2006-2007	50.21	117.02	98.29	2105.54	1616.43	696.53	804.56
2007-2008	127.67	56.32	55.46	2546.45	2293.49	559.79	1102.56
2008-2009	434.17	180.13	50.63	3775.37	3213.94	3099.13	1776.50
2009-2010	231.92	288.48	281.61	4554.82	4730.21	3330.14	2376.81
2010-2011	201.77	213.51	177.35	2968.50	3618.66	4897.72	1971.66

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	0.18	0.33	0.83	0.17	0.33	1.24	0.49
1992-1993	0.27	0.48	1.71	0.25	0.52	1.98	0.81
1993-1994	0.32	0.56	3.31	0.24	0.59	0.90	1.01
1994-1995	0.30	0.61	1.45	0.26	0.69	0.99	0.73
1995-1996	0.21	0.42	1.42	0.20	0.49	0.90	0.65
1996-1997	0.26	0.55	1.31	0.27	0.61	0.85	0.64
1997-1998	0.33	0.80	1.61	0.35	0.73	1.10	0.84
1998-1999	0.31	0.81	2.31	0.41	0.83	1.76	1.11
1999-2000	0.29	0.71	2.14	0.33	0.71	0.98	0.87
2000-2001	0.41	0.83	2.22	0.32	0.80	1.44	1.03
2001-2002	0.42	0.93	3.83	0.42	0.80	1.39	1.35
2002-2003	0.41	0.82	3.18	0.35	0.86	1.68	1.15
2003-2004	0.40	0.99	4.02	0.52	0.94	1.58	1.30
2004-2005	0.45	1.22	3.48	0.67	1.08	2.08	1.45
2005-2006	0.40	0.82	2.47	0.46	0.86	1.48	1.02
2006-2007	0.30	0.73	2.12	0.35	0.68	1.30	0.92
2007-2008	0.29	0.67	1.92	0.28	0.66	1.45	0.85
2008-2009	0.28	0.46	1.51	0.24	0.45	0.89	0.60
2009-2010	0.30	0.59	1.16	0.31	0.59	1.11	0.66
2010-2011	0.58	1.10	3.64	0.45	1.14	3.35	1.65

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	-1.60	-0.39	-1.81	-4.24	-4.17	-2.73	-1.53	-1.15	-2.27
1992-1993	-3.09	-1.72	-4.40	-3.21	-7.18	-1.42	-2.00	-2.09	-2.01
1993-1994	0.59	2.14	1.55	3.42	2.48	-0.09	2.50	3.25	1.39
1994-1995	-0.29	-0.18	-0.72	-0.56	-1.36	-1.16	0.27	-0.88	-0.63
1995-1996	-1.05	-0.51	-0.18	-0.14	-1.19	0.42	0.79	0.42	0.49
1996-1997	-0.74	1.07	-1.01	0.12	0.17	-0.62	1.79	0.34	0.34
1997-1998	-0.01	2.08	0.46	2.28	4.33	2.40	2.00	2.70	2.30
1998-1999	1.51	0.10	0.38	0.90	-1.12	-2.59	-0.87	-0.90	-1.70
1999-2000	2.41	-0.46	2.91	0.82	1.81	-0.76	-0.36	-0.58	-0.39
2000-2001	0.91	-0.22	-1.59	0.30	0.30	0.23	-1.83	-2.11	-0.99
2001-2002	0.47	1.63	0.41	-0.04	1.02	-1.94	1.24	0.69	0.24
2002-2003	0.01	2.92	-3.10	0.56	1.51	-1.25	0.22	-0.03	-0.10
2003-2004	1.13	-0.52	4.12	3.68	3.60	2.70	3.16	2.18	2.93
2004-2005	0.36	-0.42	3.48	4.28	2.33	2.30	4.08	2.62	2.95
2005-2006	-2.44	1.83	0.52	0.54	1.88	2.89	2.18	5.18	2.53
2006-2007	1.41	-0.34	3.96	4.01	2.75	1.71	2.53	2.25	2.28
2007-2008	-1.78	-3.71	-1.72	-4.73	-4.72	-0.11	-1.18	-4.54	-0.91
2008-2009	-0.54	0.04	-3.27	-4.57	-4.13	-3.94	-3.38	-3.01	-3.49
2009-2010	0.52	1.04	3.02	1.85	2.71	0.75	2.16	3.13	1.80
2010-2011	2.16	-2.33	5.88	5.08	0.15	0.67	2.22	1.74	0.62

Table A.2: Detailed Summary Statistics for Belgium

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	13	13	11	9	16	11	73
1991-1992	11	17	11	12	13	12	77
1992-1993	11	14	12	12	16	8	75
1993-1994	8	14	14	13	15	7	72
1994-1995	11	12	11	10	14	9	67
1995-1996	14	10	12	7	19	9	71
1996-1997	10	10	12	8	16	6	62
1997-1998	10	8	15	11	17	5	66
1998-1999	9	15	13	13	14	9	73
1999-2000	6	16	17	17	15	6	78
2000-2001	5	19	18	20	14	7	83
2001-2002	10	19	16	17	16	11	93
2002-2003	12	15	15	13	18	10	85
2003-2004	12	17	14	14	18	10	86
2004-2005	14	15	20	15	22	10	99
2005-2006	8	20	14	17	15	11	87
2006-2007	12	20	15	16	18	13	96
2007-2008	10	20	17	18	18	11	94
2008-2009	14	22	16	17	19	15	103
2009-2010	14	24	15	17	20	15	105
2010-2011	14	20	15	15	20	14	98

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	12.31	25.53	13.49	193.22	400.50	401.01	180.80
1991-1992	35.19	33.93	72.21	366.88	640.27	583.85	279.33
1992-1993	25.48	26.08	26.72	327.62	727.69	344.41	257.83
1993-1994	27.49	28.40	31.30	872.16	604.73	221.47	320.04
1994-1995	31.96	19.81	19.42	824.94	593.50	216.96	288.27
1995-1996	35.74	42.05	33.47	249.40	1198.45	507.58	428.27
1996-1997	68.31	39.58	56.89	575.90	1222.85	783.63	494.13
1997-1998	28.57	42.85	32.25	1061.30	986.68	1311.04	547.20
1998-1999	23.73	41.41	41.78	802.18	1207.64	1164.32	536.88
1999-2000	48.66	69.80	76.49	597.68	2602.92	1367.05	771.27
2000-2001	51.65	62.31	51.16	3035.69	4416.23	1521.16	1633.16
2001-2002	104.19	66.27	54.90	3766.60	3802.23	382.97	1472.96
2002-2003	113.62	64.46	40.75	6816.81	2068.14	1220.61	1682.47
2003-2004	66.57	82.31	65.91	6075.39	3059.06	1216.06	1807.04
2004-2005	54.19	42.20	101.97	2727.71	2450.24	1297.27	1124.27
2005-2006	98.09	75.86	66.61	2100.95	4447.12	1298.05	1379.01
2006-2007	100.10	68.98	91.54	3062.67	5878.33	1307.14	1832.15
2007-2008	22.86	83.38	76.95	1668.62	5627.89	2011.13	1666.64
2008-2009	55.42	118.84	108.60	3772.03	5431.02	4766.92	2368.41
2009-2010	102.66	117.12	156.09	4032.21	2837.50	7137.10	2275.65
2010-2011	80.28	98.56	68.49	3329.68	977.00	2061.12	1045.54

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.31	0.61	1.22	0.26	0.64	1.21	0.70
1991-1992	0.35	0.73	1.65	0.35	0.83	1.42	0.86
1992-1993	0.41	0.96	1.54	0.34	0.89	4.26	1.18
1993-1994	0.44	1.04	1.89	0.50	0.98	4.12	1.31
1994-1995	0.36	0.71	1.23	0.42	0.69	3.82	1.11
1995-1996	0.37	0.77	1.49	0.35	0.69	3.71	1.12
1996-1997	0.41	0.70	2.93	0.36	0.72	1.11	1.09
1997-1998	0.43	0.71	8.26	0.34	0.70	3.33	2.52
1998-1999	0.27	0.52	1.32	0.22	0.53	2.02	0.76
1999-2000	0.17	0.43	0.92	0.13	0.43	1.04	0.49
2000-2001	0.14	0.53	1.15	0.16	0.44	2.08	0.67
2001-2002	0.29	0.72	1.47	0.30	0.64	1.93	0.80
2002-2003	0.36	0.79	1.30	0.38	0.83	1.91	0.86
2003-2004	0.38	0.86	1.81	0.41	0.96	1.79	0.94
2004-2005	0.38	0.77	1.51	0.37	0.79	1.16	0.81
2005-2006	0.34	0.66	1.09	0.29	0.64	1.15	0.66
2006-2007	0.32	0.64	1.01	0.32	0.62	1.30	0.67
2007-2008	0.23	0.57	1.17	0.25	0.58	1.39	0.68
2008-2009	0.33	0.60	1.07	0.25	0.61	1.36	0.69
2009-2010	0.56	1.06	2.27	0.47	1.12	2.45	1.28
2010-2011	0.45	0.87	1.48	0.31	0.89	1.82	0.96

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.22	1.78	-2.56	-1.25	-0.34	-1.73	-1.39	-0.38	-1.11
1991-1992	-1.54	-0.52	-0.30	-1.66	-2.22	-0.03	-0.39	0.86	-0.10
1992-1993	-0.80	2.10	-1.59	-0.44	-0.65	-1.98	0.44	1.27	0.00
1993-1994	1.40	0.26	2.73	2.67	2.27	0.55	1.39	1.53	1.04
1994-1995	-0.56	-0.26	-0.81	-0.02	-0.51	0.45	0.26	-0.38	0.25
1995-1996	-0.46	-1.05	1.38	1.54	0.61	2.49	1.27	1.15	1.34
1996-1997	-0.27	0.85	1.79	3.36	2.24	2.41	2.13	3.67	2.43
1997-1998	0.56	-0.09	4.37	2.76	3.75	2.75	3.27	3.18	3.09
1998-1999	-0.11	-1.83	2.13	-1.64	-1.28	0.28	-0.76	0.04	-0.29
1999-2000	-0.47	2.61	-0.10	-2.51	0.12	-2.55	-0.97	2.45	-1.04
2000-2001	-1.60	3.04	-3.91	-1.92	-1.11	-2.36	-0.70	0.92	-1.24
2001-2002	-0.70	0.13	-0.62	-0.08	-0.88	0.21	-0.44	0.73	-0.02
2002-2003	0.86	1.12	-1.51	-1.90	0.14	-2.34	-1.74	-1.76	-2.06
2003-2004	0.34	1.47	1.45	1.85	4.16	2.01	2.20	2.23	2.10
2004-2005	-1.03	1.25	0.67	1.54	1.89	1.77	2.39	3.04	2.21
2005-2006	0.82	0.84	2.08	2.11	2.37	0.41	1.89	1.80	1.39
2006-2007	-0.46	-0.53	1.08	1.95	1.23	2.39	2.05	1.18	2.03
2007-2008	1.24	0.05	-0.64	-0.35	-1.00	-1.79	-2.60	-1.33	-2.24
2008-2009	0.87	-0.56	-0.69	-2.83	-1.27	-0.82	-5.21	-1.37	-2.70
2009-2010	-0.65	0.80	1.33	1.38	2.56	2.80	1.25	3.16	2.46
2010-2011	0.30	0.08	0.36	1.33	1.69	1.03	1.61	-0.15	0.53

Table A.3: Detailed Summary Statistics for Denmark

Years	Number of Stocks in Portfolios						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1990-1991	12	24	30	27	29	9	131
1991-1992	10	24	21	24	20	10	109
1992-1993	16	32	24	27	26	19	144
1993-1994	18	34	31	32	32	19	167
1994-1995	14	28	26	26	27	14	136
1995-1996	19	35	36	36	40	15	182
1996-1997	14	31	24	27	25	16	138
1997-1998	16	43	33	39	33	20	185
1998-1999	15	38	30	34	29	19	165
1999-2000	12	40	35	40	31	16	174
2000-2001	16	42	40	43	36	19	196
2001-2002	8	33	29	34	23	13	140
2002-2003	8	29	26	30	20	13	127
2003-2004	14	30	24	27	25	17	138
2004-2005	15	36	31	35	28	20	168
2005-2006	21	30	38	33	40	15	177
2006-2007	12	28	32	31	28	12	144
2007-2008	20	28	37	31	39	15	171
2008-2009	16	43	28	36	25	25	174
2009-2010	15	32	27	29	28	17	149
2010-2011	18	28	33	29	35	14	159

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	14.06	9.86	8.40	158.88	176.06	274.82	95.62
1991-1992	32.53	15.98	19.46	400.01	246.03	308.44	171.77
1992-1993	15.84	14.36	10.68	291.84	223.63	264.83	136.77
1993-1994	17.57	14.29	16.64	270.18	258.12	295.58	142.78
1994-1995	22.57	15.39	11.59	371.43	212.08	146.93	135.95
1995-1996	16.84	11.92	14.14	371.09	214.01	338.95	155.23
1996-1997	23.06	26.95	26.95	432.20	382.27	414.35	214.94
1997-1998	21.83	21.25	21.05	355.39	439.14	250.25	190.90
1998-1999	27.32	30.02	25.52	553.19	639.92	277.08	272.40
1999-2000	31.10	35.87	37.25	812.62	720.93	252.86	356.39
2000-2001	23.65	25.22	27.40	912.96	587.32	332.79	353.36
2001-2002	56.97	25.42	27.98	1556.20	462.42	209.78	488.43
2002-2003	54.59	43.12	35.41	2360.69	607.61	366.79	711.42
2003-2004	41.09	29.14	30.60	2192.38	712.58	662.90	655.80
2004-2005	31.82	28.64	28.78	1491.88	505.22	294.51	444.46
2005-2006	44.29	30.95	28.60	1482.96	1191.76	313.83	589.05
2006-2007	33.83	46.42	32.09	1179.40	2270.56	613.01	765.58
2007-2008	32.81	59.75	37.95	1799.28	1954.94	1548.27	929.78
2008-2009	77.23	81.57	55.47	2347.23	2203.76	1453.29	1047.28
2009-2010	54.63	46.12	99.61	2951.81	1836.78	1879.35	1167.66
2010-2011	27.38	38.87	23.82	2450.77	895.93	574.17	709.80

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.42	0.76	3.38	0.41	0.78	1.43	1.31
1991-1992	0.56	0.94	3.63	0.48	0.90	1.56	1.37
1992-1993	0.41	0.84	1.57	0.45	0.80	1.45	0.91
1993-1994	0.53	1.00	2.08	0.49	1.04	1.81	1.03
1994-1995	0.43	0.86	1.78	0.40	0.87	1.37	0.88
1995-1996	0.49	0.82	1.68	0.43	0.82	1.27	0.87
1996-1997	0.41	0.85	1.47	0.36	0.79	1.32	0.79
1997-1998	0.37	0.72	1.37	0.31	0.70	1.17	0.75
1998-1999	0.32	0.63	1.12	0.27	0.60	1.09	0.66
1999-2000	0.38	0.86	1.60	0.29	0.83	1.45	0.89
2000-2001	0.41	0.87	1.53	0.32	0.84	1.49	0.90
2001-2002	0.32	0.85	1.61	0.28	0.80	1.46	0.89
2002-2003	0.43	1.03	1.81	0.38	0.97	1.67	1.04
2003-2004	0.58	1.03	1.62	0.54	1.00	1.68	1.06
2004-2005	0.36	0.79	1.27	0.43	0.76	1.23	0.79
2005-2006	0.36	0.71	1.16	0.34	0.66	1.15	0.72
2006-2007	0.25	0.57	0.86	0.27	0.54	0.89	0.56
2007-2008	0.22	0.48	0.95	0.18	0.47	0.99	0.54
2008-2009	0.27	0.57	0.98	0.26	0.51	0.88	0.58
2009-2010	0.47	1.19	2.71	0.39	1.22	2.51	1.38
2010-2011	0.38	0.92	1.83	0.37	0.88	1.62	0.98

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.06	0.64	-1.35	-1.45	-0.17	-0.87	-1.16	-0.76	-0.98
1991-1992	1.89	-0.71	0.90	0.50	0.11	-0.95	-1.61	-1.58	-1.16
1992-1993	0.40	1.24	-2.27	-1.52	-0.86	-1.41	-4.10	-0.33	-1.84
1993-1994	1.32	0.27	1.73	2.29	2.42	0.72	1.20	0.57	0.90
1994-1995	0.27	0.70	-0.06	0.51	1.14	-0.25	1.10	-0.05	0.24
1995-1996	0.50	0.12	0.12	-0.12	1.47	0.87	-0.66	-0.25	0.25
1996-1997	-0.64	0.86	1.10	2.16	2.54	2.76	1.90	3.05	2.52
1997-1998	-1.79	0.41	-1.06	0.54	0.35	1.72	2.35	1.13	1.81
1998-1999	-0.38	0.70	-1.62	-2.19	-1.19	-2.02	-0.80	-1.06	-1.38
1999-2000	-1.80	0.41	-1.67	1.04	0.20	2.34	1.34	1.29	1.94
2000-2001	0.08	1.29	1.96	1.88	1.36	-0.15	2.07	3.04	0.76
2001-2002	0.97	2.27	-1.77	-0.46	1.15	-1.62	-2.39	0.01	-1.65
2002-2003	0.34	2.42	-3.10	0.38	1.45	-1.09	-0.39	-0.80	-0.96
2003-2004	1.23	-0.24	3.29	3.36	2.48	1.73	1.64	2.06	1.80
2004-2005	0.37	0.61	1.49	2.57	3.25	2.05	2.63	1.51	2.13
2005-2006	3.01	0.67	3.48	3.89	5.33	1.65	0.88	1.15	1.36
2006-2007	-0.93	0.16	1.73	0.91	1.55	2.15	2.19	2.64	2.18
2007-2008	-1.40	0.92	-3.51	-3.27	-1.03	-0.53	-1.89	-1.17	-1.31
2008-2009	-2.91	0.56	-7.15	-4.55	-5.24	-1.90	-3.63	-2.68	-2.62
2009-2010	-2.77	-0.57	1.30	-1.38	-0.63	1.96	2.90	2.74	2.24
2010-2011	-1.27	-0.66	-1.07	0.17	-0.97	1.07	1.23	-0.36	0.68

Table A.4: Detailed Summary Statistics for Finland

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	3	10	8	9	7	4	41
1991-1992	5	9	4	5	6	6	35
1992-1993	4	11	9	10	9	5	48
1993-1994	5	10	10	10	11	4	50
1994-1995	6	11	5	7	6	8	43
1995-1996	7	9	9	8	11	6	51
1996-1997	9	10	7	6	12	8	53
1997-1998	6	15	10	13	10	8	62
1998-1999	11	14	12	11	16	10	75
1999-2000	5	18	12	16	11	9	71
2000-2001	10	17	10	12	12	12	73
2001-2002	12	17	13	13	17	12	84
2002-2003	9	16	13	15	15	10	78
2003-2004	11	14	15	13	18	9	80
2004-2005	14	20	12	13	18	15	94
2005-2006	12	18	16	16	21	11	95
2006-2007	12	18	15	15	19	12	91
2007-2008	9	21	19	20	19	10	99
2008-2009	12	23	18	19	18	13	103
2009-2010	12	21	15	16	16	15	95
2010-2011	9	19	17	18	17	10	90

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	87.62	77.15	16.86	359.96	399.13	579.43	232.21
1991-1992	85.99	32.93	23.93	438.90	256.69	555.89	225.49
1992-1993	25.00	24.62	66.33	230.62	212.87	380.38	147.74
1993-1994	19.28	18.60	50.05	258.58	145.38	207.19	115.93
1994-1995	44.49	31.64	27.38	237.95	173.12	318.84	139.70
1995-1996	45.65	37.81	58.82	525.88	470.60	559.45	273.13
1996-1997	195.39	73.18	46.34	1602.68	509.67	658.97	449.45
1997-1998	45.08	39.91	21.23	755.08	644.45	531.44	348.28
1998-1999	46.53	45.22	21.27	1177.66	390.56	631.12	358.93
1999-2000	51.28	89.09	83.36	1145.99	1101.02	758.83	565.31
2000-2001	50.83	149.09	96.21	5235.66	1231.25	867.26	1260.48
2001-2002	77.65	63.29	27.47	20726.80	1374.50	794.21	3627.50
2002-2003	57.16	110.62	51.05	15598.38	1807.62	616.32	3464.12
2003-2004	81.27	42.65	53.44	11101.42	1748.69	921.09	2329.72
2004-2005	46.93	36.86	29.46	5912.31	671.67	1842.71	1259.12
2005-2006	56.02	35.22	41.67	4587.35	1042.42	2092.99	1266.22
2006-2007	89.60	55.50	49.82	4300.23	1553.09	2136.87	1345.89
2007-2008	116.21	70.65	87.99	4414.17	2054.15	2319.54	1562.99
2008-2009	113.93	106.14	154.52	5762.15	1783.55	3397.61	1867.41
2009-2010	156.60	111.55	124.76	9682.59	3180.60	1582.13	2480.38
2010-2011	67.77	54.02	55.97	3059.15	1894.53	1329.13	1146.12

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.19	0.51	2.35	0.13	0.55	1.36	0.85
1991-1992	0.33	1.10	2.15	0.31	0.88	2.25	1.16
1992-1993	0.51	1.15	4.46	0.24	0.96	2.62	1.64
1993-1994	0.37	1.02	3.53	0.14	0.90	3.07	1.42
1994-1995	0.28	0.55	2.14	0.20	0.57	0.91	0.71
1995-1996	0.34	0.58	1.51	0.17	0.66	1.11	0.67
1996-1997	0.41	0.85	1.80	0.26	0.82	1.46	0.43
1997-1998	0.29	0.57	1.49	0.25	0.59	1.14	0.70
1998-1999	0.33	0.60	1.15	0.25	0.58	1.11	0.46
1999-2000	0.24	0.68	1.63	0.20	0.62	1.32	0.77
2000-2001	0.16	0.52	1.30	0.09	0.51	1.03	0.59
2001-2002	0.19	0.58	1.39	0.12	0.60	1.41	0.70
2002-2003	0.30	0.66	1.24	0.29	0.72	1.24	0.73
2003-2004	0.45	0.73	1.64	0.41	0.82	1.44	0.91
2004-2005	0.28	0.55	1.17	0.29	0.55	1.05	0.60
2005-2006	0.26	0.56	0.99	0.25	0.56	1.02	0.59
2006-2007	0.22	0.46	0.81	0.24	0.47	0.87	0.50
2007-2008	0.21	0.41	0.87	0.21	0.45	0.75	0.47
2008-2009	0.26	0.48	1.09	0.21	0.48	0.90	0.56
2009-2010	0.41	0.96	1.97	0.39	1.01	1.90	1.11
2010-2011	0.31	0.66	1.17	0.29	0.63	1.22	0.70

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.11	0.31	-4.28	-2.35	-2.88	-2.84	-2.74	-3.61	-2.97
1991-1992	2.10	-1.06	-2.42	-1.56	-3.35	-5.46	-1.55	-6.63	-4.77
1992-1993	-0.32	-0.63	3.89	1.59	2.51	2.47	3.87	2.59	2.88
1993-1994	0.33	-1.02	2.27	3.06	3.80	4.64	2.43	1.07	3.41
1994-1995	-0.95	-1.49	-0.47	-2.20	0.83	3.31	-1.35	-0.96	0.49
1995-1996	0.71	-0.68	0.88	1.81	0.15	0.08	1.15	-0.54	0.34
1996-1997	-0.87	-0.38	1.24	3.92	2.29	4.58	2.72	2.77	3.54
1997-1998	-1.75	-2.12	1.39	3.56	1.27	6.28	3.02	2.17	4.38
1998-1999	-2.10	-2.50	-1.03	-1.57	-0.15	5.22	-1.02	-0.67	2.49
1999-2000	-1.67	-3.67	1.49	1.75	3.59	10.02	1.25	0.58	7.60
2000-2001	1.01	1.79	-2.02	0.23	0.87	-1.95	-0.72	-1.27	-1.81
2001-2002	-0.10	5.44	-2.88	0.27	0.55	-5.14	1.05	2.31	-4.43
2002-2003	0.00	-2.84	-0.21	-1.62	-2.23	1.22	-2.85	-2.44	0.45
2003-2004	2.32	2.64	4.47	2.45	4.54	-1.48	2.23	3.75	-0.15
2004-2005	-0.57	-0.71	2.47	1.53	1.48	2.43	2.74	2.00	2.35
2005-2006	-0.11	-0.06	1.58	2.61	1.88	1.79	3.24	1.37	2.06
2006-2007	-0.09	0.91	2.05	1.46	3.44	1.91	2.97	2.33	2.26
2007-2008	-0.39	-0.58	-3.37	-1.49	-1.96	-1.17	-0.76	-3.74	-1.45
2008-2009	-0.36	0.68	-3.49	-2.28	-2.51	-2.45	-2.67	-2.07	-2.42
2009-2010	0.58	2.08	2.59	2.61	2.53	-0.36	2.50	3.85	0.81
2010-2011	0.51	-0.29	3.63	0.72	0.14	-1.14	2.35	1.76	0.33

Table A.5: Detailed Summary Statistics for France

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	39	60	71	64	77	31	344
1991-1992	44	71	68	66	75	42	371
1992-1993	38	63	75	67	77	31	354
1993-1994	42	74	84	78	84	38	406
1994-1995	33	72	84	80	79	31	385
1995-1996	49	82	86	81	90	46	440
1996-1997	41	84	86	87	82	41	426
1997-1998	58	88	95	86	105	50	486
1998-1999	73	81	96	77	115	57	503
1999-2000	71	90	93	83	112	59	513
2000-2001	61	106	102	100	110	59	544
2001-2002	76	121	109	108	121	77	620
2002-2003	71	104	96	91	114	66	551
2003-2004	67	85	104	88	115	53	534
2004-2005	68	94	95	86	111	59	529
2005-2006	70	85	104	85	122	51	537
2006-2007	76	93	90	79	113	68	536
2007-2008	86	99	99	84	129	71	581
2008-2009	86	103	89	80	121	78	567
2009-2010	65	100	104	96	110	62	546
2010-2011	69	87	103	89	119	51	529

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	19.23	13.49	12.11	636.90	812.85	930.92	393.00
1991-1992	56.99	57.17	53.25	1180.86	1219.59	1363.91	640.54
1992-1993	53.60	57.31	60.48	1158.05	895.80	617.49	498.90
1993-1994	62.41	45.49	43.59	1266.79	1169.58	620.01	568.92
1994-1995	47.18	61.40	41.23	1054.18	1605.95	651.68	627.86
1995-1996	46.01	48.31	46.36	1165.29	1870.12	1034.22	739.33
1996-1997	59.25	63.87	49.80	1562.98	1663.71	959.43	765.44
1997-1998	26.31	46.61	33.65	1419.09	1546.91	917.12	700.38
1998-1999	20.18	27.49	26.67	1562.90	1881.42	524.41	742.12
1999-2000	17.38	23.51	26.47	2356.53	2149.23	940.11	970.03
2000-2001	23.86	27.38	33.63	3074.48	2879.08	904.82	1259.88
2001-2002	26.53	28.66	28.90	4450.16	5294.46	2036.49	2076.23
2002-2003	34.13	76.85	48.50	7003.16	5920.51	1455.68	2585.45
2003-2004	27.02	30.22	35.01	6102.19	3865.18	1384.70	2092.91
2004-2005	21.04	22.65	21.31	5154.49	2345.91	1050.30	1460.89
2005-2006	20.19	25.57	21.98	4630.02	3257.44	1492.50	1627.61
2006-2007	20.51	32.00	30.23	3273.44	5099.01	3064.49	1962.20
2007-2008	26.04	32.72	38.70	5478.97	5980.68	2040.04	2399.75
2008-2009	38.21	48.46	56.65	7658.18	5727.41	5188.01	3053.17
2009-2010	47.38	57.04	82.73	8247.47	5457.39	4666.60	3128.62
2010-2011	28.64	25.16	29.06	5165.48	3319.45	1538.58	1782.41

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.26	0.58	1.16	0.27	0.52	1.14	0.64
1991-1992	0.37	0.84	3.79	0.38	0.83	1.55	1.22
1992-1993	0.42	0.89	4.01	0.43	0.84	1.63	1.40
1993-1994	0.43	0.95	3.22	0.43	0.91	1.90	1.12
1994-1995	0.35	0.69	2.17	0.32	0.69	1.47	0.86
1995-1996	0.40	0.76	2.34	0.35	0.74	1.31	0.87
1996-1997	0.42	0.88	2.73	0.38	0.83	1.60	1.14
1997-1998	0.26	0.73	2.40	0.28	0.69	1.35	0.96
1998-1999	0.22	0.59	1.49	0.25	0.58	1.28	0.72
1999-2000	0.21	0.54	1.51	0.21	0.53	1.22	0.64
2000-2001	0.15	0.43	1.39	0.12	0.44	1.04	0.46
2001-2002	0.15	0.46	1.39	0.14	0.44	1.03	0.58
2002-2003	0.23	0.60	1.53	0.24	0.58	1.20	0.60
2003-2004	0.35	0.80	1.89	0.38	0.80	1.49	0.79
2004-2005	0.26	0.65	1.52	0.30	0.64	1.17	0.69
2005-2006	0.22	0.55	1.44	0.25	0.56	1.04	0.62
2006-2007	0.19	0.51	1.20	0.22	0.48	1.05	0.54
2007-2008	0.19	0.46	1.31	0.23	0.47	1.07	0.57
2008-2009	0.22	0.51	1.23	0.23	0.51	1.13	0.58
2009-2010	0.42	1.09	2.99	0.45	1.04	2.38	1.25
2010-2011	0.32	0.82	1.93	0.38	0.83	1.54	0.89

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.49	0.60	-2.33	-1.64	-1.52	-1.32	-1.79	-0.93	-1.47
1991-1992	-0.74	1.06	-1.32	-0.63	0.47	0.10	0.20	0.43	0.19
1992-1993	0.06	-0.13	-0.68	-0.82	-0.75	-0.86	-0.50	-1.07	-0.73
1993-1994	1.36	1.39	1.55	2.55	3.01	0.47	0.76	1.80	0.76
1994-1995	-0.45	-0.23	-0.72	-1.18	-0.39	0.22	-0.60	-0.57	-0.31
1995-1996	-0.09	-1.31	0.79	0.25	0.20	1.78	-0.02	-0.25	0.57
1996-1997	-0.43	-0.50	0.71	0.78	0.81	1.47	1.74	0.38	1.45
1997-1998	-0.89	1.88	3.10	2.58	2.96	1.71	3.97	5.62	3.18
1998-1999	-2.68	0.86	-3.09	-1.87	-0.79	0.80	1.26	0.22	1.00
1999-2000	0.87	-4.08	6.67	2.94	1.63	4.40	2.94	1.29	3.52
2000-2001	0.44	0.82	0.97	0.56	0.93	-0.82	1.11	0.85	0.07
2001-2002	3.87	1.59	-3.06	7.79	0.31	-2.31	-1.77	-2.50	-2.04
2002-2003	0.48	0.33	-1.09	-1.04	-0.26	-1.33	-0.99	-1.50	-1.19
2003-2004	1.25	0.09	2.76	3.35	2.80	1.38	2.28	1.51	1.67
2004-2005	0.50	0.72	1.86	2.31	2.29	1.15	1.65	2.16	1.41
2005-2006	0.04	0.67	1.88	1.71	1.78	1.06	1.68	2.49	1.49
2006-2007	-0.74	0.44	1.19	1.24	1.17	1.50	1.91	2.39	1.90
2007-2008	-0.25	-1.13	-2.60	-2.94	-1.96	-0.79	-2.27	-3.68	-1.95
2008-2009	-0.57	0.24	-2.49	-3.11	-2.56	-2.58	-1.84	-2.03	-2.18
2009-2010	0.90	1.34	0.88	1.50	3.36	0.92	0.99	1.13	0.98
2010-2011	0.32	1.00	1.60	2.31	2.27	1.12	1.65	2.45	1.13

Table A.6: Detailed Summary Statistics for Germany

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	26	38	22	25	32	29	172
1991-1992	25	49	28	35	32	32	202
1992-1993	25	48	31	37	36	31	210
1993-1994	39	45	38	34	52	36	246
1994-1995	36	46	33	32	46	36	233
1995-1996	33	45	41	38	49	31	240
1996-1997	31	54	49	49	52	32	273
1997-1998	32	53	55	54	59	29	286
1998-1999	34	43	54	44	63	24	267
1999-2000	39	54	64	55	70	32	317
2000-2001	44	82	80	79	82	44	420
2001-2002	33	113	111	120	92	45	520
2002-2003	36	86	105	100	99	27	462
2003-2004	38	81	115	103	103	28	487
2004-2005	47	79	104	91	106	32	484
2005-2006	62	85	112	93	121	45	550
2006-2007	70	94	120	101	131	53	583
2007-2008	78	101	138	112	152	52	650
2008-2009	65	112	127	118	130	56	627
2009-2010	60	110	127	119	126	51	615
2010-2011	63	108	112	106	123	53	588

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	59.11	61.28	84.05	1651.68	1849.80	2006.50	955.75
1991-1992	74.59	79.65	119.63	1344.73	1113.32	4048.43	1095.86
1992-1993	90.70	74.47	130.53	1743.61	2124.25	2160.05	1037.53
1993-1994	81.82	75.49	92.18	1737.43	1530.08	2419.15	967.37
1994-1995	79.97	74.75	79.43	2330.50	1849.30	1816.86	1010.99
1995-1996	94.73	102.40	74.02	2599.33	2554.65	3240.37	1396.76
1996-1997	82.43	116.72	103.72	1702.75	2494.28	2931.25	1187.83
1997-1998	60.86	69.82	62.77	2303.58	2432.86	1702.50	1145.96
1998-1999	46.08	57.19	50.89	2740.96	4305.93	789.71	1570.36
1999-2000	20.66	66.00	45.20	2951.41	4580.19	3022.01	1851.94
2000-2001	54.43	47.35	67.92	1538.78	6574.80	1821.72	1794.63
2001-2002	90.35	72.06	86.48	2654.20	6012.17	6064.31	2241.80
2002-2003	77.25	82.96	80.32	5697.08	4112.78	2261.13	2286.84
2003-2004	33.08	28.89	36.48	4747.21	3873.66	1349.96	1917.60
2004-2005	13.03	15.90	8.64	2622.06	2445.46	767.07	1085.56
2005-2006	14.60	21.11	14.17	1805.71	4007.30	905.69	1269.75
2006-2007	15.03	18.85	13.64	1675.31	3577.15	1542.55	1242.12
2007-2008	24.53	19.71	21.55	1466.79	3959.71	2317.28	1375.07
2008-2009	25.22	27.33	27.57	3114.21	4310.52	2499.36	1716.76
2009-2010	27.85	31.57	41.36	4989.41	3858.02	2146.05	1951.81
2010-2011	16.98	19.05	22.60	2672.72	2487.56	2155.64	1206.65

Fama – French Three Factor Regression on European Stock Markets – Before and After EMU

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.20	0.38	0.59	0.16	0.38	0.71	0.40
1991-1992	0.21	0.44	0.87	0.18	0.42	0.83	0.48
1992-1993	0.22	0.45	0.81	0.19	0.46	0.87	0.49
1993-1994	0.23	0.55	1.11	0.22	0.54	1.01	0.60
1994-1995	0.17	0.40	0.76	0.19	0.39	0.68	0.38
1995-1996	0.21	0.44	0.76	0.21	0.45	0.82	0.46
1996-1997	0.21	0.48	0.94	0.21	0.48	0.89	0.51
1997-1998	0.22	0.51	1.18	0.23	0.50	0.95	0.59
1998-1999	0.19	0.46	2.12	0.18	0.43	0.84	0.72
1999-2000	0.16	0.44	3.51	0.14	0.40	0.84	0.99
2000-2001	0.10	0.34	1.87	0.09	0.32	0.85	0.58
2001-2002	0.19	0.47	1.90	0.16	0.46	1.39	0.75
2002-2003	0.28	0.78	2.90	0.28	0.70	1.99	1.12
2003-2004	0.42	1.20	15.98	0.46	1.10	2.45	4.31
2004-2005	0.31	0.82	10.68	0.35	0.75	4.42	2.90
2005-2006	0.25	0.71	11.05	0.29	0.66	3.40	2.52
2006-2007	0.23	0.56	7.72	0.25	0.56	2.88	2.10
2007-2008	0.22	0.52	6.34	0.22	0.51	2.85	1.77
2008-2009	0.23	0.56	5.44	0.24	0.54	1.14	1.41
2009-2010	0.38	1.00	5.77	0.40	0.93	2.40	1.79
2010-2011	0.26	0.79	7.33	0.33	0.76	1.78	1.68

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.02	-0.45	-1.06	-0.83	-1.13	-0.44	-1.35	-1.28	-1.08
1991-1992	-0.49	0.71	-0.81	-2.08	-1.28	-1.86	-0.86	0.02	-0.71
1992-1993	-0.42	-0.58	-1.57	-0.67	-2.22	-0.52	-1.64	-1.03	-1.14
1993-1994	0.32	1.86	0.94	1.49	3.09	0.87	1.22	2.46	1.59
1994-1995	-0.78	-0.26	-0.90	-1.35	-1.45	-0.50	-0.42	-0.45	-0.49
1995-1996	-0.89	1.05	-0.68	-0.51	-0.10	-0.56	1.00	0.97	0.49
1996-1997	-1.25	0.74	1.28	1.11	2.01	2.54	2.32	3.29	2.65
1997-1998	-1.28	-0.66	3.00	0.86	1.58	3.46	2.28	3.56	2.83
1998-1999	-0.40	0.04	-1.15	-1.98	-0.12	-0.48	-0.14	-1.43	-0.34
1999-2000	-1.40	-1.37	2.72	-0.06	0.89	3.45	1.76	2.53	2.36
2000-2001	-0.21	4.62	-4.55	-1.20	-0.46	-4.84	-1.03	0.30	-2.00
2001-2002	-3.02	2.25	-4.98	-5.21	-3.50	-2.98	-1.68	0.04	-2.09
2002-2003	0.18	1.81	-3.62	-2.36	-0.06	-2.51	-1.65	-2.44	-2.16
2003-2004	1.27	2.12	2.14	5.21	3.98	1.36	2.41	3.76	1.87
2004-2005	0.59	0.10	1.61	2.43	1.27	0.91	1.17	1.46	1.07
2005-2006	0.03	0.56	3.52	1.28	2.74	2.01	1.53	3.90	1.78
2006-2007	-1.76	2.05	0.23	1.01	1.67	1.53	2.46	4.18	2.41
2007-2008	-1.22	0.32	-3.17	-1.74	-2.26	-0.80	-1.63	-1.07	-1.39
2008-2009	-0.52	0.15	-3.39	-2.12	-2.53	-1.78	-2.36	-2.34	-2.14
2009-2010	1.08	1.95	1.05	2.01	3.37	-0.30	2.20	1.28	0.75
2010-2011	0.41	1.16	0.76	2.19	3.03	1.62	1.46	1.67	1.03

Table A.7: Detailed Summary Statistics for Greece

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1994-1995	5	17	18	19	15	6	80
1995-1996	9	20	22	21	22	8	102
1996-1997	12	21	19	19	20	12	103
1997-1998	15	25	36	32	33	11	153
1998-1999	9	34	42	42	33	10	175
1999-2000	15	36	52	47	46	10	209
2000-2001	39	39	38	30	54	31	232
2001-2002	24	55	49	52	48	27	257
2002-2003	29	50	43	44	47	30	249
2003-2004	23	51	44	47	44	26	240
2004-2005	22	40	40	39	42	21	206
2005-2006	10	39	43	45	35	12	185
2006-2007	11	39	46	46	39	11	195
2007-2008	17	42	44	45	40	18	210
2008-2009	17	30	43	37	42	11	181
2009-2010	10	32	37	38	31	11	161
2010-2011	7	29	27	31	21	11	126

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1994-1995	3.58	8.77	4.44	64.68	96.89	179.13	50.05
1995-1996	10.06	14.35	7.56	87.52	98.72	205.27	60.74
1996-1997	8.73	17.37	8.73	132.94	83.01	164.71	66.00
1997-1998	7.90	16.00	13.31	106.31	86.88	148.32	58.27
1998-1999	12.15	9.88	8.87	249.75	93.81	47.71	85.21
1999-2000	7.92	9.82	11.35	250.13	265.70	60.78	123.03
2000-2001	17.32	19.71	24.31	179.20	199.13	1027.44	217.38
2001-2002	126.77	148.12	157.06	1104.90	1213.15	599.59	589.68
2002-2003	59.01	39.13	57.54	584.56	894.42	345.52	339.95
2003-2004	33.89	35.99	48.24	492.65	936.05	269.13	318.32
2004-2005	36.28	20.60	23.11	579.61	415.37	131.84	220.60
2005-2006	36.72	24.34	38.69	1027.96	449.07	237.82	366.84
2006-2007	21.56	23.01	18.47	1279.88	277.36	516.99	397.17
2007-2008	19.33	17.94	18.01	1621.61	345.23	365.91	453.71
2008-2009	18.83	29.67	33.33	2354.50	684.98	561.55	689.01
2009-2010	46.78	40.18	59.08	2109.15	2177.35	656.77	986.82
2010-2011	26.51	22.38	18.68	1024.57	721.38	692.67	443.40

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1994-1995	0.26	0.55	1.30	0.23	0.48	1.10	0.65
1995-1996	0.33	0.60	1.38	0.27	0.55	1.10	0.71
1996-1997	0.21	0.64	1.26	0.28	0.56	1.04	0.67
1997-1998	0.36	0.75	1.64	0.35	0.74	1.16	0.85
1998-1999	0.32	0.71	1.47	0.27	0.65	1.23	0.75
1999-2000	0.16	0.40	1.28	0.14	0.41	1.21	0.57
2000-2001	0.05	0.11	0.25	0.04	0.11	0.26	0.13
2001-2002	0.18	0.40	0.85	0.16	0.37	0.77	0.45
2002-2003	0.22	0.51	1.07	0.20	0.50	1.11	0.57
2003-2004	0.39	0.80	2.20	0.30	0.79	1.77	1.00
2004-2005	0.35	0.64	1.55	0.27	0.64	1.24	0.77
2005-2006	0.34	0.88	2.46	0.34	0.81	1.61	1.11
2006-2007	0.33	0.85	2.16	0.32	0.83	1.55	1.03
2007-2008	0.29	0.69	1.60	0.27	0.68	1.23	0.78
2008-2009	0.23	0.61	1.43	0.24	0.59	1.17	0.71
2009-2010	0.64	1.46	3.71	0.57	1.38	2.82	1.75
2010-2011	0.62	1.28	2.94	0.48	1.21	2.56	1.50

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1994-1995	-1.49	2.25	-3.23	-2.46	-1.51	-2.39	-0.72	0.39	-1.27
1995-1996	-0.34	-0.46	0.52	-1.57	-0.30	-0.40	0.57	-0.50	-0.11
1996-1997	-3.67	-0.02	2.07	1.06	0.39	5.09	2.69	6.74	4.66
1997-1998	-0.46	-1.22	6.91	0.09	2.91	2.92	3.86	4.48	3.24
1998-1999	7.02	5.86	11.29	13.85	15.55	2.00	8.16	9.46	3.91
1999-2000	6.28	2.34	7.08	9.22	8.62	0.28	2.40	3.41	1.47
2000-2001	-3.06	2.26	-10.19	-9.29	-9.35	-7.82	-7.67	-4.15	-6.38
2001-2002	0.91	1.09	-0.32	-1.47	-0.67	-3.08	-1.59	-0.54	-2.05
2002-2003	0.12	-0.37	-1.44	-1.27	-2.56	-1.72	-2.55	-1.35	-2.09
2003-2004	-1.61	0.51	0.76	0.96	1.84	2.57	3.32	2.50	2.88
2004-2005	-4.82	0.61	-5.48	-3.79	-2.01	2.18	1.09	-0.08	1.33
2005-2006	2.29	1.90	4.48	3.51	6.52	1.84	2.20	3.61	2.04
2006-2007	2.89	-0.09	4.93	4.00	5.71	2.48	1.98	1.51	2.40
2007-2008	-1.25	0.07	-1.13	-2.50	-2.98	-1.36	-2.11	0.63	-1.38
2008-2009	0.31	1.64	-3.32	-2.09	-1.18	-3.17	-2.31	-2.03	-2.88
2009-2010	-1.29	-0.64	-5.33	-4.45	-5.08	-2.57	-4.31	-4.10	-3.30
2010-2011	1.67	0.08	-1.94	0.59	1.10	-0.81	-0.75	-3.69	-0.54

Table A.8: Detailed Summary Statistics for Ireland

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	5	8	9	8	10	4	44
1991-1992	6	7	7	6	10	5	41
1992-1993	6	7	9	7	11	4	44
1993-1994	4	10	10	10	10	4	48
1994-1995	2	10	7	10	6	4	40
1995-1996	3	10	10	11	9	4	48
1996-1997	2	10	11	12	10	2	48
1997-1998	3	11	10	11	9	4	51
1998-1999	3	6	9	7	8	2	35
1999-2000	3	8	10	9	9	2	42
2000-2001	2	8	9	10	6	3	38
2001-2002	2	9	9	10	7	3	41
2002-2003	3	5	9	7	8	1	33
2003-2004	2	6	9	8	7	2	35
2004-2005	3	5	8	6	8	1	31
2005-2006	4	3	8	5	9	1	30
2006-2007	5	4	6	4	8	2	29
2007-2008	6	4	8	5	10	3	36
2008-2009	6	6	7	5	9	4	38
2009-2010	2	5	5	5	4	2	25
2010-2011	2	5	5	5	5	2	25

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	12.65	21.87	34.79	192.56	404.16	48.67	143.82
1991-1992	33.68	32.86	43.66	213.67	547.92	176.80	204.46
1992-1993	20.06	32.50	33.83	159.06	399.47	120.86	150.99
1993-1994	27.15	34.64	37.03	196.50	514.47	91.21	172.91
1994-1995	33.62	33.79	31.84	356.52	499.25	84.84	188.29
1995-1996	18.25	53.96	40.69	528.08	603.55	221.82	273.60
1996-1997	55.98	46.20	61.20	517.93	364.22	1519.04	294.70
1997-1998	57.42	45.91	65.39	618.62	738.91	220.00	307.70
1998-1999	129.64	72.10	64.27	834.32	1059.19	190.16	459.83
1999-2000	119.65	71.73	75.98	2234.37	544.54	1636.62	714.10
2000-2001	22.41	122.22	72.25	2972.70	1622.26	666.82	1135.10
2001-2002	116.95	184.26	128.98	2238.76	2102.52	1405.20	1082.34
2002-2003	180.76	141.37	83.63	5281.60	2387.62	534.15	1776.00
2003-2004	100.04	233.36	80.13	4157.84	980.64	8996.03	1727.44
2004-2005	35.43	123.30	104.73	1938.66	3318.17	451.25	1296.42
2005-2006	130.11	215.26	168.10	960.34	4019.99	3449.45	1564.73
2006-2007	309.22	366.55	205.01	2890.21	3664.67	8506.43	2142.53
2007-2008	151.52	466.60	130.72	2203.53	4257.53	5733.42	2072.63
2008-2009	173.80	179.02	225.98	1923.30	6287.08	2533.18	2228.32
2009-2010	1101.74	687.79	868.24	2899.11	1585.78	11948.76	2541.63
2010-2011	238.26	216.40	149.86	1242.95	1398.92	979.49	713.14

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.30	0.61	0.95	0.27	0.50	1.03	0.60
1991-1992	0.44	0.79	1.49	0.36	0.81	1.62	0.90
1992-1993	0.43	0.76	1.54	0.32	0.72	1.56	0.87
1993-1994	0.60	0.84	4.47	0.43	0.86	1.54	1.55
1994-1995	0.42	0.63	1.14	0.34	0.64	1.12	0.67
1995-1996	0.50	0.69	1.38	0.35	0.67	0.93	0.74
1996-1997	0.46	0.64	1.64	0.35	0.67	0.86	0.79
1997-1998	0.27	0.63	1.76	0.31	0.64	1.19	0.68
1998-1999	0.15	0.46	1.98	0.18	0.48	0.86	0.79
1999-2000	0.22	0.56	1.42	0.21	0.47	1.22	0.66
2000-2001	0.22	0.55	1.04	0.26	0.53	0.98	0.61
2001-2002	0.32	0.69	1.30	0.23	0.53	1.24	0.64
2002-2003	0.27	0.67	1.44	0.31	0.53	1.39	0.76
2003-2004	0.20	0.79	1.45	0.33	0.60	1.71	0.69
2004-2005	0.17	0.55	1.00	0.28	0.47	1.09	0.58
2005-2006	0.11	0.43	0.91	0.19	0.38	0.62	0.46
2006-2007	0.22	0.38	0.84	0.13	0.35	0.45	0.41
2007-2008	0.19	0.36	0.75	0.12	0.35	0.48	0.39
2008-2009	0.25	0.50	1.01	0.20	0.45	0.84	0.52
2009-2010	0.58	1.11	3.64	0.41	1.17	6.62	1.76
2010-2011	0.36	0.78	2.48	0.29	0.69	6.09	1.36

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.87	-1.93	-1.15	-1.92	-0.96	-0.39	-1.81	-4.44	-1.65
1991-1992	1.44	0.24	-0.53	0.24	0.84	-1.12	-0.65	-2.01	-0.78
1992-1993	-0.21	0.20	-3.05	-0.05	0.54	0.46	0.34	-2.73	0.15
1993-1994	-0.14	2.78	-0.55	1.28	2.99	0.73	0.67	2.74	0.87
1994-1995	0.14	0.28	0.09	0.30	1.46	0.48	1.29	-0.33	0.79
1995-1996	0.91	-0.36	4.79	1.74	2.36	1.24	1.97	2.95	1.72
1996-1997	0.13	-1.53	2.94	2.52	1.11	1.97	3.47	0.73	2.23
1997-1998	-1.59	0.60	0.63	2.80	2.86	4.06	3.97	3.02	3.80
1998-1999	-2.03	1.12	-3.61	-1.71	-1.29	-0.43	0.41	-0.51	-0.17
1999-2000	0.15	-0.01	-1.27	1.40	-0.09	0.36	0.05	-0.84	0.27
2000-2001	0.18	-3.86	8.22	0.03	-0.19	2.09	2.65	2.78	2.23
2001-2002	0.97	4.47	1.04	0.78	1.09	-5.26	1.64	3.63	-2.61
2002-2003	-0.54	-0.81	-2.31	-2.11	0.49	1.72	-1.33	-2.69	0.60
2003-2004	0.20	4.61	4.11	4.18	3.96	0.19	1.88	9.57	0.84
2004-2005	-2.53	0.38	0.32	2.50	-0.79	2.59	2.56	4.46	2.52
2005-2006	-2.12	-0.87	1.42	-0.70	2.36	5.58	0.97	2.89	2.04
2006-2007	0.39	-2.04	4.04	2.13	1.31	2.75	2.14	1.41	2.05
2007-2008	1.53	-1.01	-1.55	-2.51	-3.31	-3.42	-4.86	-3.69	-4.24
2008-2009	-3.31	-1.10	-0.62	-5.23	-7.36	-3.92	0.02	0.63	-1.02
2009-2010	-0.45	-2.51	3.13	2.50	-1.52	1.70	2.46	1.31	1.55
2010-2011	5.43	-8.67	2.59	3.30	1.31	2.78	1.41	-13.28	0.34

Table A.9: Detailed Summary Statistics for Italy

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	23	37	31	32	36	23	182
1991-1992	20	34	34	32	37	18	175
1992-1993	22	34	35	32	39	19	181
1993-1994	21	30	44	36	44	15	190
1994-1995	20	26	36	30	37	14	165
1995-1996	17	36	30	32	31	19	165
1996-1997	16	34	40	39	33	17	179
1997-1998	23	38	45	40	46	19	212
1998-1999	19	44	48	48	45	18	222
1999-2000	15	44	51	51	41	17	219
2000-2001	14	45	50	51	42	16	218
2001-2002	24	51	51	52	50	25	253
2002-2003	29	51	49	48	52	28	260
2003-2004	24	51	45	48	47	25	241
2004-2005	31	45	43	41	48	29	240
2005-2006	29	47	47	46	52	27	250
2006-2007	31	48	44	43	48	32	249
2007-2008	34	48	47	45	54	30	261
2008-2009	37	54	42	43	52	38	271
2009-2010	34	49	44	42	50	34	254
2010-2011	33	54	40	43	47	36	260

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	51.35	49.96	38.48	872.75	662.57	558.06	378.23
1991-1992	59.53	67.93	61.56	1038.01	751.19	892.71	472.42
1992-1993	71.43	62.43	51.90	825.10	624.08	570.24	370.65
1993-1994	54.40	68.49	48.12	999.91	587.48	363.12	382.14
1994-1995	55.25	48.01	33.70	1256.59	583.28	477.29	426.47
1995-1996	65.19	54.40	65.73	1911.65	859.79	516.21	622.26
1996-1997	45.35	63.67	76.97	1353.82	1340.46	772.20	648.78
1997-1998	43.53	42.69	50.99	2175.92	920.81	676.03	694.18
1998-1999	42.77	51.26	63.02	2333.73	947.11	317.44	749.76
1999-2000	65.52	88.78	50.33	3593.73	1134.85	542.40	1125.51
2000-2001	11.74	112.00	78.50	5215.58	2980.54	1137.79	1919.78
2001-2002	61.56	77.90	86.00	6949.00	4020.97	1811.09	2440.75
2002-2003	215.68	100.87	92.18	8220.17	3908.95	2016.65	2578.99
2003-2004	98.62	84.93	68.99	5300.92	2771.82	1679.80	1811.41
2004-2005	69.87	73.43	64.57	5731.43	1571.76	738.38	1419.45
2005-2006	79.34	80.19	99.76	4541.70	3171.16	1315.12	1682.10
2006-2007	72.04	117.03	85.95	4295.74	3766.96	1604.87	1722.76
2007-2008	106.81	126.94	119.73	5804.05	4220.42	1821.67	2142.87
2008-2009	122.35	127.31	109.61	7064.74	5144.66	2258.64	2484.95
2009-2010	103.16	136.02	124.76	5920.31	4731.57	5072.20	2651.33
2010-2011	41.33	67.30	50.07	3540.67	2791.56	1906.52	1383.90

Fama – French Three Factor Regression on European Stock Markets – Before and After EMU

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.33	0.68	1.44	0.32	0.66	1.18	0.76
1991-1992	0.36	0.89	1.83	0.41	0.92	1.66	1.01
1992-1993	0.53	1.12	2.22	0.54	1.10	1.95	1.24
1993-1994	0.67	1.33	2.84	0.64	1.40	2.54	1.59
1994-1995	0.59	1.08	2.31	0.53	1.04	2.01	1.20
1995-1996	0.56	1.04	1.96	0.53	0.94	1.64	1.11
1996-1997	0.55	1.13	2.17	0.50	1.10	1.91	1.24
1997-1998	0.54	1.17	2.41	0.47	1.07	2.08	1.28
1998-1999	0.42	0.79	1.69	0.33	0.80	1.43	0.91
1999-2000	0.34	0.64	1.21	0.29	0.62	1.02	0.70
2000-2001	0.19	0.60	1.24	0.21	0.59	1.10	0.66
2001-2002	0.22	0.53	1.00	0.20	0.50	0.96	0.56
2002-2003	0.30	0.71	1.68	0.29	0.67	1.34	0.82
2003-2004	0.45	0.88	1.80	0.37	0.86	1.69	0.98
2004-2005	0.36	0.71	1.58	0.33	0.71	1.32	0.82
2005-2006	0.30	0.60	1.20	0.29	0.63	1.05	0.67
2006-2007	0.30	0.57	1.23	0.28	0.58	1.01	0.65
2007-2008	0.26	0.52	1.04	0.26	0.51	0.87	0.56
2008-2009	0.27	0.57	1.16	0.29	0.58	1.08	0.63
2009-2010	0.42	1.15	2.37	0.47	1.13	2.29	1.29
2010-2011	0.39	0.97	2.23	0.39	0.95	1.94	1.09

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.25	-0.56	-2.02	-2.53	-2.49	-1.38	-2.86	-2.03	-2.11
1991-1992	-1.24	0.15	-3.51	-2.93	-3.50	-1.92	-2.68	-1.62	-2.20
1992-1993	-1.58	-0.71	-1.49	0.06	-1.80	0.61	1.38	-0.49	0.60
1993-1994	0.47	2.69	0.99	2.73	4.85	1.19	3.26	2.70	2.13
1994-1995	-0.30	-1.32	-1.64	-2.57	-2.92	-1.51	-1.86	-2.87	-1.78
1995-1996	-0.10	-1.34	-0.11	-1.05	-1.53	0.02	-1.17	-1.25	-0.49
1996-1997	-0.90	0.46	-0.77	0.21	0.44	0.56	1.76	0.27	0.82
1997-1998	-0.75	5.05	3.44	5.89	8.72	4.47	6.56	9.28	5.33
1998-1999	-0.79	-0.91	-0.50	-0.54	-1.06	0.88	-0.23	-0.38	0.54
1999-2000	0.82	0.29	2.66	2.16	3.84	3.10	0.59	2.50	2.61
2000-2001	0.50	1.44	-0.35	1.53	2.68	0.46	1.61	0.31	0.77
2001-2002	0.17	0.52	-2.80	-1.65	-1.16	-2.23	-1.07	-2.84	-1.88
2002-2003	-1.15	0.68	-4.03	-1.68	-1.09	-0.52	-0.71	-2.11	-0.74
2003-2004	0.02	0.01	1.64	1.24	1.17	1.17	1.15	1.66	1.21
2004-2005	0.53	1.24	2.41	2.11	3.38	1.35	2.10	2.86	1.71
2005-2006	-0.04	0.52	1.54	1.59	1.20	0.79	1.46	2.19	1.19
2006-2007	0.10	1.78	1.31	1.05	3.38	1.14	1.66	2.63	1.57
2007-2008	-0.72	-0.19	-3.84	-3.49	-2.62	-1.53	-3.14	-3.11	-2.41
2008-2009	-0.08	-0.46	-2.93	-2.21	-3.05	-2.43	-2.30	-3.22	-2.47
2009-2010	-0.92	0.39	-1.68	-0.74	-0.72	0.07	-0.34	-0.10	-0.13
2010-2011	-0.14	-1.05	0.80	0.96	0.33	1.30	1.54	-0.32	0.66

Table A.10: Detailed Summary Statistics for Netherlands

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	9	22	20	21	19	10	102
1991-1992	16	21	17	18	22	14	108
1992-1993	14	24	20	20	23	14	115
1993-1994	9	28	27	30	23	11	128
1994-1995	10	20	27	24	25	8	114
1995-1996	15	31	21	25	23	19	134
1996-1997	17	29	29	28	30	17	150
1997-1998	16	31	29	30	30	16	152
1998-1999	17	30	24	25	27	18	142
1999-2000	12	27	25	26	24	13	127
2000-2001	12	26	27	27	25	12	129
2001-2002	11	23	23	23	23	11	117
2002-2003	11	26	20	23	19	14	116
2003-2004	10	29	20	25	20	14	120
2004-2005	14	23	16	18	21	15	110
2005-2006	15	19	16	15	21	14	102
2006-2007	12	19	21	19	22	10	104
2007-2008	12	21	18	18	20	12	102
2008-2009	10	21	16	18	17	12	95
2009-2010	12	18	15	15	18	11	90
2010-2011	12	18	16	15	19	11	92

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	32.33	38.53	21.16	712.46	594.83	1044.09	375.60
1991-1992	50.46	45.77	38.23	494.95	467.48	1521.23	397.31
1992-1993	29.25	39.88	32.65	1084.07	655.91	911.65	448.26
1993-1994	33.31	39.03	38.31	986.93	1090.24	1029.67	534.66
1994-1995	41.00	46.47	32.06	1616.20	1028.14	1190.89	668.64
1995-1996	34.84	53.63	43.99	2094.48	3043.73	1952.64	1213.26
1996-1997	36.55	67.19	47.73	2019.61	3019.08	1101.63	1132.02
1997-1998	42.49	60.44	52.51	2191.15	3931.46	1282.34	1370.21
1998-1999	54.50	58.73	62.91	2716.39	6642.05	889.72	1883.74
1999-2000	47.15	88.36	103.17	5222.76	8770.83	2885.93	3065.67
2000-2001	77.74	126.26	71.35	6568.99	11032.48	743.88	3629.79
2001-2002	123.50	120.64	107.64	14293.59	6721.63	5574.17	4738.98
2002-2003	121.53	165.60	182.60	13274.87	14006.25	2397.93	5302.66
2003-2004	98.02	97.82	120.44	11704.05	8379.59	903.93	4004.83
2004-2005	43.34	109.09	102.86	9661.57	5843.37	1044.04	2900.22
2005-2006	92.41	87.69	93.33	5316.67	10050.68	2475.87	3271.21
2006-2007	152.01	151.15	117.63	5837.30	10045.37	3406.87	3587.93
2007-2008	190.88	224.20	119.11	4701.96	12084.83	6304.32	4030.68
2008-2009	314.73	277.29	245.27	7278.64	13850.47	8210.83	5030.53
2009-2010	216.50	278.55	372.80	10578.08	8452.91	16043.87	5561.24
2010-2011	114.54	141.53	82.99	5930.89	7261.11	2793.55	2857.67

Mean BME of Portfolios

Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.37	0.76	3.56	0.33	0.78	1.27	1.23
1991-1992	0.40	0.85	2.36	0.35	0.76	1.68	1.03
1992-1993	0.39	0.78	1.90	0.38	0.82	1.90	1.00
1993-1994	0.48	0.96	2.15	0.42	1.00	2.22	1.17
1994-1995	0.36	0.64	1.34	0.27	0.64	1.14	0.74
1995-1996	0.36	0.68	3.96	0.30	0.67	1.16	1.15
1996-1997	0.31	0.62	3.04	0.26	0.62	1.21	1.05
1997-1998	0.22	0.55	1.22	0.19	0.52	1.37	0.65
1998-1999	0.15	0.44	5.13	0.13	0.41	1.28	1.23
1999-2000	0.07	0.39	3.16	0.09	0.37	1.27	0.93
2000-2001	0.08	0.46	4.76	0.12	0.36	1.22	1.30
2001-2002	0.13	0.52	5.68	0.14	0.44	1.40	1.47
2002-2003	0.24	0.61	1.86	0.20	0.50	1.38	0.77
2003-2004	0.32	0.89	2.66	0.34	0.81	1.86	1.09
2004-2005	0.31	0.71	1.42	0.27	0.59	1.21	0.71
2005-2006	0.26	0.56	1.08	0.26	0.56	0.93	0.59
2006-2007	0.22	0.45	0.91	0.22	0.46	0.81	0.51
2007-2008	0.20	0.39	0.87	0.22	0.39	0.74	0.46
2008-2009	0.29	0.47	0.93	0.25	0.50	0.89	0.54
2009-2010	0.42	0.98	2.61	0.42	0.88	1.91	1.17
2010-2011	0.29	0.63	1.51	0.31	0.67	1.41	0.78

Mean Annual Returns of Portfolios (in %)

Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-1.11	-0.57	-1.53	-1.74	-1.60	-0.10	-0.27	-1.17	-0.49
1991-1992	-1.22	0.83	-2.13	-0.20	-0.24	0.58	0.16	0.36	0.30
1992-1993	-0.67	-0.83	-0.93	-1.24	-1.67	-0.20	-0.51	-1.12	-0.56
1993-1994	0.67	1.26	2.05	2.39	2.89	1.12	1.38	2.81	1.47
1994-1995	-0.71	0.28	-0.29	0.12	0.18	0.66	0.73	0.76	0.68
1995-1996	-0.39	-0.73	2.40	1.78	0.64	2.00	1.70	2.29	1.91
1996-1997	-0.25	-1.56	3.68	1.21	1.69	2.52	3.38	1.40	2.85
1997-1998	0.75	-2.50	4.28	2.97	1.91	3.37	2.81	0.74	2.85
1998-1999	-1.92	0.76	-2.18	-3.13	-0.68	-0.52	0.77	-0.49	0.34
1999-2000	-1.54	2.29	1.41	0.11	1.23	0.07	2.47	4.83	1.51
2000-2001	-0.50	2.81	-1.58	-0.26	0.08	-2.48	0.73	1.49	-0.42
2001-2002	-0.33	1.72	-4.37	-0.99	-0.47	-1.64	-1.10	-2.11	-1.49
2002-2003	0.54	1.62	-1.63	-1.64	-1.55	-3.14	-3.33	0.03	-3.00
2003-2004	2.25	0.86	4.37	3.92	4.50	1.07	2.30	2.66	1.52
2004-2005	0.43	0.98	2.58	1.65	2.46	1.06	1.21	3.13	1.25
2005-2006	1.35	0.58	2.18	3.99	2.73	1.37	1.49	1.98	1.53
2006-2007	0.14	0.95	0.21	3.26	2.60	2.17	1.78	1.70	1.90
2007-2008	-0.70	0.11	-2.84	-1.79	-2.05	-1.54	-0.93	-2.10	-1.32
2008-2009	-0.85	-0.82	-3.27	-3.51	-4.15	-2.16	-3.30	-2.92	-2.91
2009-2010	0.06	-0.77	1.96	1.67	1.73	2.39	1.70	1.08	1.84
2010-2011	1.10	0.64	2.36	2.10	2.43	0.75	0.88	1.96	0.68

Table A.11: Detailed Summary Statistics for Spain

Years	Number of Stocks in Portfolios						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1991-1992	6	17	15	17	13	7	75
1992-1993	7	14	17	16	16	6	76
1993-1994	8	13	18	16	18	5	78
1994-1995	7	14	18	17	17	6	83
1995-1996	11	18	15	15	17	11	90
1996-1997	9	17	20	18	20	7	93
1997-1998	11	18	25	21	25	8	109
1998-1999	12	19	26	22	26	8	114
1999-2000	8	17	24	21	23	4	97
2000-2001	5	20	24	24	20	5	98
2001-2002	7	18	32	28	27	2	114
2002-2003	10	18	27	23	26	6	110
2003-2004	7	18	23	21	20	6	96
2004-2005	10	19	18	19	18	10	95
2005-2006	6	25	23	27	18	9	108
2006-2007	10	19	22	21	21	8	102
2007-2008	13	16	23	18	26	8	104
2008-2009	14	19	22	19	25	11	110
2009-2010	9	18	23	21	24	6	101
2010-2011	8	21	20	21	18	10	99

Years	Mean ME of Portfolios (in millions of €)						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1991-1992	319.92	177.74	123.65	1047.02	1349.10	1400.60	692.50
1992-1993	115.93	101.04	89.49	876.50	1265.64	785.87	562.33
1993-1994	159.93	92.29	105.29	1504.05	1441.46	597.01	735.52
1994-1995	42.30	52.65	45.79	1305.11	1218.67	501.38	592.20
1995-1996	96.87	91.98	87.14	1967.45	1322.44	2311.28	905.90
1996-1997	58.09	114.78	72.97	2180.18	1665.92	582.46	866.73
1997-1998	49.83	101.87	68.97	1748.16	2100.54	570.77	898.35
1998-1999	85.21	135.82	74.05	2102.29	2469.66	2196.93	1171.76
1999-2000	129.70	387.21	190.81	3457.62	3213.74	1267.79	1688.63
2000-2001	201.10	306.54	165.34	5904.53	3998.46	811.85	2416.75
2001-2002	188.75	219.38	143.26	7980.99	3263.41	1395.54	2844.08
2002-2003	204.56	256.79	111.07	9748.24	5663.28	1664.47	3555.53
2003-2004	189.95	227.82	130.68	9984.12	3425.75	5584.01	3336.61
2004-2005	187.75	217.73	122.56	7488.00	5099.18	3113.53	2878.25
2005-2006	327.43	235.78	121.35	7221.05	6815.79	4082.29	3380.03
2006-2007	206.43	206.02	208.94	9115.05	4996.87	12084.21	3957.16
2007-2008	347.42	317.47	252.00	6976.55	6826.74	15566.67	4259.60
2008-2009	517.00	538.26	611.33	9427.17	11574.05	13680.81	5907.91
2009-2010	564.28	363.40	718.47	5951.60	17518.63	5752.38	6020.69
2010-2011	416.44	184.45	256.89	6913.16	13153.33	3627.60	4352.91

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	0.51	1.09	4.08	0.53	0.94	1.95	1.57
1992-1993	0.53	1.08	3.18	0.51	0.95	1.89	1.42
1993-1994	0.66	1.25	3.20	0.60	1.22	2.07	1.55
1994-1995	0.40	0.75	2.14	0.45	0.77	1.43	0.74
1995-1996	0.41	0.81	2.00	0.40	0.79	1.35	0.33
1996-1997	0.41	0.89	2.07	0.42	0.86	1.58	1.02
1997-1998	0.31	0.75	5.82	0.34	0.71	1.07	1.79
1998-1999	0.25	0.52	6.50	0.24	0.54	0.99	1.83
1999-2000	0.18	0.42	0.90	0.17	0.41	0.68	0.47
2000-2001	0.30	0.53	1.13	0.18	0.55	1.06	0.61
2001-2002	0.30	0.67	1.52	0.24	0.67	1.75	0.80
2002-2003	0.28	0.61	1.22	0.26	0.56	0.95	0.66
2003-2004	0.30	0.61	1.38	0.32	0.64	0.93	0.72
2004-2005	0.26	0.53	1.21	0.24	0.52	0.73	0.58
2005-2006	0.19	0.48	0.85	0.24	0.51	0.63	0.50
2006-2007	0.22	0.43	0.79	0.20	0.43	0.63	0.45
2007-2008	0.14	0.33	0.63	0.15	0.33	0.53	0.36
2008-2009	0.15	0.39	0.85	0.19	0.41	0.67	0.45
2009-2010	0.23	0.73	1.58	0.28	0.73	1.36	0.83
2010-2011	0.25	0.73	1.78	0.29	0.71	1.20	0.84

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	-3.64	-0.22	-3.59	-1.60	-5.43	-0.53	-0.05	0.87	-0.26
1992-1993	-2.53	-2.31	-1.37	-2.57	-5.53	-0.71	0.01	-1.17	-0.61
1993-1994	1.21	2.55	1.84	3.10	4.97	1.67	0.97	3.64	1.56
1994-1995	-1.11	-0.29	-1.98	-2.43	-1.73	-0.56	-0.85	-1.40	-0.78
1995-1996	-1.92	0.20	-0.22	-0.56	-1.06	0.73	1.21	1.96	1.15
1996-1997	0.48	-0.79	5.61	2.96	3.43	3.04	3.87	3.64	3.42
1997-1998	1.76	-0.23	4.96	6.89	4.93	4.22	3.51	3.77	3.87
1998-1999	-1.36	-0.13	-1.38	-1.19	-0.46	0.82	0.57	-0.35	0.49
1999-2000	-0.35	0.24	-1.14	-0.13	0.82	0.25	1.58	-1.22	0.82
2000-2001	0.60	-0.02	1.10	0.41	-1.63	-2.02	-0.57	0.67	-1.56
2001-2002	0.56	2.72	-0.23	0.43	1.29	-1.48	-1.13	2.43	-1.34
2002-2003	-0.61	0.63	-1.94	-0.02	-1.27	-0.69	-0.59	-0.12	-0.65
2003-2004	0.58	1.11	1.25	2.54	3.10	1.59	1.59	1.97	1.66
2004-2005	1.02	0.85	1.68	3.83	2.98	1.57	1.89	1.98	1.77
2005-2006	0.59	1.58	0.59	2.55	3.39	1.18	2.05	1.53	1.54
2006-2007	0.85	-0.62	4.73	2.56	3.43	2.32	3.48	2.38	2.69
2007-2008	-1.90	0.23	-3.52	-3.40	-3.88	-1.68	-2.55	-0.87	-1.92
2008-2009	-1.03	-1.12	-2.11	-3.23	-3.75	-1.48	-2.44	-2.08	-2.09
2009-2010	-0.24	0.03	-0.27	-0.68	-0.47	-0.40	-0.16	-0.15	-0.23
2010-2011	-1.20	0.45	0.24	1.03	0.66	1.76	1.51	2.26	1.20

Table A.12: Detailed Summary Statistics for Sweden

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	15	36	29	33	29	18	161
1992-1993	10	22	31	28	28	7	126
1993-1994	15	31	47	41	41	11	186
1994-1995	19	34	31	32	33	19	168
1995-1996	24	40	37	36	41	24	202
1996-1997	25	41	34	35	40	26	201
1997-1998	29	53	45	46	50	31	254
1998-1999	46	59	50	48	64	43	310
1999-2000	51	62	58	51	75	45	342
2000-2001	56	74	69	63	85	50	397
2001-2002	58	88	76	74	88	59	443
2002-2003	45	71	66	64	76	43	368
2003-2004	53	73	80	70	92	43	414
2004-2005	60	83	74	70	90	56	435
2005-2006	58	82	56	58	78	61	394
2006-2007	78	91	66	62	96	74	467
2007-2008	77	87	70	64	99	71	468
2008-2009	85	118	97	95	121	83	599
2009-2010	86	105	113	98	138	69	616
2010-2011	70	79	85	71	107	55	467

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	26.20	27.10	26.81	688.45	384.34	511.77	280.90
1992-1993	16.38	17.45	10.09	360.59	368.07	99.53	174.28
1993-1994	14.33	16.11	17.75	421.09	232.21	420.17	177.18
1994-1995	18.88	16.64	10.22	783.68	361.39	221.28	252.68
1995-1996	33.54	31.84	35.28	1123.88	618.55	583.08	411.87
1996-1997	48.28	47.25	40.89	1187.98	803.99	641.63	472.42
1997-1998	38.95	40.41	41.97	1191.24	825.61	804.85	496.80
1998-1999	20.45	37.74	42.63	1777.43	915.36	839.40	597.72
1999-2000	31.08	42.76	52.23	2007.14	1226.01	912.20	709.44
2000-2001	29.92	33.64	35.23	1962.35	909.46	775.48	620.41
2001-2002	44.03	38.60	39.78	3489.34	1340.86	865.16	984.71
2002-2003	54.95	52.05	35.52	3392.98	2020.71	717.36	1115.93
2003-2004	28.43	35.65	39.05	1512.12	1811.00	1339.52	815.35
2004-2005	27.02	26.19	25.64	1531.45	1043.60	1033.25	608.50
2005-2006	35.75	32.63	26.39	2065.46	1102.71	1595.71	785.22
2006-2007	25.58	36.88	44.05	2227.32	1477.65	1151.87	799.67
2007-2008	27.79	38.39	31.89	1876.41	2111.67	1327.48	921.17
2008-2009	27.17	32.51	33.87	1944.16	2132.72	1185.28	919.14
2009-2010	26.25	24.81	37.51	1635.03	1475.28	1753.67	801.86
2010-2011	12.37	12.75	10.73	1475.10	1013.61	651.62	539.21

Fama – French Three Factor Regression on European Stock Markets – Before and After EMU

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	0.26	0.71	5.67	0.25	0.72	1.59	1.54
1992-1993	0.43	1.15	13.87	0.43	1.02	3.20	4.15
1993-1994	0.52	1.29	10.15	0.50	1.17	4.26	3.44
1994-1995	0.32	0.72	1.25	0.35	0.66	1.01	0.72
1995-1996	0.34	0.68	1.23	0.31	0.67	1.11	0.72
1996-1997	0.33	0.75	1.27	0.32	0.68	1.14	0.75
1997-1998	0.26	0.55	1.13	0.24	0.53	0.95	0.61
1998-1999	0.19	0.46	1.06	0.21	0.47	0.90	0.54
1999-2000	0.22	0.54	1.44	0.19	0.54	1.13	0.67
2000-2001	0.15	0.44	1.20	0.12	0.45	1.00	0.55
2001-2002	0.22	0.52	1.59	0.18	0.50	1.06	0.67
2002-2003	0.22	0.54	1.33	0.23	0.55	1.02	0.64
2003-2004	0.26	0.65	1.58	0.28	0.64	1.19	0.76
2004-2005	0.24	0.53	1.30	0.24	0.52	0.94	0.62
2005-2006	0.20	0.44	1.17	0.22	0.46	0.88	0.54
2006-2007	0.16	0.40	0.87	0.17	0.40	0.86	0.47
2007-2008	0.14	0.37	0.82	0.16	0.35	0.83	0.44
2008-2009	0.18	0.46	1.32	0.18	0.45	0.97	0.59
2009-2010	0.25	0.68	2.07	0.26	0.69	1.57	0.90
2010-2011	0.18	0.53	1.22	0.20	0.52	1.09	0.62

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1991-1992	-1.08	1.67	-3.28	-2.29	-1.98	-2.72	-0.92	-0.68	-1.97
1992-1993	-1.33	-1.20	-0.91	-1.52	-1.33	0.39	1.44	-1.60	0.71
1993-1994	0.41	3.23	1.14	3.60	4.30	1.16	2.20	4.45	1.63
1994-1995	-0.30	-1.23	1.01	-0.96	-0.57	0.90	-0.53	0.03	0.29
1995-1996	-0.23	-0.44	2.11	2.29	1.55	2.41	2.14	2.10	2.25
1996-1997	-0.14	0.43	1.65	3.75	2.51	2.45	3.43	2.45	2.80
1997-1998	-1.23	-1.08	1.69	0.70	0.82	2.79	2.60	1.51	2.44
1998-1999	-0.65	-0.58	-1.46	-1.03	-0.47	0.95	-0.76	-1.21	-0.05
1999-2000	0.74	-4.53	5.70	3.29	1.59	5.83	1.65	0.89	3.74
2000-2001	0.49	1.79	-1.75	0.42	0.62	-1.57	-0.25	-0.36	-1.08
2001-2002	0.26	3.52	-2.91	-0.16	-0.62	-4.03	-1.17	0.73	-2.48
2002-2003	-1.03	0.53	-1.99	-1.60	-1.15	-0.61	-0.65	-0.40	-0.63
2003-2004	1.25	1.85	1.90	3.16	3.49	0.36	1.96	2.48	1.47
2004-2005	0.04	1.11	0.39	1.60	1.91	0.91	1.26	1.60	1.20
2005-2006	0.59	0.38	2.54	1.99	1.81	0.57	1.93	2.05	1.43
2006-2007	-0.74	0.05	1.34	1.76	0.71	1.21	2.86	1.95	2.02
2007-2008	-0.14	0.18	-2.18	-1.83	-1.66	-1.35	-2.37	-1.51	-1.87
2008-2009	0.05	-0.77	-1.81	-2.00	-1.86	-1.28	-1.78	-2.77	-1.76
2009-2010	-0.32	0.54	1.82	1.57	2.45	1.78	2.79	2.23	2.27
2010-2011	-0.92	0.85	0.63	2.30	1.04	1.63	2.19	2.91	1.72

Table A.13: Detailed Summary Statistics for Switzerland

Number of Stocks in Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	27	42	45	41	48	24	227
1991-1992	33	36	46	37	55	23	230
1992-1993	31	49	49	46	54	28	259
1993-1994	31	39	53	47	55	21	248
1994-1995	29	45	51	47	52	26	250
1995-1996	23	46	45	45	44	25	229
1996-1997	22	34	39	35	42	18	191
1997-1998	21	49	56	54	53	19	256
1998-1999	28	42	60	50	61	18	259
1999-2000	24	52	62	58	58	21	276
2000-2001	21	53	66	63	59	18	280
2001-2002	20	54	77	70	68	13	303
2002-2003	20	64	74	74	62	21	317
2003-2004	23	64	70	72	60	24	315
2004-2005	21	64	73	74	63	22	321
2005-2006	25	65	68	70	61	27	317
2006-2007	25	70	72	75	63	29	335
2007-2008	26	72	74	77	63	31	343
2008-2009	27	71	77	79	67	28	350
2009-2010	29	73	73	78	65	32	350
2010-2011	33	74	78	78	73	33	372

Mean ME of Portfolios (in millions of €)							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	40.88	33.75	24.29	532.59	760.72	463.57	321.98
1991-1992	29.39	36.36	34.33	637.54	714.94	864.35	376.73
1992-1993	23.51	31.88	26.94	716.82	670.37	222.13	305.28
1993-1994	22.84	30.97	24.50	1109.65	580.52	249.79	374.64
1994-1995	22.77	23.42	34.79	1460.18	665.79	624.08	491.86
1995-1996	54.69	47.82	41.92	2247.19	1672.39	647.32	857.17
1996-1997	63.23	63.50	50.77	3362.87	1231.16	567.56	969.62
1997-1998	49.69	42.61	49.78	4097.36	784.60	522.62	1088.81
1998-1999	42.64	41.39	44.00	5670.20	737.82	514.75	1325.69
1999-2000	62.57	64.79	51.22	7717.72	1382.93	395.31	1971.70
2000-2001	67.94	70.14	56.39	7008.61	3216.42	1152.57	2360.44
2001-2002	73.41	67.76	77.31	8128.90	3452.27	429.99	2709.42
2002-2003	74.69	105.80	81.04	10475.39	2709.21	851.41	3079.38
2003-2004	77.96	66.46	80.69	8773.31	2880.52	721.85	2649.36
2004-2005	47.89	62.09	49.87	7410.23	1656.26	566.94	2101.48
2005-2006	68.07	74.76	56.78	7720.07	2475.35	705.49	2274.10
2006-2007	80.70	76.32	60.25	7512.05	2675.06	636.40	2274.89
2007-2008	103.22	108.32	73.25	8826.63	3397.11	1364.62	2775.15
2008-2009	91.60	124.13	76.43	9544.80	3590.82	2110.76	3059.71
2009-2010	86.68	128.89	126.57	8488.30	4343.61	1787.83	2922.27
2010-2011	64.07	92.05	63.92	7492.91	2424.00	1311.29	2200.54

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Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.29	0.63	2.93	0.30	0.64	1.25	1.05
1991-1992	0.33	0.83	3.41	0.41	0.81	4.20	1.54
1992-1993	0.36	1.01	4.01	0.42	0.94	3.76	1.66
1993-1994	0.50	1.17	5.62	0.50	1.15	5.65	2.26
1994-1995	0.34	0.80	4.58	0.35	0.70	3.23	1.66
1995-1996	0.36	0.80	4.69	0.38	0.75	2.94	1.66
1996-1997	0.38	0.80	2.54	0.36	0.80	3.25	1.25
1997-1998	0.34	0.76	4.33	0.33	0.75	3.83	1.43
1998-1999	0.30	0.65	3.79	0.27	0.61	3.95	1.48
1999-2000	0.24	0.62	3.23	0.24	0.57	5.85	1.30
2000-2001	0.23	0.58	2.98	0.20	0.53	6.81	1.42
2001-2002	0.22	0.58	3.15	0.21	0.54	4.85	1.30
2002-2003	0.26	0.74	3.25	0.29	0.68	3.63	1.21
2003-2004	0.39	0.87	4.00	0.34	0.81	3.68	1.60
2004-2005	0.30	0.77	3.99	0.30	0.73	3.59	1.37
2005-2006	0.30	0.68	3.33	0.28	0.65	3.01	1.31
2006-2007	0.26	0.62	4.04	0.25	0.59	2.74	1.27
2007-2008	0.25	0.57	3.94	0.22	0.50	2.59	1.36
2008-2009	0.23	0.56	5.27	0.21	0.54	2.77	1.52
2009-2010	0.30	0.77	4.47	0.30	0.75	3.04	1.60
2010-2011	0.26	0.71	5.67	0.27	0.68	2.73	1.64

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.65	-0.36	-1.75	-1.30	-1.87	-1.11	-0.13	-1.71	-0.73
1991-1992	-1.66	0.08	-1.41	-2.04	-2.22	-0.73	-0.22	0.25	-0.35
1992-1993	-1.31	0.46	-0.09	0.18	0.58	1.27	1.82	1.51	1.51
1993-1994	0.58	0.47	3.06	2.99	3.14	1.92	2.75	2.78	2.26
1994-1995	-0.57	-0.01	-0.11	0.28	0.03	0.95	0.14	0.81	0.66
1995-1996	-0.67	-1.47	1.51	0.65	-0.09	1.81	1.79	0.48	1.67
1996-1997	-1.07	0.07	1.35	1.24	1.51	1.97	3.40	1.96	2.36
1997-1998	-1.29	1.31	2.15	2.40	2.22	2.26	3.57	4.81	2.49
1998-1999	-0.39	-0.01	0.15	-0.52	-0.12	0.02	0.39	0.27	0.07
1999-2000	1.29	-0.95	4.41	2.63	1.32	0.84	1.63	2.03	0.98
2000-2001	0.33	-0.48	3.77	1.74	0.71	0.86	1.40	2.96	1.09
2001-2002	-0.63	0.93	-2.35	-1.25	-0.43	-0.73	-0.64	-0.79	-0.70
2002-2003	0.17	0.59	-2.09	-1.72	-1.01	-1.67	-2.07	-1.57	-1.73
2003-2004	-0.12	2.21	1.12	1.81	3.05	1.18	1.50	3.68	1.28
2004-2005	0.21	0.82	1.18	1.21	1.80	0.71	1.13	1.73	0.81
2005-2006	-0.18	0.74	1.56	1.17	1.86	1.13	1.69	2.31	1.29
2006-2007	0.05	-0.25	2.23	1.84	0.77	0.93	1.88	1.89	1.18
2007-2008	1.29	-0.63	0.53	-0.59	-0.67	-1.48	-1.59	-1.54	-1.49
2008-2009	0.05	0.28	-1.55	-1.53	-0.45	-1.27	-0.60	-1.81	-1.15
2009-2010	-0.66	1.15	0.96	1.70	2.08	1.82	1.91	3.00	1.89
2010-2011	-0.07	0.94	1.11	2.31	2.37	1.96	1.46	2.58	1.71

Table A.14: Detailed Summary Statistics for Eurozone

Years	Number of Stocks in Portfolios						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1990-1991	101	161	158	151	174	95	842
1991-1992	133	201	199	187	222	124	1072
1992-1993	145	220	214	206	239	134	1165
1993-1994	166	244	248	233	278	146	1324
1994-1995	141	223	240	222	263	118	1222
1995-1996	147	231	268	240	284	121	1305
1996-1997	168	253	258	244	281	153	1371
1997-1998	183	287	287	273	321	163	1528
1998-1999	163	269	307	281	315	142	1493
1999-2000	158	265	311	280	323	130	1480
2000-2001	166	305	306	300	309	167	1568
2001-2002	210	337	352	328	384	187	1818
2002-2003	220	370	345	342	379	216	1904
2003-2004	219	356	360	343	392	201	1921
2004-2005	221	321	379	331	421	168	1893
2005-2006	240	327	370	325	408	204	1932
2006-2007	233	330	371	329	408	197	1909
2007-2008	227	330	404	348	435	178	1962
2008-2009	249	333	393	332	449	194	1986
2009-2010	236	354	394	357	431	196	1999
2010-2011	243	333	367	328	401	213	1927

Years	Mean ME of Portfolios (in millions of €)						$R_m - R_f$
	SL	SM	SH	BL	BM	BH	
1990-1991	53.61	33.63	34.27	35.86	31.12	56.99	375.04
1991-1992	62.72	41.50	41.92	44.61	37.57	67.27	449.70
1992-1993	88.48	58.32	59.95	62.28	53.68	95.75	595.82
1993-1994	62.79	42.72	42.03	44.74	37.49	71.39	481.75
1994-1995	85.33	53.96	50.13	54.20	45.75	101.97	608.36
1995-1996	70.56	44.90	38.70	43.22	36.52	85.72	580.25
1996-1997	90.32	59.97	58.81	62.19	54.00	99.17	850.33
1997-1998	72.15	46.00	46.00	48.36	41.13	81.00	709.77
1998-1999	68.04	41.23	36.12	39.47	35.21	78.10	771.41
1999-2000	77.04	45.94	39.14	43.47	37.69	93.64	1009.76
2000-2001	85.41	46.48	46.33	47.26	45.88	84.90	1371.62
2001-2002	94.16	58.68	56.17	60.29	51.49	105.74	1618.75
2002-2003	165.94	98.67	105.82	106.75	96.32	169.01	2268.18
2003-2004	128.30	78.93	78.05	81.92	71.68	139.79	2384.12
2004-2005	68.34	47.05	39.85	45.63	35.88	89.90	1957.52
2005-2006	40.60	29.80	26.34	29.98	23.88	47.77	1233.50
2006-2007	52.22	36.87	32.80	36.98	29.82	61.77	1625.89
2007-2008	60.73	41.77	34.12	39.61	31.69	77.44	1723.61
2008-2009	68.09	50.92	43.14	51.07	37.76	87.40	2277.67
2009-2010	95.84	63.90	57.41	63.36	52.48	115.40	2611.96
2010-2011	82.20	59.98	54.43	60.90	49.81	93.78	2495.00

Mean BME of Portfolios							
Years	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	0.33	0.69	2.95	0.32	0.66	1.43	1.08
1991-1992	0.29	0.60	2.15	0.26	0.60	1.25	0.85
1992-1993	0.38	0.82	2.85	0.33	0.80	1.83	1.14
1993-1994	0.36	0.76	2.31	0.33	0.76	1.63	0.99
1994-1995	0.40	0.88	2.61	0.38	0.87	2.01	1.11
1995-1996	0.30	0.64	1.99	0.29	0.64	1.48	0.84
1996-1997	0.35	0.72	2.02	0.33	0.71	1.39	0.90
1997-1998	0.35	0.75	2.80	0.33	0.75	1.55	1.09
1998-1999	0.30	0.72	2.87	0.30	0.69	1.55	1.09
1999-2000	0.25	0.59	2.08	0.24	0.57	1.21	0.84
2000-2001	0.20	0.56	2.23	0.19	0.54	1.28	0.82
2001-2002	0.12	0.46	1.82	0.11	0.44	1.12	0.68
2002-2003	0.17	0.50	1.30	0.17	0.47	1.14	0.60
2003-2004	0.25	0.62	2.90	0.24	0.61	1.32	0.94
2004-2005	0.39	0.93	5.71	0.40	0.89	1.82	1.72
2005-2006	0.29	0.67	3.61	0.30	0.66	1.21	1.09
2006-2007	0.29	0.69	3.68	0.31	0.66	1.29	1.16
2007-2008	0.23	0.59	3.52	0.27	0.58	1.17	1.10
2008-2009	0.24	0.51	2.62	0.23	0.50	1.01	0.86
2009-2010	0.25	0.61	2.73	0.26	0.60	1.15	0.95
2010-2011	0.42	1.09	3.98	0.45	1.07	2.57	1.52

Mean Annual Returns of Portfolios (in %)									
Years	SMB	HML	SL	SM	SH	BL	BM	BH	$R_m - R_f$
1990-1991	-0.42	-0.15	-1.41	-1.52	-1.46	-0.84	-1.19	-1.08	-1.08
1991-1992	-1.07	0.67	-1.89	-1.40	-1.20	-0.83	-0.26	-0.19	-0.47
1992-1993	-0.35	0.44	-1.36	-0.36	-0.64	-0.39	-0.69	-0.23	-0.50
1993-1994	1.00	1.18	1.99	2.66	3.11	0.98	1.56	2.22	1.50
1994-1995	-0.52	-0.33	-0.98	-0.89	-0.95	-0.11	-0.33	-0.80	-0.33
1995-1996	-0.28	0.12	0.35	0.59	0.53	0.66	0.95	0.70	0.81
1996-1997	-0.64	0.06	1.57	1.51	1.54	1.93	2.53	2.09	2.24
1997-1998	-0.28	1.69	2.99	3.31	4.33	2.96	3.50	5.02	3.50
1998-1999	-0.07	0.56	-0.84	1.28	0.50	0.49	0.40	0.26	0.43
1999-2000	-0.05	-0.22	1.97	1.68	2.61	2.44	2.59	1.37	2.43
2000-2001	-1.00	1.36	-1.78	-1.39	-0.39	-0.99	0.09	0.34	-0.43
2001-2002	0.25	2.14	-3.09	-1.51	-0.37	-3.03	-1.24	-1.46	-1.87
2002-2003	0.62	-0.48	-1.04	-1.37	-0.70	-1.10	-1.46	-2.40	-1.34
2003-2004	0.71	0.82	2.15	2.92	2.84	1.46	1.92	2.41	1.66
2004-2005	-0.41	0.77	0.61	1.81	1.45	1.37	1.64	2.08	1.51
2005-2006	0.70	0.93	2.48	2.21	2.83	1.13	1.66	2.65	1.55
2006-2007	-0.20	0.98	1.54	2.10	2.47	1.83	2.04	2.85	2.04
2007-2008	-0.59	-0.19	-2.95	-2.12	-2.33	-1.38	-1.88	-2.37	-1.77
2008-2009	-0.40	-0.21	-2.59	-2.61	-2.79	-2.12	-2.35	-2.34	-2.29
2009-2010	0.07	0.47	0.19	1.17	1.16	0.68	0.98	0.66	0.83
2010-2011	0.44	0.56	1.05	1.90	2.17	1.18	1.43	1.19	1.28