European Equity Markets and EMU:

Are the differences between countries slowly disappearing?

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First Draft, October 1998
This Version: October 1998

Abstract

During the 1980s country effects have been larger than industry effects in the equity markets of Western Europe. This has continued to be the case for the EMU countries in the 1993-1998 period, despite the convergence of interest rates and the harmonization of fiscal and monetary policies following the Maastricht Treaty of 1992. As of now, there is no evidence that the differences between countries have disappeared.

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I thank ARCAS - Wessels Roll Ross for providing the data used in this paper.

One of the most surprising empirical regularities in international equity markets is the low correlation among country portfolio returns. For example, between 1970 and 1998, the average correlation between the MSCI index returns of Japan and the United States has been 0.25, and the correlation between the United Kingdom and the United States 0.50. These correlations are low because these country indices correspond to portfolios that are well-diversified in terms of the number of securities that they contain. By comparison, the correlation between two random portfolios obtained by splitting the SP500 into halves exceeds 0.99.

There are a variety of explanations for these low correlations. First, there is a home bias in the portfolio holdings of investors (French and Poterba (1991), Cooper and Kaplanis (1994), Tesar and Werner (1995)). Instead of diversifying across all markets and holding a portfolio that mirrors the world portfolio, investors have historically strongly overweighted domestic securities in their portfolios. If the marginal investor of Dutch securities lives in Holland, and the marginal investor in French securities in France and they evaluate stocks relative to other stocks in their country, country portfolios may in part reflect the different sentiment of Dutch and French investors.

A second explanation does not rely on investor myopia. Instead it emphasizes that country indices differ in terms of sector composition. For example, relative to Switzerland, the Swedish index contains more firms in basic industries while Switzerland has more banks. To the extent that basic industries and banks are imperfectly correlated, the country indices of Sweden and Switzerland will be imperfectly correlated.

A third explanation is that there are important economic shocks that affect firms differently across countries. This may be because the shocks are regional in nature, such as a change in fiscal or monetary policy that specific to a country. Alternatively, it may be that national markets respond differently to global shocks, because differences in institutions across countries affect the transmission of global shocks to asset values. Either way, economic shocks can cause variation in stock returns that is country-specific.

Prior empirical evidence has shown that differences in the industrial makeup of countries only plays a minor role in explaining country correlations (Beckers et al (1992, 1998), Heston and Rouwenhorst (1994,1995)). Instead the low correlations are primarily due to large country-

specific sources of return variation. In other words, the occurrence of shocks that affect banks in Switzerland differently from banks in Sweden is more important for explaining the low correlation between their country returns than the fact that Sweden has fewer banks. Or alternatively, cross-country variation in investor sentiment drives a wedge between the return of firms that are in the same sector but located in different countries. Heston and Rouwenhorst (1995) also show that the these country effects are dominant even in geographically concentrated, and economically integrated regions such as Western Europe. They argue that country effects are likely to be even more important for returns of countries that are geographically further apart, a hypothesis that was confirmed by Griffin and Karolyi (1998).

At the same time there is a belief among members of the investment community that country effects in certain regions of the world may be disappearing. With the approach of the European Monetary Union (EMU) member countries have increasingly coordinated their monetary and fiscal policies. During the past five years, the spread between interest rates of EMU countries has decreased, and governments have started to bring their fiscal deficits in line with the guidelines set out in the Maastricht Treaty of 1992. In addition, many sectors have experienced an increase in cross-border merger activity to prepare for a common European market. Will this ultimately lead to a decrease in the size of country effects, and therefore a diminished role for country selection in European portfolios? A recent Morgan Stanley Dean Witter report states that "*...while country influences will continue to be important, the intra-EMU-Europe activity will likely over time shift away from country level decisions, and more toward more active stock and sector strategies.*"[1] And a Goldman Sachs report notes that "*.....from the perspective of EMU, it seems likely that the ability of any analytical system to generate country rotation signals within Europe will fall as interest rate and exchange rate changes among countries included in EMU fade into history.*"[2]

At this point, it is mostly speculation whether the importance of country specific return

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[1]Global Equity and Derivative Markets, Special Edition: Europe, Morgan Stanley Dean Witter Quantitative Strategies, June 1998, pp. 54-55.

[2] Sectors Versus Country. When is an Asset Class an Asset Class?, Portfolio Strategy Europe, Goldman Sachs Investment Research, March 1998, pp 21

variation will disappear in Europe. Perhaps the recent history of European markets following the Maastricht Treaty of 1992 can provide a glimpse of things to come. This article shows that despite the fiscal and monetary coordination by many European states following the Treaty, there has been no tendency for country effects to disappear from European stocks. As was the case prior to the Treaty, country effects in stock returns continue to dominate industry effects.

Data and Summary Statistics

The paper analyzes the returns of all 952 stocks in the Morgan Stanley Capital International (MSCI) indices of twelve European countries between 1978 and August of 1998: Austria (32 firms), Belgium (41), Denmark (36), France (134), Germany (100), Italy (103), The Netherlands (34), Norway (55), Spain (55), Sweden (73), Switzerland (75), and the United Kingdom (214). Except for Sweden and Switzerland, these countries are members of the European Union, while Denmark, Sweden and the U.K. are members of the European Union but not projected to be part of the EMU in 1999. A firm is in the sample only in those months that it was part of one of the twelve MSCI country indices. Each firm is assigned to one of seven broad industry categories defined by the Financial Times Actuaries: Basic Industries (205 firms), Capital Goods (143), Consumer Goods (265), Energy (28), Finance (214), Transportation (38), and Utilities (59).

Table 1 summarizes the value-weighted performance of countries and sectors between 1978 and August of 1998. For ease of comparison, all returns are expressed in a common currency, the Deutschmark, and expressed as percent per month. Over the full sample period of more than twenty years, country returns have been more volatile than industry returns: six of the twelve countries experienced a higher standard deviation of returns than the most volatile industry (Energy), and all country standard deviations are higher than the four least volatile industries. The average full sample country correlations have historically been lower than industry correlations: the average pair-wise correlation between countries is 0.41 and between sectors 0.71. A similar picture arises from looking at country and sector correlations with the "European market", defined as the value-weighted index of the twelve sample countries. The average country correlation with the European market is 0.63, the average correlation of industries 0.86. This suggests that sectors have historically been closer substitutes than countries.

Some caution is in place in comparing these correlations, because country portfolios have on average fewer securities than industry portfolios, and are for that reason less well diversified. Also, since each country and sector is also part of the market, the larger countries (sectors) will tend to have higher correlations with the European market (for example U.K. 0.82).

Correlations by sub-period

How close does the return in a country or sector track the return on a portfolio of stocks from other countries and sectors? Table 2 gives the correlations between each country and sector with an index of stocks that includes every firm not in that particular country/sector. Two patterns emerge. First, the average correlation is lower for countries than sectors, which implies that sectors tend to move together more than countries do. The second finding is that both country and sector correlations tend to be higher in the second half of the sample than in the first half, although the average increase is not as pronounced for sectors as it is for countries. Interestingly, the estimated correlation for the largest country in terms of market cap (U.K.) shows very little variation over the sub-samples, and is the lowest among the twelve countries between 1993 and 1998:8. During this period the U.K. contributed on average 36 percent of the total market capitalization of the sample. By comparison, the largest sector (consumer goods) accounted for 33% of the total market cap, yet its correlation with firms in other sectors was considerably higher at 0.87. This suggests that the dominance of country effects has not disappeared. However, since countries differ in terms of sector composition, a country's performance relative to the market is an imprecise measure of its country effect. For similar reasons, a sector's relative performance is a noisy measure of its industry effect. A more precise estimation of industry and country effects is the subject of the next section.

A decomposition of stock returns

Assume that the return on each stock can be decomposed into four components: a common factor (α) which is shared among all securities, an industry factor (β) and a country factor (γ) to represent the influence of the industry and country that the stock belongs to, and an idiosyncratic disturbance (e). The return on a stock *i* that belongs to industry *j* and country *k* is:

$$R_{i,t} = \alpha_t + \beta_{j,t} + \gamma_{k,t} + e_{i,t} \qquad (1)$$

To estimate the realizations of the common factor, industry factors and country factors, I estimate for each month the following cross-sectional regression of returns on a set of industry and country dummies:

$$R_i = \alpha + \beta_1 I_{i1} + \beta_2 I_{i2} + ... + \beta_7 I_{i7} + \gamma_1 C_{i1} + \gamma_2 C_{i2} + ... + \gamma_{12} C_{i12} + e_i \qquad (2)$$

where I_{ij} = 1 of firm *i* belongs to industry *j* (zero otherwise), and C_{ik} =1 if firm *i* belongs to country *k* (zero otherwise). By running a cross-sectional regression for each month, one obtains a time series of estimated industry and country effects.

There are two issues in the estimation of equation (2). First, Weighted Least Squares is used instead of Ordinary Least Squares: each firm's return is weighted by its market capitalization at the beginning of the month, so that in the estimation of the country and industry effects a large firm has the same weight as two firms half its size. Second, the βs and the γs need to be restricted to avoid perfect multi-collinearity in equation (2). Intuitively, the problem is that because each firm belongs to both an industry and a country, industry and country effects can only be measured relative to a benchmark. One can choose an industry in a particular country, but a more natural benchmark is to use the value-weighted index of all twelve countries, which I will refer to as the "European" market[3]. This means that I will compare the performance of industries and countries relative to the European value-weighted average. The estimated βs and γs have the interpretation of excess returns relative to the value-weighted European index return. For example, β_j is the excess return on a diversified portfolio of stocks that invests in industry *j*, has

[3]The exact restrictions are that for each month *t*:

$$\sum_{k=1}^{12} w_{k,t}\ \gamma_{k,t} = 0 \quad , \quad \sum_{i=1}^{7} w_{j,t}\ \beta_{j,t} = 0$$

where $w_{k,t}$ and $w_{j,t}$ respectively correspond to the weights of country *k* and industry *j* in the European index at the beginning of month *t*.

no net position in other industries, and has the same country composition as the European value-weighted index. It is therefore the excess return corresponding to a pure industry tilt. Similarly, γ_k is the excess return of a portfolio of stocks in country *k* that has the same industry composition as the European value-weighted index, and represents the excess return of a pure country tilt. The time series of βs and γs provide information about the tracking errors associated with deviating from country and industry composition of the European market, or alternatively the room that is available for active sector and country management of a European portfolio.

The relative importance of country and industry effects 1982-1998:8

Table 3 summarizes the estimated values of the industry and country effects between 1978 and 1998:8. Evaluated over the full sample, country effects have been more variable than industry effects: the standard deviation of the country effects of eight of the twelve countries has been higher than the most volatile industry effect (Energy). Because industries and countries differ in size, I also report the average absolute value of the country and industry effects over time. On each date the absolute value of the country and industry effects are weighted by their respective market capitalizations[4]. The average country effect is 2.76 per cent per month (in absolute value) while the average industry effect is 1.47 per cent per month. This means that an industry-neutral country tilt relative to the European index has given on average rise to a tracking error that has been twice as large as a country-neutral industry tilt of similar size.

The next columns give a breakdown of the industry and country effects by 5-year sub-period. Both industry and country effects are somewhat smaller during the first half of the sample than during the second half, but country effects are larger than industry effects in every five year

[4] The average absolute country and industry effects are computed as:

$$\sum_{t=1}^{N}\sum_{k=1}^{12} w_{k,t}\,|\gamma_{k,t}| \qquad , \qquad \sum_{t=1}^{N}\sum_{j=1}^{7} w_{j,t}\,|\beta_{j,t}|$$

Note that without taking absolute values these sums would be zero by construction (see footnote 3).

sub-period. For example, during the last sub-period of 1993-1998:8, which follows the Maastricht Treaty of 1992, the volatility of the country effects is larger than the volatility of the most volatile industry effect (Energy) in all but one country (The Netherlands). A similar pattern emerges from Figure 1, which shows the 36-month moving average of the absolute value of the industry and country effects, the latter broken down by EMU and non-EMU countries. It is striking that as of August of 1998 the moving averages are very close to their 1981 levels, the beginning of the sample. For most of the last two decades, the country effects of the EMU countries have exceeded those of non-EMU countries, both being larger than the industry effect in every 36 month sub-period.

The question whether differences between countries will slowly disappear under EMU continues to be speculative. What can be concluded from Table 3 and Figure 1 is that despite the convergence of economic policies and interest rates among EMU countries following the Maastricht Treaty of 1992, there is no evidence that industry effects have become more important than country effects in European stock returns. During the past 5 years country-neutral industry tilts have continued to cause smaller deviations from the European benchmark than industry-neutral country tilts.

Summary and Conclusions

Since 1982 country effects in stock returns have been larger than industry effects in the geographically concentrated, and economically integrated countries of Western Europe. This has continued to be the case during the 1993-1998 period, despite the convergence of interest rates and the harmonization of fiscal and monetary policies following the Maastricht Treaty of 1992. What are the practical implications of these findings for portfolio managers? For passive managers, who attempt to match the performance of their portfolios to the European market, it is still more important to get the country composition of their portfolios right than the sector composition. Active managers may conclude that the room for country selection continues to be large in Europe. However, the success of active country and sector strategies depends on their ability to successfully exploit this room and time these effects, a topic that is beyond the scope of the current paper.

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Table 1: Average Performance of European Countries and Industries 1978:1 -1998:8

The table gives the average return and standard deviation of 12 European country and 7 industry portfolios, as well as their correlations. Returns are computed in Deutschmarks and expressed in percent per month .

Countries	Monthly returns		Correlations											
	mean	stdev	Aus	Bel	Den	Fra	Ger	Ita	Net	Nor	Spa	Swe	Swi	UK
Austria	0.67	6.56	1.00											
Belgium	1.65	4.83	0.36	1.00										
Denmark	1.42	5.23	0.28	0.38	1.00									
France	1.75	6.12	0.39	0.57	0.35	1.00								
Germany	1.14	5.47	0.58	0.55	0.46	0.59	1.00							
Italy	2.29	7.47	0.27	0.35	0.40	0.45	0.37	1.00						
Netherlands	1.59	4.91	0.40	0.58	0.46	0.55	0.64	0.40	1.00					
Norway	1.62	7.51	0.33	0.43	0.34	0.43	0.39	0.21	0.55	1.00				
Spain	2.02	6.49	0.32	0.41	0.38	0.41	0.43	0.42	0.43	0.27	1.00			
Sweden	2.19	7.17	0.27	0.32	0.33	0.33	0.40	0.30	0.40	0.34	0.47	1.00		
Switzerland	1.15	5.14	0.47	0.50	0.42	0.50	0.68	0.32	0.62	0.43	0.43	0.38	1.00	
United Kingdom	1.64	5.34	0.26	0.39	0.23	0.45	0.39	0.27	0.48	0.37	0.37	0.34	0.42	1.00
Europe	1.49	4.15	0.50	0.64	0.47	0.73	0.77	0.52	0.76	0.52	0.59	0.53	0.73	0.82
Industries														
			Bas	Cap	Con	Ene	Fin	Tra	Uti	Eur				
Basic Industries	1.23	4.58	1.00							0.93				
Capital Goods	1.31	4.87	0.91	1.00						0.92				
Consumer Goods	1.61	4.25	0.89	0.87	1.00					0.95				
Energy	1.67	5.58	0.60	0.58	0.57	1.00				0.70				
Finance	1.46	4.67	0.84	0.83	0.85	0.56	1.00			0.94				
Transportation	1.10	5.25	0.81	0.78	0.75	0.53	0.76	1.00		0.80				
Utilities	1.73	4.23	0.65	0.65	0.68	0.42	0.70	0.59	1.00	0.74				

Table 2: Correlation of countries / industries with European market exclusive of that country/industry

	Correlation with index of stocks outside country/industry				
Country	Full Sample	1978-1982	1983-1987	1988-1992	1993-1998:8
Austria	0.49	0.12	0.39	0.54	0.76
Belgium	0.62	0.24	0.68	0.73	0.70
Denmark	0.46	0.09	0.36	0.61	0.69
France	0.65	0.40	0.69	0.68	0.80
Germany	0.65	0.51	0.63	0.65	0.79
Italy	0.44	-0.01	0.46	0.71	0.60
Netherlands	0.71	0.56	0.71	0.79	0.81
Norway	0.51	0.33	0.59	0.56	0.62
Spain	0.55	0.14	0.55	0.60	0.74
Sweden	0.49	0.31	0.57	0.46	0.69
Switzerland	0.66	0.31	0.69	0.80	0.70
United Kingdom	0.51	0.51	0.56	0.57	0.49
Country Average	**0.56**	**0.29**	**0.57**	**0.64**	**0.70**
Industry					
Basic Industries	0.91	0.86	0.94	0.92	0.88
Capital Goods	0.90	0.79	0.94	0.92	0.88
Consumer Goods	0.90	0.84	0.95	0.94	0.89
Energy	0.60	0.36	0.66	0.66	0.78
Finance	0.88	0.79	0.90	0.93	0.87
Transportation	0.80	0.61	0.81	0.86	0.83
Utilities	0.70	0.25	0.72	0.83	0.82
Industry Average	**0.81**	**0.64**	**0.84**	**0.87**	**0.85**

Table 3: Industry and country effects in European stock returns 1978-1998:8

	Full sample		1978-1982		1983-1987		1988-1992		1993-1998:8	
Country effects (γ)	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
Austria	-0.79	5.81	-1.25	4.41	-1.03	7.16	0.08	7.44	-0.94	3.53
Belgium	0.13	4.00	0.11	4.98	0.47	4.36	-0.37	3.52	0.29	3.03
Denmark	-0.10	5.00	0.57	5.29	-1.09	6.22	-0.14	4.65	0.23	3.63
France	0.27	4.19	0.50	5.40	0.53	4.35	0.14	4.01	-0.05	2.82
Germany	-0.31	3.48	-0.81	2.40	-0.60	4.40	-0.17	3.90	0.26	2.90
Italy	0.78	6.42	2.14	8.48	1.12	6.76	-0.53	4.28	0.45	5.38
Netherlands	0.07	2.91	0.02	3.21	-0.25	3.43	-0.16	2.34	0.61	2.54
Norway	0.15	5.91	0.58	7.77	0.53	5.97	-0.23	5.38	-0.20	4.30
Spain	0.50	5.26	-0.18	5.26	2.06	6.42	-0.95	4.70	1.01	4.16
Sweden	0.78	6.12	1.67	6.68	-0.03	5.42	0.58	8.02	0.90	3.87
Switzerland	-0.35	3.58	-1.05	3.95	-1.03	3.85	0.24	2.87	0.37	3.39
United Kingdom	0.14	3.03	0.46	2.96	0.40	3.33	0.33	2.90	-0.55	2.87
Average absolute country effect	**2.76**		**2.86**		**3.25**		**2.53**		**2.44**	
EMU-members countries	3.04		3.09		3.80		2.82		2.52	
Non-member countries	2.52		2.67		2.79		2.27		2.38	
Industry effects (β)										
Basic Industries	-0.19	1.65	-0.14	1.47	0.18	1.54	-0.38	1.70	-0.40	1.83
Capital Goods	-0.20	1.86	-0.14	1.97	-0.65	1.66	-0.02	1.58	-0.01	2.10
Consumer Goods	0.09	1.25	0.11	1.57	0.20	1.04	0.23	1.08	-0.15	1.24
Energy	0.09	3.94	0.17	5.40	0.26	4.24	0.05	3.21	-0.09	2.57
Finance	0.05	1.56	0.00	1.44	0.12	1.25	-0.19	1.42	0.25	1.97
Transportation	-0.23	2.98	-0.56	3.18	0.00	3.43	-0.16	2.90	-0.21	2.44
Utilities	0.13	2.72	0.26	2.80	-0.59	3.46	0.46	2.15	0.37	2.27
Average absolute industry effect	**1.47**		**1.82**		**1.44**		**1.24**		**1.40**	

FIGURE 1: Absolute Country and Industry Effects
36-month moving average