RESEARCH PAPERS OF WROCŁAW UNIVERSITY OF ECONOMICS No. 138
Financial Sciences 5 2010

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COUNTRY VERSUS INDUSTRY EFFECTS IN EURO-ZONE CORPORATE PERFORMANCE – A DYNAMIC APPROACH

Summary: This study aims to compare the relative importance of industry and country factors in corporate performance within euro zone. Classification methods of clustering analysis were employed in order to verify whether the similarities between enterprises follow the country or the industry patterns more. The territory of the analysis was limited to nine euro-zone countries, which is a highly integrated area, and therefore fairly homogenous. Findings provide empirical evidence about the increasing role of industry factors in comparison with the previous findings. The main practical implication of the study is therefore the growing importance of cross-industry diversification strategies in comparison to the traditional cross-country investment diversification.

Key words: industry effect, country effect, corporate performance.

1. Introduction

How to search for the factors determining corporate performance is a question asked by many researchers in the area of finance. The factors could be both external, including e.g. macroeconomic, political or social conditions affecting an enterprise, and internal, i.e. controlled by an entity, such as its size or managerial competence. This study focuses on external aspects of corporate performance, specifically on the country of origin of an enterprise and its industrial sector. Both factors have significant influence on corporate activity and therefore economic results, which are reflected in financial ratios.

The following research is involved in an important stream of contemporary economy and finance, which can be defined as the analysis of reasons and consequences of the diversity of objects. The objects can be treated here either as countries or as industrial sectors. The country effect can be defined as the occurrence of certain factors specific for a particular country and therefore affecting economic entities of that country in a similar way. Industry effect is interpreted likewise.

A clear lack of homogeneity among researchers of country and industry effects and the relative importance of these two effects implies the need for further investigation of the problem. Some contradictions between the results of different

studies, depending on methodology, period or population make it clear that it is purposeful to apply alternative methods of solving the problem, also within the European area.

Furthermore, most of the hitherto analyses have focused on corporate performance reflected mainly in their stock returns. There are few of those which consider fundamental ratios, however, which can be an equally important criteria for investment decisions, especially in the long-term. Therefore updating and broadening the study of country and industry effect within the euro zone seems a useful addition of knowledge to this area.

The analysis of this sort is particularly important in terms of risk diversification. On the one hand, the issue of corporate performance diversity depending on industry, i.e. the industry effect, plays an important role in cross-industry investment diversification. The country effect, on the other hand, is crucial from the point of view of cross-country diversification. It is also related to the integration processes taking place within Europe, as they can affect the relative importance of the two effects.

In the first, theoretical part of the paper the results of the previous studies concerning country and industry effects are discussed. The following empirical research attempts to verify which of the two effects prevails when influencing the financial condition of enterprises in the euro-zone. In order to measure the financial condition, a set of appropriately selected ratios was employed. The ratios are meant to enable a fairly complete corporate performance evaluation. They reflect two basic criteria of corporate assessment, i.e. effectiveness and risk. These criteria are at the same time the most obvious aspects considered when making investment decisions.

2. Review of studies on country and industry effects

Finding the determinants of covariance in stock returns among countries has long been challenging both researches and practitioners of portfolio management. The early studies [Grubel 1968; Levy, Sarnat 1970; Solnik 1974] prove a low correlation between return indices in different countries and argue that the benefits of cross--country diversification exceed its costs due to e.g. higher transaction costs, political or cultural differences or currency risk. However, it is not clear where the source of these benefits is. Some analysts claim that those benefits result from differences in monetary and fiscal policies, from interest rates, budget deficits and national growth rates. Others believe that the reasons for benefits from geographical diversification are due to the diversity of industrial structures among countries.

Industry factors were first considered as potential determinants of stock returns in the 1960's. A clear meaning of these factors is shown in the study of structure of American returns [King 1966; Meyers 1973]. The international importance of industrial sectors was addressed by Lessard [Lessard 1974]. His analyses of stock exchange indices and industry indices reveal the dominance of country effects. These

results are also confirmed by Grinold et al. [Grinold, Rudd, Stefek 1989], although they demonstrate significant differences across countries and industries analysed, which is reflected in the conclusion: "Most countries are more important than industries, but most important industries are more important than the less important countries".

Most literature tends to confirm similar statements concerning the dominance of country factors over industrial ones [Beckers, Connor, Curds 1996; Beckers, Grinold, Rudd, Stefek 1992; Cavaglia, Cho, Singer 2001; Griffin, Karolyi 1998; Heston, Rouwenhorst 1994, 1995; Kuo, Satchell 2001; Rouwenhorst 1999]. One of the few exceptions in this fairly homogenous literature is the study by Roll [Roll 1992], who recognized industrial factors as more important. Another study by Beckers et al. [Beckers, Connor, Curds 1996] shows that industrial factors prove more significant when a more detailed industrial classification is employed (36 different sectors instead of just 7 main branches). In any case though, country effects still prevail. Moreover, they show that the member countries of the European Monetary Union are characterized by a significantly higher integration level than other countries. Similar conclusions were drawn by Griffin and Karoloi [Griffin, Karolyi 1998], who considered two levels of industrial classification (66 and 9 industries). A more detailed classification leads to a higher significance of industrial factors.

As correlations are crucial in terms of benefits from cross-country diversification, there have been many attempts to explain which country factors are responsible for low correlation coefficients. Surprisingly, not all of them are strictly related to the integration level of international markets. A literature review shows some likely reasons for their low correlation. According to some studies, they result from different industrial structures across countries, which are revealed in the construction of stock exchange indices. Therefore, as there is no correlation between different industries, capital markets involving different industries are not going to be correlated, either. Consequently, these are the industrial factors that are crucial [Roll 1992].

However, Heston and Rouwenhorst [Heston, Rouwenhorst 1994] prove that the influence of pure industry factor is insignificant. On the contrary, country factors are of big impact and they dominate any other kinds of influence. With the use of monthly stock returns from 7 industries in 12 European countries in 1978-1992 they show that the method of recognizing industrial factors employed by Roll already includes country effects and therefore it overestimates the importance of industry effect.

Other researchers [Drummen, Zimmermann 1992; Grinold, Rudd, Stefek 1989; Lessard 1976] also support the theory of low influence of industry factors upon stock exchange indices. However, these studies reveal a more important role of industries than previously indicated. Similar conclusions can be drawn from a study of developing countries [Serra 2000], which confirms that market returns are mainly influenced by country factors and that the international correlation does not depend on industrial structure of indices. Employing a detailed classification does, however,

show that ignoring industry effect results in significantly smaller benefits from diversification. The domination of country effects over industrial ones can also be seen in other studies of developing markets, as opposed to developed economies [Phylaktis, Xia 2006].

Some of the differences among countries can be explained by their different exposition to global risk [Ferson, Harvey 1993]. Another factor potentially responsible for different results of national stock exchanges is the market segmentation resulting from the dominance of domestic investments. In such a case different market behaviours can be caused by differences in preferences and in market evaluations performed by domestic investors, who hold the majority of stocks. The diversity of policies and institutions across countries can be another reason for segmentation. It can result in producing economic shocks affecting only one country, or affecting more countries, but not in the same way.

Some later studies though [Baca, Garbe, Weiss 2000; Brooks, Del Negro 2004; Cavaglia, Brightman, Aked 2000; Flavin 2004; L'Her, Sy, Tnani 2002; Weiss 1998], have shown that recently industry effects equal or sometimes even prevail country effects. This in turn implies that the combination of cross-country and cross-industry diversification might prove more efficient in terms of risk reduction than traditional international diversification.

Recent changes concerning the relative importance of country and industry effect are usually attributed to the progress of globalization, as well as to the integration of financial markets. Over the last decades, many enterprises aimed at consolidating and optimizing their activities globally, which resulted in their international expansion and a series of mergers and takeovers [Cavaglia, Cho, Singer 2001]. As a result, companies have become more diversified internationally, so country-specific economic shocks have less powerful influence upon domestic markets. At the same time though, they are affected by similar changes due to the integration of global capital markets [Freimann 1998]. Such transformations tend to blur boundaries among countries and make the country effect less significant in comparison with the industry effect.

It could be expected that the higher the market segmentation, the bigger the influence of the country effect. Therefore in integrated capital markets it should be the industry factors that play more important role.

Most practitioners believe that nowadays industry-specific factors are more important in terms of stock returns than nationalities. According to a report on the impact of euro upon European financial markets [Galati, Tsatsaronis 2003], in 1997 only 20% of portfolio managers considered cross-industry portfolio diversification strategies more effective than cross-country strategies. 50% of them thought that country factors still dominated. Four years later, however, the proportion inversed with about ¾ of managers thinking that cross-industry strategies were better than international diversification. Merely 10% of them still believed in the domination of country effects.

To sum up, we can observe a growing significance of industry factors as determinants of stock returns. It could be argued that such changes, especially when concerning member countries of the European Monetary Union, are a natural consequence of economic and fiscal convergence within this area. However, harmonization does not seem to be the direct reason, as a similar increase in industry-specific factors is characteristic for most developed countries. The shift should therefore be attributed to the globalization of the world economy, rather than to the economic convergence of the euro-zone.

3. Data description

The Directorate General for Economic and Financial Affairs of the European Commission collects and harmonizes annual company financial report statistics for European countries. The information is published in the BACH database (Bank for the Accounts of Companies Harmonized), which is a rich data source organized by year, country, industry and size of firm. It is a database containing harmonized annual accounts statistics of non-financial enterprises. The database was set up in 1987, in co-operation with the European Committee of Central Balance Sheet Data Offices ECCB.

The examined population involves nine European Union countries (Austria, Belgium, Germany, Finland, France, Italy, the Netherlands, Spain and Portugal), all of which belong to the euro-zone. This makes a group of countries with a high level of integration. The choice of countries was purposefully limited to the long-harmonized territory of the euro-zone in order to examine the relative importance of country and industry effect within this fairly homogenous area. The inclusion of some other countries, especially relatively new EU members, could exaggerate the influence of country effect due to significant economic differences.

For each of these countries, thirteen sectors were analysed, according to the NACE (*Nomenclature statistique des Activités économiques dans la Communauté Européenne*) classification. Enterprises were grouped at three levels, i.e. sections, subsections and divisions. The analysis includes sixteen industries at the level of sections (one-digit level). They are those industries which have three-letter symbols next to them in Table 1. The symbols are used for easier identification of industries in further analyses.

The financial sector was excluded from the analysis because of the dissimilarity of financial reports of these companies which makes it difficult to compare them with non-financial firms. Due to a very limited range of data, the remaining sectors, i.e. L – public administration and defense, P – activities of households and Q – extra-territorial organizations and bodies were also excluded.

Based on harmonized, aggregated data from yearly financial reports a number of ratios were calculated for each country, year and industry in the 7 years' period from 1999 to 2005. The analyzed ratios were categorized into three groups: profitability

Table 1. Industrial sections by NACE

NACE	Section	Symbol
A	Agriculture, hunting and forestry	AGR
B	Fishing	FSH
C	Mining and quarrying	MIN
D	Manufacturing	MNF
E	Electricity, gas and water supply	ELE
F	Construction	CST
G	Wholesale and retail trade	TRD
H	Hotels and restaurants	HOT
I	Transport, storage and communication	TRS
K	Real estate, renting and business activities	RLE
L	Public administration and defense	–
M	Education	EDU
N	Health and social work	HLT
O	Other community, social and personal service activities	COM
P	Activities of households	–
Q	Extra-territorial organisations and bodies	–

Source: author's own compilation based on BACH database.

and turnover ratios, liquidity ratios and long-term solvency ratios. The detailed list of ratios in each category is presented in Table 2.

The above list of ratios is slightly wider than in previous studies based on BACH database, although it involves most ratios analyzed previously [Cinca, Molinero, Larraz 2005]. Widening the range of financial ratios is meant to enable a more comprehensive analysis of companies. The variables are ratios of means and not means of ratios, as the available data is aggregated. Most of the ratios are stimulants, with the exceptions of ratios P_7, P_{11}, P_{12}, P_{13}, L_9, L_{10}, S_2, S_3, S_6, S_7 and S_8, which are considered anti-stimulants. Although some of the ratios, e.g. liquidity ratios should formally be considered nominants, they were also treated as variables whose higher values mean a better object evaluation, as practically there is no over-liquidity within the analysed population.

Table 2. Financial ratios employed in the analysis

Profitability and turnover ratios		Liquidity ratios		Long-term solvency ratios	
P_1	Gross operating profit/Turnover	L_1	Current assets/Short-term creditors	S_1	Gross operating profit/Interest paid on financial debts
P_2	Net operating profit/Turnover	L_2	(Current assets - Stocks)/Short-term creditors	S_2	Long-term creditors/Assets
P_3	Net profit/Turnover	L_3	(Current investments + Cash)/ Short-term creditors	S_3	Long-term creditors/Equity
P_4	Net profit/Equity	L_4	Costs of materials and consumables/ Stocks	S_4	Equity/Assets
P_5	Net profit/Assets	L_5	Turnover/Accounts receivable	S_5	Long-term creditors/Net working capital
P_6	Net profit/Net working capital	L_6	Cash/Assets	S_6	Interest paid on financial debts/ Turnover
P_7	Costs of materials and consumables/ Turnover	L_7	Current assets/Assets	S_7	Interest paid on financial debts /Financial debt
P_8	Turnover/Assets	L_8	(Current assets – Stocks)/Assets	S_8	Provisions for liabilities and charges/Assets
P_9	Turnover/Fixed assets	L_9	Stocks/Net working capital		
P_{10}	Value added/Turnover	L_{10}	Stocks/Current assets		
P_{11}	Staff costs/Turnover	L_{11}	Turnover/Net working capital		
P_{12}	Wages and salaries/Value added				
P_{13}	Financial income/Turnover				

Source: author's own compilation.

In conclusion, the following study involves thirty-two financial ratios for nine countries in a seven-years' period. In total, and taking into account the missing data items, there were 23660 observations.

4. Methodology

A natural procedure when dealing with a relatively large number of data is organizing the elements of the population according to some criteria, i.e. classifying them. The classification of objects which are combinations of both countries and industries should provide some information about the domination of one of the two effects in question. Therefore two opposing hypotheses could be formulated:

(1) country factors have bigger influence on corporate performance than industry,

(2) industry factors have bigger influence on corporate performance than country.

If different industry sectors from the same country had a tendency to group in the same clusters, it would mean that the first hypothesis is true. At the same time we could also expect that the same industry from different countries would be scattered into various clusters. In other words, the obtained clusters would be closer to the national than to the industrial division of the objects.

However, if the same industry from different countries was classified into the same cluster, whereas countries were dispersed, regardless of industry, the other hypothesis would be favoured. It would mean that the resulting categorisation is more similar to industrial than national classification of the population.

It might also occur that none of the above statements is favoured, as there might be clusters where it is difficult to indicate a dominating element of either a country or an industry. This would prove that none of the two effects prevails when affecting corporate financial condition.

Agglomerative hierarchical clustering analysis is a useful tool which can be employed in order to answer the above question. Identifying the nature of each cluster either as country-dominated or industry-dominated groups will reveal the prevailing effect.

The classification can be interpreted as categorizing objects according to their characteristic features. One of the numerous grouping methods which enables to distinguish internally homogenous categories of objects is the agglomerative cluster analysis [Hartigan 1975]. The higher the aggregation level, the smaller the similarity of objects from different groups of the organised structure. The classification of objects can be based on various characteristics. The criterion used in the following analysis is the general corporate performance measured with the use of financial ratios.

Financial condition of companies in industries and countries can be compared when an appropriate measure of similarity or dissimilarity is defined. One of such

measures could be the distance between the objects (industrial sectors in countries) which means that two objects are the more similar, the smaller the distance between them.

The algorithm of the applied agglomeration method groups the objects with the use of squared Euclidian distance, which requires previous standardisation of all variables. The ratios were normalised according to [0;1] unitarisation formula. In order to determine the distances between new clusters formed by linked objects, i.e. the amalgamation procedure, the hierarchical Ward's method was chosen, which employs the analysis of variance for estimating the distances between clusters [Milligan 1996]. The effectiveness of Ward's method in discovering data structure is better in comparison with other methods, although it tends to form clusters of small number of objects [Ward 1963].

The diagnostic variables in cluster analysis should be characterized with significant variability and independence. These conditions mean that from the initially suggested set of ratios those that do not discriminate the analyzed objects should be excluded. Similarly, the effect of doubling the information carried by different variables should also be eliminated.

The variability of ratios was examined with the use of variability coefficient. Within the set of proposed variables, none of them is a stable variable. In each case a standard deviation is at least a few times bigger than the mean. However, taking into account the interdependence of variables, several of them had to be eliminated because of correlation coefficient exceeding the arbitrarily accepted level of 0,7. As a result the following ratios were eliminated from further analysis: P_1, P_3, P_9, P_{11}, L_2, L_6, L_8, L_{10}, S_5 and S_6.

5. Results

The results of cluster analysis for sectors in countries are presented in Figure 1. Due to some missing data, the analysis involves the total of 107 cases, after excluding fishing sector for Austria and Germany, education and health sector for Italy and Germany, manufacturing for Austria and agriculture, hotels and community services for Germany.

Cutting the branches of the tree-diagram where the linkage distance is 10 allows for the identification of twelve clusters of a similar homogeneity and number of objects. The first cluster (starting from the top of the graph) is a group of rather national character, as there are seven different industries, most of which representing the Netherlands. Even stronger country effects can be observed in the second cluster, which is dominated by industrial sectors from Finland. Although there are four sectors of hotels and restaurants from different countries in the third cluster, the country effect also seems slightly stronger here because of the presence of even more different sectors from the same country, namely Italy. However, the fourth cluster is clearly dominated by industry effect, as it is concentrated mainly around

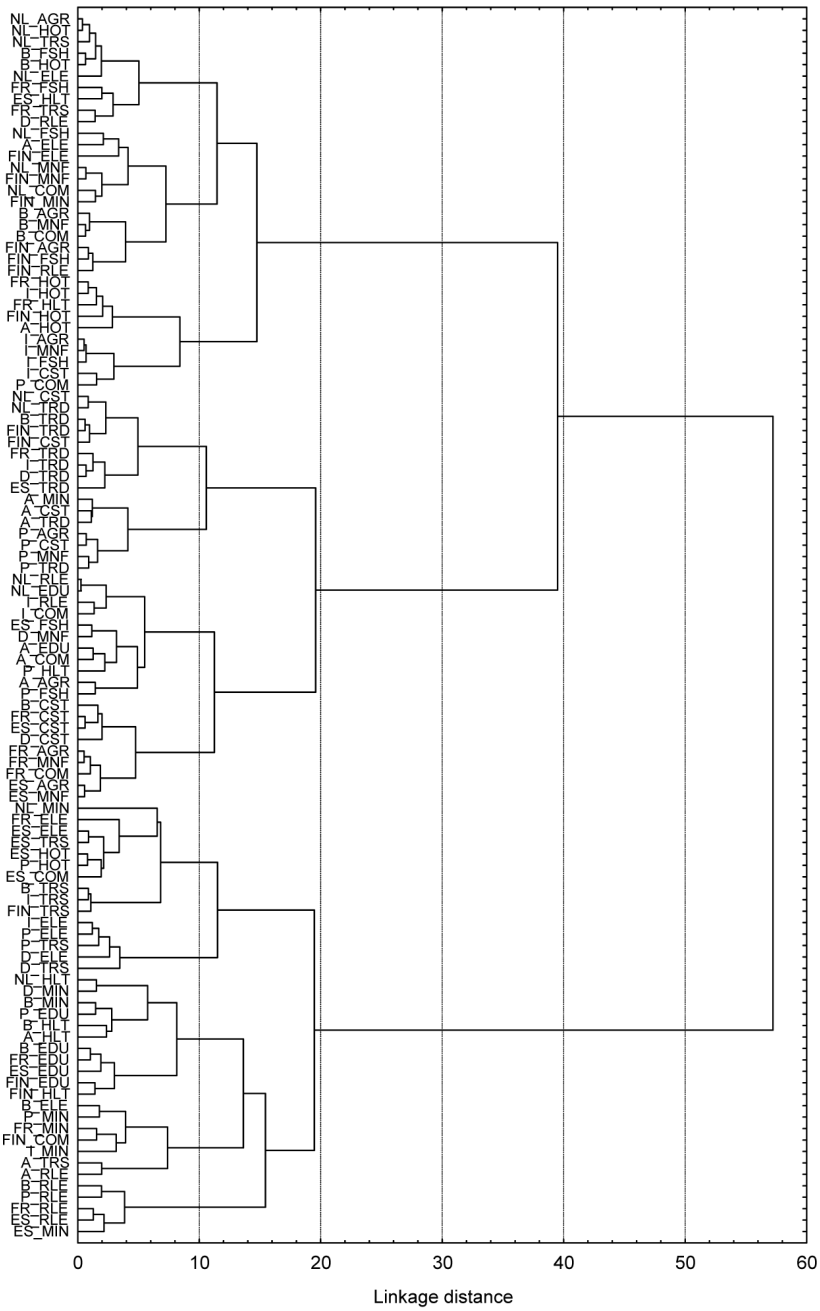

Fig. 1. Dendrogram. Ward's clusering method

Source: author's own compilation based on BACH database.

just one sector: trade, and at the same time represents almost all countries analysed. Some common influences of trade and construction industries can also be seen in the next and fifth cluster, although they are dominated by the national factors of Portugal and Austria, which are the only countries represented in this group. Austria is also the most frequent element in the sixth cluster, although it is much less obvious here which of the two kinds of factors prevail. Neither of the two effects seems to dominate in the following – seventh cluster, as there are both country (France, Spain) and industry (construction) factors present. However, the linkage distances between different sectors from France are slightly shorter than those between construction industries from different countries, which indicates objects are more similar across countries than across industries. A similar situation can be observed in the eighth cluster, which can be described as both Spain and transport-dominated.

The last four clusters, however, are clearly dominated by industry effects. They can be described as an electricity and transport group (cluster 9), education and health care (cluster 10), mining cluster (11) and real estate cluster (12).

The identification of the dominating effect can be facilitated by a comparison of the numbers of object from the same countries and the same industries in each cluster. Both specifications are shown in Tables 3 and 4.

Table 3. Numbers of sectors in clusters

Industry sector	Clusters											
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**
AGR	1	2	1	–	1	1	2	–	–	–	–	–
FSH	2	2	1	–	–	2	–	–	–	–	–	–
MIN	–	1	–	–	1	–	–	1	–	2	3	1
MNF	–	3	1	–	1	1	2	–	–	–	–	–
ELE	1	2	–	–	–	–	–	2	3	–	1	–
CST	–	–	1	2	2	–	4	–	–	–	–	–
TRD	–	–	–	7	2	–	–	–	–	–	–	–
HOT	2	–	4	–	–	–	–	2	–	–	–	–
TRS	2	–	–	–	–	–	–	4	2	–	1	–
RLE	1	1	–	–	–	2	–	–	–	–	1	4
EDU	–	–	–	–	–	2	–	–	–	4	–	–
HLT	1	–	1	–	–	1	–	–	–	4	–	–
COM	–	2	1	–	–	2	1	1	–	–	1	–

Source: author's own compilation based on BACH database.

Table 4. Numbers of countries in clusters

Country	Clusters											
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**
NL	4	3	–	2	–	2	–	1	–	1	–	–
B	2	3	–	1	–	–	1	1	–	3	1	1
FR	2	–	2	1	–	–	4	1	–	1	1	1
ES	1	–	–	1	–	1	3	4	–	1	–	2
I	–	–	5	1	–	2	–	1	1	–	1	–
A	–	3	1	–	3	3	–	–	–	1	2	–
D	1	–	–	1	–	1	1	–	2	1	–	–
P	–	–	1	–	4	2	–	1	2	1	1	1
FIN	–	6	1	2	–	–	–	1	–	1	1	–

Source: author's own compilation based on BACH database.

In conclusion, taking into consideration the character of each cluster in terms of evaluation of the relevant importance of country and industry factors, it can be said that although the nature of most clusters can be easily identified, it is still difficult to say which of the two effects has more influence on corporate performance. Five of the clusters were described as country-dominated, another five as industry-dominated and the remaining two clusters were a combination of both types of factors. The definite indication of the prevailing effect is even more difficult, as in the industry-dominated countries there are also certain symptoms of country effects. Similarly, the country-dominated clusters are not free from industrial influences.

The above clustering algorithm was performed with the use of time means of variables, which obviously reduces the number of analytical dimensions. However, it might also be interesting to observe the dynamics of the effects and to verify if there were any significant changes in time within the analytical period in terms of country and industry factors dominance. Therefore another grouping was applied separately for each of the seven years. In order to facilitate the year-to-year comparison between clusters and to maintain the same number of clusters in each year, the *k*-means grouping method was employed instead of agglomerative clustering. The latter method does not always lead to exactly the same number of clusters, as opposed to the *k*-means grouping, where the number of clusters has to be declared beforehand. The number was consequently set at twelve.

Due to the large amount of detailed results, only selected information from *k*-means grouping is presented in the paper. The following Table 5 shows for each cluster in every year the number of items from different countries and from different industries. Then, it is also indicated which country (countries) or industry (industries) were identified as the dominating elements of a given cluster. Moreover, the bolded

Table 5. K-means grouping selected results

Year	Countries (C)/ industries (I)	Clusters																							
		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		**C11**		**C12**	
1999	C	2	**NL I**	5	none	8	FR	5	**NL**	3	**B FR**	6	none	4	ES	5	**FIN ES**	2	NL P	1	**FIN**	2	D	8	none
	I	5	TRS COM	3	**AGR MNF FSH**	5	**CST**	7	FSH	6	none	4	**ELE TRS**	3	**RLE**	8	HOT	2	FSH MIN	3	none	2	ELE	1	**TRD**
2000	C	4	**NL**	4	**D**	IN	B ES P FIN	7	none	4	none	3	**FIN**	2	**I**	8	FR	1	FIN	3	FR	7	NL	1	ES
	I	8	COM	4	MIN ELE	6	TRS RLE	1	**TRD**	3	**AGR MNF**	5	HLT	3	none	5	**CST**	1	EDU	3	EDU HOT	5	**ELE**	1	FSH
2001	C	7	**NL**	8	FR	7	none	5	none	4	B P	4	**D**	2	**I**	5	B P	1	**FIN**	1	D	5	none	1	NL
	I	10	COM MIN	6	**CST**	2	**TRS ELE**	2	**MIN RLE**	3	**AGR MNF**	4	MIN ELE	3	TRD	7	**HOT**	4	none	1	TRD	1	**TRD**	1	MIN
2002	C	1	**FIN**	1	NL	6	none	6	**NL FIN**	6	B	4	FR	2	**I**	3	**P**	4	**D**	7	none	4	ES	8	FR
	I	5	None	1	MIN	1	**TRD**	8	MIN	4	**MNF**	3	**EDU HLT**	5	TRD	5	HOT	5	ELE	3	**ELE TRS**	2	**RLE**	3	**CST**
2003	C	8	NL	1	NL	1	D	6	ES	2	none	5	none	8	I	3	**FIN**	4	ES	4	D	1	FIN	8	I
	I	9	MNF	1	MIN	1	MIN	3	**HOT TRS**	1	**FSH**	3	**ELE**	3	**TRD**	7	none	2	**RLE**	2	**RLE TRS**	1	EDU	4	**CST**
2004	C	7	NL	4	FR P	4	**FIN**	7	I	1	NL	4	none	7	none	5	P	5	none	5	none	4	ES	2	**D**
	I	6	**COM**	5	AGR MNF	7	none	6	**CST**	1	MIN	4	**HOT**	1	**TRD**	3	**ELE**	2	**MIN**	2	**TRS ELE**	3	**RLE**	3	none
2005	C	3	ES	7	FR P FIN	5	none	2	B ES	2	NL FR	2	**I**	7	none	2	**D**	7	none	5	FIN	1	FIN	5	none
	I	2	**RLE**	8	**HOT**	5	**MNF AGR**	2	FSH EDU	1	**MIN**	7	none	1	**TRD**	3	ELE	4	**ELE TRS**	5	**HLT**	1	EDU	1	**CST**

Source: author's own compilation based on BACH database.

and shaded items in the table show which of the two effects in question is the prevailing one. For instance, if we take a look at the first cluster (C1) in 1999, we can see from the table that it consists of objects from only two countries (namely the Netherlands and Italy), but at the same time the objects derive from five different industries. Two of the industries (transport and community services) were distinguished as the most numerous in the cluster. However, it is the country effect that dominates within this group, due to the fact that the number of leading country items is larger than that of the leading industry.

The analysis of the table content can be further summarized by a synthetic list of the number of clusters with the dominating effect in each year, which is presented in Table 6. It shows that e.g. in 1999 there were both five industry-dominated clusters and five country-dominated ones. There were also two clusters without any prevailing effect. According to the analyses in the following years, however, the number of industry-affected clusters gradually increased – up to eight industrial clusters in the last two years. It could be argued that the analytical period of only seven years is not long enough to prove any long-term tendency. Nevertheless, the findings do show empirical evidence that the importance of the industry factors seems to grow in comparison with the country factors. This conclusion, however, might only be true for the analysed group of the euro-zone member countries.

The choice of countries makes the analytical area fairly homogenous, but it also prevents any further conclusions about the dominating effect in terms of wider geographical area, where the investment risk is more varied and where currency risk is still present.

Table 6. Number of industry- and country-dominated clusters according to k-means grouping results

Year	Industry effect	Country effect	No dominating effect
1999	5	5	2
2000	4	4	4
2001	6	4	2
2002	6	5	1
2003	7	1	4
2004	8	2	2
2005	8	2	2

Source: author's own compilation based on BACH database.

Another conclusion from the cluster analyses is that there are certain objects (countries and industries) which are particularly vulnerable to the examined effects. Country effects are most clearly observable in the case of Finland, the Netherlands, Italy and Portugal. The industries most susceptible to common industrial factors are: trade, construction, education, health care and real estate. The biggest dispersion of

industries across countries, implying relatively weaker common industry factors, concerns such industries as agriculture, fishing and community services.

6. Conclusion and implications

Evaluating the relative importance of country and industry effect is an important subject of recent research performed mainly in order to recommend appropriate investment strategies based either on international diversification in the case of country-domination effects or on cross-industry diversification in the case of industry-domination effects.

The review of the research over these two effects shows that until the early 90's capital allocation was mainly based on the assumption that national factors are the main source of stock return variability. Therefore the international diversification was considered the most effective method of reducing this variability in assets management. The main conclusion from literature review in this area is the domination of country effects over industry effects as the determinants of returns. However, more recent literature from the late 90's brings some new results in the area. Nowadays more practitioners tend to recognize global strategies based on cross-industry sections as more effective. The shift is often explained as a natural consequence of globalization and is attributed to the capital markets integration. A clear lack of literature coherence in terms of relative significance of the two effects was the main reason for reconsidering the problem within the European perspective.

With reference to the main aim of the research, which was to verify which of the two effects is more significant in influencing corporate performance, it can be said that according to the analysis both kinds of factors are almost equally important within the 7-years' analytical period treated as a whole. Even though in some cases national factors were more visible as determinants of corporate financial condition, there were also some obvious indications in other cases that the opposite is true. Therefore, although both effects are present, none of them can be definitely recognized as the dominant, at least within the analysed population. However, the dynamic approach, where each year was considered separately, reveals the growing importance of industry factors. It can be seen in the clearly higher number of industry-dominated clusters in the later years.

These conclusions raise certain important implications in terms of optimizing investment diversification strategies. The growing importance of industry factors, which seem to level with country-specific influences, or even outweigh them, suggests that the role of cross-industry diversification strategies should also increase. Therefore a combination of national and industrial diversification strategies seems more effective than traditional cross-country strategies.

However, it should be borne in mind that the above recommendation refers to the analysed territory, i.e. a group of nine highly-integrated countries, all of which are the members of the euro-zone. The extrapolation of these suggestions to other

regions of the world, or even Europe, should therefore be done very carefully, if not completely avoided. Considering a bigger number of countries in the analysis, or performing the research in other continents could verify the hypothesis differently and probably expose the bigger role of regional factors.

It can be expected that, according to the tendency initiated by the end of the previous century, the role of industry-specific effects will continue to grow. Consequently, the importance of international diversification is likely to decrease gradually. The probability of such changes seems to grow as integration processes progress.

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EFEKT KRAJU I SEKTORA W KONDYCJI FINANSOWEJ PRZEDSIĘBIORSTW W UJĘCIU DYNAMICZNYM

Streszczenie: Celem podjętego badania jest porównanie relatywnej ważności specyfiki sektora i kraju jako czynników wpływających na kondycję finansową przedsiębiorstw w strefie euro. Aby zweryfikować, czy podobieństwa występujące pomiędzy kondycją finansową przedsiębiorstw bardziej pokrywają się z podziałami narodowymi czy sektorowymi, zastosowano metody klasyfikacji w postaci analizy skupień. Zakres terytorialny analizy ograniczono do dziewięciu krajów strefy euro, jako obszaru o wysokim stopniu integracji, a zatem stosunkowo homogenicznego. Wyniki badania empirycznego pozwalają wnioskować o wzroście znaczenia czynników sektorowych w porównaniu z dotychczasowymi badaniami. Głównym wnioskiem praktycznym jest zatem rosnąca rola międzysektorowej dywersyfikacji inwestycji w stosunku do tradycyjnej metody dywersyfikacji międzynarodowej.