The ERICA series:

10. Group sizes and geographical activity

ERICA (European Records of IFRS Consolidated Accounts) WG

European Committee of Central Balance Sheet Data Offices (ECCBSO)

June 2018

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10. Group sizes and geographical activity

(Document prepared by Saskia Vennix, National Bank of Belgium)

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IMPORTANT INFORMATION ABOUT THE SOURCE USED (ERICA[1] DATABASE)

The data used in this note are obtained from publicly available financial statements of European non-financial listed groups, having been treated manually, by CBSO statistics and accounting specialists, to be fitted on a standard European format (ERICA format); this manual treatment involves, in some cases, the interpretation of the original data, a constraint that readers of this document should bear in mind.

The database does not represent the total population of European non-financial groups. Nevertheless, the coverage attained with ERICA on the listed European groups is well-attuned to the situation and national composition of the stock markets.

The opinions of the authors of this note do not necessarily reflect those of the national central banks to which they belong or those of the ECCBSO.

The "ERICA series" complement the annual report prepared on the ERICA database, with additional pieces of information and/or analysis on specific issues, using the full database ERICA, or its subset ERICA+. Due to its interest and/or the speciality of the themes treated, these short notes are diffused apart from the annual report, in the ECCBSO webpage (www.eccbso.org).

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[1] ERICA (European Records of IFRS Consolidated Accounts) is a database of the European Committee of Central Balance Sheet Data Offices.

GROUP SIZES AND GEOGRAPHICAL ACTIVITY

INTRODUCTION

In 2017, the ERICA Working Group decided to analyse the level of expansion of groups included in the ERICA database. To that end, the group agreed to collect some additional information for a limited number of non-financial listed groups. The following information was retrieved from the 2016 annual reports of 311 groups:

- Number of fully consolidated subsidiaries
- Geographical breakdown of revenue
    - Amount of revenue that can be allocated to Europe (including Russia)
    - Amount of revenue that can be allocated to the American continent
        - (of which) Amount of revenue that can be allocated to North America
        - (of which) Amount of revenue that can be allocated to South America (including Central America)
    - Amount of revenue that can be allocated to the rest of the world
        - (of which) Amount of revenue that can be allocated to Asia
        - (of which) Amount of revenue that can be allocated to Africa
        - (of which) Amount of revenue that can be allocated to Oceania

This document focuses on analysing the information gathered for the 311 groups. More specifically, it provides an overview of the size of these groups in terms of the number of subsidiaries and the location of their activities, taking account of their sector classification and country of incorporation of the parent entity. In view of the rather small sample, the resulting figures should be interpreted with care and not generalised as such. Instead, the observations give an insight into the overall trends among the main listed non-financial groups from the eight countries under review. To conclude, we tested whether groups that are active on a more global level (i.e. active on more than one continent), are more profitable.

1. INFORMATION ON GROUP SIZE

To analyse the information collected on the number of subsidiaries, we eliminated two groups from the sample, as for these groups the annual reports only permitted a geographical breakdown of the revenue. The data on the number of subsidiaries was used as follows to classify all groups into size classes:

- Small: <= 15 subsidiaries
- Medium-sized: >15 and <=50 subsidiaries
- Large: >50 subsidiaries

Size classes have also been used in other ERICA publications, but in these cases, the classification is based on the level of revenue:

- Small: < € 250 million
- Medium-sized: >= € 250 million and < € 1.5 billion
- Large: > € 1.5 billion

Table 1 compares the two definitions based on the resulting size class for all groups in the sample. The distribution of the groups among the size classes is quite comparable whether the criterion concerns the revenue or the number of subsidiaries. Based on the number of subsidiaries, the number of medium-sized groups is somewhat lower, in favour of both small and large groups. Two-thirds of the groups are in the same size class under both definitions. 17% upgrade their size classification when the number of subsidiaries criterion is used, while 16% downgrade their size classification. According to the table, it is clear that the sample is biased towards large groups, and that has an impact on the results obtained further in this report.

TABLE 1   COMPARISON OF SIZE CLASSIFICATION BASED ON DIFFERENT CRITERIA
Number of groups in 2016

		Size classes based on number of subsidiaries			
		Small	Medium	Large	
Size classes based on revenue	Small	54	21	4	79
	Medium	24	31	27	82
	Large	6	20	122	148
		84	72	153	

Source: ERICA WG

Chart 1 shows a detailed distribution of the number of groups according to their number of subsidiaries. Obviously, small groups are highly concentrated. The spread is highest among large groups. The median group includes 48 subsidiaries. Only a minority of the groups – 11 to be precise – includes more than 750 subsidiaries. These are all French and German groups, plus one Spanish group.

CHART 1   DISTRIBUTION OF THE NUMBER OF GROUPS ACCORDING TO THE NUMBER OF SUBSIDIARIES
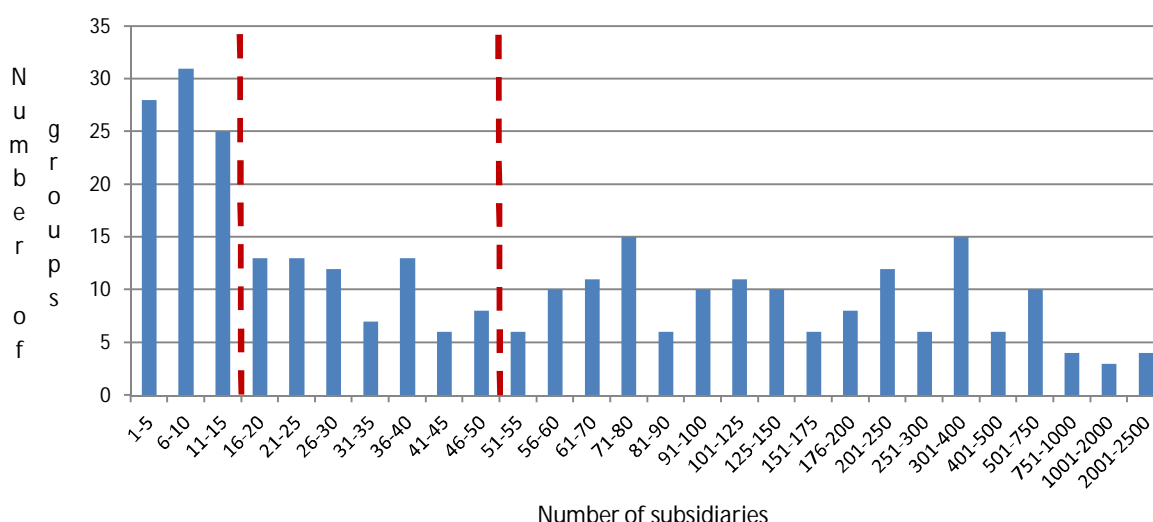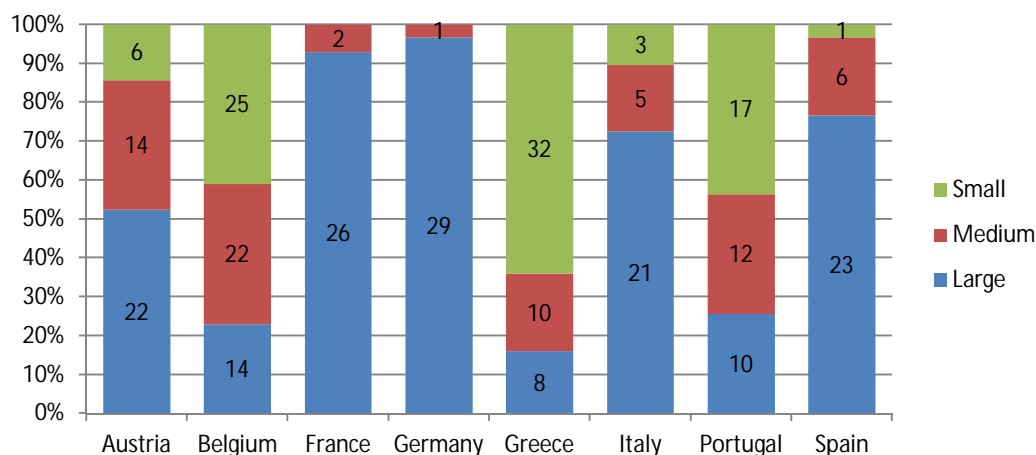

Source: ERICA WG

The assumption that French and German groups are generally larger is confirmed in chart 2, given that the French sample comprises two medium-sized groups, the German sample includes one, and neither contains any small groups at all. The Spanish sample, too, includes only one small group.

Obviously, the results obtained for these countries further in this report will be biased accordingly. Belgium, Greece and Portugal are the only countries where large groups do not make up the majority. In fact, in these three countries, small groups are the most common.

CHART 2   GROUP SIZES BY COUNTRY
(based on number of subsidiaries)

Source: ERICA WG

Analysis of the group sizes by sector (chart 3) reveals that – in our sample – large groups are relatively better represented in the construction sector, whereas they are relatively less represented in the services sector. Small groups are most common in the services sector.

CHART 3   GROUP SIZES BY SECTOR OF ACTIVITY
(based on number of subsidiaries)
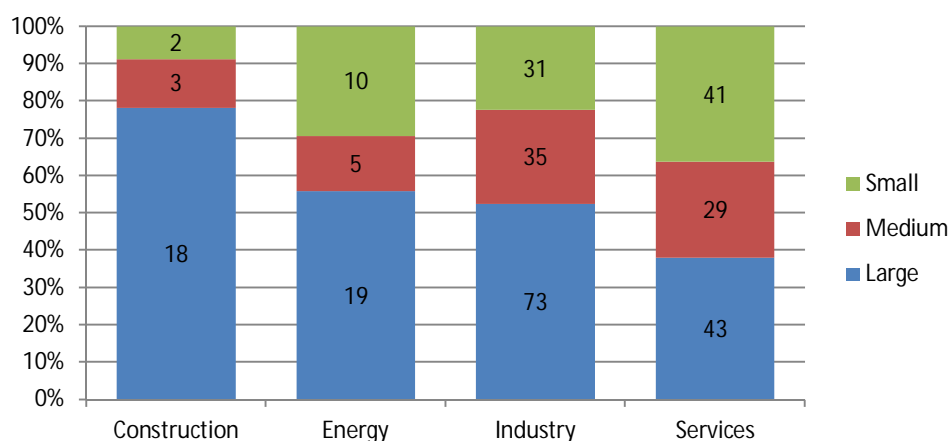
Source: ERICA WG

2. INFORMATION ON REVENUE BY REGION

In order to analyse the information collected on the geographical breakdown of revenue, 29 groups had to be eliminated from the original sample of 311 groups:

- 11 groups did not provide a revenue breakdown according to geographical location

- 8 groups apply the EMEA[2] definition, which could not be mapped according to the breakdown used in this report
- 9 groups apply another geographical breakdown, which could not be mapped according to the one used in this report either
- 1 group did not generate revenue in 2016

Therefore, the analysis is based on 282 groups.

2.1 ANALYSIS BY NUMBERS OF GROUPS

Chart 4 indicates that the majority (52.8%) of the groups under review develop activities simultaneously in Europe, America[3] and the rest of the world[4]. This finding is of course related to the fact that large groups make up half of the sample. However, despite the overrepresentation of large groups, 31.6% are active in only one continent. The graph demonstrates that once European groups develop activities out of Europe, the vast majority of them become active almost worldwide. At country level, it can be observed that French and German groups, in particular, are globalised. None of the French and German groups only generate revenue in Europe or even just in Europe and America. As chart 2 shows, this is due to the French and German samples that consist almost exclusively of large groups. Also in Spain, there is no group developing activities exclusively in Europe. Greece is the only country where the majority (66.7%) of the groups limit their activities to the European continent. For the other countries, the share of this type of groups ranges from 26.3% in Portugal to 45.3% in Belgium. Finally, it is noteworthy that groups active in Europe and America are more common in Spain, Italy and Portugal, partly owing to those countries' past colonisation activities in South America.

CHART 4   NUMBER OF GROUPS ACCORDING TO GEOGRAPHICAL ACTIVITY – BY COUNTRY
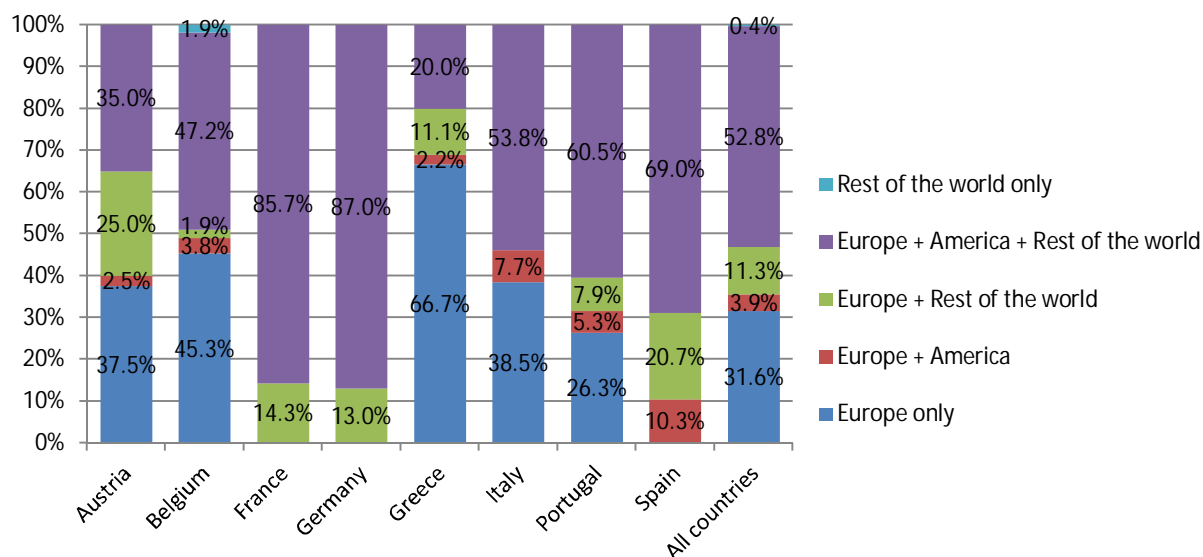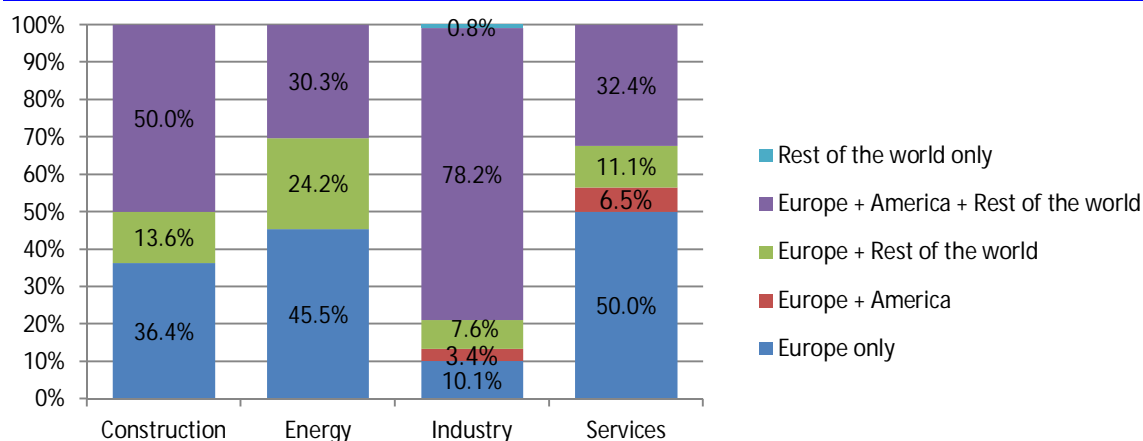

Source: ERICA WG

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[2] Europe, Middle East and Africa.

[3] North and/or South America.

[4] Asia, Africa and/or Oceania.

The same graph by sector of activity (chart 5) shows that purely European groups are more common in the services and the energy sector. Industrial groups, on the other hand, are the most globalised. The share of groups that are active almost worldwide varies from 30.3% in the energy sector to 78.2% in the industry sector. This might have something to do with the fact that industrial groups often have production facilities in low-wage Asian countries.

CHART 5   NUMBER OF GROUPS ACCORDING TO GEOGRAPHICAL ACTIVITY – BY SECTOR

Source: ERICA WG

Unsurprisingly, the larger the group, the more likely it is to operate at an intercontinental level (chart 6). 21.5% of the small groups generate revenue almost worldwide, whereas this percentage rises to 45.2% for the medium-sized groups and 73.8% for the large groups.

CHART 6   NUMBER OF GROUPS ACCORDING TO GEOGRAPHICAL ACTIVITY – BY SIZE
*(based on number of subsidiaries)*
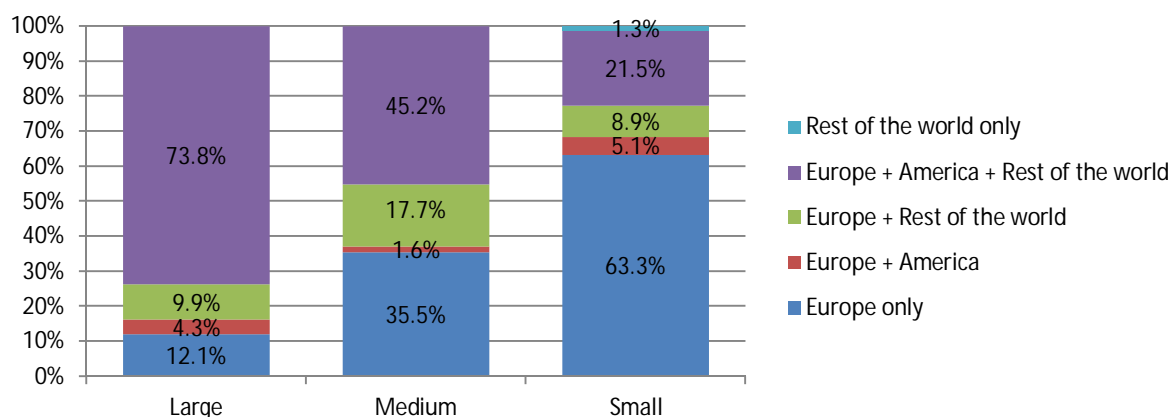
Source: ERICA WG

2.2 ANALYSIS BY REVENUE

Despite the fact that the majority of the groups do not operate solely in Europe, the biggest part of aggregate revenue is generated in Europe: 62.7% to be precise (chart 7). Overall, revenue generated in America seems more or less on a par with revenue generated in Asia, Africa and Oceania (18-19%

each). At country level, the differences are clear-cut. The share of revenue generated in Europe is lowest for German groups (57.1%). This share rises to 84.7% for Portuguese groups and 88.2% for Greek groups. Revenue allocated to America is especially substantial for Spanish (27.3%) groups. In the next section, it is demonstrated that this is largely due to significant activities in South America, linked to their past colonisation in that area, as mentioned earlier. American revenue only plays a minor role in Greek (4.7%) and Austrian (5.4%) groups. Revenue originating from Asia, Africa and Oceania is most significant for French (21.6%) and German (20.4%) groups, whereas this type of revenue is least relevant for Portuguese (5.7%), Greek (7.1%) and Italian (7.8%) groups.

CHART 7   REVENUE ACCORDING TO GEOGRAPHICAL REGION – BY COUNTRY
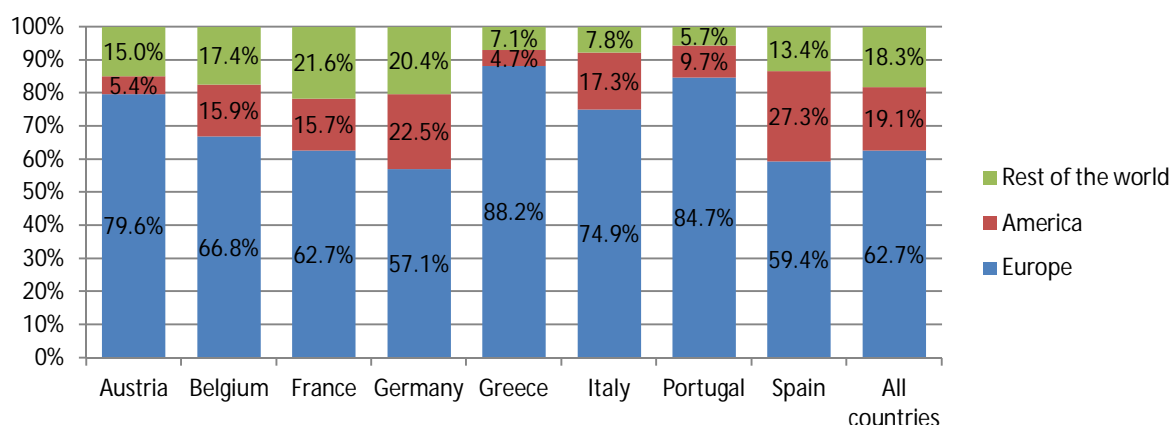
Source: ERICA WG

In the energy sector, European revenue is clearly dominant (80.2%), whereas it does not even represent half (49.2%) of aggregate revenue in the industry sector. American revenue and revenue from the rest of the world are both most relevant in the industry sector. The share of revenue from Asia, Africa and Oceania is relatively low not only in the energy sector, but also in the services sector.

CHART 8   REVENUE ACCORDING TO GEOGRAPHICAL REGION – BY SECTOR
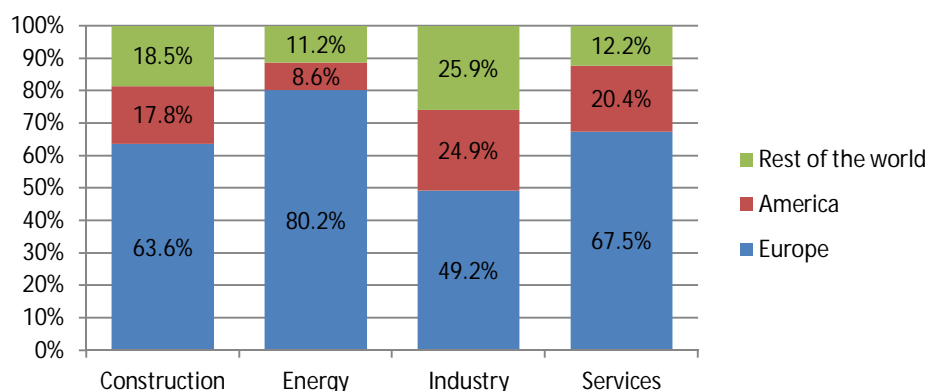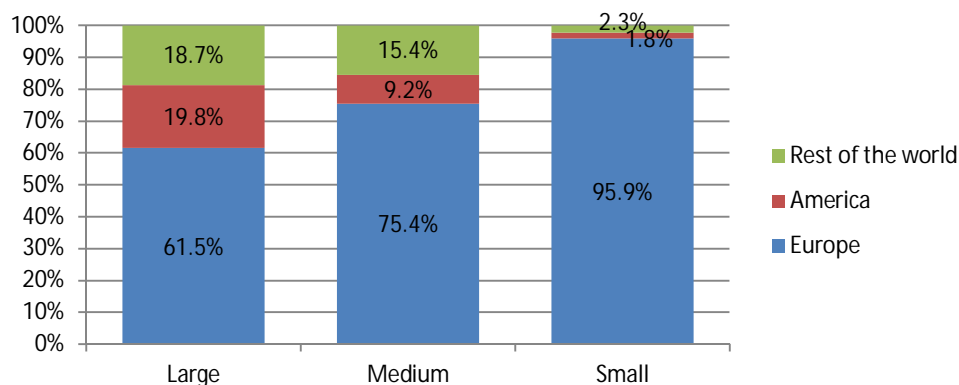

Source: ERICA WG

Chart 9 leads to conclusions comparable to those resulting from chart 6. The larger the group, the more significant the share of revenue generated out of Europe. For small groups, the share of

revenue that can be attributed to other continents is virtually marginal: 1.8% for America and 2.3% for Asia, Africa and Oceania.

CHART 9   REVENUE ACCORDING TO GEOGRAPHICAL REGION – BY SIZE
*(based on number of subsidiaries)*

Source: ERICA WG

2.3 FOCUS ON REVENUE GENERATED IN AMERICA

As stated in the introduction, more detailed information about revenue assigned to America was collected, if available in the financial statements of the groups. In this section, this detailed information is analysed in greater depth. As this information is not available in several cases, the sample had to be limited to 230 groups. Chart 10 indicates that the overall picture does not change significantly given this reduced sample. Nearly all American revenue could be assigned to either North America or South America. On aggregate, approximately two-thirds of the revenue generated in America can be attributed to North America, and around one-third to South America.

**CHART 10   REVENUE ACCORDING TO GEOGRAPHICAL REGION WITH FOCUS ON AMERICA – BY COUNTRY**
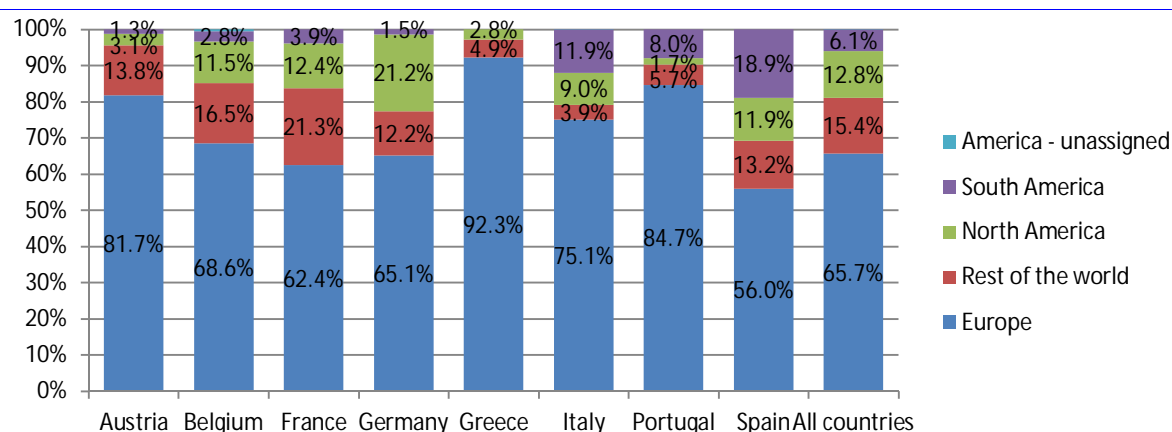
Source: ERICA WG

Information at country level reveals a clear distinction between Spanish, Italian and Portuguese groups on the one hand, and groups from the other countries on the other. For the former groups, activities in South America are obviously more relevant. In the case of Spain and Portugal, this might

be explained by the historical links between these countries and South America. In the case of Italy, it is explained by the energy provider ENEL, the largest Italian group in the sample in terms of revenue. ENEL, that also owns the majority of the shares of the Spanish energy group Endesa, has a particular focus on European and Latin American markets. North American activities are especially important for German groups (21.2%). Portuguese (1.7%), Greek (2.8%) and Austrian (3.1%) groups only generate a minor share of their revenue in the US and Canada.

CHART 11   REVENUE ACCORDING TO GEOGRAPHICAL REGION WITH FOCUS ON AMERICA – BY SECTOR
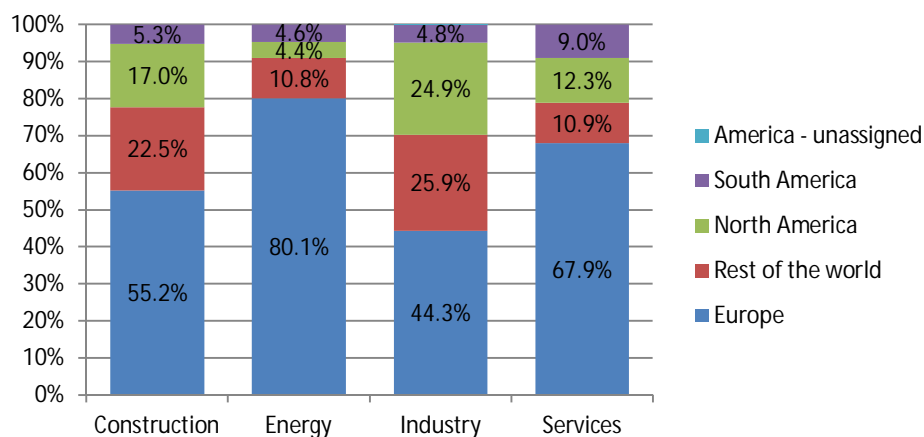
Source: ERICA WG

Chart 11 indicates that sales in South America are more significant in the services sector compared to the other three sectors. To a large extent, this is due to Telefónica that operates both in Europe and in Latin America. In the other three sectors, the share of South American revenue fluctuates around 5%. Regarding operations in North America, differences are more clear-cut. In the energy sector, revenue generated in North America is actually slightly lower than revenue from South America. The share of revenue attributed to the US and Canada rises to nearly a quarter in the industry sector.

CHART 12   REVENUE ACCORDING TO GEOGRAPHICAL REGION WITH FOCUS ON AMERICA – BY SIZE
*(based on number of subsidiaries)*
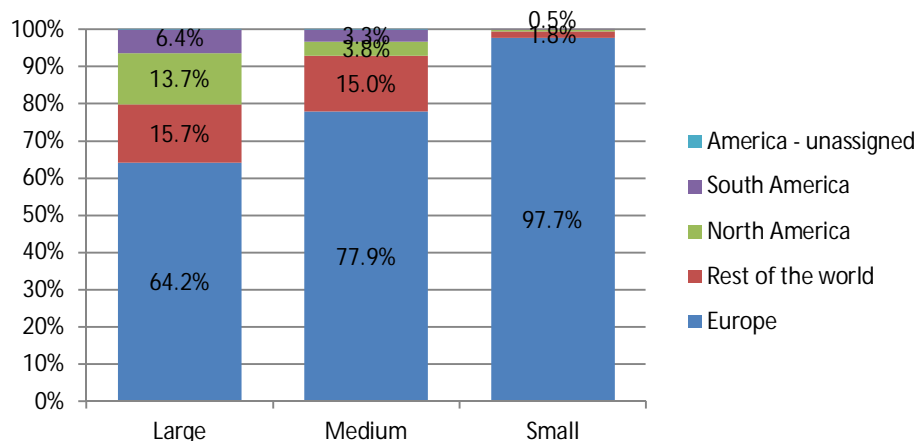
Source: ERICA WG

Small groups only have minor revenue generating activities in North America, but their business operations in South America are even more negligible (chart 12). The larger the group, the bigger the share of both North and South America.

2.4 FOCUS ON REVENUE GENERATED IN REST OF THE WORLD

More detailed information was collected not only for America but also for the rest of the world, if available in the financial statements of the groups. This section presents that detailed data. The information could not be retrieved for all groups, so the sample was reduced to 203 groups, eliminating all those with activities in Asia, Africa and/or Oceania without any further breakdown. Overall, nearly three-quarters of the revenue generated in the rest of the world can be assigned to Asia. At country level, the share of Asian revenue ranges from barely 1.3% for Portuguese groups to 18.7% for German groups. On aggregate, Africa seems operationally more important than Oceania, although nearly 9% of the rest of the world revenue could not be assigned in an accurate way. This observation seems to be logical as – on the one hand – historical reasons (colonisation) will play a role, and – on the other hand – the distance between Europe and Oceania might deter companies from developing activities in Australia or New Zealand. The figures at country level seem to support the colonisation argument, as Portugal, France and Italy all used to have several African colonies. 63% of Portuguese groups and 46% of French groups have activities in Africa. For German groups, the figures are somewhat obscured by the significant amount of rest of the world revenue that could not be assigned. Nevertheless, operations in Australia or New Zealand seem to occur only occasionally. For Spanish groups, sales in Oceania are most relevant (5.3%). This figure is boosted in particular by the construction company ACS that has extensive activities in Australia and New Zealand. In Belgium, too, the share of revenue originating from Oceania amounts to 2.1%. This is to a large extent explained by the mining and metals company Nyrstar. Nyrstar was created in 2007 by combining the zinc smelting and alloying operations of Zinifex (an Australian mining company) and Umicore (a Belgian materials technology company). Therefore, it is obvious that this group generates a big part of its revenue in Oceania.

CHART 13   REVENUE ACCORDING TO GEOGRAPHICAL REGION WITH FOCUS ON REST OF THE WORLD – BY COUNTRY
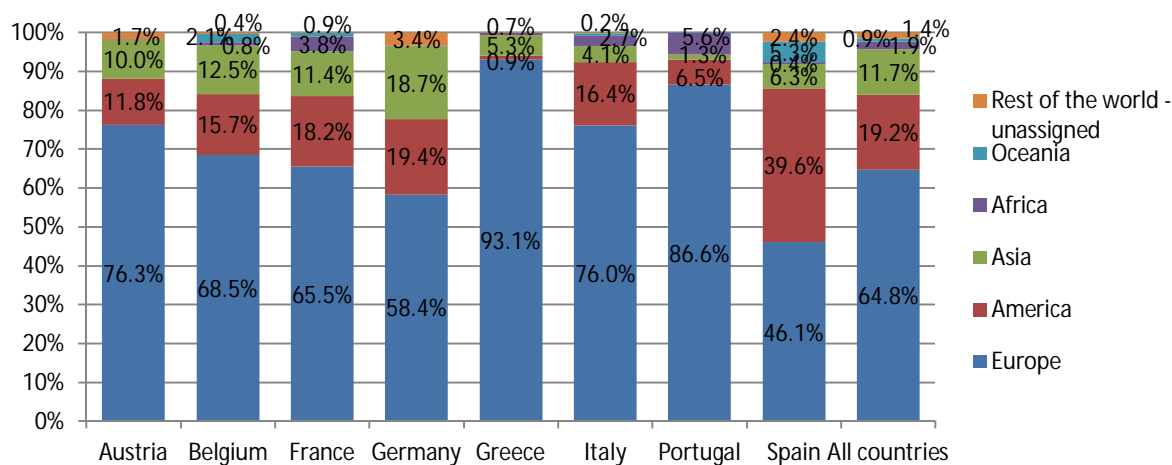
Source: ERICA WG

The weight of ACS and Nyrstar is also observed in chart 14, in the construction and industry sectors respectively. The 4.1% share of African revenue in the construction sector can be traced back to the French groups Bouygues and Vinci. Activities in Asia are most significant in the industry sector. As already mentioned, industrial groups often have production facilities in China or other Asian low-wage countries, which facilitates sales in this region.

CHART 14   REVENUE ACCORDING TO GEOGRAPHICAL REGION WITH FOCUS ON REST OF THE WORLD – BY SECTOR
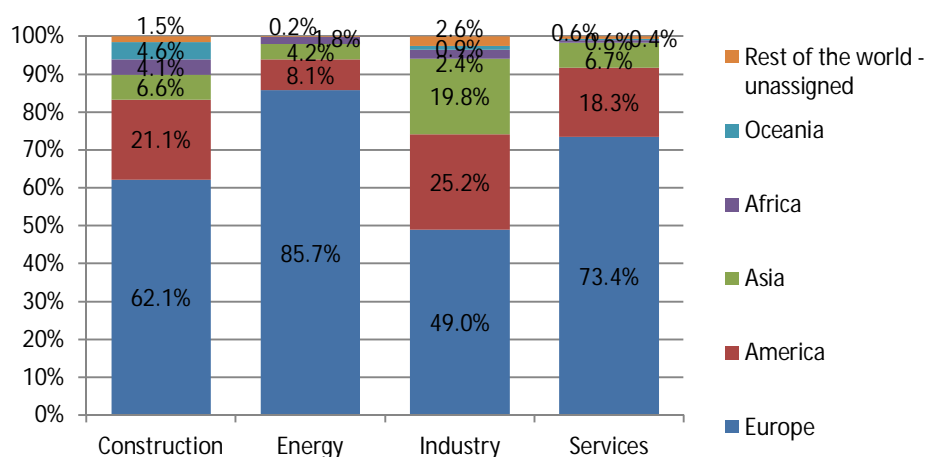
Revenue from Oceania seems to be more or less non-existent for small groups (chart 15). Income from operations in Asia increases as a function of group size. This does not seem to be the case for revenue generated in Africa. Despite the fact that at least 59 out of the 203 groups have activities in Africa, revenue resulting from these operations remains rather limited in most cases.

CHART 15   REVENUE ACCORDING TO GEOGRAPHICAL REGION WITH FOCUS ON REST OF THE WORLD – BY SIZE
(based on number of subsidiaries)
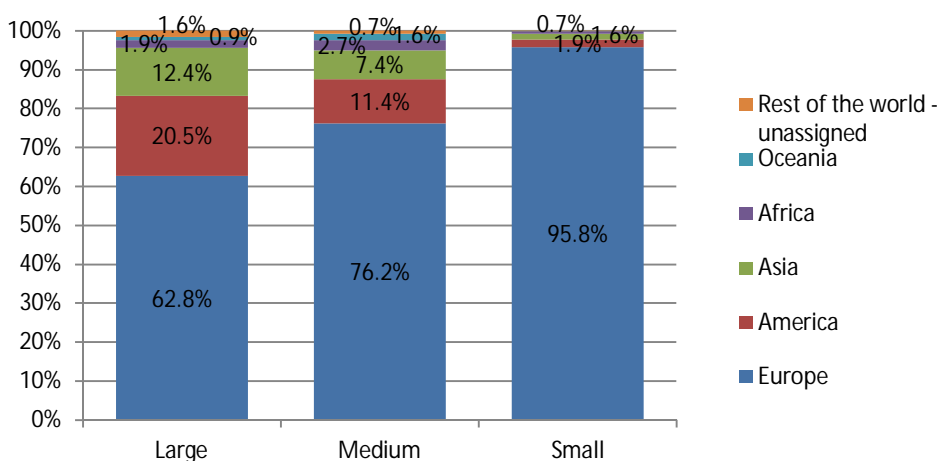
3. ARE GLOBALISED GROUPS MORE PROFITABLE?

In this chapter, we would like to test whether groups active on more than one continent are more profitable than those only active in Europe. To be precise, we want to examine the correlation between profitability and the level of geographical expansion of the group. We do not want to look for causality between these two variables. The dependent variable is a measure of profitability. Return on assets (ROA) is used as a measure of profitability. ROA is defined as follows:

$$ROA = \frac{Profit\ (loss)}{Total\ assets}$$

Several independent explanatory variables are used: ROA during the previous year (ROA_PY), equity ratio (EqRatio), net indebtedness ratio (NetIndebt), capital interest burden (CapIBurd), current ratio (CurrRat), the number of subsidiaries (NrSub) as a measure of size, and a measure of globalisation (Int). These variables are defined as follows:

$$EqRatio = \frac{Total\ equity}{Total\ assets}$$

$$NetIndebt = \frac{Current\ and\ non\ current\ interest\ bearing\ borrowings - cash\ and\ cash\ equivalents}{Total\ assets}$$

$$CapIBurd = \frac{Interest\ expense - capitalised\ borrowing\ costs}{Total\ assets - liabilities\ included\ in\ disposal\ groups\ held\ for\ sale}$$

$$CurrRat = \frac{Current\ assets}{Current\ liabilities}$$

Int is a dummy variable. Its value is 1 if the group only generates revenue in Europe. Its value equals 2 if the group generates revenue in Europe and America or in Europe and the rest of the world. The value 3 represents groups that have operations in all three regions defined. Exclusively European groups are used as the reference point, to which all other groups are compared.

A correlation matrix was compiled to identify collinearity between the different independent accounting variables.

TABLE 2 CORRELATION MATRIX BETWEEN THE EXPLANATORY ACCOUNTING VARIABLES

	ROA_PY	EqRatio	NetIndebt	CapIBurd	CurrRat
ROA_PY	1	0.5226904	-0.4319028	-0.4578330	0.2165908
EqRatio	0.5226904	1	-0.6563744	-0.6170915	0.5186724
NetIndebt	-0.4319028	-0.6563744	1	0.7052757	-0.4069435
CapIBurd	-0.4578330	-0.6170915	0.7052757	1	-0.2738972
CurrRat	0.2165908	0.5186724	-0.4069435	-0.2738972	1

Source: ERICA WG

To measure a possible country-related impact and a possible sector-related impact, country and sector dummies are created and included in the regression as well. The dataset contains data for 8 countries and 4 sectors, so 7 country dummies and 3 sector dummies are included. The situation of Austrian construction groups is used as the reference point to which all other groups are compared. As a result, the following linear regression was calculated:

$$ROA = \alpha + \beta_1 ROA_{PY} + \beta_2 EqRatio + \beta_3 NetIndebt + \beta_4 CapIBurd + \beta_5 CurrRat + \beta_6 NrSub$$
$$+ \beta_7 Country + \beta_8 Sector + \beta_9 Int + \varepsilon$$

The data sample is the one used in chapter 2 (282 groups), from which two groups have been eliminated for which the number of subsidiaries is not known, as well as 11 groups with outlier[5] values. Therefore, 269 observations were taken into consideration. The results are presented in box 1. They reveal a correlation between ROA and ROA in the previous year, and between ROA and the equity ratio. Indeed, the respective coefficients are statistically significant (different from 0) at a 99.9% confidence level. The coefficient of the current ratio is statistically significant too, but only at a 90% confidence level.

BOX 1   RESULTS OF THE REGRESSION *(Int as explanatory variable)*

Residuals:

Min	1Q	Median	3Q	Max
-0.248659	-0.012244	-0.000226	0.017255	0.109264

Coefficients:

	Estimate	Std.	Error	t value	Pr(>|t|)
(Intercept)	-5.292e-03	1.455e-02	-0.364	0.7164	
ROA_PY	4.188e-01	4.566e-02	9.171	< 2e-16	***
EqRatio	1.123e-01	1.771e-02	6.342	1.05e-09	***
NetIndebt	-2.549e-03	1.740e-02	-0.147	0.8836	
CapIBurd	-2.474e-01	3.395e-01	-0.729	0.4669	
CurrRat	-6.075e-03	3.171e-03	-1.916	0.0565	.
Int2	1.596e-03	8.704e-03	0.183	0.8547	
Int3	1.248e-02	7.986e-03	1.563	0.1194	
NrSub	5.676e-07	9.520e-06	0.060	0.9525	
CountryBelgium	-8.926e-03	9.216e-03	-0.969	0.3337	
CountryFrance	-9.184e-03	1.155e-02	-0.795	0.4272	
CountryGermany	-5.426e-03	1.211e-02	-0.448	0.6544	
CountryGreece	2.532e-04	9.878e-03	0.026	0.9796	
CountryItaly	4.205e-03	1.100e-02	0.382	0.7026	
CountryPortugal	-3.267e-03	1.021e-02	-0.320	0.7494	
CountrySpain	9.637e-03	1.126e-02	0.856	0.3927	
SectorEnergy	-1.765e-02	1.231e-02	-1.434	0.1529	
SectorIndustry	-1.239e-02	1.058e-02	-1.170	0.2430	
SectorServices	-7.999e-03	1.044e-02	-0.766	0.4444	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.04085 on 250 degrees of freedom
Multiple R-squared: 0.5936, Adjusted R-squared: 0.5643
F-statistic: 20.29 on 18 and 250 DF, p-value: < 2.2e-16

Source: ERICA WG

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[5] Groups with ROA below -35% and/or ROA above 39% and/or ROA_PY -44% and/or equity ratio -244% and/or capital interest burden above 9% and/or net indebtedness ratio -90% and/or current ratio above 9.

In order to check for hidden multicollinearities, the variance inflation factor has been calculated. The results, however, indicate that it is not worthwhile to add interaction-dummies in the regression.

The exercise was repeated using the share of revenue generated out of Europe in total revenue (NonEurRev) as an explanatory variable instead of the categoric variable Int. The results (box 2), however, are comparable to those of the first regression.

BOX 2   RESULTS OF THE REGRESSION *(NonEurRev as explanatory variable)*

Residuals:

Min	1Q	Median	3Q	Max
-0.249592	-0.011198	0.001031	0.016152	0.111731

Coefficients:

	Estimate	Std.	Error	t value Pr(>|t|)
(Intercept)	-3.229e-03	1.433e-02	-0.225	0.8219
ROA_PY	4.184e-01	4.625e-02	9.046	$<$ 2e-16 ***
EqRatio	1.152e-01	1.772e-02	6.500	4.3e-10 ***
NetIndebt	-7.084e-03	1.731e-02	-0.409	0.6827
CapIBurd	-1.633e-01	3.407e-01	-0.479	0.6322
CurrRat	-6.478e-03	3.171e-03	-2.043	0.0421 *
NonEurRev	3.274e-03	1.304e-02	0.251	0.8020
NrSub	2.167e-06	9.520e-06	0.228	0.8202
CountryBelgium	-7.466e-03	9.091e-03	-0.821	0.4123
CountryFrance	-3.964e-03	1.168e-02	-0.339	0.7347
CountryGermany	-5.957e-04	1.213e-02	-0.049	0.9609
CountryGreece	-4.889e-04	9.765e-03	-0.050	0.9601
CountryItaly	6.650e-03	1.095e-02	0.607	0.5441
CountryPortugal	1.906e-03	9.830e-03	0.194	0.8464
CountrySpain	1.495e-02	1.115e-02	1.342	0.1809
SectorEnergy	-1.944e-02	1.244e-02	-1.563	0.1194
SectorIndustry	-8.928e-03	1.054e-02	-0.847	0.3978
SectorServices	-9.602e-03	1.049e-02	-0.915	0.3608

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.04102 on 251 degrees of freedom
Multiple R-squared: 0.5886, Adjusted R-squared: 0.5607
F-statistic: 21.12 on 17 and 251 DF, p-value: $<$ 2.2e-16

Source: ERICA WG

Overall, we can conclude that no correlation could be found between profitability and geographical expansion.