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# Corporate governance analysis and financial valuation of food industry in Europe, Australia and Japan

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# *Executive summary*

This paper examines the possible relationships between qualitative and quantitative factors in a company. More specifically, the analysis prefixes the goal to study all the main relevant corporate governance elements and their accordance with laws and codes and focus on some others characterizing directors' background as a professional. These are the resources dependence role of corporate directors and represent the expertise, the experience and roles that a director may or may not possess: insiders, business experts, support specialists and community influentials. Hence, the thesis will support the idea that there is a statistical relation between these characteristics and the financial performance of a company, measured by ROA.

However, to carry on these suggestions, we divided our analysis in multiple stages, starting from the very general idea of corporate governance and ending up to the more specific feature of a company.

First of all, the paper is divided into two chapters: one more focused on the theoretical analysis and one based on applying the theory to empirical analysis models.

In the first chapter, the screening of sample of companies is conducted by setting specific criteria to make the observations as similar and comparable, between one another, as possible. Then, corporate governance systems are researched; systems represent a more general idea of corporate governance, which seems to be quite different from our specific target analysis, but it is necessary to find out reasons and possible solutions to the application of some corporate governance rules from companies: e.g. the adoption of a mandatory board size, or the exact proportion of a particular class of directors rather than one another. Moreover, the 7 chosen countries: Australia, France, Germany, Italy, Japan, Spain and United Kingdom are scrutinized in their intrinsic Corporate Governance status, by exploring their CG system (e.g. one tier etc.), operating mechanisms and reasons that brought to a radical change, potential issues, relevant laws and CG features related to the national index (e.g. average board size). All this will offer an assist to group our indices in a more reasonable sample, select the element that appeared to be more relevant and extract data, features and information that can be more feasible to our next empirical analysis. Finally, an overview on the four categories of variables to be used in the empirical processes will be illustrated: dependent variables (or financial performance), independent variables (or corporate governance factors), control functions and dummy variables (or geographic locations).

Chapter number two will be mainly quantitative and process all the qualitative information collected in the previous pages. In fact, it will open with the construction of a statistical hypothesis testing, composed of four different tests, which will be studied along the computations of the linear regression models.

Secondly, the methodology will be explained, and in particular how and why each variable is selected and measured. The third paragraph, then, is concentrated on the development of linear regressions. In this case, we decided to adopt a hierarchical linear regression approach, since we possess many variables in our pool, but we just want to focus on some of them, and in particular on those representing the proper characteristics of a director (direct category labels, e.g. business experts). This way, step-by-step, we can test the

significance of our regression and choose to investigate further or not. In addition, research design and descriptive statistics will highlight the general overview of the next phases. Hence, moving deeply, three hierarchical regression models *(see Table in Appendix: Summary results of Hierarchical Regression Analyses for ROA)* will be calculated, with a specific step for each singular variable or group of variables added:

1) *General Model (2 steps):* composed of a unique dependent variable (ROA), two control variables acting as moderators (Log Sales and Leverage) and all the other independent variables (Corporate Governance factors, e.g. board size);
2) *Model 1 (2 steps):* developed according to the results of the general model. Indeed, it will be constituted of ROA, control variables and one isolated independent variable, which was significant in the previous general model;
3) *Model 2 (2 steps):* the same approach as in Model 1 will be applied but a different independent variable will be considered.

The peculiarity of Model 1 and Model 2 is that they will be organized with three symmetrical sub-models (a, b and c), in order to wide our scanning range:

- *Models (a), (3 steps):* a further step will be added comprising the inclusion of dummy variables;
- *Models (b), (3 steps):* the introduction of dummy variables will be exchanged with the construction of a new variable, which is the interaction between the dummy variable and the referred independent variable;
- *Model (c), (4 steps):* model (a) and model (b) will be combined.

At the end of each model, the hypothesis tests will be verified and will make room for considerations.
Therefore, the final conclusion will be represented by the idea that at least one model will deliver significant results and, thus, that it does exist a linear relationship between at least one of the independent variable with the financial performance of the company, and that this effect is greater in some country rather than in one another (dummy variables and interactions).

# Chapter I: Corporate Governance analysis

The first chapter will mainly focus on the corporate governance analysis of the screened countries and companies. First of all, an overview of screening criteria factors will better explain how the selection has been computed. The pool will eventually compose the subject of the thesis' analysis. In addition, this will be accompanied by an examination on the different corporate governance systems among the referred countries. Board composition and companies' features will help to determine the intrinsic characteristics of the leading organs as well as their strategy on the market. Then, a study on the environment will define the influence of external factors, while an analysis of the category director label will help understand the specific characteristic of each singular member of the board. Furthermore, companies and countries may be subject to independent factors that affected them during the past, leading to radical changes, and may still have an impact on their corporate policies nowadays. This study will lead to the consideration that some countries may share some similarities and be grouped together, while others will not. In addition, the analysis will help us understand special characteristics that may affect companies in the food industry in the next chapter.
Finally, companies will be studied according to their corporate governance and these factors will be extrapolated in order to obtain fundamental data to input into our next-stage-empirical analysis.

## *Paragraph 1: Screening criteria*

The screening was performed through *S&P Capital IQ* platform by setting specific criterias. The first step has been conducted by the cross-selection of companies between the same **industry classification**: f*ood, beverage and tobacco*, and their **geographic locations**: *Australia, France, Germany, Italy, Japan, Spain and United Kingdom*. The idea of this double-factor choice is to study a pretty "national" sector among different cultures and compare it with the different countries' environments and laws, firms' strategies and visions and their financial policies. Hence, to cut the pool down to a reasonable sample and, thus, get it to be as more manageable as possible, market capitalization limit of € 3,000,000,000 has been applied, with the sample of companies going down to a few hundreds. It is, however, worth to consider the heterogeneity of the indices among the different countries. In fact, in order to make it a fair analysis, only listed companies were considered and extreme differences clearly emerged. Japanese and Italian listed companies, for instance, largely differ in terms of both number of selectable firms and composition of boards of directors; whereas, Australia and France for the products they use to deal with. Therefore, to squeeze the data into a more homogeneous and linear pool, **Italian index** has been determined as **benchmark**. This means that the 5 listed Italian companies were used to compose the matrix and, thus, fill it with 5 other companies from each of the other 3 countries in Continental Europe: Spain, France and Germany, with similar characteristics in terms of treated products, size of the company and cultural habits.[1] The same process has been carried out with the British, Australian and Japanese indices, but 10 companies for each country have been selected in

[1] See next *Paragraph 2.6: Considerations*, to observe the process for geographic distinctions.

this case, in order to fix a sample as reliable and significant as possible. To set an example on the criteria: *La Doria S.p.A. (BIT:LD)*, manufacturing company of traditional Italian commodities such as pasta and sauces and with a market capitalization of € 231.00 million, led to the selection of *Kyokuyo Co., Ltd. (TSE:1301)*, Japanese firm with a market capitalization of € 245.80 million and committed to the fishing and the delivery of the most popular national food: seafood. This way, a total of 65 different firms were grouped in 4 indices: Continental Europe (20), United Kingdom (15), Australia (15) and Japan (15), representing the final screen from which the consequent analysis will stand on.

***Screening classification***

| *Company Name* | *Geographic Locations* | *Market Capitalization* | | *Specific food sector* |
|---|---|---|---|---|
| *AgroGeneration SA (ENXTPA:ALAGR)* | France (Continental Europe) | € | 15.60 | Agricultural products |
| *Bodegas Riojanas, S.A. (BME:RIO)* | Spain (CE) | € | 23.10 | Wine |
| *Centrale del Latte d'Italia S.p.A. (BIT:CLI)* | Italy (CE) | € | 39.20 | Dairy products |
| *Berentzen-Gruppe Aktiengesellschaft (DB:BEZ)* | Germany (CE) | € | 55.80 | Beverage |
| *Deoleo, S.A. (BME:OLE)* | Spain (CE) | € | 74.50 | Agricultural products |
| *Masi Agricola S.p.A. (BIT:MASI)* | Italy (CE) | € | 120.90 | Wine |
| *Natra, S.A. (BME:NAT)* | Spain (CE) | € | 136.20 | Food (e.g. cocoa) |
| *Fleury Michon SA (ENXTPA:FLE)* | France (CE) | € | 162.40 | Food (e.g. poultry) |
| *Vranken-Pommery Monopole (ENXTPA:VRAP)* | France (CE) | € | 203.30 | Wine |
| *Massimo Zanetti Beverage Group S.p.A. (BIT:MZB)* | Italy (CE) | € | 209.90 | Beverage (e.g. coffee, tea) |
| *La Doria S.p.A. (BIT:LD)* | Italy (CE) | € | 231.00 | Food products (e.g. sauce, pasta) |
| *B.F. S.p.A. (BIT:BFG)** | Italy (CE) | € | 375.60 | Agricultural products |
| *FRoSTA Aktiengesellschaft (DB:NLM)* | Germany (CE) | € | 405.30 | Food (e.g. frozen) |
| *Barón de Ley, S.A. (BME:BDL)* | Spain (CE) | € | 424.80 | Wine |
| *Südwestdeutsche Salzwerke AG (DB:SSH)* | Germany (CE) | € | 809.10 | Food (e.g. salt byproducts) |
| *Savencia SA (ENXTPA:SAVE)* | France (CE) | € | 891.80 | Dairy products |
| *Bonduelle SA (ENXTPA:BON)* | France (CE) | € | 892.60 | Food (e.g. canned products) |
| *KWS SAAT SE & Co. KGaA (DB:KWS)* | Germany (CE) | € | 2,039.40 | Agricultural products |
| *Viscofan, S.A. (BME:VIS)* | Spain (CE) | € | 2,329.70 | Food (e.g. meat casings) |
| *Südzucker AG (DB:SZU)* | Germany (CE) | € | 2,751.80 | Food products (e.g. fruit concentrates) |
| *Real Good Food plc (AIM:RGD)* | United Kingdom | € | 14.21 | Food (e.g. bakery) |
| *Gusbourne PLC (AIM:GUS)* | United Kingdom | € | 31.90 | Wine |
| *Anpario plc (AIM:ANP)* | United Kingdom | € | 87.14 | Food (e.g. natural feed) |
| *Wynnstay Group Plc (AIM:WYN)* | United Kingdom | € | 107.88 | Agricultural products |
| *Finsbury Food Group Plc (AIM:FIF)* | United Kingdom | € | 116.50 | Food (e.g. bread) |
| *Devro plc (LSE:DVO)* | United Kingdom | € | 366.18 | Food (e.g. meat casings) |
| *Premier Foods plc (LSE:PFD)* | United Kingdom | € | 382.45 | Food (e.g. cake bars) |
| *Hotel Chocolat Group Plc (AIM:HOTC)* | United Kingdom | € | 406.73 | Food (e.g chocolate) |
| *M.P. Evans Group plc (AIM:MPE)* | United Kingdom | € | 438.40 | Agricultural products |
| *The Scottish Salmon Company PLC (OB:SSC)* | United Kingdom | € | 466.10 | Seafood |
| *Nichols plc (AIM:NICL)* | United Kingdom | € | 639.64 | Beverage |
| *Hilton Food Group plc (LSE:HFG)* | United Kingdom | € | 721.32 | Food (e.g. meat) |
| *Bakkavor Group plc (LSE:BAKK)* | United Kingdom | € | 835.60 | Food (e.g. bakery) |
| *A.G. BARR p.l.c. (LSE:BAG)* | United Kingdom | € | 839.81 | Beverage |
| *Cranswick plc (LSE:CWK)* | United Kingdom | € | 1,598.95 | Food (e.g. meat) |
| *Murray River Organics Group Limited (ASX:MRG)* | Australia | € | 22.80 | Agricultural products |
| *Buderim Group Limited (ASX:BUG)* | Australia | € | 13.75 | Food (e.g. confectionary ginger) |
| *Ocean Grown Abalone Limited (ASX:OGA)* | Australia | € | 17.71 | Seafood |
| *Australian Dairy Nutritionals Group (ASX:AHF)* | Australia | € | 24.00 | Dairy products |
| *Farm Pride Foods Limited (ASX:FRM)* | Australia | € | 26.93 | Food (e.g. eggs) |
| *Clean Seas Seafood Limited (ASX:CSS)* | Australia | € | 47.29 | Seafood |
| *Australian Vintage Ltd (ASX:AVG)* | Australia | € | 82.50 | Wine |
| *Ricegrowers Limited (ASX:SGLLV)* | Australia | € | 212.40 | Food (e.g. rice) |
| *Huon Aquaculture Group Limited (ASX:HUO)* | Australia | € | 259.63 | Seafood |
| *Webster Limited (ASX:WBA)* | Australia | € | 330.39 | Food (e.g. livestock) |
| *Australian Agricultural Company Limited (ASX:AAC)* | Australia | € | 495.90 | Food (e.g. beef) |
| *Tassal Group Limited (ASX:TGR)* | Australia | € | 524.20 | Seafood |
| *Bellamy's Australia Limited (ASX:BAL)* | Australia | € | 719.96 | Food (e.g. organic baby food) |
| *GrainCorp Limited (ASX:GNC)* | Australia | € | 1,195.99 | Agricultural products |
| *Bega Cheese Limited (ASX:BGA)* | Australia | € | 1,213.20 | Dairy products |
| *Ishigaki Foods Co.,Ltd. (JASDAQ:2901)* | Japan | € | 6.78 | Food (e.g. dried) |
| *Boso oil and fat Co., Ltd. (TSE:2608)* | Japan | € | 19.47 | Agricultural products |
| *Asahimatsu Foods Co., Ltd. (TSE:2911)* | Japan | € | 31.43 | Food (e.g. miso soup) |
| *Nichiryo Baking Co., Ltd. (SPSE:2218)* | Japan | € | 33.43 | Food (e.g. bakery) |
| *Ensuiko Sugar Refining Co., Ltd. (TSE:2112)* | Japan | € | 53.90 | Food (e.g. sugar) |
| *Dairei Co.,Ltd (TSE:2883)* | Japan | € | 91.07 | Food (e.g. frozen) |
| *Oenon Holdings, Inc. (TSE:2533)* | Japan | € | 189.70 | Wine |
| *Kyokuyo Co., Ltd. (TSE:1301)* | Japan | € | 245.80 | Seafood |
| *Rokko Butter Co., Ltd. (TSE:2266)* | Japan | € | 314.90 | Dairy products |
| *Kadoya Sesame Mills Incorporated (TSE:2612)* | Japan | € | 428.55 | Food (e.g. sesame) |
| *S&B Foods Inc. (TSE:2805)* | Japan | € | 435.45 | Food (e.g. instant) |
| *Hokuto Corporation (TSE:1379)* | Japan | € | 509.37 | Agricultural products |
| *J-Oil Mills, Inc. (TSE:2613)* | Japan | € | 522.70 | Agricultural products |
| *DyDo Group Holdings, Inc. (TSE:2590)* | Japan | € | 626.60 | Beverages (e.g. coffee, tea) |
| *Nippon Suisan Kaisha, Ltd. (TSE:1332)* | Japan | € | 1,626.77 | Seafood |

*data retrieved from* S&P Capital IQ

## *Paragraph 2: Corporate governance systems*

Corporate governance represents one of the main mechanisms to monitor managements' behaviours and ensure transparency, fairness and sustainable long-term outlook in the company.

"*It is an umbrella term that covers many aspects related to concepts, theories and practices of boards of directors and their executive and non-executive directors. It is a field that concentrates on the relationship between boards, stockholders, top management, regulators, auditors and other stakeholders*", Cochran and Wartick (1988).

This paragraph will be focused on analysing the different corporate governance systems that rule companies' models for the referred countries and try to find out the most relevant similarities and differences among them. First of all, we have to distinguish between two different approaches: the *market-oriented corporate system* and the *relationship-based corporate system* (Franks, Mayer, 1992; Moerland, 1995). The former is associated with the Anglo-Saxon model, where the governance system is determined by the influence that investors exercise in the public company. In fact, in this case, markets are the primary source for public companies, and the highest power in determining and influence corporate policies is given to the investors. The latter, instead, is typical of family businesses or companies where the network plays the key-role. This system, indeed, does not collect information directly from the market but relies on private guidelines and informal relationships. Focusing on our analysis, two main basic corporate governance systems dominate on the global stage, while a few others have been created and modelled by some countries.

More specifically, governance systems are:

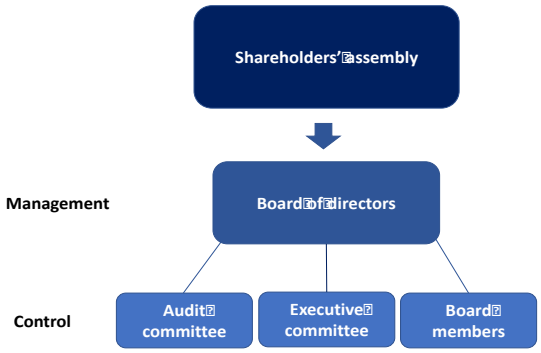
- *Monistic or one-tier system*, typical of United Kingdom and Australia;
- *Dualistic or two-tier system*, unique to the German case;
- *Voluntary systems* based on the discretionary choice between monistic and dualistic or *own system* for France, Italy and Spain;
- *Keiretsu* as network of companies' relationships in Japan.

Therefore, companies will be aggregated according to their typical corporate governance system and, then, analysed as of the following structure:

- brief explanation of changes leading to the current model;
- general overview of the corporate governance systems, mechanisms and ownership;
- potential issues;
- proper features of corporate governance (e.g. average number of seats in the board).

## 2.1 The monistic model

***The one-tier board model*** is traditional of the Anglo-American countries and is characterised by universal power in terms of management and control given to only one organ: the board of directors.




First of all, the fragmented number of shareholders will meet at the ***Annual General Meeting (AGM)***, where they appoint the members of the board of directors and the chief executive officer. From this moment on, all the spotlight turns on the board, which is instructed to carry out all the core business' tasks in terms of administration, execution, management and audit. In fact, shareholders are informed on the progresses and results of the company through reports. In addition, the board has the possibility to independently supervise and devolve different functions to subordinate committees, such as audit one, and simply exercise the main function of management. As it is evident to see, UK-system strongly relies on self-regulation and market-based rules.[2]

***Board of directors*** is mainly composed of the chief executive officer (CEO), executive directors, a chairman or lead director (sometimes can be the CEO) and independent directors. The Company Act requires all firms to have at least two directors, but does not specify the distinction between executive and non-executive. As a consequence, boards can be composed of only executive directors and it will be completely legal. Nothing forces the company to separate the CEO and chairman figures either.

***Audit committee*** is in charge to supervise financial, operational and compliance controls as well as risk management. They must cooperate with members of the board and with the other committees and must report the results of their review to the shareholders at least annually. Interestingly, as the other committees, they are appointed and can be removed by the board of directors whenever it is deemed, thus putting their activity of control largely under the influence of the board.

***Remuneration committee*** "should make recommendations to the board, within agreed terms of reference, on the company's framework of executive remuneration and its costs; and to determine on their behalf specific

[2] Short Helen and Keasey Kevin, *Institutional Shareholders and Corporate Governance in the UK*, 1996.

remuneration packages for each of the executive directors, including pension rights and any compensation payments. Remuneration committees should consist exclusively of non-executive directors who are independent of management and free from any business or other relationship which could materially interfere with the exercise of their independent judgement. The members of the remuneration committee should be listed each year in the board's remuneration report to shareholders" (*Hampel, 1998b:14)*. Thus, the role of remuneration committee is crucial for the financial performance of the company. Indeed, since most of directors and senior managers are paid, at least partly, with a variable salary and/or through stock options, then the deliberated salary structure can tremendously affect the final outcomes.

***Board members*** is mainly referred to the authority investing the CEO to re-appoint some directors, thus rooting them in the corporation and making his figure even more powerful.

However, both in the United Kingdom and in Australia, even if some issues have been well solved through the Codes, some are still in place and are linked to the nature of the corporate governance model and to the figure of the CEO, who completely dominates the company with his power. According to *Boyd (1996:169)*, "there is obvious potential for corruption in this process, as a CEO can affect the nomination of directors who may further the board's interest rather than the shareholders."
This can happen in three main ways:

1. CEO can nominate close friends or people with his same vision as executive and non-executive directors;
2. The board can nominate NEDs who are allies of the CEO as well as financially incentivized by company's performance;
3. Since there is no specific law, the CEO can re-appoint the directors.

In addition, it worth to recall that the CEO:

- controls both the functions and composition of the board;
- can chair the audit committee;
- can control the nomination of an auditor;
- may influence the decisions of AGM.

### 2.1.1 United Kingdom

The United Kingdom system perfectly symbolizes the one-tier model in all its aspects. However, the model does have some downturns in the structure, bringing the authorities to continuously update the legislative framework in order to regulate the corporations. Although the Combined Code acts as a series of guidelines and recommendations for listed corporations, it immediately contributed with many changes. In 1995,

indeed, from an analysis conducted by the Cadbury Committee on the top 500 British companies, was shown that among these firms:

- ✓ 98% successfully included audit and remuneration committees;
- ✓ 86% were managed by the separation of roles of chairman and CEO (in 1992, this number was 76%);
- ✓ 90% issued a statement of full compliance with the code.

It is worth to affirm the nowadays widely adoption of boards to environmental subjects. Indeed, almost 33% of companies created a specific fourth committee to regulate and follow internal procedure in terms of green measures and initiatives. As this is becoming a global debate, investors may decide not to invest in one company or reduce their power spending just because that firm does not comply with global warming issues. Being aware of that, companies, especially the bigger, are increasing their number of committees both to have a more proper activity of monitoring on a wider scale as well as release more protection and sense of commitment of their operations to their investors. As of 2018, 30% of companies in the food sector declared to have adopted an additional committee on environmental affairs.

Current issues in the British CG regard:

1. *Board independence and the power of the CEO*: is referred to the strong power given to the CEO and his ability to influence the independence of the members in the boards;
2. *Managerial remuneration*: sometimes in UK, managers are overpaid or only paid through incentives and stock options. Although, this may align the interests between shareholders and managers (since both look for the maximisation of value in the company, it can be a negative factor as well. Indeed, managers can be biased to cook financial numbers in the book just to receive a higher salary at the end of the fiscal year. However, in the long term, shareholders will be negatively affected by these actions. An effective compensation scheme is composed of the sufficient incentives to make the management maximising decisions at the lowest possible cost to shareholders;
3. *Blockholders' role*: blockholders role can be achieved with less effort and stake of ownership as compared to the insider system. The blockholder can, thus, largely influence both the AGM and the boards decisions and assume much more power in terms of management and control.
4. *Greater chances of takeovers*: these chances are lower than those in US, since the disclosure requirements for block shareholders in the UK is equal to 3% as compared to 5% in US, and thus leading to more awareness of potential bidders. However, the fact that in UK, the takeover threshold is placed at the limit of 30% increases the possibility of any individual to gain the total control of the company with a much lower effort with respect to a concentrated-ownership corporate governance.
5. *Social issues*: deriving from current political problems that British government is facing, such as deal agreements for Brexit with European Union. These may influence CG in the next years.

In addition, from a study of *Spencer Stuart Board*[3] on the FTSE index (tables below), we can find out that that the UK average board size is quite constant and equal to 10.1 members as of 2018, maintaining a pretty constant level since 2013 and reaching a -3.8% change in 10 years. This has surely been a result of the process of CG renewal made by the Code. Regarding the board composition, important results have been achieved as well. The independence of directors, for example, is a feature now well-established and regards almost 95% of analysed companies and so it is the presence of a senior independent director in every board (97.3%). Furthermore, the main issue of separation of roles between CEO and chairman has also been truly solved, where just 0.7% of corporations face this problem as of 2018.

| *UK Spencer Stuart Board* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1991 | 1996 | 2013 | 2014 | 2015 | 2018 | 5 year change | 10 year change |
| **Average board size** | **12.7** | **12.5** | **10.3** | **10.5** | **10.3** | **10.1** | **-1.94%** | **-3.80%** |

| **Board composition** | 2008 | 2013 | 2018 | 5 year change | 10 year change |
|---|---|---|---|---|---|
| **Independent directors** | **92%** | **95%** | **94.40%** | **-0.60%** | **2.40%** |
| **Combined CEO/chairman** | **0%** | **0.7%** | **0.7%** | **0%** | **0.70%** |
| **Full Time chair** | **10%** | **8%** | **6.7%** | **-1.30%** | **-3.30%** |
| **Senior independent director** | **98%** | **100%** | **97.3%** | **-2.70%** | **-0.70%** |

### 2.1.2 Australia

Many scholars describe Australia's system of corporate governance as part of the Anglo-Saxon outsider system of ownership and control. At a first glance, this consideration seems correct since many Australian large listed company are represented by relatively *dispersed shareholdings*. Furthermore, many of the key aspects of the outsider system can be here easily found, such as securities market, a securities regulator, a takeover panel and outsider corporate governance codes. In addition, as of the common law system, Australia has always been credited as a "similar-style" British colony.

However, a controversial debate illustrate that the Australian listed market is, instead, characterised by:

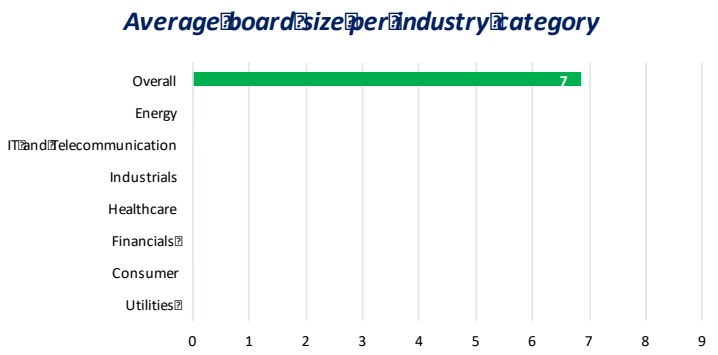
- significant blockholders engaged in private rent extraction;
- institutional investor powerlessness;
- a strong relationship between management and blockholders, which results in a weak market for corporate control;
- a historic weakness in public and private securities regulation, which allows the creation and perpetuation of crucial blocks to information flow.[4]

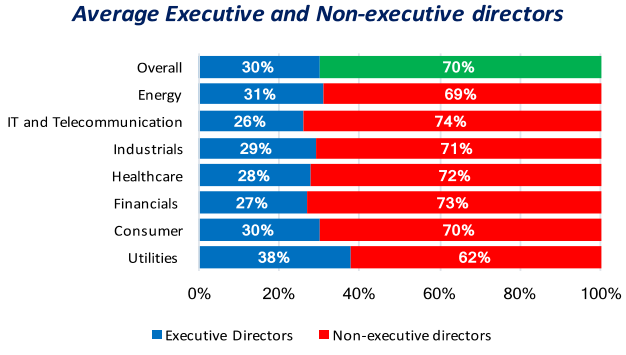
These factors lead researchers argue that although Australian CG system follows the one-tier model and has many Anglo-Saxon features in common, it is probably shifting towards an insider system, which may affect the choice and the application of some dispositions from authorities in the future. A constant improvement in terms of Australian corporate governance coincided with the introduction, in 1992, of a ***system of compulsory superannuation (pension) contribution***, where companies' employees indirectly invest in

[3] Spencer Stuart, *UK Board Index, Current board trends and practices at major UK companies*, 2015.
[4] Dignam Alan and Galanis Michael, *Australia inside-out: the corporate governance system of the Australian listed market*, Melbourne, 2004.

domestic and global equities. The employer contribution rate has increased up to 9.5% since 1 July 2014, and as of 2015, was planned to increase gradually from 2021 to 12% in 2025. As companies changed their structure both in terms of ownership and of sources of funding from the market, corporate governance gained more importance and needed to be reviewed and improve the transparency of its operations.

In a study of *A. Chandrakumara, G. McCarthy and J. Glynn*[5] on the top 166 ASX companies and 1244 corporate board members in 2013/2014 (left chart below), it is possible to obtain some important key-indicators in terms of board evaluation in Australia. Board size clearly depends on the sector. Anyway, except for the utilities segment, the others seem to converge around the same range of 7-8 directors, thus leading to a final average of 7 members per board. This number is quite small if we compare it to the rest of the world and especially to its closest neighbour: the UK[6]. Furthermore, 7 directors represent the result of a decreasing trend in the Australian companies, which is in line with the ASX principles. In fact, the Code seems to favour narrow board size to encourage efficient decision making and reduce the agency cost. Again, it is important to observe the influence that the Code, even if it is not a mandatory rule-maker, has on the companies' decision-making processes and structure in general. Moving next (right graph), according to the ratio of executive and non-executive directors in the board, the ASX Code exactly follows the UK Combined Code guidelines: "*at least half of the board, excluding the chairman, should be represented by independent non-executive directors*". Companies' ratios confirm the recommendation and actually even improve it. Indeed, corporations from all over the sectors have a percentage of 70% of NEDs, with the only exception again of the utilities sector, which seems to slowly adapt to the new guidelines.




[5] Chandrakumara A., *McCarthy G. and Glynn J., Exploring the Board Structures and Member Profiles of Top ASX Companies in Australia: An Industry-level Analysis*, 2017.
[6] see table average board size UK = 10 members

## 2.2 The dualistic model

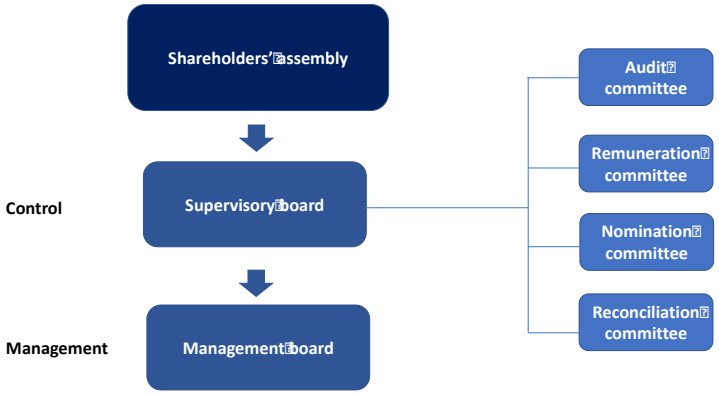
### 2.2.1: Germany

German ownership is characterized by high ownership concentration, predominance of strategic ownership ties among corporations and great presence of banks in external funding and monitoring.[7]

German Stock Corporation Act makes the two-tier system for German limited companies mandatory.

The ***two-tier system*** *(or sometimes known as German system)* is characterised by:

1. ***Shareholders' General Meeting (Hauptversammlung)***
2. ***Management Board (Vorstand)***
3. ***Supervisory Board (Aufsichtsrat)***
4. ***Other committees*** *(non-mandatory by German laws)*[8]




The ***General Meeting*** is the upper organ of a limited company under the dualistic system. It is in charge to appoint directors in both the management and supervisory board and can have control on many activities of the company such as the approval of statutory liability and of some disclosure information. Interestingly, it can take an action against the management board only after the supervisory board approved and reported a misbehaviour from the management.

The ***Management Board*** develops and approves company's strategies and decision-making processes. The members are appointed and dismissed for cause by the supervisory board. The board size depends on the company's size, the applicability of Co-Determination rules and statutes and can vary from one to more people with a maximum tenure of 5 years (renewable). The Code requires that the supervisory board must observe criterias of professional and gender diversity when appointing a member.

The ***Supervisory Board*** acts as controller body of management activities, by analysing the actions and information of the management board, such as review of accounting reports, and by reporting them to the general meeting. Its members are appointed and dismissed by the ***shareholders' meeting*** and must comprise

[7] Jackson Gregory, Hopner Martin and Kurdelbusch Antje, *Corporate Governance and Employees in Germany: Changing Linkages, Complementarities, and Tensions*, 2004.
[8] Baums Theodor, *Corporate Governance in Germany – System and current developments*, 1998.

of at least three members. This number may increase up to 21 members (must be always divisible by 3) depending on the amount of stock that a corporation is able to generate (share capital), the Co-Determination rules and the statutes of the company. The main feature of the two-tier system is the presence of ***employee representatives*** in the boards. In fact, when a company's size grows between 500-2,000 employees, then, one-third of the supervisory board members are elected by employees and must achieve some ratios in terms of gender diversity. In addition, when a company has more than 2,000 employees, one half of supervisory board members must be elected by employees and at least 30% of them must be women. Hence, since the remaining part is elected by the Shareholders' meeting, in big companies both shareholders and employees governs the day-today running of the company and can jointly change the company's structure when necessary. In addition, it is worth to mention that a member of the supervisory board clearly cannot simultaneously have a seat in the management board.

In light of this, the two-tier system is based on the relevant role covered by the supervisory board, which can easily influence the activities of the management board. For example, there are some actions, such as incentives through remuneration, that can be performed only after the approval of the supervisory board.

***Other committees*** are not required but may be created by the supervisory board to help supervise and fasten processes of control and execution of management. They can be represented by: *audit, remuneration, nomination* and/or *reconciliation committee.*[9]

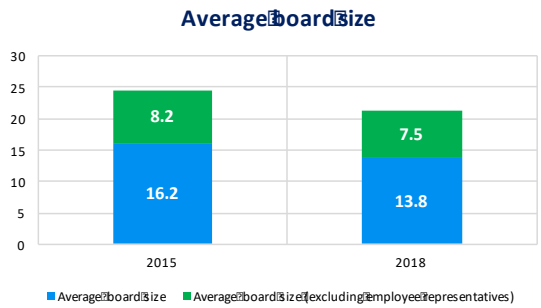
Retrieving data from *Spencer Stuart 2015 and 2018 Board Index* on the German index DAX 30 (charts below), we can observe some features completely making the German corporate governance unique to the other systems in the world. From the following bar chart, we can first of all notice a decreasing number of seats in the board by almost 15% in just 3 years. German average size of the board in 2015 was way greater than any other one in Europe. However, a size of 13.8 seems to catch up with the global average, which is always below 15 seats. The big size is for sure determined by more groups having voice in the board, especially the employees. In fact, if we subtract the number of employee representatives (8.2 and 7.5) to the total average, we obtain a size of 8 and 6.3, as of 2015 and 2018 respectively. This shows the high relevance given to the employees in the two-tier system, who gain more than 50% of members in the board and can, thus, strongly influence the management.

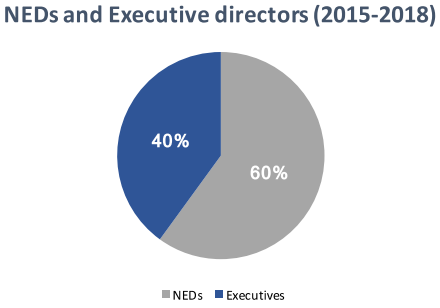
Finally, two other relevant characteristics along 2015-2018 period regard:

1) Constant and high NEDs proportion over the total number of directors equal to 60%. This percentage is higher than many other countries and largely exceeds what is recommended by the Code;

2) Chairman/CEO duality approximately equal to zero especially due to the stringent activity of control of the supervisory board, which makes the two-tier model better than the one-tier from this point of view.

9 when both shareholders and employees are in the supervisory board, a mediator party should be elected.




## *2.3 One-tier vs. Two-tier model*

Global CG systems are mainly defined by the contrast between the monistic and dualistic models. Some countries, like France, Italy and Spain, have the possibility to freely decide which system is considered more suitable according to their national scheme. Others, such as Japan, have personalized their own model based on the traditional one-tier system. However, in any case, a clear understanding of the pros and cons of these opposing structures may help recognize the foundations of single countries in relation to their CG choices.[10]

**Advantages one-tier**

- ***Better flow of information***: this feature is related to the CG structure in general. First of all, the contained size and high frequency of meetings make decisions more understandable and faster. Then, the fact that the board nominates all the various committees increases the knowledge and relationships between the members of the board. This will contribute to reach an agreement more easily.

- ***Faster decision-making process***: both the high frequency of board meetings and the management and control's single body expedites the operations.

- ***Efficient understanding and management by the board***: the interaction of different members' backgrounds in the board facilitates the understanding of an issue and challenge independent directors to a wider range of actions.

**Disadvantages one-tier**

- ***Chairman/CEO duality****:* since there is one main body and power comes from the shareholders' meeting, it is more frequent to find no separation in the roles of the chairman and the CEO. When this happens, the CEO is invested by too much power and may strongly influence company's direction.

[10] D. Block and A. M. Gerstner, One-Tier vs. Two-Tier Board Structure: A Comparison Between the United States and Germany, 2016.

- ***Risk of lack of neutrality in small boards****:* when there are small boards, control and management may be strictly correlated since there may be the possibility of more relationships. This may affect the independence factor of the company.

- ***Confusion in management and control tasks****:* faster decisions may also create confusion. In the one-tier model, a decision is taken and monitored at the same time and may not be proper processed because of the lack of time and/or overlap of tasks.

- ***Compensation related to the stock****:* although this may incentivize managers' work, it can also bias their behaviours just to the maximisation of their salary.

**Advantages two-tier**

- ***Separation of control and management:*** the main characteristic of the two-tier model clearly increases the monitoring efficiency, especially, on the management board.

- ***Balance of power:*** shareholders nominate supervisory directors, who, in turn, nominate the managers. This leads to a more balanced power to those who have to manage the company. In addition, since CEO is not directly appointed by the shareholders' meeting, like in the one-tier, then the Chairman/CEO duality becomes less frequent and almost absent in the German model.

- ***Control on upper management:*** the supervisory board can appoint and dismiss management board members whenever there is a right cause. Hence, managers feel more under control and responsible for their actions.

- ***More representation:*** boards are wider and thus more representative of different groups. The different background and interests can balance the final decision of an issue.

**Disadvantages two-tier**

- ***Inefficiency and complexity of tasks:*** confusion of tasks and competences among the different boards. Some decisions need the approval of the supervisory board, while some do not. This does not give a clear understanding of the areas of expertise.

- ***Board size:*** more representation brings to larger boards and, thus, more people to listen to and understand before taking whatever action.

- ***Low information flow:*** this is due by two main factors: 1) bigger boards may lead to the slowdown of decisions; 2) highly structure vertical hierarchy clearly reduce the speed of information from the

top to the bottom and vice-versa.

- ***Weakness of the German legal framework***: it is composed by many regulatory bodies which can contrast each other on some issues (governance Code may be contradicted by a Co-Determination rule) and sometimes offers too much free interpretation on definitions such as the independence of the supervisory board members.

## *2.4 Voluntary models*

For *voluntary models* are intended all the countries that have free choice about the preferred CG system they want to adopt. In France and Spain, for example, the one-tier system is the most diffused one, although some companies still opt for the two-tier system. In Italy, instead, the most prevalent model is the "traditional", which has specific features and quite different from both the monistic and dualistic vertical.

### 2.4.1 France

Shareholders of a *société anonyme,* large businesses or listed companies in France, are allowed by French laws to freely choose their corporate governance model between:

1. ***One-tier system;***
2. ***Two-tier system.***

However, we have to clarify that the monistic model is way more diffused among French companies. Moreover, among the French listed corporations, about 50% adopt the one-tier structure with the board chaired by the CEO, about 30% the one-tier with the head of the board represented by another person rather than the CEO and the remaining 20% have a two-tier system. Hence, the large influence of the Anglo-Saxon set of laws during French history clearly has marked a fundamental influence on the companies' direction in matter of corporate governance. The choice of one system rather than the other is relevantly important since the two models have a completely different structure and require different heads' roles to lead the management and control activities of the companies. Corporate governance model must be voted and approved by a majority of the Board's members and must be based on the fact that:

*1. "The board of directors must be able to decide in the best interests of the company according to its specific characteristics, particularly its business sector, shareholder composition and even the characteristics of its executive management team."*

*2. "Major differences exist between French law and British law that must then be underlined."*

Traditionally, as the majority of continental European countries, French companies were characterised by a concentrated ownership structure, although the number of individual investors has tremendously increased

during the recent years[11]. A big change in shareholding structure from 1998 to 2004 is summarised by two main events:

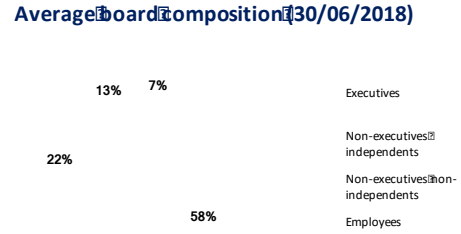
1. Privatization process: which leads to the decline of the stake owned by the State in the companies Nowadays, the State only has around 2% stake.
2. Increase in the presence of institutional investors, especially foreigners and pension funds. This

brought more capital injections in the companies and more possibilities to go public in the market.

As of the number of committees and recommended board composition, French laws are aligned to the directives given by the Common Code or the German, depending on which model a company will choose.

Numerous studies have been made on the benchmark French stock market index: CAC 40 (first table below), regarding the different aspects of corporate governance. [12] Hence, starting from the board size, we can notice a much greater number of seats on average with respect to the other countries. Although the trend expresses a decreasing path with a change of -4.20% in just 3 years, the average is still pretty high. One of the reasons can surely be reported to the employees' pattern typical of French companies, which are required to involve some employees' representatives in the board after they reach specific thresholds in terms of size of the company. As of a more recent analysis (second chart) conducted on the same sample, we can observe that the employees represent 13% of proportion in a given board on average, which may confirm the hypothesis explained before. Then, the proportion of NEDs over the total directors is 58% and still represents the majority but is a bit lower when compared to its European neighbours.

| *France Spencer Stuart Board* | | | |
|---|---|---|---|
| | 2015 | 2018 | 3-year change |
| **Average board size** | **14.3** | **13.7** | **-4.20%** |



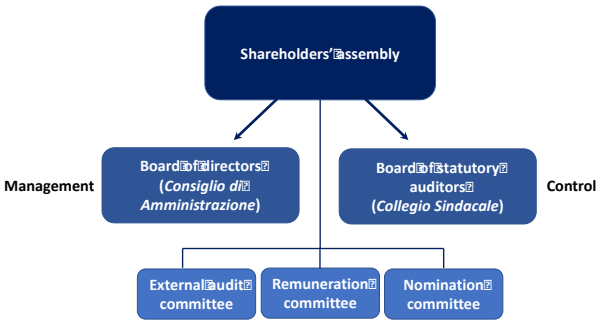

## 2.4.2 Italy

Nowadays, the Italian system seems to have radically changed its structure and become a sort of "*middle-way*" between the one-tier and two-tier system. Concerning the Italian ownership structure, it is well-known that Italian companies are mostly family businesses, characterised by highly concentrated ownership representing around 60% of the Italian shareholding market. These features lead to a reduction in the number

[11] Charreeaux Gerard and Wirtz Peter, *Corporate Governance in France*, 2007.
[12] Spencer Stuart, *Spencer Stuart Board Index France*, 2018.

of listed companies and to a robust blockholder domination, since the *family owner* tends to keep a major role and control in the company and avoid incurring in issues such as the dispersion of ownership. Currently, Italian laws allow listed companies to choose between the monistic, the dualistic or the traditional system. However, as of 2017, 228 out of 234 listed companies have adopted the traditional system, two adopted the single-tier system and four the two-tier system.

The ***traditional system,*** also called ***dualistic horizontal***, is characterized by the following structure:




13

***Shareholders' meeting*** is the organ in charge to appoint:

1. ***A management body*: only one director or Board of directors (*Consiglio di amministrazione*);**
2. ***A board of statutory auditors (Collegio sindacale)***
3. ***Other committees, such as external audits, remuneration and nomination committees;*** 14

The number of members in the ***Board of directors*** is freely determined by the shareholders' meeting, if not clearly specified by company's by-laws. The composition is characterised by the presence of both executive and non-executive directors (NEDs), with NEDs representing the majority. Both are proposed by either the chairperson or by the blockholder and, later, appointed by the shareholders' meeting. In addition, listed companies are required to include at least one director chosen by the minority shareholders (*section 147-ter, Legislative Decree 58/1998 (Testo Unico della Finanza, TUF*) and one independent director (or two if the board has more than seven members). The board of directors exercises all the general management activities in the company, execute the corporate strategies, and are responsible for the company's decision-making processes. Some directors may constitute executive committees to help facilitating boards' activities and are evaluated by the board itself. Among the directors, NEDs cover a major role in the company, since they have to report general directors' behaviours and may be asked by the shareholders' meeting to give an opinion on the CEO figure and/or remuneration procedures.

***Collegio sindacale*** must be composed by at least three members, where at least one must represent the

13 G. Fiori and R. Tiscini, *Economia aziendale*, 2014.
14 Corporate Governance Committee, *Corporate Governance Code*, 2015.

minority shareholders. In addition, its majority (at least two out of three members) has the power to convene a straordinary shareholders' meeting every time it is deemed necessary. Auditors are responsible for general control functions as well as ensure that the company is managed in compliance with the law. Members of Collegio sindacale are required to supervise the executive directors with the same approach as non-executive director would. The company may require them to carry out accounting control tasks, otherwise, this activity must be executed by the external auditors, typically appointed by the shareholders' meeting (*section 2409-bis, Italian Civil Code*). Moreover, recently, the Italian Corporate Law Reform introduced a compulsory independent external auditor for all the companies, while in the past non-listed firms just needed to follow the Italian Civil Code.

Despite the respect of this condition, criticisms regarding the real independence and issues of Italian boards are still ongoing and mainly regard:

2. *The blockholders/family owners have too much influence* over the other shareholders and general management activities. They are the ones who can appoint and remove members from the board and committees anytime and most of the time they nominate themselves as directors of the board;
3. *Members of collegio sindacale may be not independent*: this issue is due to the fact that since its directors are nominated by the shareholders' meeting, then they can be related to whom elected them and, thus, be biased.
4. *The separation of roles between the chairman and the CEO is not always ensured*, leading to an extensive power to the leader of the company over the other managers;
5. *Collegio sindacale does not have any voting power*.[15]
6. *Passivity of board of directors:* it, sometimes, does not really manage the company but just follow shareholders' instructions.

More particularly, the separation of Chairman and CEO has played a key role on this debate, since many Italian companies, especially non-listed, still entrust both the managerial responsibilities to one person. This factor, for instance, has been one of the main pitfalls that brought to the huge scandal of Parmalat, dairy company that collapsed in 2003 and raised many questions to the efficiency of Italian corporate governance system. In light of this, Italian laws hardly tried to get listed companies engaged as much as possible to the *Italian Corporate Governance Code*, so to improve the framework and avoid managers' discretion in too many situations.

It is worth to observe that ***the particular structure of Italian listed companies*** affected many choices in terms of corporate governance. Situations where companies do not appoint LID[16], for example, mostly belong to small firms in non-financial sectors, where the different board composition and/or proportions of

[15] A. Zattoni, *Corporate Governance*, 2015.

[16] the Italian Code advises to appoint a Lead Independent Director (LID) either when the Chairman and the CEO or the Chairman and the Controlling shareholder are the same person.

non-executive/independent directors may influence the decision to hire another specialist. Since most companies in Italy are small-medium and family-run, Italian by-laws and the Code are not able to influence a large part of them. Therefore, if, on one hand, the characteristics of family-run businesses lead to positive factors in terms of economic and managerial results as well as make a significant contribution to GDP, on the other hand, the different nature of Italian firms makes harder the application of rules, especially in matter of corporate governance. In fact, it is tough to reduce the power of the major shareholder, when he is the founder and obviously pretends to carry on his company on his own. In Italy, family businesses represent more than 85% of the total number of companies. This percentage is similar to that of many countries in Europe, such as France (80%), Germany (90%), Spain (83%) and UK (80%). However, what makes Italian system different from the others is the dominance of family members in the management of the company: 66% of Italian family businesses are managed by family members, while for France and UK is just 26% and 10%, respectively. Nonetheless, the analysed results and the clear Italian legal convergence to international systems such as the American one (especially after Enron and Parmalat), seem to show that Italian corporations are going to become more homogenous to the global corporate governance, despite the different ownership structure and features of Italian listed companies.

From a study of Spencer Stuart on 100 Italian listed: 37 (FTSE MIB) + 63 (Mid Cap, Small Cap, Other) and along the period 2015-2018 (table below), we can observe a quite big and constant number of seats in board of directors, as well as a high proportion of independent directors. However, we have to illustrate that although in 2015 the independence factor did not meet the requirements of the Code (more than 50%), the trend moved towards this recommendation just after 3 years.

| *Italy Spencer Stuart Board* | | | |
|---|---|---|---|
| **Board composition** | 2015 | 2018 | 3-year change |
| Average board size | **11.9** | **11.5** | **-3.36%** |
| Independent directors | **49.2%** | **51%** | **1.80%** |

## 2.4.3 Spain

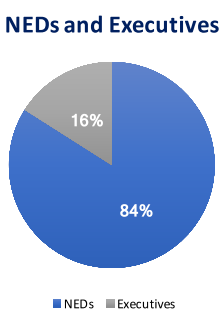
Many scholars paint Spain's corporate governance system as a hybrid model since it is composed by factors belonging to both the outsider and insider systems such as: *newly privatized corporations owned by core national and foreign investors; a weak market for corporate control; increasing internationalization of financial markets; a dual labor market system; an emphasis on passive labor market policies; and a selective transplant of 'Anglo-Saxon' best CG practices, such as board independence or transparency and accountability practices* (Aguilera, 2006).[17] However, currently the Spanish system has been strongly declared to be very similar to the British one, but this process took a long time. Like in Italy and many other

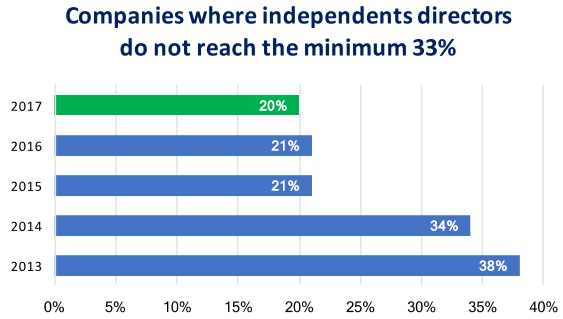
[17] García- Castro Roberto and V. Aguilera Ruth, *A Decade of Corporate Governance Reforms in Spain (2000-2010)*, 2012.

European countries, Spain is currently living a difficult situation from an economic and political point of view, which may affect corporate governance in the short term. Spanish public limited companies (*"Sociedad Anónima"* or *"S.A."*) must choose categorically the ***one-tier system***. Only European Limited Companies in Spain are allowed by Spanish legislation (under the name of Companies Law 2010) to adopt a two-tier board. Hence, we could categorize Spain as a country under the monistic system, but the fast-growing importance and relevance of the European corporation in Spanish stock markets make the country more under the "voluntary models".

From a study by the consulting firm Spencer Stuart on the Spanish index IBEX-35, it is possible to extract some valuable numbers (graphs below). First of all, according to the Unified Code under its recommendation number 13: "*companies must have at least three members, which can be individuals or entities but to maximise the efficiency and effectiveness of procedures in the board, this should have a number of members comprised between 5 and 15*". Moreover, as we can see from the table, the average size of the board is equal to 10.9 directors, constantly reducing the number of seats since 2007 and getting closer to halfway between 5 and 15. In addition, Companies Law 2010 forces listed companies to include a detailed report of the different proportion of directors, where the external should account for the majority of the board. Then, it is possible to observe that NEDs represent the greater portion of seats (84% vs. 16%). However, even if it is quite high, this number is lower than most countries in Europe. Another interesting fact regard the number of independent directors, which account for just 45% of the total as of 2017. Spanish reforms and more pressure executed from the Unified Code led the independence factor increasing pretty quickly in the last decade. In fact, the proportion of independent directors in 2013 was equal to 35% of the total, thus leading to a +10% improvement in just 4 years. Moving on the independence subject, recommendation n° 17 of the Unified Code suggests every company to achieve a minimum portion of 33% independent directors in the board over the total number (50% in companies with high market capitalization). In Spain, the independence factor increased over time and, thus catching up the other European values pretty fast. Indeed, companies that do not reach this limit constantly decreased since 2013. However, in 2017 a conspicuous number of corporation in Spain, accounting for 20%, still do not exceed the required 33% minimum proportion.

| Spain Spencer Stuart Board | | | | | |
|---|---|---|---|---|---|
| | 2007 | 2012 | 2016 | 2017 | 10-year change |
| **Average board size** | **12** | **11.5** | **11** | **10.9** | **-9.17%** |



## *2.5 Keiretsu*

### 2.5.1 Japan

Currently, the largest shareholder in Japanese banks is almost always a bank, owning a stake of around 5% but going up to 20% and 40% due to its reciprocal cross-shareholdings and stable shareholdings, respectively. This scheme contributed to create a dense network of long-term relationships *(Kester 1992; Osano 1996)*, simply known as ***keiretsu***[18]. It can be of two types:

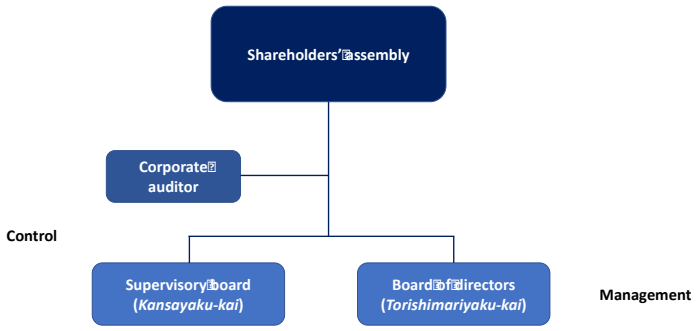
- ***Bank-centred horizontal*** *(more popular)*: such as the as the Mitsubishi group *(Gerlach 1992*), where the main bank sets out cross-shareholding relationships with other companies and assist these companies with multiples services such as providing loans at favourable terms or monitoring the management (*Aoki and Patrick 1994; Miyajima 1999; Miyajima and Aoki 2002)*. Its role is mainly passive, but when the company performs below its expectations and below a certain limit already pre-set, then the bank intervenes on behalf of the other banks and shareholders and start a more-active approach in order to change the management and help the corporation to recover avoid the crisis or bankruptcy.
- ***Jump-style or vertical structured***: such as the famous buyer–supplier relationships in the Japanese automobile industry *(Sako 1992)*, mainly relates suppliers, manufacturers and distributors of one industry. Here, banks have less influence on the structure, while subsidiaries companies, mainly family businesses, are created to support the distribution.

Keiretsu and ownership structure make the Japanese system strongly correlated to the German for:

- *Shareholding relations:* the keiretsu cross-shareholdings is similar to the strong correlation among German companies, insurance groups and banks;[19]
- *Employee system*[20]*:* in both the countries, employees are invested by a relevant position around the company's environment.

Japanese corporate governance is characterised by the ***one-tier system with special features***:

1. ***With the board of directors;***
2. ***Without the board of directors.***




[18] Aoki Masahiko, Jackson Gregory, Miyajima hideaki, *Corporate Governance in Japan: Institutional Change and Organizational Diversity*, 2007.
[19] Maria Lucia Passador, *Corporate Governance Models: the Japanese Experience in Context*, 2016.
[20] In Japan, employees use to stay in the company for a lifetime employment period.

**1.** The model shown above represents the most used form of corporate governance adopted by listed companies in Japan. The board basically covers the same functions as the traditional Anglo-Saxon one. It must have three or more directors. To form committees, it is mandatory to have a board of directors and, thus, to have three or more directors as well. Committees can be the same as the ones of the classic one-tier, such as nomination, audit and remuneration committees. In addition, for larger and listed companies, shareholders appoint a Supervisory board (like in the German model), with an average of 4 *kansayakus*, of which the majority must be external, who create the final audit committee. However, this supervisory board has a different power from the German organ, since here it cannot appoint and dismiss directors and does not have any influence on the activity of the management board in general. Thus, the board of directors can just focus on the daily management tasks of the companies and need to respond only to the general shareholders' meeting. [21] What differentiates the most the Japanese one-tier model from the Anglo-Saxon is the highest degree of influence given to the shareholders' meeting, which is in fact the one that composes all the boards, included the committees and can, hence, guide the company to 360 degrees.

**2.** In companies without the board, decisions are simply taken by the majority of directors and, thus, shareholders are entrusted by an even wider power. In fact, since they do not appoint a special body for the management, many actions will be subject to their approvals. On the other side, this may create a little bit of confusion among the directors' areas of expertise. It must be composed of one or more directors.

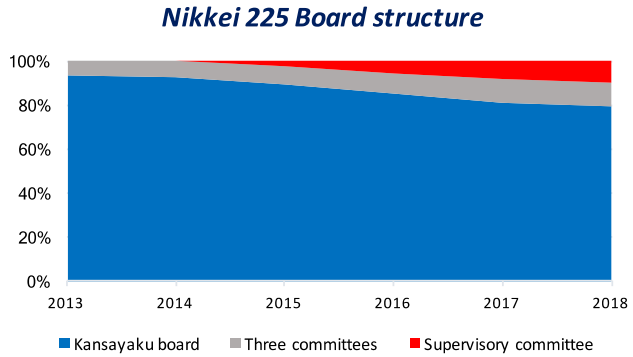
A study on the data analysis on the Nikkei 225 Japanese index along the 15-year period going from 1998 to 2015 (charts below) clearly shows a big change occurred to the Japanese corporate governance and, especially, to the board composition. As mentioned above, *kansayakus directors* compose the supervisory board and represent the most used form of corporate governance in Japan. Throughout this period, due to strong reforms, incoming globalization and the desire to adapt to the international markets, the number of directors consistently and largely decreased from 25.1 members in 1998 to 10.9 in 2013, which represent the current average in 2018 as well. Although the number of supervisory auditors remained constant, the portion of them being external increased constantly since 1998. Furthermore, the year-by-year decreasing trend in number of directors has been followed by the inverse and increasing number of outside members. They accounted only for 5% of the total directors in 1998, while are now a solid reality, with more than 1 out of 3 being so. Although 32.45% external members is still a considerable low proportion with respect to any other country (where at least 50% of directors are external), it surely shows the positive direction adopted by listed companies in Japan. The Revised Companies Act of 2015 had a great influence on the board structure of companies in Japan. It improved the number of companies opting for the inclusion of three committees in order to better exercise the different functions given by the shareholders' meeting. However, as the three committees was gaining more relevance at the expense of the classic *kansayaku board*, so the attention on the inclusion of the supervisory committee in the structure was increasing as well. In 2013, this latter scheme

[21] T. Seki and T. Clarke, *The Evolution of Corporate Governance in Japan: The Continuing Relevance of Berle and Means*, 2011.

(with the supervisory committee) was literally unknown, while in 2018, around 10% of the analysed Japanese companies already shifted to its adoption.

The future of corporate governance in Japan relies on how the different trends are going to move towards the next global challenges and whether the dense relationship represented by keiretsu is going to be monitored and to bring additional benefits to the "more internationalized" structure.

| *Nikkei 225 analysis* | | | | | | |
|---|---|---|---|---|---|---|
| | 1998 | 2001 | 2004 | 2007 | 2010 | 2013 |
| **Total directors** | **25.1** | **17.9** | **13.6** | **12.1** | **11.4** | **10.9** |
| *Outside directors* | 0.2 | 0.7 | 1 | 1.4 | 1.9 | 2.3 |
| **Total kansayakus** | **4.2** | **4.2** | **4.1** | **4.3** | **4.3** | **4.2** |
| *Outside kansayakus* | 1.3 | 2.1 | 2.3 | 2.5 | 2.6 | 2.6 |
| **% external board members** | **5.12%** | **12.67%** | **18.64%** | **23.78%** | **28.66%** | **32.45%** |




## *2.6 Final considerations*

Since our analysis will be focused on different geographic locations, it is worth to group the above-mentioned countries, according to their corporate governance systems, policies, national laws and special features.

As seen, some countries follow the same CG path (e.g. United Kingdom, Australia and some in Europe), while others created their own (e.g. Germany). However, some other factors, such as belonging to European Community prevails over CG systems in terms of influencing the companies' common practices on the day-by-day basis.Furthermore, the impression leads to the consideration that although nations result to diverge in Europe from a CG model point of view, they appear pretty similar from the law and set of rules that governments apply to their national companies, except for the United Kingdom, which seems to follow an independent CG process. On the other side, Japan appears pretty distant from every other system, while Australia and United Kingdom share the same one-tier model and culture, but different set of good practices. In fact, Australia is shifting its idea of CG to a completely opposite one with respect to the British structure. In light of this discussion, as of the next investigations, we will recognize four groups, which represent the most distinguished classification, as our geographic components:

1. *Continental Europe*, comprising France, Germany, Italy and Spain;
2. *United Kingdom*;
3. *Australia*;
4. *Japan*.

## *Paragraph 3: Components of empirical analysis*

The empirical analysis will be based on qualitative and quantitative factors, the related relationship between the two and how these will directly affect the selected companies in the food industry. From the particular sample of firms and their different features coming from the governance models, just analysed in the previous paragraph, some qualitative elements (*independent variables or x*) have arisen. In particular, they are divided in two main categories: **intrinsic factors and director category label** and will represent the **independent variables** for our empirical analysis. The intrinsic factors are referred to the indispensable items that may influence a good governance in a company and that some firms must follow according to their national regulations; while the director category label primarily indicates the category of each director in the board, and how it can affect the governance performance of the firm. Finally, these variables will be carried out on our selected companies and will give light to considerations on whether or not they bring to different financial performance conclusions, depending on the country and the way the companies perform their businesses.

In addition, a dependent variable (*y*) strictly representative of the company's financial performance will be chosen and explained, while control functions will be used to control and moderate the relation between our x's and y.

## *3.1 Independent variables*

### 3.1.1 Intrinsic factors

Intrinsic factors are those deep-seated in the fundamentals of the corporate governance of a company. Furthermore, they may come right from the choice of the administration to adopt a particular structure or must be set according to specific national and international rules and regulators.

These elements are:

1) *Board size;*
2) *Number of committees;*
3) *Presence of environmental committee;*
4) *Proportion of independent directors;*
5) *CEO/Chairman duality.*

As of *board size*, it directly measures the total number of directors in the board of a company. Along with the historical theories, this factor has been considered of fundamental importance[22] in influencing the final performance, since it is precisely related to the directors' activities of controlling and monitoring the

[22] E. F. Fama & M. C. Jensen, *Separation of Ownership and Control*, Journal of Law and Economics, Vol. 26, n° 2, 1983.

managers.[23] Some scholars found a positive relation between the number of directors and company performance. Hence, larger boards should be composed of more skilled directors and higher ability to monitor the managers.[24] On the other hand, some critics argued that smaller board size may be more efficient and improve the company performance as well, since the greater monitoring benefits of larger boards are outweighed by the poorer communication of directors, and consequently, slower decision-making processes.[25] Our empirical analysis will show whether, in our case, larger or smaller boards have a direct influence.

*Number of committees* regards the decision of boards to create multiple commissions for different responsibilities. This may facilitate and fasten the decision-making processes, since the board of directors will be focused on fewer duties and agendas. However, these entrusted directors may not possess the same differentiated level of expertise since more skilled ones may be included in other committees and, thus, not be involved in the main day-by-day decisions. With the next analysis, we will confirm whether a higher number of committees should be considered as a good indicator.

*Presence of environmental committee* is a related element to the number of committees. Moreover, when a company decides to adopt more than three committees, the choice almost always ends up to one linked to environmental subjects, since investors may ask to feel protected on this matter. Therefore, nowadays, discussions on environmental issues such as global warming and air pollution are increasing their importance, and the fact that a company is active in this matter may raise company's confidence and trust among the investors and increase its performance as a consequence.

*The proportion of independent directors* over the total represents a controversial feature that contributed to many scandals over the years. Furthermore, a board composed of just a few independent members may be biased into its decisions and lead to personal rather that collective results. In addition, the independent director is the one responsible to monitor that all the activities from managers are executed in agreement with the shareholders' value creation principle. Here, what is most important is that the "correct game of percentage of independence" is assured. This proportion, indeed, must be not too much high as well, since people emotionally-and-personally-tied to the company may, anyway, represent an added power to the company survival in the long-term.

*The duality between CEO and chairman* positions has been considered a disputed debate for a long time. Furthermore, it probably represented one of the major issues that brought to renew corporate governance practices, codes and rules. First of all, it is important to say that this problem is more evident in systems where the board of directors is more strongly invested by power, such as the one-tier system or in

23 J. Christensen & P. Kent & J. Stewart, *Corporate Governance and Company Performance in Australia*, 2010.
24 R. J. Williams, P. A. Fadil, R. W. Armstrong, *Top Management Team Tenure and Corporate Illegal Activity: The Moderating Influence of Board Size,* Journal of Managerial Issues, Vol. 17, n° 4, 2005.
25 M.C. Jensen, *The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems*, 1993.

corporations characterized by a highly concentrated ownership, such as family businesses in Italy. Moreover, the issue lies on the fact that a manager entrusted by both the functions can assume too much power in the company and truly affect the decision-making process of the board and of the company as a whole. Therefore, by now, it is well-known the recent manoeuvre adopted by regulators, almost everywhere in the world, aimed at shifting to a mandatory separation of roles. Although right now, the separation is not a law yet, it is considered a practical common sense for a company, especially to protect shareholders and try to attract more investors. In fact, it is general opinion that a company separating the two roles does not have anything to hide and does entrust two key-leading positions to two different experienced people, thus enriching the firm of more judgement, knowledge and sense of commitment.

### 3.1.2 Director category labels

In addition to the intrinsic factors, some other characteristics of directors may affect corporate governance. These come from the famous article: "*The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change*", written by Hillman, Cannella and Paetzold. More particularly, they observed that each member of a board of directors may be required to possess some specific expertise before being selected and included in the administration of a corporation, in order to increase company's overall experience and knowledge.

Hence, directors, can be classified as follows:

1) *Insiders;*
2) *Business Experts;*
3) *Support Specialists;*
4) *Community influential.*[26]

*Insiders* are the ones who have already covered in the past and/or currently hold internal functions in the company, such as managers, employees or officers, or are personally related to the firm, such as employees' representatives in Germany. This, of course, goes in line with the proper definitions of insider and outsider directors of a company. More generally, an insider provides the board with information about the firm itself and about the external environment, since he is the one who knows the company better from the inside and he already faced its competitive status. On the other hand, too many insiders in a board can bias the decisions and reduce the objectivity as compared to external directors.

*Business Experts* are, instead, directors who are effective or retired executives of other for-profit organizations, and directors who work or have worked for other large companies. Since they had positions in other relevant corporations, they can bring an added-valued experience in the company in terms of decision-making processes, strategy and internal operations. Furthermore, their importance with the competitive

[26] A. J. Hillman, A. A. Cannella Jr, R. L. Paetzold, *The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change*, 2000.

environment makes them extremely valuable for a board. In fact, from their expertise in terms of linkage with suppliers and external directors in general, they can help the company to better develop the right strategy or decision whenever an issue from the external surroundings must be dealt with.

*Support Specialists* are executives of specific and identifiable areas that support firm's strategies. At the same time, they do not provide the board with a general foundation, but they rather focus on particular fields. These areas can be recognized as: capital markets, law, insurance and public relations. Hence, the major difference between business experts and support specialists is the lack of the latter category to help with general management expertise. However, support specialists are invested by an extremely higher specialization and ability on specific matters and their contribution in the board can assume great importance. For example, a support specialist working for a financial institution, may be better related to these external organizations and provide with financing capitals in a faster and more proper way. Hence, their exclusion may slow down some companies' external and internal processes.

*Community Influentials* are similar to symbolic directors. They are directors with experience in areas beyond competitor firms and suppliers. This category includes directors who have influence and expertise over important non-business organizations, including politicians, university representatives, and officers of social organizations. They strongly help the company build linkages to social organizations, which can have a highly important influence in company's future decisions, such as the possibility to obtain a license from the government. In addition, their knowledge can benefit the company to cut costs and time in organizing the right strategy and avoid mis-steps. Finally, community influentials serve the company to legitimacy, and, in fact, the higher the prestige and background of a director, the higher the legitimacy and the reputation the firm will assume.

To sum up, in electing board of directors, corporations will, certainly, pay much attention to keep all the intrinsic factors under control, by following by-laws and codes directives, as well as to the proper characteristics of a director. In particular, the latter may bring added overall knowledge to the company and both the factors can eventually fasten and improve its decision-making processes, and thus, enhance firm performance.

## *3.2 Dependent variables*

The dependent variables for our empirical analysis have been researched among the main financial indicators of corporations.[27] Clearly, each index can assume a different interpretation and final consideration on the proper result. In this case, the choice has fallen on three main types of financial ratios:[28]

[27] Financial ratios, available at: https://www.investopedia.com/financial-ratios-4689817.
[28] K. Guan Lim, *Financial Valuation and Econometrics*, 2015.

1) *Return on Assets (ROA);*
2) *Tobin's Q;*
3) *Valuation multiples (e.g. EV/EBITDA, P/E);*

We have to observe that all the three ratios are different between one another. First of all, ROA is measured as: Net Income/Total Assets and shows the profitability of a specific company related to its total assets.[29] Thus, ROA is a good indicator of operational performance. On the other side, the other two are more focused on investors' perceptions, growth opportunities, market valuation and peers. In fact, Tobin's Q is equal to the ratio: Total Market Value of Firm/Total Asset Value of Firm while P/E, for instance, is equal to: Company's Stock Price/Earnings per share. Hence, by a financial performance side, ROA can give us a more objective outcome and less related to market expectations. In fact, promising values for Tobin's Q and Valuation Multiples (undervalued companies) can be simply obtained by particular managers' behaviors. In particular, focusing on Tobin's Q, "*this ratio does not measure firm performance since underinvestment increases rather than decreases Tobin's q*".[30] A good way could be to use both ROA and one between Tobin's Q and Valuation Multiples. However, we might balance this decision with the financial results coming from the sample of companies on the next chapter. Moreover, if either ROA values are too much volatile or multiples do not provide us with a unique final consideration on the performance-relation, then just one ratio, the most accurate for our analysis, will be selected. Therefore, for the empirical analysis we will at first consider the possibilities to develop and include all these three kinds of ratio as related to the results of our sample, and, then, take a decision on which will achieve the easiest and strongest way to build a solid regression model.

## *3.3 Control functions*

These variables will be included as moderators of our relation. They are optimal for correcting the problems of endogenous explanatory variables in our linear models. In fact, control functions will be held constant along our processes in order to accurate the relationship, if any, between independent and dependent variables. Since we want to explain the variations in the financial performance through corporate governance predictors, then controllers must be chosen with regard to their relation to the dependent variables. Particularly, in our case, they will be:

1) *Sales;*
2) *Leverage.*

*Sales* are excellent predictor of company's operations health and surely positively related to the final financial performance of a company. Indeed, a firm, which does not obtain quite good sales levels, will rarely reach a satisfying performance. In addition, revenues allow to control for the size of a company as

[29] M. Hargrave, *Return on Assets — ROA*, Investopedia: https://www.investopedia.com/terms/r/returnonassets.asp.
[30] P. H. Dybvig and M. Warachka, *Tobin's q Does Not Measure Firm Performance: Theory, Empirics, and Alternatives*, 2010.

well, and thus, making the sample consistent with companies slightly diverging in market capitalization.

*Leverage* has been computed in our case as the simple ratio between Total Liabilities and Total Assets of a firm. It must be monitored, since its value can positively or negatively affect the financial performance of a particular company.[31] In fact, various levels of debt-to-equity ratios may bring to different financial results according to the sector and the specific level of leverage reached by the company. In particular, it has been demonstrated by many scholars that leverage can truly impact the financial performance of companies in a specific sector, and this ratio appears to be pretty low on average for the food industry. Therefore, it is a very conservative decision to include this item as control function for our empiric analysis, in order to protect the possible relation between CG independent variables and our financial performance.

## *3.4 Dummy variables*

As explained in *Paragraph 2.6: Final considerations*, we separated the geographic collocation in four different groups: Continental Europe, United Kingdom, Australia and Japan. Hence, to obtain a more relevant information of the analysis[32], it may be useful to include binary variables or zero-one variables, also called dummy variables, to better capture the effects of qualitative factors in the regression model. In fact, when this dummy independent variable has a value equal to 0, depending on the criteria we will set on the observations, then the coefficient of that variable will not influence our dependent variable. On the other side, when the dummy has a value of 1, then the dependent variable's coefficient and, thus, value will be affected and shifted. [33]

For our empirical analysis, the following dummy will be computed:

1) *Dummy Continental Europe (dEU):* comprising all the French, German, Italian and Spanish companies from our sample;
2) *Dummy United Kingdom (dUK):* comprising all the British companies from our sample;
3) *Dummy Australia (dAU):* comprising all the Australian companies from our sample;
4) *Dummy Japan (dJ):* comprising all the Japanese companies from our sample;

Furthermore, we will choose a reference group or benchmark dummy, that is the dummy against which comparisons are made, according to the regression model data. So, this reference dummy will give us the right comparison and collocation of the effects from the multiple regression model and let us understand where, if any, the effects of the relation between the corporate governance variables on the financial performance are more evident and significant.

[31] S. Rehman, *Relationship between Financial Leverage and Financial Performance: Empirical Evidence of Listed Sugar Companies of Pakistan*, 2013.
[32] J. M. Wooldridge, *Introductory Econometrics: A modern approach*, 2012.
[33] *Dummy variable (statistics)*, Wikipedia: https://en.wikipedia.org/wiki/Dummy_variable_(statistics).

# Chapter II: Empirical Analysis

By taking into consideration what explained above for independent, dependent, control and dummy variables, now our study will move to research these variables directly into the board of the selected companies in the food sector. Moreover, platforms such as Bloomberg, Thomson Reuters, Market Screener and companies' official annual reports helped to retrieve our data and compare them with the theoretical definition of each variable.[34] Therefore, this chapter will be mainly divided into four paragraphs. The first will focus on the hypothesis testing, where the data set will be used to formulate the hypotheses that are going to be tested in our next regression. Afterwards, the regression will be explained in its various steps and methodology to be adopted along the process. Finally, the multiple regression will be run and consequent results will be analyzed, interpreted and tested whether or not accepting or rejecting a null hypothesis. Conclusions will show the final outcome of our analysis, and the possibility to have demonstrated what we had introduced in our initial premises.

## *Paragraph 1: Hypothesis testing*

Hypothesis tests will be used as the way to see if the regression computations have meaningful results, and will be mainly executed on three different models: General Model, Model 1 and Model 2, where each of Model 1 and Model 2 will have three sub-models (a, b and c). The hierarchical linear regression will achieve some specific outputs at each step, useful to test and determine which outcomes of the study would lead to a rejection of the null hypothesis.[35]

When testing the models, we will use the F-Test for the statistical significance of the overall model, since this test is more appropriated for joint hypotheses (e.g. Test 1 below), while we will adopt a t-test procedure and, thus, p-value approach, to test the significance of single variables.[36]

**Test 1: General Model: all independent variables**

$\rightarrow y = \beta 0 + \beta 1 * Board\ size + \beta 2 * Board\ Independence + \beta 3 * CEO/Chairman\ duality + \beta 4 * Insiders + \beta 5 * Business\ Experts + \beta 6 * Support\ Specialists + \beta 7 * Community\ Influentials + \beta 8 * Log\ Sales + \beta 9 * Leverage + \varepsilon$

- ***H0: B1 = B2 = B3 = B4 = B5 = B6 = B7 = B8 = B9 = 0***
- ***H1: Bk ≠ 0 for at least one k***

To examine whether we have an explanatory model, we set the above hypotheses. If we reject the null

[34] M. E. Maher and T. Andersson, *Corporate Governance: Effects on Firm Performance and Economic Growth*, 1999.
[35] A. Gelman, *Data Analysis Using Regression and Multilevel/Hierarchical Models*, 2007.
[36] R. Alt, *Multiple Hypotheses Testing in the Linear Regression Model with Applications to Economics and Finance*, 2005.

hypothesis, we will state that there is at least one linear relationship existing between one independent variable x (or predictor) and the dependent variable y (or response variable).

**Test 2: Model (a): one independent variable and dummies (with no interaction)**

→ $y = B0 + \delta 0 * d1 + B2 * x1 + \varepsilon$

- ***H0: δ0 = 0***
- ***H1: δ0 ≠ 0***

where *δ0* measures the difference in intercepts between dummy Continental Europe, dummy United Kingdom, Dummy Australia and dummy Japan. Hence, if Model 1 (a) and Model 2 (a) are statistically significant, then, we would be able to reject the null hypothesis (*H0*) that financial performance measured by ROA is the same for all the dummies. Consequently, we can state that there is, indeed, at least one difference in the financial performance among the different geographic locations, and, if more than one difference, where this distance is higher.

**Test 3: Model (b): one independent variable and interaction terms between *x1* and dummy variables**

→ $y = B0 + B1 * x1 + \delta 1 * d1 * x1 + \varepsilon$

- **H0: δ1 = 0**
- **H1: δ1≠ 0**

where *δ1* measures the difference in the level of company performance (slope) between dummy Continental Europe, dummy United Kingdom, Dummy Australia and dummy Japan.
It is important to highlight that this hypothesis puts no restriction on the difference in intercepts, *δ0.*
So, if Model 1 (a) and Model 2 (b) would represent statistically significant values, then we will reject the null hypothesis that ROA is the same value for all the dummies, and accept the alternative hypothesis (*H1*) that at least one slope (ROA) is different from the others.

**Test 4: Model (c): one independent variable, dummy variables and interaction terms between *x1* and dummy variables**

→ $y = B0 + \delta 0 * d1 + B2 * x1 + \delta 1 * x1 * d1 + \varepsilon$

- **H0: δ0 = 0, δ1 = 0**
- **H1: at least one δ ≠ 0**

Here, we are interested in the hypothesis that the average financial performances are identical for all the dummy variables, which have the same level of proportion in the independent variable. This means that *δ0* and *δ1* must both be zero under the null hypothesis.

## *Paragraph 2: Methodology*

## *2.1 Measurement of independent variables*

Literature review provided much support to the relation between corporate governance variables and financial performance. However, this study highlights specific variables that may or may not affect food industry in four different geographic locations. Relations may exist between particular factors and, thus, some of them may be excluded from our analysis because of their meaninglessness to our analysis. Moving forward with our CG variables. First of all, it is worth to say that the focus of our study is more projected to the *director category label* rather than *intrinsic factors*. The latter will be helpful to describe possible correlations and interactions, but it is important that the former will show some affinity to the dependent variable.[37] As mentioned in *paragraph 3.1: Independent variables*, we at first considered the following CG variables as intrinsic factors:

1) *Board size;*
2) *Number of committees;*
3) *Presence of environmental committee;*
4) *Proportion of independent directors;*
5) *CEO/Chairman duality*.

And the following as director category labels:

6) *Insiders;*
7) *Business Experts;*
8) *Support Specialists;*
9) *Community influential.*

However, among the intrinsic, number of committees and presence of environmental committee were immediately excluded since they had no particular relevance with our set of data and were pretty constant among all the selected companies. In particular, presence of environmental committee was especially found in France, where 3 out of 5 companies adopted this extra-committee. However, this decision was not directly related with an increase or decrease in the financial performance as high as the other variables and was decided to remove it and number of committees (strictly connected to the former), in order to compose the model of fewer independent variables and more significant.

Secondly, board size and separation of roles of chairperson and chief executive officer are self-explanatory elements, since their values are clearly stated both in the annual reports and database. Specifically, annual reports were used as the must criteria, while either in absence of them or when full assurance was not

[37] G. C. Kiel and G. J. Nichols, *Board Composition and Corporate Performance: how the Australian experience informs contrasting theories of corporate governance*, 2003.

provided on the value by the annual reports, then Thomson Reuters platform has been considered the right way to follow. In addition, CEO/Chairman duality assumed two values in our model: 0 when there is separation in the roles, and 1 when there is not and thus, the duality is established.

With regard to the independence of directors, instead, they have been researched with the same criteria, but a more subjective method came up. In fact, besides the proper wording "independent" in the reports, it has been recognized independent also the non-executive director, who started working for the company in a time-frame lower than 5 years and who has no familiar connection, such as the same family name of the founder or relation to one or more members of the board.

On the other side, director category labels have followed a more rigorous process. Basically, the description found in the article "*The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change*" has been considered the starting point for the definition of each director.[38] Then, every single company has been researched along with its website and annual report, where history, background and curriculum vitae of each director have been scrutinized. At the same time, it is necessary to observe that many companies did not attach a proper CV of members of the board, and, therefore, LinkedIn and Google have been applied as alternative methods. Once found the qualifications of every director in the board, they have been classified as "insiders, business experts, support specialists and/or community influentials" according to the definition of the paper. Furthermore, the approach here has been pretty subjective but straightforward as well. Every director who matched the definition of business expert, for example, has been categorized as such and, if the same director matches the definition of insider, support specialist and/or community influential, then he or she was included in that division as well.

To be more precise, in the Italian dairy company *Centrale del Latte d'Italia S.p.A. (BIT:CLI)*, for instance, a director is a "retired executive of another for-profit organization", and thus business expert, specialized in a specific area of analysis, such as "finance and capital markets, and so support specialist, and acts as "representative of other institutional organization and/or universities", hence community influential. In this case, this specific director respected all three the categories and could help the company in all these different areas; so, he or she was considered as such: both a business expert, support specialist and community influential for Centrale del Latte d'Italia S.p.A.

Finally, the results for director categories have been recorded both in absolute and relative terms, since companies have different board size and the relative terms are more comparable between one another.

At the end, data collection, for Italian companies for example, looked like the following tables:

[38] See definitions in *Paragraph: 3.2.2 Director category labels*.

| Italy | Board size | Number independent directors | % ID | CEO duality | Number of Insiders | % Insiders |
|---|---|---|---|---|---|---|
| Centrale del Latte d'Italia S.p.A. (BIT:CLI) | 13 | 8 | 61.54% | 0 | 3 | 23.08% |
| Masi Agricola S.p.A. (BIT:MASI) | 9 | 2 | 22.22% | 1 | 2 | 22.22% |
| Massimo Zanetti Beverage Group S.p.A. (BIT:MZB) | 10 | 4 | 40.00% | 1 | 4 | 40.00% |
| La Doria S.p.A. (BIT:LD) | 9 | 4 | 44.44% | 1 | 5 | 55.56% |
| B.F. S.p.A. (BIT:BFG) | 11 | 6 | 54.55% | 0 | 3 | 27.27% |
| **Average** | **10.4** | **4.8** | **44.55%** | **60%** | **3.4** | **32.69%** |

| Italy | Number Business Experts | % BE | Number Support Specialists | % SS | Number Community Influentials | % CI |
|---|---|---|---|---|---|---|
| Centrale del Latte d'Italia S.p.A. (BIT:CLI) | 8 | 61.54% | 5 | 38.46% | 3 | 23.08% |
| Masi Agricola S.p.A. (BIT:MASI) | 8 | 88.89% | 8 | 88.89% | 5 | 55.56% |
| Massimo Zanetti Beverage Group S.p.A. (BIT:MZB) | 8 | 80.00% | 7 | 70.00% | 3 | 30.00% |
| La Doria S.p.A. (BIT:LD) | 6 | 66.67% | 6 | 66.67% | 2 | 22.22% |
| B.F. S.p.A. (BIT:BFG) | 10 | 90.91% | 8 | 72.73% | 5 | 45.45% |
| **Average** | **8** | **76.92%** | **6.8** | **65.38%** | **3.6** | **34.62%** |

As it is possible to observe from the data, the set on independent variables is composed of 7 variables, having excluded the number of committees and the presence of environmental committee from our initial set of 9 variables. However, a more focus will be targeted to the relative values of direct category labels.

## *2.2 Measurement of dependent variables*

In the previous *paragraph 3.2: Dependent variables*, we mentioned three possible dependent variables as a measure of the financial performance: Return on Asset, Tobin's Q and Multiples.[39] However, from the collection of data, only ROA appeared to be more predictive of companies' results.[40] This was confirmed by two main factors:

1) *Discordance between Tobin's Q and Multiples;*
2) *Literature review.*

First of all, ROA has been taken as the benchmark of financial performance, since it represents an intrinsic and true value of company's results and not affected as much as the other two ratios by market dynamics.
However, Tobin's Q and Multiples from our set of data gave back completely different trends and data, which were pretty inconsistent with ROA outcomes. In particular, Valuation Multiples were all different predictors between one another: e.g. EV/EBITDA showed different conclusions on the financial health of a particular company as opposed to EV/EBIT or P/E. In addition, the considerations made by Tobin's Q were frequently divergent from those coming from Valuation Multiples, in general. Hence, the decision to not consider any of these other two possibilities, in order to perform an analysis and make a judgement as reliable as possible.
This choice has also been supported by the literature review, which suggests that operating performance measured by ROA is a preferred measure for examining the relation between performance and corporate governance because it is not affected by leverage, extraordinary items and other discretionary items.[41] ROA explicitly takes into account the assets used to support business activities and claims whether the company is able to generate an adequate return on these assets rather than simply showing robust return on sales. Thus,

[39] J. R. Hitchner, *Financial Valuation: Applications and Models*, 2006.
[40] J. Hagel III, J. S. Brown and L. Davison, *The Best Way to Measure Company Performance*, Harvard Business Review, 2010.
[41] J. E. Core, W. R. Guay and T. O. Rusticus, *Does Weak Governance Cause Weak Stock Returns? An Examination of Firm Operating Performance and Investors' Expectations*, The Journal of Finance, Vol. 61, Issue n°2, 2006.

the ROA results determine a greater focus on the ability of managers and executives in the decision-making processes of the company. In addition, ROA is our measure of financial performance in this analysis, since it has produced positive and meaningful results among many researchers (*Haniffa and Hudaib 2006; Muth and Donaldson 1998 etc.*). Then, a three-year post-period average for 2016-2018 for ROA has been computed in order to include possible variations in the short term and consider a pretty medium time-frame for the implementation of corporate governance practices and their impact on company performance. ROA data has been retrieved directly from Bloomberg.com and as the proper ratio of Net Income over the total asset of the firm. Since we are considering only the food sector, no adjustments for sector medians has been calculated.
At the same time, it is important to observe that the other two metrics, Tobin's Q and Valuation Multiples have been retrieved and computed for each company, in order to collect an additional financial source to use whenever values of ROA would reach abnormal findings, such as extremely high negative or positive percentages. So, this approach will contribute to perform an extra double-check[42] on the financial status of the firm and decide to confirm or exclude these anomalies from our pool. In the end, all the observations have been kept in the sample, even when irregularities in ROA occurred, because they were verified to be consistent and predictors of the proper results of the company in question.

## *2.3 Measurement of control variables*

Sales and Leverage confirmed to be the most decisive moderator for our analysis. In particular, it is worth to consider that sales have been transformed into the natural logarithm of sales. Indeed, the use of the Log function granted to prevent the skewness towards large values and, thus, alter these skewed data to follow an almost normal distribution. Here is the case, since there may a big difference in revenues between some companies in the sample, especially the lowest and highest ranked as of market capitalization. For example, the Australian *Buderim Group Limited* with a market cap equal to $13.75 million and the Japanese *Nippon Suisan Kaisha Limited* with a market cap of $1,626.77 million have become more comparable between one another due to the logarithm introduction.
On the other side, leverage has simply been computed as total liabilities divided by total assets, and, thus, becoming a Debt-to-Asset ratio. Generally, the higher the degree of leverage (DoL), the greater the financial risk of the company. Hence, for total liabilities and total assets, the calculations considered all of the company's debts and assets, including intangibles. Therefore, our sample is composed by values ranging between 0 and 1, where, for example, a value equal to 0.41 for the British *The Scottish Salmon Company PLC (OB:SSC)* indicates that 41% of its assets are financed by creditors, with owners (shareholders) financing the remaining 59% with equity.[43]

[42] B. Goldsmith, *How Can You Be Sure What Your Business Is Worth?*, Forbes, 2018.
[43] W. Kenton, Total-Debt-to-Total-Assets Ratio Definition, Investopedia: https://www.investopedia.com/terms/t/totaldebttototalassets.asp, 2019

## *2.4 Measurement of dummy variables*

In this study, four dummy variables have been included with regard to the geographic collocation of the observations.[44] The important thing to establish was the reference group, and thus, the dummy to get out of our dummy variables and be the one against which makes the comparisons, since the number of dummies to take into consideration must be equal to n-1 along with an intercept. The intercept for the base group will be the overall intercept of the mode (*B0*). Moreover, after trying multiple times along with the regression, dummy United Kingdom (*dUK*) appears to be our base group since it represents the category with the highest mean with regard to ROA.[45] More specifically, British companies on average showed a ROA equal to 6.77%, with a premium over the second highest ranked category, Continental Europe, equal to 4.67%. Therefore, this process allowed the model to be even more significant in its independent variables and better compare the other variables to the one appearing at first better financially performing. Dummies are useful to create an extra-category variable: the interactions.[46] In fact, once regression will run, interactions between dummies and significant and relevant independent variables will be made. The interaction makes us understand whether there is the possibility that the independent variable(s) and geographic locations may interact in terms of their effect on ROA and that the relationship between dummies and ROA may be different at different levels of CG variables (or that the relationship between CG variables and ROA may vary for different geographic locations).[47]

## *2.5 Summary of data collection*

In the representative table below, we can observe an image of the first data elaboration. More specifically, data for each company have been collected and processed in order to be grouped by their dummy order or geographic location. This analysis can release a first interpretation of the differences and similarities in variables among the different countries.

As of **board size**, Continental Europe confirms to be, on average, the location with the greatest number of seats (11.7), especially due to the high contribution given by German and French companies, which were represented by 12.4 and 13.2 seats, on average. Anyway, this number confirms the theory with regard to the CG model that companies decide to adopt, and, in fact, the German two-tier system is characterized by one of the greatest board of directors, given the mandatory representation of employees. Moreover, this practice contributes to enlarge the size and give more power and voice to a large number of shareholders. As we saw

[44] see paragraph 3.4: Dummy variables.
[45] K. Grace-Martin, Strategies for Choosing the Reference Category in Dummy Coding, available at: https://www.theanalysisfactor.com/strategies-dummy-coding/, 2019.
[46] Use and Interpretation of Dummy Variables, available at: http://personal.rhul.ac.uk/uhte/006/ec2203/Lecture%2013_Use%20and%20Interpretation%20of%20Dummy%20Variables.pdf
[47] National Centre Research Methods, Exploring Interactions Between a Dummy and a Continuous Variable, available at: http://www.restore.ac.uk/srme/www/fac/soc/wie/research-new/srme/modules/mod3/11/index.html, 2019.

in *paragraph 2.4.1: France*, French companies are allowed to adopt the two-tier system, and thus, follow the same German practice. In our case, indeed, 4 out of 5 selected companies were under the two-tier system.
On the other side, companies following the monistic system are more "*small-size-board-oriented*", since they prefer to fasten the decision-making processes and the activities of the firm as a whole. This theory is favoured by our set of data, which sees an average of 9 seats among the other three dummies, with the United Kingdom taking the leadership in this case.

The **proportion of independent directors** supports the strict line taken by almost all the international Corporate Governance Codes, which, following the first attempt of the British Combined Code, asked the corporations to be administered by independent directors for the majority. The only one exception under 50% is represented by the Japanese companies, which are, anyway close enough to that threshold to say that the recommendation has been complied with.

The **separation of roles of Chairman and CEO** seems to be an issue that has been truly overcome, since in United Kingdom and Australia is totally absent, although the pool analysed was quite big (30 companies), and is almost marginal in Continental Europe and Japan, where 6 (3 in Italy, 1 in Spain and 1 in France) and 3 companies, respectively still faces this practice. This situation comes from the CG structure and the geographic origin of companies, of course. In fact, it is not a case that the monistic models strongly moved to a zero duality, while family businesses in Italy are still run and administered by the founder or family owner. Therefore, the separation is not to be considered as a problem if the particular organization of the firms works better in a scenario where one person is in charge to take the lead.

Moving on to the director category label, the **proportion of insider directors** is more present in Continental Europe and it is not surprising, since this geographic part is characterised by both many companies adopting the two-tier system, and, thus giving seats to representative employees, who are in many cases actively related to the company's main affair, and by many family businesses, which are represented by many people close to the family interests. Besides that, Australia affirms itself as the country with the lowest absolute and relative number of insiders in its board of directors in the food industry.

**The proportion of Business Experts** is almost constant among all the selected countries, confirming the choice of companies to be administered by people expert in the general management area. The only peak is characterised by Japanese companies, where 80% of members of the board have this kind of characteristic.

**The proportion of Support Specialists** is, instead, constituted by a wider range: at the bottom, we observe the Continental European companies, which are support specialists entrusted by only 60%; in the middle United Kingdom and Australia almost following the same proportion (close to two-third of the board); while, we found the Japanese ones at the top range, where almost 83% of directors are specialized, on average.

Again, these numbers recall what CG theory previously suggested. As previously observed, Japanese corporation follow the Keiretsu model[48], which is characterised by an extensive network of banks, and other institutions. And this is the reason why, probably, many bankers and people specialized in public relations and law have been heavily found among the selected Japanese companies.

**The proportion of Community Influentials** finds its highest value in the United Kingdom, immediately followed by Japan, and with Australia and Continental Europe close to each other. In the study of director backgrounds, the selection of these members as community influential occurred in large part for the presence of university professors or academic people present in the board. This may give us the idea that companies are opting to include member linked to the academic world to have a broader view on the day-by-day decisions.

As said in the previous paragraph, the **financial performance** comparison in the food industry has been predominantly won by the British corporations. The latter performed way better than every other company in the sample and with 6 companies out of 15 above the positive 10% ROA in the 2016-2018 period and with Nichols plc (*AIM:NICL*) to be the best financially performer among all the observations. Continental Europe and Japan almost achieved the same results. However, Australian companies, exceptionally, showed a negative ROA on average, especially due to the extremely negative contribution into the sample by three companies: Murray River Organics Group Limited (ASX:MRG), Buderim Group Limited (ASX:BUG), Ocean Grown Abalone Limited (ASX:OGA), which are struggling a lot along this time-frame and registered a final ROA equal to -16.20%, -14% and -8.83%, respectively. Therefore, except for those and one other observation, all the other Australian companies are positively financially performing. Anyway, this result is quite interesting because can be related to problems of Corporate Governance or restructuring, which should be highlighted by the next regression analysis.

To conclude with the **control functions**, the choice of including the log function has confirmed to be the good one, since it gave us more room for expanding the sample and include some bigger company by market cap. Furthermore, this manoeuvre has been executed in every sample, in order to see how things can change from a CG point of view between big and small corporations. Values are close to 6-7 among all the four samples, supporting the fact that the pattern is right and the samples are quite comparable by size. It is worth to notice that the greater number of sales is achieved by Continental European corporations, with French and German companies ahead.

Finally, as of the leverage effect, it is almost similar among all of them but it is interesting to observe a higher value reached by Japan, result of two main factors:

[48] See *Paragraph 2.5.1: Japan*.

1) the Keiretsu network (composed principally by banks), which may lead to an easier loaning money;

2) The impact of the "*no interest rates*" governmental measure[49], which brought banking interest rates down to almost 0% and even negative in many cases, in order to incentivize companies to borrow money and grow faster. In fact, it is cheaper in Japan to use money from banks than equity from shareholders.

This shows how the CG models and actions adopted by the national authorities may drive up or down the financial structure of a company and strongly influence its financial performance or CG strategies.

| | *Summary results of variables by geographic location* | | | |
|---|---|---|---|---|
| | ***Continental Europe*** | ***United Kingdom*** | ***Australia*** | ***Japan*** |
| Board size | 11.7 | 9 | 9.6 | 9.27 |
| Number of Independent Directors | 6.5 | 4.6 | 5.07 | 4.6 |
| % ID | 53.42% | 50.49% | 52.62% | 49.94% |
| CEO duality | 30% | 0% | 0% | 20% |
| Number of insiders | 3.3 | 1.53 | 1.4 | 2.13 |
| % Insiders | 28.46% | 17.04% | 14.58% | 23.02% |
| Number of Business Experts | 7.7 | 6.73 | 6.67 | 7.67 |
| % BE | 66.06% | 74.81% | 69.44% | 82.73% |
| Number of Support Specialists | 7.05 | 6.87 | 7.07 | 7.53 |
| % SS | 60.38% | 76.30% | 73.66% | 81.29% |
| Number of Community Influentials | 4.05 | 4.2 | 3.73 | 3.93 |
| % CI | 34.39% | 46.67% | 38.89% | 42.45% |
| ROA | 2.10% | 6.77% | -0.34% | 2.06% |
| Log Sales | 6.92 | 6.28 | 5.99 | 6.83 |
| Leverage | 0.53 | 0.51 | 0.44 | 0.58 |

# *Paragraph 3: Regression*

## *3.1 Research design*

The data consist of listed companies operating in the food sector, with specific focus to the national food business. Therefore, we excluded from the sample, those firms engaged areas too wide or not correlated to the national operations or food products, such as alcohol and spirits and retail services, since they may make the sample inconsistent. In addition, seven different countries have been considered: Australia, France, Germany, Italy, Japan, United Kingdom and Spain, where France, Germany, Italy and Spain have been grouped in a unique category: Continental Europe, for simplicity.[50]

Initially, a pool of 35 companies was selected. However, by running our analysis, this was not big enough to deliver significant results. Hence, the decision to double the sample up to 65 listed firms, by following the same criterias mentioned above, and picking them as follow:

[49] P. Silitschanu, *The Impact of Japan's Low to No Interest Rates on International Wire Transfers for Business*, available at: https://www.americanexpress.com/us/foreign-exchange/articles/influence-of-japanese-interest-rates-on-businesses/.

[50] See *Paragraph: 2.6: Final considerations.*

- *20 companies in Continental Europe;*
- *15 in United Kingdom;*
- *15 in Australia;*
- *15 in Japan.*

The research design requires the construction of a multiple regression model to test whether the specified corporate governance factors are related, somehow, with a better or worse financial company performance, and where, geographically, this effect represents a stronger impact.

Descriptive statistics were developed for the initial data set and highlighted some first outliers, observed through Mahalanobis distances. These were winsorised and more focus was brought to the director category label variables.

It is important to recall that our regression model analysis consists of seven corporate governance variables:

1) *Board size (x1);*
2) *Proportion of independent directors (x2);*
3) *CEO/Chairman duality* (x3);
4) *Insiders (x4);*
5) *Business Experts (x5);*
6) *Support Specialists (x6);*
7) *Community influential (x7).*

Two control variables:

8) *Natural logarithm of sales (x8);*
9) *Leverage (x9).*

Ordinated by four geographic location, or dummy variables, with United Kingdom as reference group:

- *Dummy Continental Europe (dEU);*
- *Dummy Australia (dAU);*
- *Dummy Japan (dJ).*

Finally, one dependent variable was tested: ROA and multiple models were run to prove the analysis.

In this study, a **hierarchical linear regression model** is developed.[51] This process shows if variables of our interest can explain a statistically significant amount of variance in our Dependent Variable (ROA), after considering all the other variables (independent variables) and while controlling for some of them (log sales

[51] University of Virginia Library, *Hierarchical Linear Regression*, available at: https://data.library.virginia.edu/hierarchical-linear-regression/.

and leverage). In this configuration, we run several regression models by adding variables to a previous model at each step. This way, the very first models will be composed by a few variables, while the later ones will be way larger than previous steps. The goal is to determine whether the newly added variables show a significant improvement in $\mathbf{R}^2$ (R squared, or amount of variance explained in ROA by the entire set of independent variables and control functions).

Hence, this model will allow to include and exclude some variables step-by-step and select the ones having more impact on the financial performance.

Therefore, we will start with a general hierarchical linear regression model, containing all the independent variables at its final step and depending on the intermediate results, two or more models will be isolated and developed.

To sum up, the general hierarchical regression at the final step, without the inclusion of the dummy variables yet, will be the following:

***General regression equation (1): ROA*** $= \beta_0 + \beta_1 * Board\ size + \beta_2 * Board\ Independence + \beta_3 * CEO/Chairman\ duality + \beta_4 * Insiders + \beta_5 * Business\ Experts + \beta_6 * Support\ Specialists + \beta_7 * Community\ Influentials + \beta_8 * Log\ Sales + \beta_9 * Leverage + \varepsilon$

Where:

- *Board size* = number of directors in the board for each company;
- *Board independence** = proportion of independent directors on the board;
- *CEO/Chairman duality* = binary variable, assuming value equal to 1 if the CEO is also the chairman of the board, and 0 otherwise;
- *Insiders** = proportion of directors identified in insiders category;
- *Business Experts** = proportion of directors identified in business experts category;
- *Support Specialists** = proportion of directors identified in support specialists category;
- *Community Influentials** = proportion of directors identified in community influentials category;
- *Log Sales* = natural logarithm function of revenues, calculated as the average of the period 2016-2018;
- *Leverage* = ratio of total liabilities to total assets, calculated as the average of the period 2016-2018;
- $\varepsilon$ = error term.

*All these variables will be included in relative terms, and, thus, as a percentage of the board size of the relative company.

So, the initial steps will be to define which of those variables are more significant and will explain better the variance of our dependent variable. Afterwards, dummies will be included in the next steps with the selected

variables only, and from this point the model regressions of our interest will be developed and analysed.

## *3.2 Hierarchical linear regression*

In this paragraph, the hierarchical linear regression model will be developed.[52] The model will be, mainly, run through the software SPSS Statistics[53], while each final result will be double-checked with other similar softwares.[54] The paragraph will start with a brief explanation of the descriptive statistics and correlation matrix of the variables. Then, a deeper analysis will be executed. Three models will be showed:

1) General model, including all the variables;[55]
2) Model 1 and Model 2, both composed of four different steps, starting from the isolated independent variable, which will be Business Experts for Model 1 and Support Specialists for Model 2, up to the interactions with the dummies;

### 3.2.1 Descriptive statistics

Table 1 illustrates the descriptive statistics for all the variables included in the model. The mean for ROA is equal to a positive 3%. As we saw, levels of sales and leverage are pretty constant among the sample of 65 companies, and with a total average of 5.5 and 48%, respectively. Then, the average board size is in line with the limits of the recommendations and equal to 10 seats, thus representing a medium size, and balancing the effects of big boards like the German and small boards like the British ones. Overall, independent directors constitute the majority of the members in the boards and CEO duality is present in only 8 companies out of the 65 in the sample, with half of them (4) being Italians. In addition, Business Experts and Support Specialists are considered the top one characteristics from the board in the sample, where two-third of members matching these features, and, in most cases, a director who is business expert, possess supportive specialist expertise as well. Finally, Community Influentials are the second lowest director category, after insiders. The latter obtain only 1 out of 5 seats in a board of food industry, on average, while the former almost 40% of members, with the great majority being academic figures. Finally, Standard Deviation distribution appears pretty similar among the observations, with the only exception of Log Sales and Board Size having a quite bigger one as compared to the other variables.

[52] Hierarchical Regression in SPSS, https://www.ibm.com/support/pages/hierarchical-regression-spss.
[53] Multiple Regression Analysis using SPSS Statistics, available at: https://statistics.laerd.com/spss-tutorials/multiple-regression-using-spss-statistics.php.
[54] R Tutorial, Hierarchical Linear Model, available at: http://www.r-tutor.com/gpu-computing/rbayes/rhierlmc.
[55] H. Aguinis, *Regression Analysis for Categorical Moderators*, 2004.

| *Table 1. Descriptive Statistics of Variables* | | | |
|---|---|---|---|
| **Variable** | **Mean** | **Standard Deviation** | **N** |
| ROA | 0.03 | 0.07 | 65 |
| Log Sales | 5.50 | 1.75 | 65 |
| Leverage | 0.48 | 0.18 | 65 |
| Board size | 10.03 | 3.75 | 65 |
| % Independent | 0.52 | 0.14 | 65 |
| CEO duality | 0.12 | 0.33 | 65 |
| Insiders | 0.21 | 0.11 | 65 |
| Business Experts | 0.73 | 0.14 | 65 |
| Support Specialists | 0.72 | 0.19 | 65 |
| Community Influentials | 0.41 | 0.14 | 65 |

The correlation matrix is, instead, summarized in Table 2 below, showing the correlation coefficients of all the different types of variables in our study. These coefficients range from -1 to +1, where +1 means a perfect positive relationship, 0 means no relationship between the variables at all and -1 represents a perfect negative relationship.

First of all, we have to notice the correlation among the variables with the dependent variable (ROA). Both the control functions have the same strength in terms of correlation with ROA but in the opposite ways: Log Sales is 0.39 positively correlated, while Leverage is 0.36 negatively correlated. Moreover, these results make sense, since the financial performance may increase when either the revenues increase or the debt-to-total assets ratio decreases. Then, board size, CEO duality, Insiders and Business Experts are almost "zero correlated" to ROA, while the proportion of Independent directors and Community Influentials are oppositely correlated, with ROA increasing when there is a lower percentage of independent directors and/or greater proportion of community influentials. Interestingly, ROA seems to be significantly (at both 5% and 1% levels) and more largely positively affected when there is a rise in the number of support specialists in the board of directors.

Moving to the inter-relation among independent variables and focussing only on the ones statistically and relevantly significant, it is worth to notice a quite good positive correlation between leverage ratio and log sales, support specialists and log sales, and community influentials and business experts. In addition, board size and log sales have a positive correlation almost equal to 0.50, describing an increase in the size of a company, and thus, sales, whenever the board increases the number of seats. Among the director category labels, support specialists and business experts are highly and positively correlated (0.50), and so are community influentials and support specialists (0.51), confirming that when the number of either business experts or community influentials rises, the support specialists increments as well.

Ultimately, it is valuable to mention the negative and significant correlation of support specialists with both

leverage and board size, and community influentials with both leverage and board size.

The high correlation between variables could represent a problem, since one variable could fully explain the other one, and thus, represent an outlier in the model. However, by running a Wald test and restricting these variables, it is confirmed that multicollinearity is unlikely to threaten the efficiency of the model. This is supported by the results for the collinearity diagnostics, the condition index and variance inflation factors.

***Table 2. Correlation matrix***

| | ROA | Log Sales | Leverage | Board size | % Independent | CEO duality | Insiders | Business Experts | Support Specialists | Community Influentials |
|---|---|---|---|---|---|---|---|---|---|---|
| ROA | 1 | | | | | | | | | |
| Log Sales | 0.39** | 1 | | | | | | | | |
| Leverage | -0.36** | 0.36** | 1 | | | | | | | |
| Board size | 0.04 | **0.49**** | 0.13 | 1 | | | | | | |
| % Independent | -0.22* | 0.07 | 0.14 | 0.20 | 1 | | | | | |
| CEO duality | -0.07 | 0.08 | 0.12 | 0.06 | -0.11 | 1 | | | | |
| Insiders | 0.01 | 0.13 | 0.09 | 0.08 | -0.05 | 0.11 | 1 | | | |
| Business Experts | 0.11 | 0.12 | -0.15 | -0.11 | -0.19 | -0.14 | 0.10 | 1 | | |
| Support Specialists | **0.54**** | 0.23** | -0.28** | -0.24** | -0.17 | -0.24* | -0.08 | **0.50**** | 1 | |
| Community Influentials | 0.30** | -0.01 | -0.33** | -0.23** | -0.03 | -0.19 | -0.15 | 0.32** | **0.51**** | 1 |

*Note * and **, correlation statistically significant at 5% and 1% levels (two-tailed).*
*Number = 65*

From this first interpretations, it is possible to observe a first idea on how two variables are related among our set. In the next paragraph, the regression model results will, instead, show whether some independent variables will be numerically related to the dependent variable and with which intensity.

## *3.3 Regression models and results*

### 3.3.1 General Model: all independent variables

The first general hierarchical linear regression model to explain the dependent variable ROA[56] is shown in Table 3 below and composed of two steps:

1) *Step 1:* include only the two control variables Leverage and Log sales;
2) *Step 2:* add all the other CG variables.

The most relevant observation has to be made on the R Square of the model. It improves by 0.147 as we move from step 1 to step 2. Then, it is important to consider that the R square of the final model is quite high and equal to 0.590. Hence, 59% of variation of ROA can be explained by the set of independent and control variables. This is true since both the models are statistically significant. The adjusted R square is a little bit lower than the standard R square, since it takes into account sample size and other effects, but it is still high as well. Next, Durbin-Watson, which is a statistic metric testing the hypothesis that there might be a serial correlation in the data, confirms with its value equal to 1.726[57] that there is not significant serial correlation. Finally, as we add more variables in the second step, the degree of freedom increases as well from 2 to 7 and

[56] A. Ranjbar, *Corporate Governance and Financial Performance: a Study of Malaysian Listed Companies*, 2009.
[57] A rule of thumb is that test statistic values in the range of 1.5 to 2.5 are relatively normal. Field (2009), available at: https://www.statisticshowto.datasciencecentral.com/durbin-watson-test-coefficient/.

F-value associated with the model goes down, since each variable we add just adds a small amount of variance.

***Table 3. General Model: Summary[c]***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| **1** | .666[a] | **0.443** | 0.425 | 0.055 | **0.443** | 24.687 | 2 | 62 | **0.00000001** | |
| **2** | .768[b] | **0.590** | 0.523 | 0.050 | **0.147** | 2.807 | 7 | 55 | **0.01425465** | 1.726 |

*a. Predictors: (Constant), Leverage, Log Sales*

*b. Predictors: (Constant), Leverage, Log Sales, CEO duality, Insiders, % Independent , Business Experts, Community Influentials, Board size, Support Specialists*

*c. Dependent Variable: ROA*

Now, it comes, probably to the most crucial part, where we have to observe which independent variables positively or negatively affect and explain ROA and at which intensity.

From Table 4, first of all, we can better explain what we previously anticipated on the possibility of multicollinearity, which is a phenomenon of very high inter-correlations among the independent variables.[58] This can cause an erroneous change in the coefficients of the multiple regression in response to changes in the set of data. Clearly, it is better when no multicollinearity in the model exists. Moreover, to verify the absence of this state, we can look for the value of "*collinearity statistics*" in Table 4. More specifically, as general rule, if the value of tolerance of each variable in the model is greater than 0.2 or 0.1 and, simultaneously, the value of variance inflation factor (VIF) is lower than 10, then, the multicollinearity effect should be controlled and not be considered a problem.[59] Hence, as we can observe from the data below, the conditions are respected by every variable inserted in the model.

Now, we must focus on the p-value of each singular variable in the previous model number 1 and select only the ones with a p-value < 0.05:

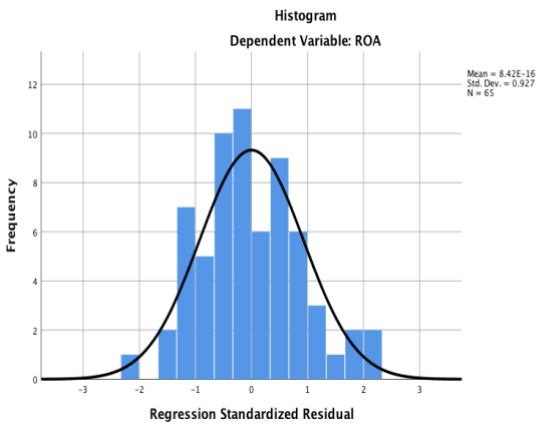
1) *Log Sales* is significant for the model 1 ROA: t = 4.391, p < 0.05, and with a positive coefficient equal to 0.023, thus providing support that greater sales are associated with higher company performance when measured by ROA;
2) *Leverage* is significant for the model 1 ROA: t = -4.303, p < 0.05, and with a negative coefficient equal to -0.184, thus showing that higher level of debt-to-total asset ratio leads to higher company performance when measured by ROA;
3) *Business Experts* is significant for the model 1 ROA: t = -2.533, p < 0.05, and with a negative relation to the ROA equal to -0.136. Hence, here an interpretation must be delayed to the next regression models, since a negative association is not truly explainable because business experts should, instead, increase the financial performance of a company;
4) *Support Specialists* is significant for the model 1 ROA: t = 2.619, p < 0.05, and with a positive

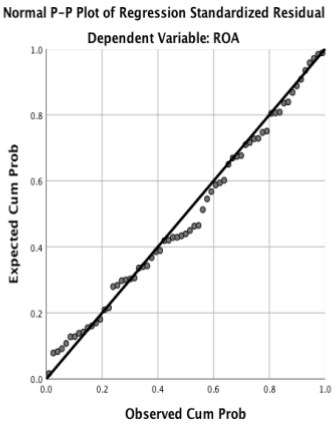
58 J. Gruber and G. Kockläuner, *Multicollinearity and Biased Estimation: proceedings of a Conference at the University of Hagen*, 1984.

59 Statistics Solution, available at: https://www.statisticssolutions.com/multicollinearity/.

coefficient equal to 0.130. Therefore, from this analysis, when boards are composed by a higher number of support specialists, then the financial performance should increase as well.

Before moving to hypothesis testing section, it is worth to briefly outline that the histogram below of the residuals associated with ROA follows a normal distribution and that the dot values on right almost constantly hug the line of least squares (or line of greatest fit). Hence, the error term $\varepsilon$ from our regression equations can be considered, henceforth, irrelevant for our analysis.




## Test results

From Test 1 in *Chapter 2: Paragraph 1: Hypothesis testing*, we stated the hypotheses testing for this model:

- *H0: B1 = B2 = B3 = B4 = B5 = B6 = B7 = B8 = B9 = 0*
- *H1: Bk ≠ 0 for at least one k*

Since we explained that the overall General model showed a statistical Specialists (independent variables) with a p value equal to 0.000005, 0.000006, 0.014 and 0.011, respectively, and, hence, less than 0.05. Therefore, we can reject the null hypothesis and accept the alternative H1, saying that there are at least four significant variables with F-Value = 0.014 and $p < 0.05$. However, we observed that four variables had a linear relationship with our dependent variable. These are Log Sales and Leverage (control variables), and Business Experts and Support that are linearly related to ROA.

| Table 4. General Model: Coefficients[a] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Variables | Unstandardized Coefficients | | | | Collinearity Statistics | |
| | | B | Std. Error | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 | | |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 | 0.874 | 1.145 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 | 0.874 | 1.145 |
| 2 | (Constant) | 0.043 | 0.059 | 0.726 | 0.471 | | |
| | Log Sales | **0.023** | 0.005 | **4.391** | **0.000** | 0.455 | 2.199 |
| | Leverage | **-0.184** | 0.043 | **-4.303** | **0.000** | 0.650 | 1.539 |
| | Board size | -0.002 | 0.002 | -0.739 | 0.463 | 0.566 | 1.768 |
| | % Independent | -0.092 | 0.049 | -1.889 | 0.064 | 0.886 | 1.129 |
| | CEO duality | -0.005 | 0.020 | -0.271 | 0.787 | 0.881 | 1.135 |
| | Insiders | 0.025 | 0.058 | 0.431 | 0.668 | 0.921 | 1.086 |
| | Business Experts | **-0.136** | 0.054 | **-2.533** | **0.014** | 0.705 | 1.418 |
| | Support Specialists | **0.130** | 0.049 | **2.619** | **0.011** | 0.436 | 2.294 |
| | Community Influentials | 0.014 | 0.055 | 0.260 | 0.796 | 0.665 | 1.504 |

*a. Dependent Variable: ROA*

This study allowed us to move our empirical analysis in the next regression models on just a few variables. In fact, we will now isolate and carry out only, the control variables, Business Experts and Support Specialists, and observe whether their effects are constant in the next processes and whether they increase or decrease their impact on ROA, when interacting with some other variables.

### 3.3.2 Model 1: Business Experts

#### a) Dummy variables

The model number 1 has been developed by including the dummy variables and look for potential effects on the first previous significant independent variable in the model, by controlling for Leverage and Log Sales effects. This model will, therefore, be based on three steps:

1) *Step 1:* include only the two control variables Leverage and Log sales;
2) *Step 2:* add Business Expert as independent variable;
3) Step 3: add the dummy variables.

Before showing the results of the revised model 1, we have to recall that although the sample is composed of four different geographic locations, only three dummies will be included in the model, thus making dUK, henceforth, the reference group.

Table 5 illustrates the results of Model 1, where dummy variables will try to collocate the effects of business experts on ROA.

The Model is significant overall at step 3. However, at step 2, where only Business Experts where inserted as independent variable, besides the control functions of course, the model was not significant, with a Sig. F. Change equal to 0.577. Anyway, the model increases its R square from 0.443 to 0.445 at step 2 to 0.548 at the final step 3, thus leading to an R square change equal to 0.102. Hence, the incorporation of more independent variables brought to an increase in the explanation of variance in ROA as well as incrementing the significance of the regression. In fact, Dummy variables changed the statistically significance of the model, although we have to notice that business experts still achieve a non-significant p-value (Table 6).

***Table 5. Model 1 (a): Summary[d]***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| **1** | .666[a] | **0.443** | **0.425** | 0.055 | **0.443** | 24.687 | 2 | 62 | **0.000** | |
| **2** | .668[b] | **0.446** | **0.419** | 0.055 | **0.003** | 0.314 | 1 | 61 | **0.577** | |
| **3** | .740[c] | **0.548** | **0.501** | 0.051 | **0.102** | 4.343 | 3 | 58 | **0.008** | 2.129 |

*a. Predictors: (Constant), Leverage, Log Sales*

*b. Predictors: (Constant), Leverage, Log Sales, Business Experts*

*c. Predictors: (Constant), Leverage, Log Sales, Business Experts, dAU, dJ, dEU*

*d. Dependent Variable: ROA*

From the Coefficients Table number 6, indeed, Log Sales and Leverage still keeps their significant and opposite trend associated with ROA, while dummy Europe and Dummy Australia show a significant p-value.

In particular:

1) *Log Sales* is significant for the model 1 ROA: $t = 6.004$, $p < 0.05$, and with a positive coefficient equal to 0.024, thus providing support that greater sales are associated with higher company performance when measured by ROA;
2) *Leverage* is significant for the model 1 ROA: $t = -5.894$, $p < 0.05$, and with a negative coefficient equal to -0.240, thus showing that higher level of debt-to-total asset ratio leads to higher company performance when measured by ROA;
3) *Business Experts* is not significant for the model 1 ROA: $t = -1.013$, $p > 0.05$, but still confirming its negative relation to the ROA;
4) *Dummy Continental Europe* is significant for the model 1 ROA: $t = -2.224$, $p < 0.05$, and with a negative coefficient equal to 0.042.
5) *Dummy Australia* is significant for the model 1 ROA: $t = -3.562$, $p < 0.05$, and with a negative coefficient equal to 0.067;
6) *Dummy Japan* is not significant for the model 1 ROA: $t = -1.486$, $p > 0.05$, but $p = 0.143$, so it is quite close to the threshold of 0.05, and with a negative coefficient equal to 0.030.

## Test results

From Test 2:

$\rightarrow y = B0 + \delta 0 * d1 + B2 * x1 + \varepsilon$

- $H0: \delta 0 = 0$
- $H1: \delta 0 \neq 0$

We can reject the null hypotheses, since there is at least one difference in the coefficients that is statistically significant and $p < 0.05$. These are dummy Europe and dummy Australia, which showed a clear difference with dummy United Kingdom.

***Table 6. Model 1 (a): Coefficients*** [a]

| Model | Variables | Coefficients | | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | | B | Std. Error | | | Tolerance | VIF |
| 1 | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 | | |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 | 0.874 | 1.145 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 | 0.874 | 1.145 |
| 2 | (Constant) | 0.018 | 0.045 | 0.397 | 0.693 | | |
| | Log Sales | 0.025 | 0.004 | 5.874 | 0.000 | 0.842 | 1.187 |
| | Leverage | -0.233 | 0.042 | -5.617 | 0.000 | 0.835 | 1.198 |
| | Business Experts | -0.029 | 0.051 | -0.561 | 0.577 | 0.942 | 1.062 |
| 3 | (Constant) | 0.081 | 0.049 | 1.662 | 0.102 | | |
| | Log Sales | **0.024** | 0.004 | **6.004** | **0.000** | 0.810 | 1.234 |
| | Leverage | **-0.240** | 0.041 | **-5.894** | **0.000** | 0.744 | 1.345 |
| | Business Experts | -0.056 | 0.055 | -1.013 | 0.315 | 0.697 | 1.435 |
| | dEU | **-0.042** | 0.019 | **-2.224** | **0.030** | 0.541 | 1.849 |
| | dAU | **-0.067** | 0.019 | **-3.562** | **0.001** | 0.635 | 1.575 |
| | dJ | -0.030 | 0.020 | -1.486 | 0.143 | 0.570 | 1.754 |

*a. Dependent Variable: ROA*

The coefficients of dummy variables represent a way to compare each one of them with the reference group: in this case dummy United Kingdom.
In fact, Beta of dummy EU equal to -0.042 means that dummy EU, as compared to dummy UK, will realize a -0.042 decrease on the dependent variable, and so on for the other Betas.

Therefore, we must introduce a new equation for this relation:
**General regression equation (2):** $y = B0 + B1 * d1 + B2 * x1 + \varepsilon$

Where:

- *B0* = beta of Constant in step 3;
- *B1* = coefficient of referred dummy associated with ROA (e.g. if we are computing the regression equation for dummy Continental Europe, then B1 = Unstandardized B of dEU associated with ROA

from Table 6, and thus equal to -0.042);

- *d1* = referred dummy variable;
- *B2* = coefficient of independent variable (e.g. in this case Business Experts) associated with ROA;
- *x1* = independent variable (e.g. in this case is Business Experts).

In light of the establishment of equation (2), we can develop 4 different regression equations with dummy variables by extrapolating values from Table 6, as following:

- **United Kingdom (reference group)**

ROA = B0 + B1 * 0
→ ROA = B0 + B2 * (Business Experts)
→ **ROA (United Kingdom) = 0.081 - 0.056 * (Business Experts)**

- **Continental Europe**

y = B0 + B1*1 + B2 * (Business Experts)
→ y = (B0+B1) + B2 * (Business Experts)
→ y = (0.0808639742090227 - 0.0416556659059782) - 0.0558751797835835 * (Business Experts)
→ **ROA (Continental Europe) = 0.039 - 0.056 * (Business Experts)**

- **Australia**

y = (B0+B1) + B2 * (Business Experts)
→ y = (0.0808639742090227 - 0.0674416069725508) - 0.0558751797835835 * (Business Experts)
→ **ROA (Australia) = 0.013 - 0.056 * (Business Experts)**

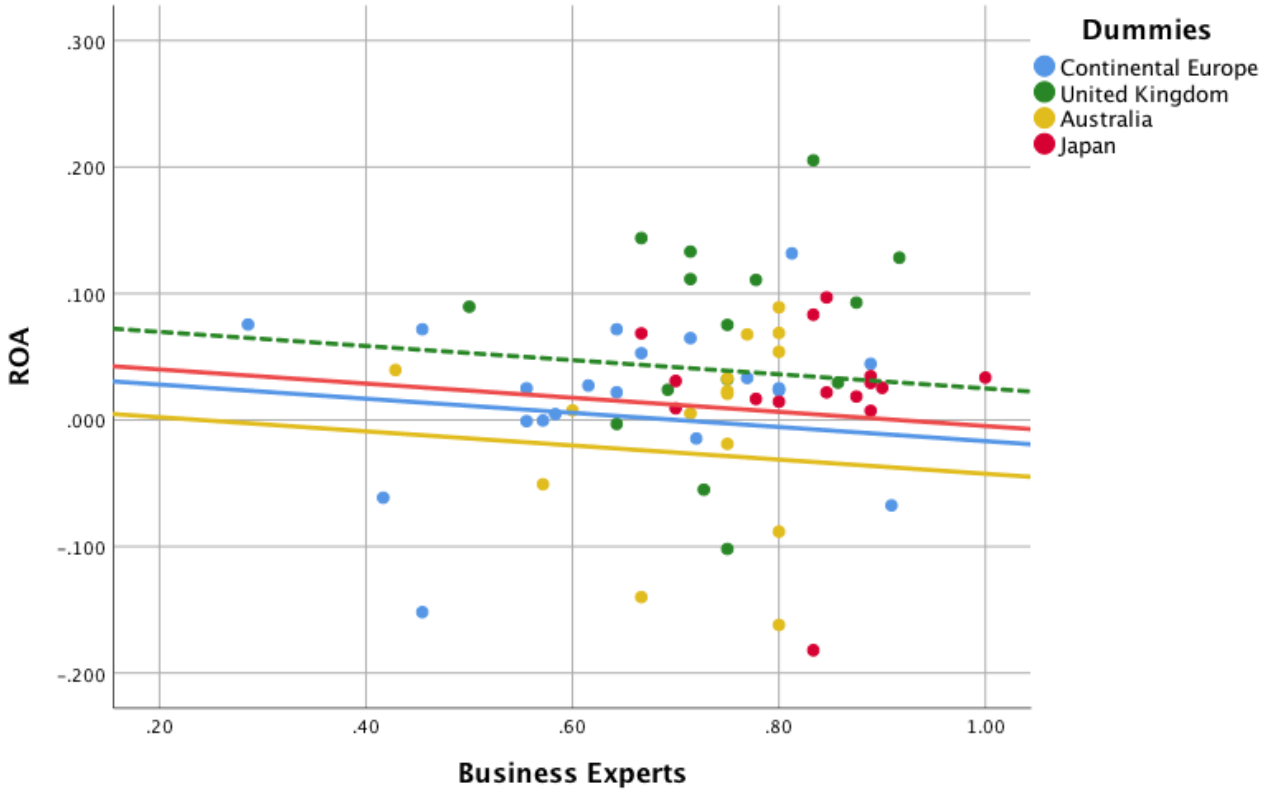
- **Japan**

y = (B0+B1) + B2 * (Business Experts)
→ y = (0.0808639742090227 - 0.0296989638439555) - 0.0558751797835835 * (Business Experts)
→ **ROA (Japan) = 0.051 - 0.056 * (Business Experts)**

In the graph below, we positioned each regression equation just computed, with four different colours for each dummy-geographic variable. Graph 1 below shows the analyzed situation graphically. As we noticed from the regression equations, the number of business experts is fixed since the equations have the same slope equal to 0.056, but their intercepts change due to the different geographic positions. In fact, the reference group, United Kingdom, represent the highest level of ROA, given the number of business experts.

It is, then followed by Japan, Continental Europe and, lastly, Australia, where Continental Europe and Australia showed a significant dummy correlation as well. Hence, since the correlation between Business Experts and ROA is inverse, then the slope of the equation is negative (-0.056), and thus, ROA is lower when Business Experts is high. Therefore, for a given number of Business Experts, British companies will show a higher company performance than the other companies in the sample.

Graph 1. Relation ROA – Business Experts by geographic location




In the next model, we will analyze better the relation between dummy and business experts, and business experts and ROA, in order to explain the negative relation between these two.

## Model 1: Business Experts

### b) Interaction terms between Business Experts and dummy variables

Up to now, we assumed that the effects for the business experts are equal for everyone.[60] However, there are reasons to believe that this is not the case. For instance, the effect of business experts may be different for United Kingdom than for Japan as a study of Silke Hermann and her associates (2011)[61] demonstrated. Indeed, we introduce a new phenomenon linked to dummy variables: interaction or moderation. This is when the effects may differ among different groups.

[60] M. Te Grotenhuis and P. Thijs, *Dummy variables and their interactions in regression analysis: examples from research on body mass index*, 2015.
[61] S. Hermann, *The association of education with body mass index and waist circumference in the EPIC-PANACEA study*, BMC Public Health, 2011.

Here, we keep the 3-step structure of the model, but we exchange the presence of dummies in the final step with a new variable: interaction between dummy variables and Business Experts. This factor will try to explain whether the interaction may increase or decrease the effects of the independent variables on ROA and will measure the differences in slope effects between the four groups:

1) *Step 1:* include only the two control variables Leverage and Log sales;
2) *Step 2:* add Business Expert as independent variable;
3) Step 3: add the interaction terms between dummy and Business Expert variables (*int_d_BE*).

Table 7 shows that the introduction of interaction terms in the model tremendously improve its statistically significance: Sig. F Change goes from 0.577 at step 2 to 0.009 at step 3, and thus $p < 0.05$, overall. In addition, interaction terms contribute to increment the value of R square as well, leading to a final 54.5%.

***Table 7. Model 1 (b): Summary[d]***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| **1** | .666[a] | **0.443** | **0.425** | 0.055 | **0.443** | 24.687 | 2 | 62 | **0.000** | |
| **2** | .668[b] | **0.446** | **0.419** | 0.055 | **0.003** | 0.314 | 1 | 61 | **0.577** | |
| **3** | .738[c] | **0.545** | **0.498** | 0.051 | **0.099** | 4.188 | 3 | 58 | **0.009** | 2.117 |

*a. Predictors: (Constant), Leverage, Log Sales*
*b. Predictors: (Constant), Leverage, Log Sales, Business Experts*
*c. Predictors: (Constant), Leverage, Log Sales, Business Experts, int_dEU_BE, int_dAU_BE, int_dJ_BE*
*d. Dependent Variable: ROA*

Important results are achieved in terms of coefficients (Table 8), where two out of three interactions have a $p < 0.05$. These are the same as the significant dummy variables already explained in the previous Model 1, but with the implementation of the effects due to the interaction between the variables: In particular:

1) *Dummy Continental Europe* is significant in the previous model, and so it is its Interaction with Business Experts (*int_dEU_BE,* $t = -2.226$, $p < 0.05$), but its relation to ROA becomes more negative and goes down from -0.042 to -0.058;
2) *Dummy Australia* was significant in Model 1 as well as its Interaction in this model (*int_dAU_BE,* $t = -3.467$, $p < 0.05$), but, again, its relation to ROA increases in terms of effects, moving from -0.067 to -0.089;
3) *Dummy Japan* and interaction between dJ and BE remains not-significant. However, the relation is affected by the same trend as the other two interactions and goes from -0.030 to -0.043;

## Test results

From Test 3:

$\rightarrow y = B0 + B1 * x1 + \delta 1 * d1 * x1 + \varepsilon$

- *H0: δ1 = 0*
- *H1: δ1≠ 0*

We can reject the null hypothesis and accept the alternative H1: δ1≠ 0, since both *int_dEU_BE* and *int_dAU_BE* achieved a statistical significant p-value and confirmed that ROA is not the same value for all dummy variable.

***Table 8. Model 1 (b): Coefficients[a]***

| Model | Variables | Unstandardized Coefficients | | | |
|---|---|---|---|---|---|
| | | B | Std. Error | t | Sig. |
| **1** | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 |
| **2** | (Constant) | 0.018 | 0.045 | 0.397 | 0.693 |
| | Log Sales | 0.025 | 0.004 | 5.874 | 0.000 |
| | Leverage | -0.233 | 0.042 | -5.617 | 0.000 |
| | Business Experts | -0.029 | 0.051 | -0.561 | 0.577 |
| **3** | (Constant) | 0.040 | 0.047 | 0.864 | 0.391 |
| | Log Sales | **0.024** | 0.004 | **5.942** | **0.000** |
| | Leverage | **-0.238** | 0.041 | **-5.818** | **0.000** |
| | Business Experts | -0.002 | 0.055 | -0.041 | 0.967 |
| | int_dEU_BE | **-0.058** | 0.026 | **-2.226** | **0.030** |
| | int_dAU_BE | **-0.089** | 0.026 | **-3.467** | **0.001** |
| | int_dJ_BE | -0.043 | 0.025 | -1.689 | 0.097 |

*a. Dependent Variable: ROA*

This step has been descripted, especially, to construct a new general regression equation (where all the variables assume the same characteristic as the previous model with dummies) and see the graphically effects as well as constitute the foundation for the next and final model.

**General regression equation (3):** $y = B0 + B1 * x1 + B2 * d1 * x1 + \varepsilon$

- **United Kingdom (reference group)**

y = B0 + B1 * (Business Experts) + B2 * 0 * (interaction Business Experts and dummy UK)

→ y = B0 + B1 * (Business Experts)

→ **ROA United Kingdom = 0.040 - 0.002 * BE**

- **Continental Europe**

y = B0 + B1 * (Business Experts) + B2 * (interaction Business Experts and dummy EU)
→ y = B0 + (B1 + B2int_dEU_BE) * (Business Experts)
→ y = 0.0403330824463653 + (-0.00226093743736554 - 0.0576344818091339)
→ **ROA Continental Europe = 0.040 - 0.060 * BE**

- **Australia**

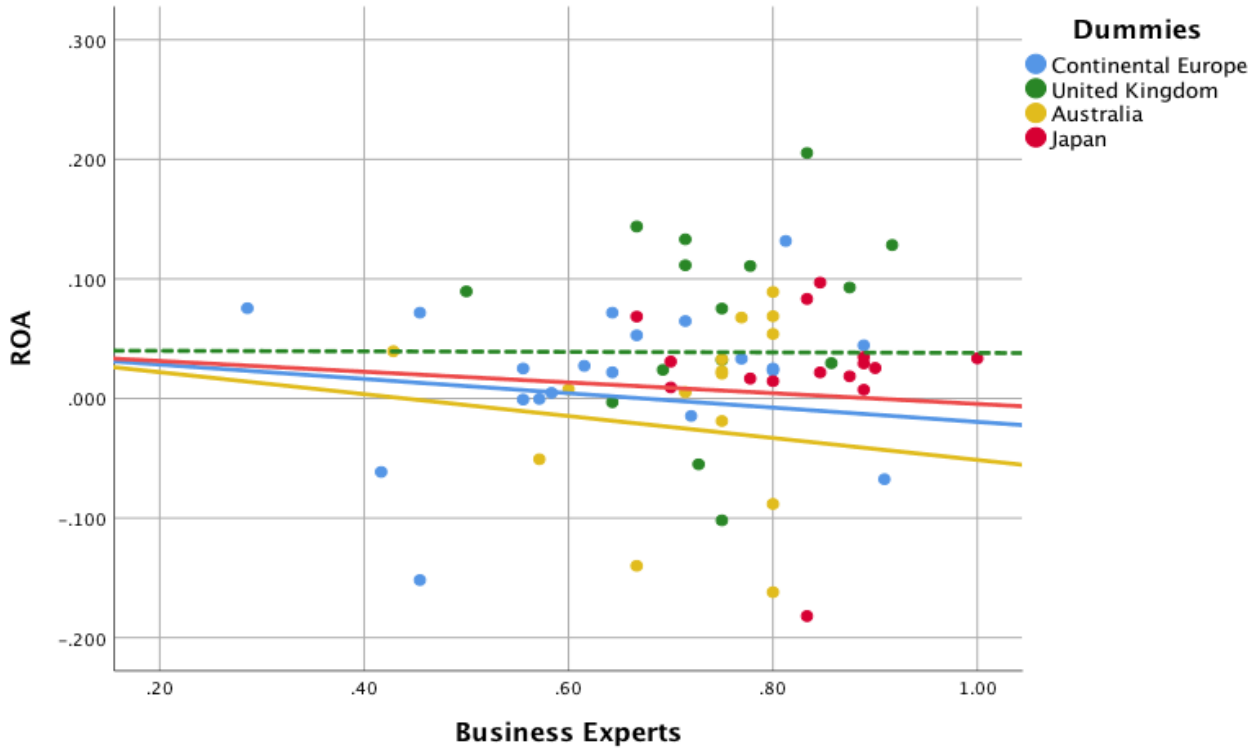
y = B0 + B1* (Business Experts) + B2 * (interaction Business Experts and dummy AU)
→ y = B0 + (B1 + B2int_dJ_BE) * (Business Experts)
→ y = 0.0403330824463653 + (-0.00226093743736554 -0.0894379679349677) * (Business Experts)
→ **ROA Australia = 0.040 - 0.092 * BE**

- **Japan**

y = B0 + B1 * (Business Experts) + B2 * (interaction Business Experts and dummy J)
→ y = B0 + (B1 + B2int_dJ_BE) * (Business Experts)
→ y = 0.0403330824463653 + (-0.00226093743736554 - 0.0426154623577957) * (Business Experts)
→ **ROA Japan = 0.040 - 0.045 * (Business Experts)**

Graph 2 is used to show the rate of increase or decrease of the effects on ROA by the independent variable BE. Indeed, all the regression lines start at the same place or intercept equal to 0.040. However, as we increase the proportion of Business Experts in the board, Australia decreases its ROA at a much faster rate than the other countries, followed by Continental Europe, Japan and United Kingdom, respectively. At the same time, the proportion of Business experts seem not to affect that much the financial performance of British companies, since the slope of dummy UK is just equal to -0.002 and is almost parallel to the x-axis. Therefore, this confirms that the reference group perform, on overall, better in terms of ROA.

Graph 2. Regression lines with interaction between dummies and Business Experts




## Model 1: Business Experts

### c) Dummy variables and interaction terms between Business Experts and dummy variables

Starting from Model 1 (b), we now integrate model 1 (a) and (b) to see the combined effects of both different coefficients and slopes on our study.

As shown in Table 6. Coefficients and Graph 1. Relation ROA – Business Experts for geographic location, dummies can have an impact on our model, just acting separately. In this model, we want, instead, to combine the results from Table 6 in one unique regression model, by including the creation of a completely new variable: interaction between dummies and our independent variable (Business Experts).

Hence, revised Model 1 will be constructed with an extra-step, and thus four in total:

1) *Step 1:* include only the two control variables Leverage and Log sales;
2) *Step 2:* add Business Expert as independent variable;
3) Step 3: add the dummy variables;
4) *Step 4:* add the new interaction variables between dummies and business experts.

Table 9 below, illustrates a brief summary of the results in the regression. Firstly, the model gets improving in R square step-by-by-step, although the R Square change from step 3 to step 4 is relatively small. However,

a downturn in the statistical significance is achieved by the overall model, where p-value > 0.05. This may be due to the low number of observations, which lose significance as we added more independent variables in the regression.

***Table 9. Model 1 (c): Summary[e]***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| **1** | .666[a] | **0.443** | 0.425 | 0.054995 | **0.443** | 24.687 | 2 | 62 | **0.000** |
| **2** | .668[b] | **0.446** | 0.419 | 0.055302 | **0.003** | 0.314 | 1 | 61 | **0.577** |
| **3** | .740[c] | **0.548** | 0.501 | 0.051250 | **0.102** | 4.343 | 3 | 58 | **0.008** |
| **4** | .745[d] | **0.555** | 0.483 | 0.052177 | **0.008** | 0.319 | 3 | 55 | **0.812** |

*a. Predictors: (Constant), Leverage, Log Sales*

*b. Predictors: (Constant), Leverage, Log Sales, Business Experts*

*c. Predictors: (Constant), Leverage, Log Sales, Business Experts, dAU, dJ, dEU*

*d. Predictors: (Constant), Leverage, Log Sales, Business Experts, dAU, dJ, dEU, int_dEU_BE, int_dAU_BE, int_dJ_BE*

*e. Dependent Variable: ROA*

Anyway, we can still try to explain the effects of the interaction terms that we included.

In Table 10, we have p-values and betas for each new variable. As we can observe, only the control variables possess a statistically significant p-value < 0.05, while all the others are not significant at 95% confidence level. Due to the very limited number of observations (65), we feel that we can still describe the results of this model, and agree that it would have been more significant in case of a larger sample.

***Table 10. Model 1 (c): Coefficients[a]***

| Model | Variables | Unstandardized Coefficients | | t | Sig. |
|---|---|---|---|---|---|
| | | B | Std. Error | | |
| **1** | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 |
| **2** | (Constant) | 0.018 | 0.045 | 0.397 | 0.693 |
| | Log Sales | 0.025 | 0.004 | 5.874 | 0.000 |
| | Leverage | -0.233 | 0.042 | -5.617 | 0.000 |
| | Business Experts | -0.029 | 0.051 | -0.561 | 0.577 |
| **3** | (Constant) | 0.081 | 0.049 | 1.662 | 0.102 |
| | Log Sales | **0.024** | 0.004 | 6.004 | **0.000** |
| | Leverage | **-0.240** | 0.041 | -5.894 | **0.000** |
| | Business Experts | -0.056 | 0.055 | -1.013 | 0.315 |
| | dEU | **-0.042** | 0.019 | -2.224 | **0.030** |
| | dAU | **-0.067** | 0.019 | -3.562 | **0.001** |
| | dJ | **-0.030** | 0.020 | -1.486 | 0.143 |
| **4** | (Constant) | 0.041 | 0.105 | 0.396 | 0.694 |
| | Log Sales | 0.025 | 0.004 | 5.953 | 0.000 |
| | Leverage | -0.240 | 0.042 | -5.747 | 0.000 |
| | Business Experts | -0.007 | 0.136 | -0.052 | 0.959 |
| | dEU | 0.009 | 0.112 | 0.078 | 0.938 |
| | dAU | -0.090 | 0.139 | -0.648 | 0.520 |
| | dJ | 0.083 | 0.166 | 0.498 | 0.620 |
| | int_dEU_BE | -0.071 | 0.153 | -0.464 | 0.644 |
| | int_dAU_BE | 0.034 | 0.188 | 0.180 | 0.858 |
| | int_dJ_BE | -0.141 | 0.208 | -0.677 | 0.501 |

*a. Dependent Variable: ROA*

## Test results

From Test 4:

→ $y = B0 + \delta 0 * d1 + B2 * x1 + \delta 1 * x1 * d1 + \varepsilon$

- *H0:* $\delta 0 = 0, \delta 1 = 0$
- *H1: at least one* $\delta \neq 0$

As we already described above, none of the overall model and single independent variable in step 4 has a significant p-value. Therefore, we fail to reject the null hypothesis *H0:* $\delta 0 = 0, \delta 1 = 0$.

However, the interaction terms can offer some suggestions for the creation of a new regression equation with interactions and see the effects graphically:

**General regression equation (4):** $y = B0 + B1 * d1 + B2 * x1 + B3 * x1 * d1 + \varepsilon$

Where:

- *B0* = beta of Constant in step 3;
- *B1* = coefficient of referred dummy associated with ROA (e.g. if we are computing the regression equation for dummy Continental Europe, then B1 = Unstandardized B of dEU associated with ROA from Table 6, and thus equal to -0.042);
- *d1* = referred dummy variable;
- *B2* = coefficient of independent variable (e.g. in this case Business Experts) associated with ROA;
- *x1* = independent variable (e.g. in this case is Business Experts);
- *B3* = coefficient of interaction between independent variable and referred dummy variable.

➢ **United Kingdom (reference group)**

y = B0 + B1 * 0 + B2 * (Business Experts) + B2 * (Business Experts) * 0

→ y = B0 + B2*(Business Experts)

→ **ROA (United Kingdom) = 0.041 - 0.007 * (Business Experts)**

➢ **Continental Europe**

y = B0 + B1*1 + B2*(Business Experts) + B3 * (Business Experts) * 1

→ y = (B0+B1) + (B2+B3) * (Business Experts)

→ y = (0.041479446372 + 0.008763811329) + (-0.007051633146 - 0.071236563723) * (Business Experts)

→ **ROA (Continental Europe) = 0.050 - 0.078 * (Business Experts)**

- **Australia**

y = (B0+B1) + (B2+B3) * (Business Experts)

→ y = (0.041479446372 - 0.089982191746) + (-0.0070516331469 + 0.033830664129) * (Business Experts)

**→ ROA (Australia) = -0.049 + 0.027 * (Business Experts)**

- **Japan**

y = (B0+B1) + (B2+B3) * (Business Experts)

→ y = (0.041479446372 + 0.082691785751) + (-0.0070516331469 - 0.140913501) * (Business Experts)

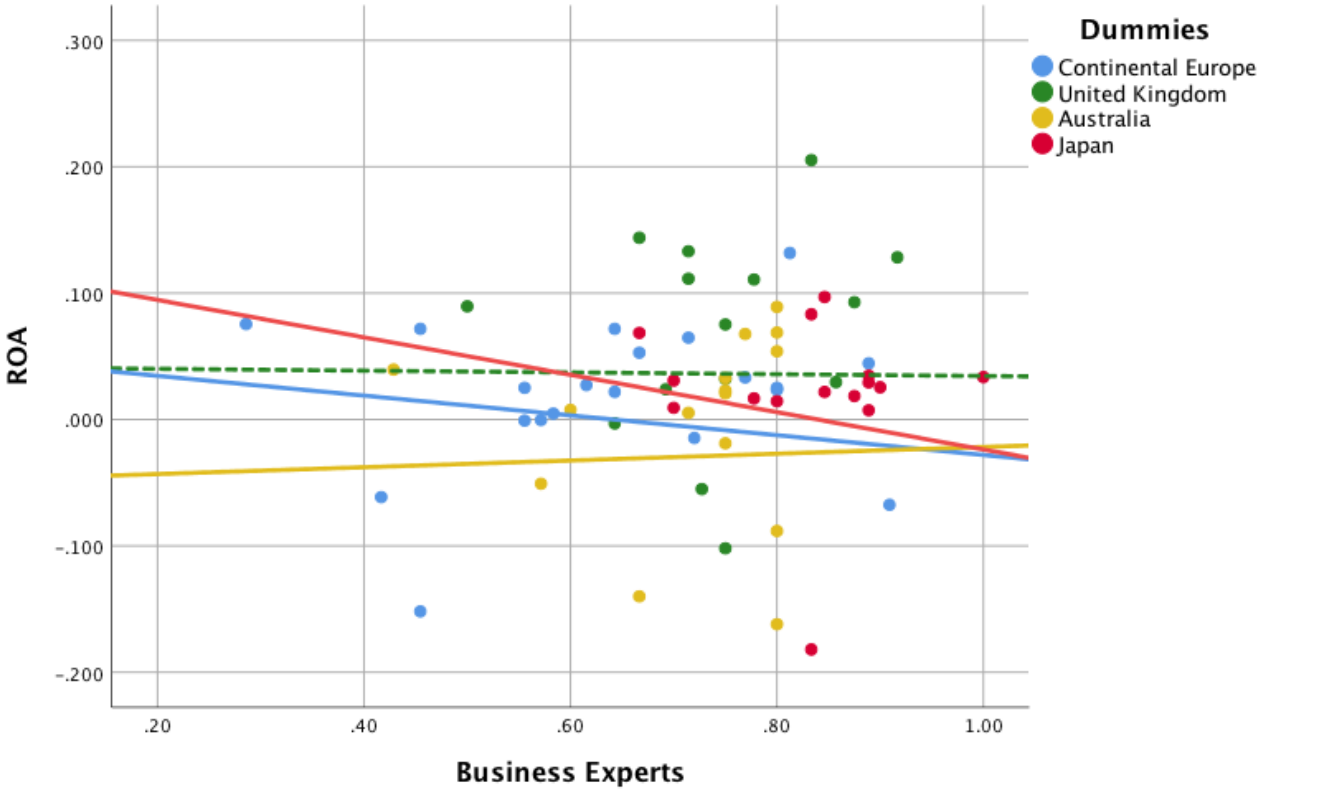
**→ ROA (Japan) = 0.124 - 0.148 * (Business Experts)**

The chart below pictures the new mentioned equations graphically and two interpretations can be made:

I. **Coefficients:** the effect of number of business experts on ROA is stronger for Japan than for any other country. It is followed by Continental Europe, first, and United Kingdom, then, with a slightly coefficient difference, between the two, equal to (0.050 – 0.041) = 0.009. Lastly, Australia is the last performer and the only one with a negative intercept in terms of interaction, with a pretty large coefficient difference with Japan of (0.124 + 0.049) = 0.173 and discrepancy with the penultimate, United Kingdom, of (0.041 + 0.049) = 0.090.

II. **Slopes:** Australian companies are the only one to possess a good and positive slope. This means that after a given number of business experts, their performance starts to rise, by equalling Continental European and Japanese companies at proportion of business experts equal to 91% and 95%, respectively. On the other side, these two dummies will start decreasing their financial performance, as Business experts rise in number. Nonetheless, this is an unreal situation, because a proportion of business experts equal to 91% of the total number of directors in the board is pretty hard to achieve and, almost impossible due to the heterogeneity of competences that board of directors are pursuing, nowadays. The intercept for United Kingdom is below that for Japan and Continental Europe, but the slope of the line is smaller and more negative for Japan and Continental Europe. This means that Japanese and Continental European companies accomplish a higher level of performance at given proportions of Business Experts. Then, this gap decreases as the proportion of business experts in the board of directors get larger, up to a value of 55%, where British companies start to improve their ROA over all the other countries. Furthermore, at some point, British firms confirm to be our reference group due to the interaction between the geographic dummy variable and the number of business experts.

Graph 3. Regression model with dummy and interaction between dummy and Business Experts




## Final considerations

The first model illustrated a negative relation between Business Experts and ROA and we suggested to wait and investigate more deeply before describing this surprising effect. As we run more steps in the model, we understood, especially from the interaction of dummies with business experts in Australia and United Kingdom, and firms' financial health (by looking at the other financial metrics, such as multiples and a longer time-frame of ROA) that this negative correlation is given by the current financial situation of that specific company at that given time. More specifically, companies seem to call the business experts, and, thus, increase their proportion in the board of directors, whenever their financial performance, measured by ROA, is going negative or low. Hence, the intervention of this new fraction of the board may take a bit of time to reform the strategies in the company and achieve better financial results. Therefore, this is supported by the fact that most of the companies broaden the number of business experts in their boards, whenever their performance was going slightly or largely down. In light of this analysis, it is, indeed, possible that business experts' operations will take a while before making a concrete and positive impact on the company results.

### 3.3.3 Model 2: Support Specialists

#### a) Dummy variables

Starting from Table 4 in General Model, we decided to mark "Support Specialists" as the independent variable to carry on for the next empirical analysis since it was the only one, together with the control functions and Business Experts, to show a significant correlation with the financial performance. In particular, t = 2.619, p = 0.011, with a positive correlation equal to 0.130, prefigured even stronger effects with respect to Business Experts.

From these data, the procedure moved to the development of model number 2, including the dummy variables and look for potential effects on Support Specialists.

Hence, this model will be computed as follows:

1) *Step 1:* include only the two control variables Leverage and Log sales;
2) *Step 2:* add Support Specialists as independent variable;
3) Step 3: add the dummy variables (where *dUK* will be still kept as our reference group, henceforth).

Table 11 describes the results of Model 2 from step 1 up to the final step, with our dummies incorporated in the hierarchical regression.

Firstly, an interesting fact is that, as opposed with Model 1, all the steps show a highly statistical significant p-value, accompanied by a constant increase in R Square. Indeed, the model as a whole reaches a level of R Square so to explain almost 61% of variation in ROA, and with and adjusted R Square just a little bit lower but still pretty high (56.6%). So, p-value of the final model is equal to 0.007 and remarkably below the 0.05 threshold. Furthermore, the decision to add dummy variables brought to an overall good improvement in the model, both in terms of significance and of variability of Y.

Finally, Durbin-Watson still maintain its levels in the range between 1.5 and 2.5, excluding potential dangers from the serial correlations.

***Table 11. Model 2 (a): Summary[d]***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| **1** | .666[a] | **0.443** | **0.425** | 0.055 | **0.443** | 24.687 | 2 | 62 | **0.000** | |
| **2** | .717[b] | **0.515** | **0.491** | 0.052 | **0.071** | 8.981 | 1 | 61 | **0.004** | |
| **3** | .779[c] | **0.606** | **0.566** | 0.048 | **0.092** | 4.503 | 3 | 58 | **0.007** | 1.940 |

*a. Predictors: (Constant), Leverage, Log Sales*

*b. Predictors: (Constant), Leverage, Log Sales, Support Specialists*

*c. Predictors: (Constant), Leverage, Log Sales, Support Specialists, dAU, dJ, dEU*

*d. Dependent Variable: ROA*

The coefficients (Table 12) support the significant tests from the model summary and reinforces the role of Support Specialists, that achieves a p-value well below 0.05 and close to the always strongly significant

control functions. The control functions assume the same characteristics and direction of relations with ROA as in Model 1, while the contribution of dummy variables in the model is very relevant and will leave room for good interpretations in the next phases of our analysis.

More precisely:

1) *Log Sales* is significant for the model 2 ROA: t = 4.543, p < 0.05, and with a positive coefficient equal to 0.018, thus confirming as in Model 1 that greater levels of revenues are associated with higher company performance when measured by ROA;
2) *Leverage* is significant for the model 2 ROA: t = -4.460, p < 0.05, and with a negative coefficient equal to -0.180, thus, as in Model 1, holding that higher level of debt-to-total asset ratio leads to higher company performance when measured by ROA, and this effect is greater than its opposite effect from Sales;
3) *Support Specialists* is significant for the model 2 ROA: t = 3.135, p < 0.05, and with a positive coefficient, associated with ROA, equal to 0.123;
4) *Dummy Continental Europe* is not significant for the model 2 ROA: t = -1.020, p > 0.05, and with a negative coefficient equal to -0.018;
5) *Dummy Australia* is significant for the model 2 ROA: t = -3.359, p < 0.05, and with a negative coefficient equal to 0.060;
6) *Dummy Japan* is not significant for the model 2 ROA: t = -2.324, p < 0.05, and with a negative coefficient equal to 0.042.

## Test results

From Test 2:

$\rightarrow y = B0 + \delta 0 * d1 + B2 * x1 + \varepsilon$

- $H0: \delta 0 = 0$
- $H1: \delta 0 \neq 0$

We can reject the null hypothesis H0, since there is at least one difference in the intercepts, and, thus, in the financial performance among the dummy variables. More specifically, dummy Australia and dummy Japan showed a statistical significant difference with dummy United Kingdom (reference group).

***Table 12. Model 2 (a): Coefficients*** [a]

| Model | Variables | Coefficients | | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | | B | Std. Error | | | Tolerance | VIF |
| 1 | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 | | |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 | 0.874 | 1.145 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 | 0.874 | 1.145 |
| 2 | (Constant) | -0.082 | 0.036 | -2.314 | 0.024 | | |
| | Log Sales | 0.020 | 0.004 | 4.730 | 0.000 | 0.755 | 1.325 |
| | Leverage | -0.179 | 0.041 | -4.323 | 0.000 | 0.736 | 1.360 |
| | Support Specialists | 0.113 | 0.038 | 2.997 | 0.004 | 0.797 | 1.255 |
| 3 | (Constant) | -0.051 | 0.038 | -1.339 | 0.186 | | |
| | Log Sales | **0.018** | 0.004 | **4.543** | **0.000** | 0.708 | 1.413 |
| | Leverage | **-0.180** | 0.040 | **-4.460** | **0.000** | 0.662 | 1.510 |
| | Support Specialists | **0.123** | 0.039 | **3.135** | **0.003** | 0.626 | 1.597 |
| | dEU | -0.018 | 0.018 | -1.020 | 0.312 | 0.519 | 1.928 |
| | dAU | **-0.060** | 0.018 | **-3.359** | **0.001** | 0.630 | 1.587 |
| | dJ | **-0.042** | 0.018 | **-2.324** | **0.024** | 0.604 | 1.655 |

*a. Dependent Variable: ROA*

Before moving on the next examination, the non-significant p-value showed by dummy Continental Europe can be conducted to the fact that there is not enough difference between dummy United Kingdom and dummy Continental Europe, and it can be supported by their geographic proximity and similarity in some features of Corporate Governance and general practices and laws suggested from the European Community.

Recalling the **General regression equation (2): y =** $B0 + B1 * d1 + B2 * x1 + \varepsilon$,
with the same description of variables as in Model 1, but x1 will be equal to Support Specialists in this case.

Hence, we can compute the regression equation for different dummy variables and at the same proportion of support specialists (slope).

- **United Kingdom (reference group)**

$y = B0 + B1 * 0$
→ y = B0 + B2 * (Support Specialists)
→ **y United Kingdom = -0.051 + 0.123 * (Support Specialists)**

- **Continental Europe**

$y = B0 + B1*1 + B2 *$ (Support Specialists)
→ y = (B0+B1) + B2* (Support Specialists)
→ y = (-0.0509514436394853 - 0.0181928187553088) + 0.123437933479198* (Support Specialists)

→ **y Continental Europe = -0.069 + 0.123 * (Support Specialists)**

- **Australia**

*y = (B0+B1) + B2 **(Support Specialists)

→ y = (-0.0509514436394853 - 0.0595668764749679) + 0.123437933479198* (Support Specialists)

→ **y Australia = -0.111 + 0.123 * (Support Specialists)**

- **Japan**

*y = (B0+B1) + B2 **(Support Specialists)

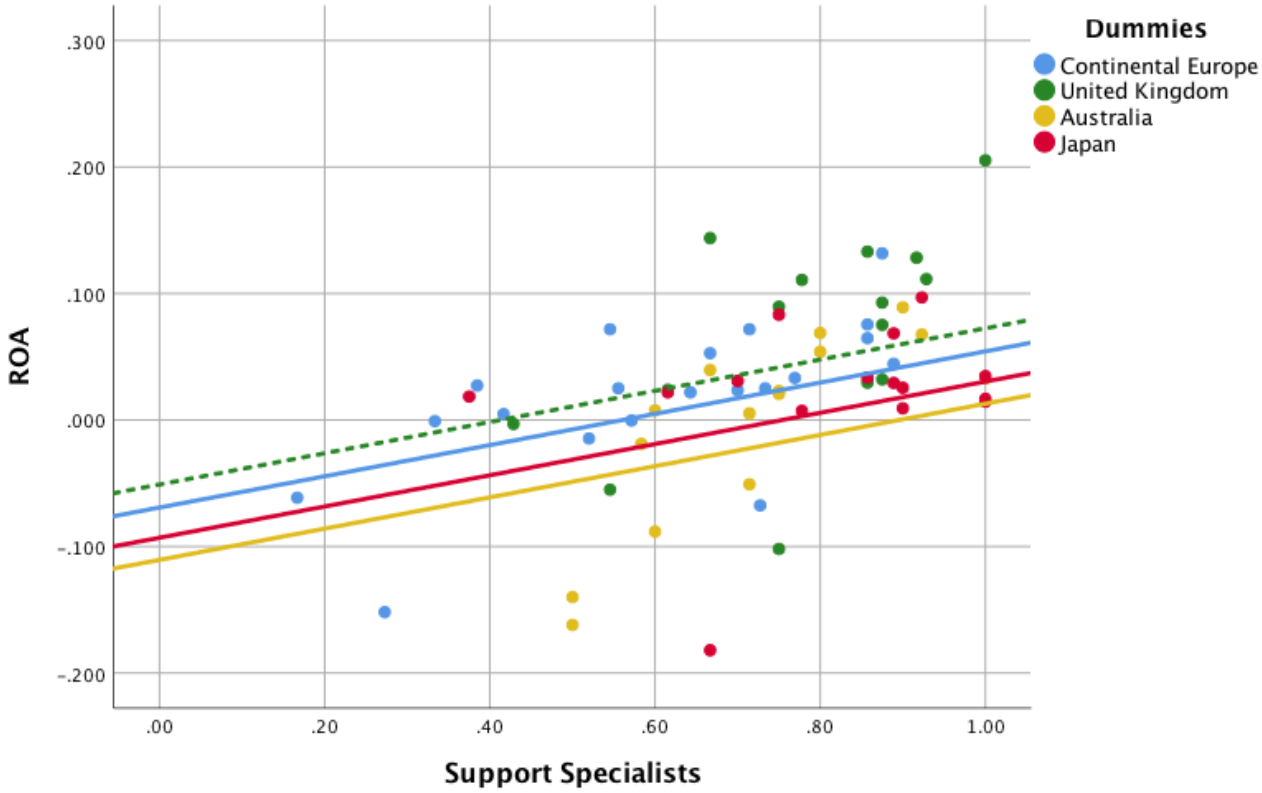
→ y = (-0.0509514436394853 + -0.0420829712416794) + 0.123437933479198 * (Support Specialists)

→ **y Japan = -0.027 + 0.123 * (Support Specialists)**

Graph 1 below exhibits the relation between financial performance and Support Specialists by a geographic point of view. As for Model 1, at this step, we just want to visualize the effects of dummy variables on the model, and thus we fixed the proportion of support specialists. In fact, all the equations have the same slope equal to 0.123, which is positive because so it is the relation between ROA and Support Specialists. What we want to deeply analyze, here, is the different collocation of the dummies at a given proportion of support specialists. Moreover, again, the reference group: United Kingdom, accomplished the highest level of ROA, by having the greatest intercept value (-0.051). Then, the second dummy is represented by Continental Europe, that, as we said before, showed no particular difference with its British neighborhood. Next follows Japan and Australia, respectively, with a coefficient difference, between the two, equal to (0.111 - 0.027) 0.084 and between Continental Europe and Japan of (0.111 – 0.069) 0.042.

Again, according to Model 2, for a given level of Support Specialists, British companies will show a higher company performance than all the other companies in the sample, but with Continental European firms very close to the British trend.

Graph 4. Relation ROA – Support Specialists by geographic location




## Model 2: Support Specialists

### b) Interaction terms between Support Specialists and dummy variables

As in Model 2 (b), we have the same structure but different independent variable and interactions:

*1) Step 1:* include only the two control variables Leverage and Log sales;

*2) Step 2:* add Support Specialists as independent variable;

*3)* Step 3: add the interaction terms between dummy and Business Expert variables (*int_d_SS*).

The model is significant and improves the coefficient of determinants at all the stages. In particular, R square increases more from step 2 to the final step than from step 1 to step 2 (R Square change: 0.083 > 0071).

*Table 13. Model 2 (b): Summary*[d]

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| **1** | .666[a] | **0.443** | **0.425** | 0.055 | **0.443** | 24.687 | 2 | 62 | **0.000** | |
| **2** | .717[b] | **0.515** | **0.491** | 0.052 | **0.071** | 8.981 | 1 | 61 | **0.004** | |
| **3** | .773[c] | **0.598** | **0.556** | 0.048 | **0.083** | 3.987 | 3 | 58 | **0.012** | 1.895 |

*a. Predictors: (Constant), Leverage, Log Sales*
*b. Predictors: (Constant), Leverage, Log Sales, Support Specialists*
*c. Predictors: (Constant), Leverage, Log Sales, Support Specialists, int_dEU_SS, int_dAU_SS, int_dJ_SS*
*d. Dependent Variable: ROA*

All the coefficients are statistically significant (Table 14), except of interaction between support specialists and dummy Europe, but this is true also in Model 2 (a), where we already suggested that there is not much

difference in the effects associated with ROA between dummy EU and dummy UK. As in Model 1 (b), the effects with ROA get increasing. In fact:

1) *Interaction Dummy Continental Europe and SS* (*int_dEU_SS*) is still not significant, but its relation to ROA becomes more negative and goes down from -0.018 to -0.031;
2) *Interaction Dummy Australia and SS* (*int_dAU_SS*, $t = -3.077$, $p < 0.05$) maintains its significant and increases its negative relation to ROA from -0.060 to -0.072;
3) *Interaction Dummy Japan and SS* (*int_dJ_SS*, $t = -2.622$, $p < 0.05$) follows the same characteristic as *int_dAU_SS* and goes from -0.042 to -0.059;

## Test results

From Test 3:

$\rightarrow y = B0 + B1 * x1 + \delta 1 * d1 * x1 + \varepsilon$

- $H0: \delta 1 = 0$
- $H1: \delta 1 \neq 0$

As in Model 1 (b), here as well, we can truly reject the null hypothesis H0 because there are at least two interactions, int_dAU_SS and int_dJ_SS, that are statistically significant and let the financial performance assume different values according to the different slopes of the regression lines.

***Table 14. Model 2 (b): Coefficients*** [a]

| Model | Variables | Unstandardized Coefficients | | | |
|---|---|---|---|---|---|
| | | B | Std. Error | t | Sig. |
| **1** | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 |
| **2** | (Constant) | -0.082 | 0.036 | -2.314 | 0.024 |
| | Log Sales | 0.020 | 0.004 | 4.730 | 0.000 |
| | Leverage | -0.179 | 0.041 | -4.323 | 0.000 |
| | Support Specialists | 0.113 | 0.038 | 2.997 | 0.004 |
| **3** | (Constant) | -0.085 | 0.036 | -2.344 | 0.023 |
| | Log Sales | **0.019** | 0.004 | **4.682** | **0.000** |
| | Leverage | **-0.170** | 0.041 | **-4.130** | **0.000** |
| | Support Specialists | **0.159** | 0.040 | **4.009** | **0.000** |
| | int_dEU_SS | -0.031 | 0.024 | -1.291 | 0.202 |
| | int_dAU_SS | **-0.072** | 0.023 | **-3.077** | **0.003** |
| | int_dJ_SS | **-0.059** | 0.023 | **-2.622** | **0.011** |

*a. Dependent Variable: ROA*

**Calling up the general regression equation (3):** $y = B0 + B1 * x1 + B2 * d1 * x1 + \varepsilon$, we have:

- **United Kingdom (reference group)**

y = B0 + B1 * (Support Specialists) + B2 * 0 * (interaction Support Specialists and dummy)
→ y = B0 + B1* (Support Specialists)
→ **ROA United Kingdom = -0.085 + 0.159 * (Support Specialists)**

- **Continental Europe**

y = B0 + B1 * (Support Specialists) + B2 * (interaction Support Specialists and dummy EU)
→ y = B0 + (B1 + B2int_dEU_SS) * (Support Specialists)
→ y **= -0.0853177422194389** + (0.158793172810123 - 0.0314514839080796) * (Support Specialists)
→ **ROA Continental Europe = -0.085 + 0.127 * (Support Specialists)**

- **Australia**

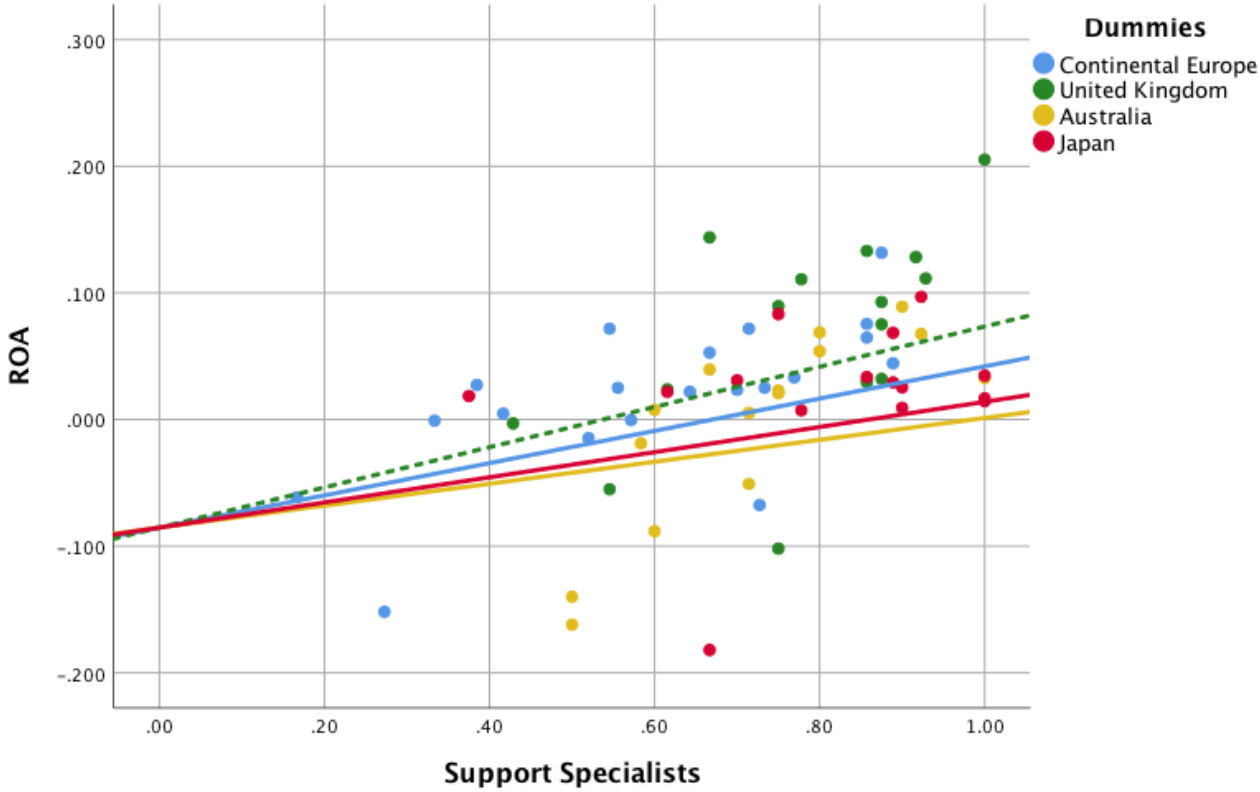
y = B0 + B1* (Support Specialists) + B2*(interaction Support Specialists and dummy AU)
→ y = B0 + (B1 + B2int_dJ_SS) * (Support Specialists)
→ y = -0.0853177422194389 + (0.158793172810123 - 0.0721631368940017)* (Support Specialists)
→ **ROA Australia = -0.085 + 0.087 * (Support Specialists)**

- **Japan**

y = B0 + B1* (Support Specialists) + B2 * (interaction Support Specialists and dummy J)
→ y = B0 + (B1 + B2int_dJ_SS) * (Support Specialists)
→ y = -0.0853177422194389 + (0.158793172810123 - 0.0594719238264217) * (Support Specialists)
→ **ROA Japan = -0.085 + 0.099 * (Support Specialists)**

In graph 5, we have a visual representation of the above regression equations. As opposed to Model 1 (b), the relation between ROA and Support Specialists is direct, and, thus all the slopes are positive. However, the reference group: Dummy UK has the highest slope (0.159) and grows at a faster rate than the other dummies. Hence, the greater the proportion of support specialists in the board, the better the financial performance of British companies. As we said before, Continental Europe shows similar and not too much divergent trend, and, in fact, is the second dummy per growth rate. Finally, in order, Japan and Australia increase their financial performance at a slower level.

Graph 5. Regression lines with interaction between dummies and Support Specialists




## Model 2: Support Specialists

### c) Dummy variables and interaction terms between Support Specialists and dummy variables

Thus far, we assumed that the effects of support specialists are equal among all the dummies.
However, as we observed in the final step of Model 1, the effects of support specialists may be geographically different when a dummy interacts with this independent variable.

Therefore, we introduced our last Model 2, composed of 4 steps:

1) *Step 1:* include only the two control variables Leverage and Log sales;
2) *Step 2:* add Support Specialists as independent variable;
3) Step 3: add the dummy variables;
4) *Step 4:* add the new interaction variables between dummies and support specialists.

The first thing to explicit is that, as opposed to Model 1, here the significance is kept under $p < 0.05$ along all the steps. Hence, this may leave room for more robust conclusions. Again, the coefficient of determination increases its ability of prediction of the variance of ROA as we move to the final step, with a final R square equal to 65.8%, which seems to be a quite highly satisfying amount. The incorporation of interactive

variables contributed to both a constant reduction in F-value, and an improvement from step 3 to step 4 of R square equal to around 5%. Overall, Model 2 seems more promising in results than Model 1.

***Table 15. Model 2 (c): Summary[e]***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| **1** | .666[a] | **0.443** | 0.425 | 0.054995 | **0.443** | 24.687 | 2 | 62 | **0.000** | |
| **2** | .717[b] | **0.515** | 0.491 | 0.051764 | **0.071** | 8.981 | 1 | 61 | **0.004** | |
| **3** | .779[c] | **0.606** | 0.566 | 0.047810 | **0.092** | 4.503 | 3 | 58 | **0.007** | |
| **4** | .811[d] | **0.658** | 0.602 | 0.045795 | **0.051** | 2.738 | 3 | 55 | **0.036** | 1.920 |

*a. Predictors: (Constant), Leverage, Log Sales*
*b. Predictors: (Constant), Leverage, Log Sales, Support Specialists*
*c. Predictors: (Constant), Leverage, Log Sales, Support Specialists, dAU, dJ, dEU*
*d. Predictors: (Constant), Leverage, Log Sales, Support Specialists, dAU, dJ, dEU, int_dEU_SS, int_dAU_SS, int_dJ_SS*
*e. Dependent Variable: ROA*

Table 16 confirms the significant effects of Support Specialists as well as point out that all the dummy variables and interactions between Support Specialists and the dummies appear to be with $p > 0.05$. However, these outcomes differ from Model 1, since here the range of level of significance moves around the range 0.127 and 0.430, and, hence, it is really close a significant level. Anyway, the model overall is significant, while the variables are not, and we keep the same assumption made previously in Model 1: the low number of observation, clearly, did not help the significance of model but we will interpret these results as significant.

## Test results

From Test 4:

$\rightarrow y = B0 + \delta 0 * d1 + B2 * x1 + \delta 1 * x1 * d1 + \varepsilon$

- $H0: \delta 0 = 0, \delta 1 = 0$
- $H1: at\ least\ one\ \delta \neq 0$

Here, we have a significant F-value for the overall model, but none of either the dummy variables or the interactions accomplished a significant p-value. Therefore, we fail to reject the null hypothesis $H0: \delta 0 = 0, \delta 1 = 0$.

| Table 16. Model 2 (c): Coefficients[a] | | | | | |
|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | | |
| | | B | Std. Error | t | Sig. |
| 1 | (Constant) | -0.003 | 0.025 | -0.115 | 0.909 |
| | Log Sales | 0.025 | 0.004 | 5.907 | 0.000 |
| | Leverage | -0.228 | 0.040 | -5.657 | 0.000 |
| 2 | (Constant) | -0.082 | 0.036 | -2.314 | 0.024 |
| | Log Sales | 0.020 | 0.004 | 4.730 | 0.000 |
| | Leverage | -0.179 | 0.041 | -4.323 | 0.000 |
| | Support Specialists | 0.113 | 0.038 | 2.997 | 0.004 |
| 3 | (Constant) | -0.051 | 0.038 | -1.339 | 0.186 |
| | Log Sales | 0.018 | 0.004 | 4.543 | 0.000 |
| | Leverage | -0.180 | 0.040 | -4.460 | 0.000 |
| | Support Specialists | 0.123 | 0.039 | 3.135 | 0.003 |
| | dEU | -0.018 | 0.018 | -1.020 | 0.312 |
| | dAU | -0.060 | 0.018 | -3.359 | 0.001 |
| | dJ | -0.042 | 0.018 | -2.324 | 0.024 |
| 4 | (Constant) | -0.117 | 0.068 | -1.734 | 0.089 |
| | Log Sales | **0.019** | 0.004 | **4.734** | **0.000** |
| | Leverage | **-0.176** | 0.040 | **-4.441** | **0.000** |
| | Support Specialists | **0.206** | 0.080 | **2.590** | **0.012** |
| | dEU | 0.080 | 0.070 | 1.150 | 0.255 |
| | dAU | -0.119 | 0.087 | -1.374 | 0.175 |
| | dJ | 0.090 | 0.086 | 1.045 | 0.301 |
| | int_dEU_SS | -0.139 | 0.093 | -1.498 | 0.140 |
| | int_dAU_SS | 0.090 | 0.113 | 0.795 | 0.430 |
| | int_dJ_SS | -0.166 | 0.107 | -1.551 | 0.127 |

*a. Dependent Variable: ROA*

Recalling the **General regression equation (3): y =** $B0 + B1 * d1 + B2 * x1 + B3 * x1 * d1 + \varepsilon$, where all the variables assume the same description as in Model 1, expect of x1 equal to Support Specialists here.

Hence, we can infer and draw our new regression equations by dummy distribution:

- **United Kingdom (reference group)**

y = B0 + B1 * 0 + B2 * (Support Specialists) + B3 * (Support Specialists) * 0

→ y = B0 + B2 * (Support Specialists)

→ **ROA United Kingdom = -0.117 + 0.206 * (Support Specialists)**

- **Continental Europe**

y = B0 + B1 * 1 + B2 * (Support Specialists) + B3 * (Support Specialists) * 1
→ y = (B0+B1) + (B2+B3) * (Support Specialists)
→ y = (-0.11721727346 + 0.080146503123) + (0.20628749720 -0.13861092318) * (Support Specialists)
→ **ROA Continental Europe = -0.037 + 0.068 * (Support Specialists)**

- **Australia**

y = (B0+B1) + (B2+B3) * (Support Specialists)
→ y = (-0.11721727346 - 0.11913557880) + (0.20628749720 + 0.089958484691) * (Support Specialists)
→ **ROA Australia = -0.236 + 0.296 * (Support Specialists)**

- **Japan**

y = (B0+B1) + (B2+B3) * (Support Specialists)
→ y = (-0.11721727346 + 0.090138296040) + (0.20628749720 -0.16604475901) * (Support Specialists)
→ **ROA Japan = -0.027+ 0.040 * (Support Specialists)**

Again, the graph below makes room for a couple of interpretations:

I. **Coefficients:** First of all, the effect of the proportion of support specialists on the financial performance is stronger in Japan than in any other country. It is followed, in order, by Continental Europe, United Kingdom and, again, lastly, Australia. At the same time, the difference in the coefficients between Japan and Australia is really marginal and almost non-existent; it is, indeed, equal to (0.037 – 0.027) 0.01. Nonetheless, such distance is much larger between Japan and United Kingdom (0.09) and Japan and Australia (0.209). Actually, Australian equation starts even below the shown Cartesian plane.

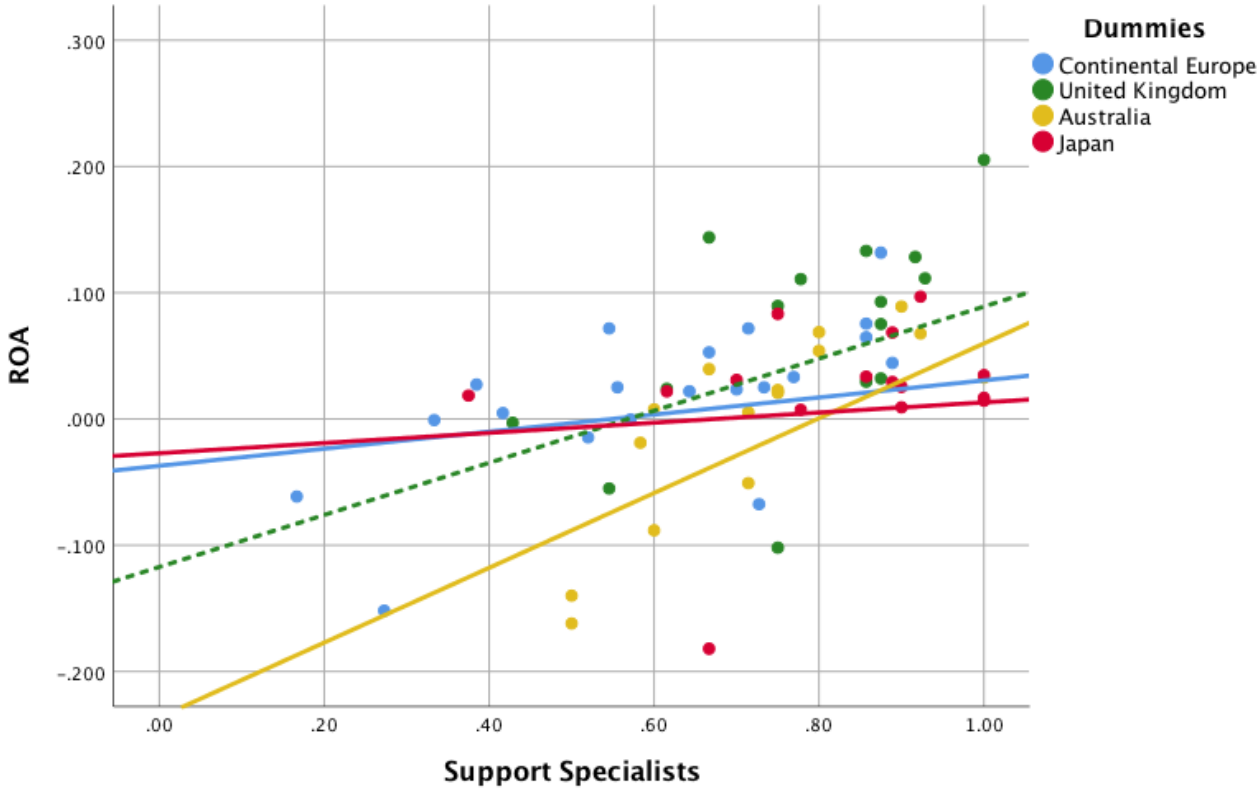
II. **Slopes:** However, Australian and British lines have the highest slopes: 0.296 and 0.206, which allow them to grow at a much faster rate than the other two dummies. This means that after a given number of support specialists, which is around 50% for United Kingdom and 85% for Australia, their ROA will overcome that of Continental Europe and Japan. In addition, due to the positive correlation among support specialists and ROA, whenever, companies increase the proportion of support specialists, so will improve their performance, and after the already mentioned threshold, Australian

and British companies will improve much faster. Interestingly, the higher effect of the Australian slope is offset by its highly negative coefficient as well, granting British companies to take the lead and perform better along all the possible proportion of support specialists, given that 100% is the last possible percentage.

This representation is just a combination of the effects of Model 2 (a) and (b). Both the Models showed the reference dummy group, UK, to have a better relation with ROA than the other nations. This analysis is supported for given threshold levels of proportion of support specialists. In fact, although Japan and Continental Europe seems to have a much greater coefficient and perform better at initial levels of percentages of SS in the board, their supremacy over British companies runs out after the 50%-threshold proportion of SS. Once reached this amount, on average, in the board, British companies perform way better than their competitors and the ranking will be established as follows: UK, Continental Europe, Japan and Australia.

On the other side, Australian companies seem to have a faster recovering effect, but it is positively relevant and greater than Japanese and European only after reaching a proportion of SS in the board equal to 85%. As mentioned before, this percentage is an unreal situation or not possible, on average. Therefore, the British target equal to 50%, is instead a very feasible condition, which makes quite supportive the geographic ranking above.

**Graph 6. Regression model with dummy and interaction between dummy and Support Specialists**



# Conclusions

The main outcome of the thesis is to achieve some conclusions or important interpretations in terms of the relation between corporate governance variables and company financial performance. That is why a hypothesis testing scheme is constructed and tested regression by regression in order to investigate the results. First of all, the null hypothesis is rejected for Test 1, supporting that there exist some strong linear relationships between the CG independent variables we proposed and the dependent variable, measured by ROA as the only indicator of financial performance. Moreover, since, among all the independent variables, the focus was primarily turned to the direct category labels, the General Model has been able to indicate at least two of them being statistically significant in influencing the company performance (Test 1). These are 1) *business experts* and 2) *support specialists*, and, hence, 1) directors experienced in general management and/or operating for other large for-profit organizations; 2) directors specialized in some specific and relevant areas, such as banking or law. This is, indeed, the first result of our study and the starting point for next empirical stages. Consequently, the research dug deeper and tried to isolate the two independent variables and find out some way to better explain the relationship between these x's and the y by a geographic point of view while still monitoring this association with two moderators: Log Sales and Leverage. At this point, a new variable associated with the geographic collocation of the observations is introduced: dummy variable, representing the four origins of the sample of selected companies.

Among Continental Europe (France, Germany, Italy and Spain), United Kingdom, Australia and Japan, British dummy has been considered the reference group since produced the highest mean for ROA and it could give a good try to start. So, dummy UK has been in both the models the group against which comparisons are made. Hence, Model 1 and Model 2 are computed separately and hierarchically, composed of the same structure except of step 2, where Model 1 has business experts as independent variable, while Model 2 support specialists.

The structure is based on three different regression approaches *(see Table in Appendix: Summary results of Hierarchical Regression Analyses for ROA):*

- *Models (a)* with 3 steps: where we had control variables at step 1, independent variable at step 2 and dummy variables at step 3.
- *Models (b)* with 3 steps: control variables, independent variable and interaction between the dummy variables and the referred independent variable;
- *Model (c)* with 4 steps: incorporation of model (a) and model (b).

These three variants outline also the three ways of testing the hypotheses number 2, 3 and 4.

Furthermore, we find Model 1 (a) and Model 2 (a) to be both statistical significant and support the alternative hypothesis that there is at least one difference in the financial performance among the different geographic locations (Test 2). However, we note that Model 1 and Model 2 have a different direction in the relation associated with ROA: Business Experts is negatively related, and Support Specialists is positively.

- *Model 1 (a):* dummy United Kingdom represent the highest level of ROA, given the number of business experts, followed, in order, by Japan, Europe and Australia;
- *Model 2 (a):* dummy UK again confirmed to be the best performer in terms of ROA given a proportion of support specialists, but, here, there is a very little distance with dummy Continental Europe; while a bit further, dummy Japan and Australia.

Next, Models (b) showed the growth and gaps of the slopes, and thus, the intensity of each dummy variable. Again, both rejected the null hypothesis H0 for Test 3, affirming that there is at least one interaction being statistically significant and letting the financial performance assume different values according to the different slopes of the regression lines. The same geographical ranking has been maintained constant.

Finally, we tested the hypothesis number 4, but both the models failed to reject the null hypothesis. However, some important considerations have been still made since the model is composed by only 65 observations and this, clearly, contributed to limit the significance. Hence, by combining the two effects we have two different interpretations:

- *Model 1 (c):* Japanese companies have a higher effect on ROA from an intercept point of view, but due to the slope of the regression lines, British firms grow faster reducing this gap when the proportion of business experts in the board of directors get larger, up to a value of 55%.
  This negative relation made room for further investigations, since it seemed unreal that the larger the number of business experts in a board, the worst its performance. In fact, because our financial data is based on a 3-year time frame, we tried to analyse the various levels of business experts in a smaller sample of our companies over a 5-year horizon. Therefore, we discovered that the board of directors increase its proportion of business experts whenever the financial performance of the company, measured by ROA, is starting to go down. To sum up, since business experts may need some time before improving the poor performance of the corporations they are called to administrate, this may be the true reason of its negative relation with ROA.

- *Model 2 (c):* based on the starting point of the regression lines (coefficients), the effect of the proportion of support specialists on the financial performance is stronger in Japan than in any other country. Then, in order, Continental Europe, United Kingdom and, lastly, Australia. However, based on the growth rate, Australian and British lines have the highest slopes, meaning that after a given amount of support specialists, which is around 50% for UK and 85% for Australia, their ROA will be better than that of Continental Europe and Japan.
  In light of this consideration, since from our sample of data British firms possess an average proportion of support specialists equal to 76.30%, while Australian companies of 73.66%, then 50% represents a truly more feasible threshold, supporting the initial hypothesis that British corporations perform better from a ROA point of view due also to their higher specialized experience.

# APPENDIX

**Summary results of Hierarchical Regression Analyses for ROA**

| Independent variables | General Model: all variables | Model 1: Business Experts | Model 2: Support Specialists |
|---|---|---|---|
| ***Step 1*** | | | |
| Constant | - 0.003 | - 0.003 | - 0.003 |
| Log Sales | **+ 0.025*** | **+ 0.025*** | **+ 0.025*** |
| Leverage | **- 0.228*** | **- 0.228*** | **- 0.228*** |
| *R Square* | ***0.443*** | *0.443* | *0.443* |
| *F-Value* | *0.000* | *0.000* | *0.000* |
| ***Step 2*** | | | |
| Constant | + 0.043 | + 0.018 | - 0.082 |
| Log Sales | **+ 0.023*** | **+ 0.025*** | **+ 0.020*** |
| Leverage | **- 0.184*** | **- 0.233*** | **- 0.179*** |
| Board size | - 0.002 | | |
| % Independent | - 0.092 | | |
| CEO duality | - 0.005 | | |
| Insiders | + 0.025 | | |
| Business Experts | **- 0.136*** | - 0.029 | |
| Support Specialists | **+ 0.130*** | | **+0.113*** |
| Community Influential | + 0.014 | | |
| *R Square* | *+ 0.590* | *0.446* | *0.515* |
| *Δ R Square* | *+ 0.147* | *0.003* | *0.071* |
| *F-Value* | *+ 0.014* | *0.577* | *0.004* |
| ***Step 3 (a)*** | | | |
| Constant | | + 0.081 | - 0.051 |
| Log Sales | | **+ 0.024*** | **+ 0.018*** |
| Leverage | | **- 0.240*** | **- 0.180*** |
| Business Experts (BE) | | - 0.056 | |
| Support Specialists (SS) | | | **+ 0.123*** |
| dummy Continental Europe (dEU) | | **- 0.042*** | - 0.018 |
| dummy Australia (dAU) | | **- 0.067*** | **- 0.060*** |
| dummy Japan (dJ) | | - 0.030 | **- 0.042*** |
| *R Square* | | *0.548* | *0.606* |
| *Δ R Square* | | *0.102* | *0.092* |
| *F-Value* | | *0.000* | *0.007* |
| ***Step 3 (b)*** | | | |
| Constant | | + 0.040 | - 0.085 |
| Log Sales | | **+ 0.024*** | **+ 0.019*** |
| Leverage | | **- 0.238*** | **- 0.170*** |
| Business Experts | | - 0.002 | |
| Support Specialists | | | **+ 0.159*** |
| interaction_dEU_BE | | **- 0.058*** | |
| interaction_dAU_BE | | **- 0.089*** | |
| interaction_dJ_BE | | - 0.043 | |
| interaction_dEU_SS | | | - 0.031 |
| interaction_dAU_SS | | | **- 0.072*** |
| interaction_dJ_SS | | | **- 0.059*** |
| *R Square* | | *0.545* | *0.598* |
| *Δ R Square* | | *0.099* | *0.083* |
| *F-Value* | | *0.009* | *0.012* |
| ***Step 4 (c)*** | | | |
| Constant | | + 0.041 | - 0.117 |
| Log Sales | | + 0.025 | **+ 0.019*** |
| Leverage | | - 0.240 | **- 0.176*** |
| Business Experts | | - 0.007 | |
| Support Specialists | | | **+ 0.206*** |
| dummy Continental Europe | | + 0.009 | + 0.080 |
| dummy Australia | | - 0.090 | - 0.119 |
| dummy Japan | | + 0.083 | + 0.090 |
| interaction_dEU_BE | | - 0.071 | |
| interaction_dAU_BE | | + 0.034 | |
| interaction_dJ_BE | | - 0.141 | |
| interaction_dEU_SS | | | - 0.139 |
| interaction_dAU_SS | | | + 0.090 |
| interaction_dJ_SS | | | - 0.166 |
| *R Square* | | *0.555* | *0.658* |
| *Δ R Square* | | *0.008* | *0.051* |
| *F-Value* | | *0.812* | *0.036* |

*Note *, relation statistically significant at 5% level (two-tailed)*

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# Summary Master Thesis

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*Department of Economics and Management*
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# Corporate governance analysis and financial valuation of food industry in Europe, Australia and Japan

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Academic Year 2018/2019

## Table of contents

## *Executive Summary*

The paper aims at highlighting and analyzing the statistical linear relationships, if any, and the effects between variables of Corporate Governance and the financial performance of companies of the food industry in Europe (France, Germany, Italy, United Kingdom and Spain), Australia and Japan.

To do so, the master thesis has been divided into two main chapters:

1. ***Theoretical analysis;***
2. ***Empirical analysis.***

# Chapter I: Corporate Governance analysis

### 1.1. Corporate Governance features

The first chapter focused mainly on examining the proper characteristics of the geographic locations: Corporate Governance models (e.g. one tier in United Kingdom etc.), operating mechanisms (e.g. which duties belong to the board of directors etc.), possible reasons that brought to radical changes in CG (e.g. change in ownership structure in Australia due to the 1992 law on the system of compulsory superannuation/pension contribution by employers etc.), potential issues (e.g. presence of CEO/Chairman duality etc.), relevant systems of law and CG features related to the national index (e.g. average board size etc.). In fact, this process has been useful to outline the aspects governing the choices of corporations to take a specific decision or adopt a particular structure rather than one another and whether food industry in general follows the national CG standards. For instance, we found out that although the CG model may be relevant in comparing two particular samples, these samples can also be different and affected due to many other factors, which can, thus, be considered more important for our connections. More specifically, from our initial study, United Kingdom and Australia seemed to be quite identical both in terms of the one-tier structure and some other common components coming from the background links between the two countries. However, the essence of policies, the nature of the CG codes and the directions assumed by the government regarding the set of laws and protection rules made the two countries less similar than expected. On the other side, some other elements, such as being supra-regulated by European Union directives, prevailed over CG systems especially in terms of influencing the companies' common practices on the day-by-day basis.

In light of this consideration, many criteria have been considered along the comparisons and led to the decision to group some countries appearing similar for many aspects and leave independent those having unique characteristics. Furthermore, the European nations, except for the United Kingdom, have been recognized as a singular class, while UK, Australia and Japan as separated bodies.

### 1.2 Characteristics of the sample

The geographic classification, previously illustrated, is necessary for two main reasons:

1. *Ease the data collection, the creation of the sample and the further analyses;*
2. *Bring to light more crucial Corporate Governance factors.*

Just discussing about the first point, the approach allowed to develop a precise sample and a methodology for the further researches:

- ***Geographic locations***

As explained above, the classes are four:

1. Continental Europe (France, Germany, Italy and Spain);
2. United Kingdom;
3. Australia;
4. Japan.

- ***Industry***

Food sector but with a spotlight on avoiding food corporations operating in the retail and alcohol businesses and focusing on the very national products, comparable sizes and cultural habits. For this reason, for instance, *La Doria S.p.A. (BIT:LD*), manufacturing company of traditional Italian commodities such as pasta and sauces and with a market capitalization of € 231.00 million, led to the cross-selection of *Kyokuyo Co., Ltd. (TSE:1301),* Japanese firm with a market capitalization of € 245.80 million and committed to the fishing and the delivery of the most popular national food: seafood.

- ***Size***

Size criteria has been applied to both the market capitalization of each company, limit of € 3,000,000,000, and to the overall market capitalization of the different groups, in order to make each singular geographic sample as comparable as possible with the others;

- **Number of companies**

Once established the specific food sector and the size limits, the quantity of selectable corporations went terribly down. In this step, Italy was set as the benchmark and from the Italian companies' features, such as products offered, size and number of admissible firms and so on, the research on the other indices was executed. Especially the third feature played a crucial role. In fact, only 5 Italian corporations matched the sample criteria, and were, thus selectable. Hence, this number must have been respected for the other Continental European nations too. At the end, the final sample is composed of 65 companies divided as follows: Continental Europe 20 (with 5 firms per each of the 4 countries), United Kingdom 15, Australia 15 and Japan 15.

From this final sample, the methodology is to collect all the corporate governance and financial data per each company, group them by the geographic class and create an ideal set of variables.
The type and the number of such variables are central to all the empirical analysis and their selection has to be in line with our premises as well as highly probable to deliver some important conclusions.

### 1.3 Collection and measurement of variables for empirical analysis

In obtaining data, we created four categories of variables to investigate before moving forward to the next chapter:

*1) Corporate Governance elements or independent variables (x's);*

*2) Ratios of financial performance or dependent variables (y's);*

*3) Control variables or moderators for the x and y relation (x's);*

*4) Geographic locations or dummy variables (d's).*

***1)*** The ***Corporate Governance components*** have been themselves separated in two categories:

- ***Intrinsic factors (3 variables)***

These factors are deep-seated in the fundamentals of the corporate governance of a company. Furthermore, they may come right from the choice of the administration to adopt a particular structure or must be set according to specific national and/or international rules and regulators.

Intrinsic factors are:

***i.*** ***Board size****:* measuring the total number of directors in the board of a company;

***ii.*** ***Number of committees****:* regarding the decision of boards to create multiple commissions for different responsibilities;

***iii.*** ***Presence of environmental committee:*** related to the number of committees and the willingness of boards to reserve an extra-committee on matters linked to the environmental issues (e.g. control on CO2 emissions etc.);

***iv.*** ***Proportion of independent directors****:* representing the number of independent directors over the total number of directors in a board;

***v.*** ***CEO/Chairman duality:*** referring to the possibility for a particular company to have its Chief Executive Officer being also the Chairman of the board.

However, among the intrinsic factors, *ii. number of committees and iii. presence of environmental committee* have been immediately excluded since they had no particular relevance with our set of data and were pretty constant among all the selected companies.

- ***Director category labels (4 variables)***

These come from the famous article: *"The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change*", written by Hillman, Cannella and Paetzold. More particularly, the authors observed that each member of a board of directors may be required to possess some specific expertise before being hired and included in the administration of a corporation, in order to increase company's overall experience and knowledge. Particularly, directors can be classified as follows:

**i.** ***Insiders****:* members having already covered in the past and/or currently hold internal functions

in the company, such as managers, employees or officers, or are personally related to the firm, such as employees' representatives in the two-tier system;

ii. ***Business Experts:*** effective or retired executives of other for-profit organizations, and directors who work or have worked for other large companies;

iii. ***Support Specialists****:* executives of specific and identifiable areas that support firm's strategies. At the same time, they do not provide the board with general foundations, but they rather focus on particular fields, such as capital markets, law, insurance and public relations;

iv. ***Community influentials****:* similar to symbolic directors. They are directors with experience in areas beyond competitor firms and suppliers. This category includes directors who have influence and expertise over important non-business organizations, including politicians, university representatives, and officers of social organizations.

Especially director category labels have followed a more rigorous measurement process. Basically, the description found in the article *"The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change"* has been considered the starting point for the definition of each director. Then, every single company has been researched along with its website and annual report or, where history, background and curriculum vitae of each director have been scrutinized; where information on the director was not fully reachable, then LinkedIn and Google have been applied as alternative methods. Next, every director who matched the definition of business expert, for example, has been categorized as such and, if the same director matches the definition of insider, support specialist and/or community influential, then he or she was included in that division as well.

To be more precise, in the Italian dairy company *Centrale del Latte d'Italia S.p.A. (BIT:CLI)*, for instance, a director is a "retired executive of another for-profit organization", and thus business expert, a specialist in a specific area, such as "finance and capital markets, and so support specialist, and acts as "representative of other institutional organizations and/or universities", hence community influential. In this case, this specific director respected all the three categories' descriptions of the paper and could provide support to the company in all these different areas. Therefore, the member has been considered both a business expert, support specialist and community influential for *Centrale del Latte d'Italia S.p.A.* The same approach has been applied to every other director.

Finally, the results for director categories have been recorded in relative terms, and, thus, as a percentage of the board size of the relative company.

To sum up, for our analysis we have a total of 7 Corporate Governance independent variables. In addition, we observed that in electing their board of directors, corporations will, certainly, pay much attention to keep all the intrinsic factors under control, by following by-laws, codes and directives, as well as to the proper backgrounds of a director. In particular, the latter group may bring an added overall knowledge to the company and both the factors can eventually fasten and improve the decision-making processes, and thus,

enhance firm performance.

Therefore, since the object of this thesis is pretty oriented to finding out more on the possibility of a relation between directors' characteristics and financial performance of a company, the targets of the next empirical analysis will be more focused on "*director category labels*" rather than "*intrinsic factors*", which will be anyway useful to highlight important differences or similarities among the different companies and variables.

***2) The dependent variables*** have been researched among the main financial indicators of performance. Clearly, each index can assume a different interpretation and final consideration on the proper result, and so, the idea to consider these three financial ratios:

- *Return on Assets (ROA);*
- *Tobin's Q;*
- *Valuation multiples (e.g. EV/EBITDA, P/E);*

However, from our data collection, only ROA appeared to be the more predictive of companies' results. This idea is supported by many considerations. First of all, ROA has been pre-determined our initial benchmark, since it is a more objective measure of operating performance and it is not highly affected by market expectations and dynamics as opposed to the other two metrics. Then, it explicitly takes into account the assets used to support business activities and claims whether the company is able to generate an adequate return on these assets rather than simply showing robust return on sales. Thus, its results determine a greater focus on the ability of managers and executives in the decision-making processes of the company, which is the corporate governance relation we want to focus more on. Thirdly, when comparing ROA outcomes with those of Tobin's Q and Multiples, we have often three different type of results, inconsistent and discordant between one another. Lastly, a further evidence derives from the literature review claiming that ROA has produced positive and meaningful results among many researchers (*Haniffa and Hudaib 2006; Muth and Donaldson 1998 etc.*). Therefore, the decision to consider only ROA as measure of companies' financial performance. Anyway, it is worth to observe that the other two metrics, Tobin's Q and Valuation Multiples have been retrieved and computed for each company, in order to collect an additional financial source to use whenever values of ROA would reach abnormal findings, such as extremely high negative or positive percentages. So, this approach will contribute to perform an extra double-check on the financial status of the firm and decide to confirm or exclude these anomalies from our pool. In the end, all the observations have been kept in the sample, even when irregularities in ROA occurred, because they were verified to be consistent and predictors of the proper results of the company in question. It is worth to add that a three-year post-period average for 2016-2018 for ROA has been computed in order to include possible variations in the short term and consider a pretty medium time-frame for the implementation of corporate governance practices and their impact on company performance. ROA data has been retrieved directly from Bloomberg.com and as the proper ratio of Net Income over the total asset of the firm.

***3) Control variables or moderators*** are optimal for correcting the problems of endogenous explanatory variables and reduce the effects of confounding variables in our linear models. In fact, control functions will be held constant along our processes in order to accurate the relationships between independent and dependent variables. Since we want to explain the variations in the financial performance through corporate governance predictors, then controllers must be chosen with regard to their correlation and influence with ROA. This way, the possible relation between CG variables and ROA will be more reliable and less affected by strange strong correlations or anomalies.

Moderators are:

1. *Sales;*
2. *Leverage.*

*Sales* are excellent predictors of company's operations health and surely positively related to the final financial performance of a company. Indeed, a firm, which does not obtain quite good sales levels or targets, will rarely reach a satisfying performance. Moreover, revenues allow to control for the size of a company as well, and thus, make the sample consistent with companies slightly diverging in market capitalization.

In addition, the natural logarithm function has been introduced for this variable, since the log function granted to prevent the skewness towards large values and, thus, alter these skewed data to follow an almost normal distribution. Here is the case, since there are some big differences in revenues between some companies in the sample, especially the lowest and highest ranked as of market capitalization. For example, the Australian *Buderim Group Limited* with a market cap equal to $13.75 million and the Japanese *Nippon Suisan Kaisha Limited* with a market cap of $1,626.77 million have become more comparable between one another due to the logarithm introduction.

*Leverage* has been computed in our case as the simple ratio between Total Liabilities and Total Assets of a firm. This ratio must be monitored, since its value can positively or negatively affect the financial performance of a particular company. In fact, various levels of debt-to-equity ratio may bring to different financial results according to the sector and the specific level of leverage reached by the company. Generally, the higher the degree of leverage (*DoL*), the greater the financial risk of the company. Hence, for total liabilities and total assets, the calculations considered all of the company's debts and assets, including intangibles. Therefore, our sample is composed by values ranging between 0 and 1, where, for example, a value equal to 0.41 for the British *The Scottish Salmon Company PLC (OB:SSC)* indicates that 41% of its assets are financed by creditors, with owners (shareholders) financing the remaining 59% with equity.

The same three-year post-period average for 2016-2018 of ROA has been chosen for computing the values of Sales and Leverage.

***4)*** As mentioned before, we created four different ***geographic groups***: Continental Europe, United Kingdom, Australia and Japan. Hence, to obtain a more relevant information from the analysis, it may be useful to

include binary variables or zero-one variables, also called ***dummy variables*** to better capture the effects of qualitative factors in the regression model. In fact, when this dummy independent variable has a value equal to 0, then the coefficient of that variable will not influence our dependent variable ROA. On the other side, when the dummy assumes a value of 1, then the dependent variable's coefficient and, thus, its value will be affected and shifted upward or downward. For the empirical analysis, the following dummy variables will be considered:

- *Dummy Continental Europe (dEU):* comprising all the French, German, Italian and Spanish companies from our sample;
- *Dummy United Kingdom (dUK):* all the British companies from our sample;
- *Dummy Australia (dAU):* all the Australian companies from our sample;
- *Dummy Japan (dJ):* all the Japanese companies from our sample.

In addition, it is important to establish the dummy reference group, and thus, the dummy to get out of our dummy variables and be the one against which makes the comparisons, since the number of dummies to take into consideration must be equal to n-1 along with an intercept. The intercept for the dummy base group will be equal to the overall intercept of the model (*B0*). Furthermore, after trying multiple times along with the regressions and by applying the method of "*extremes*", *dummy United Kingdom (dUK)* appears to be our *base group* since it represents the category with the highest mean (extreme) with regard to ROA. More specifically, British companies showed an average ROA equal to 6.77%, with a premium over the second highest ranked category, Continental Europe, of 4.67%. Therefore, this approach worked out and drove the model to be even more significant in its independent variables.

Finally, dummy variables are also useful to create an extra-category variable: the ***interactions***. In fact, once regression will run, interactions between dummies and significant and relevant independent variables will be made. The interaction makes us understand whether there is the possibility that the independent variable(s) and geographic locations may interact in terms of their effect on ROA and that the relationship between dummies and ROA may be different at different levels of CG variables (or that the relationship between CG variables and ROA may vary for different geographic locations).

Below, a summary table of the collection and measurement of variables for our next-chapter empirical analysis.

| | *Summary results of variables by geographic location* | | | |
|---|---|---|---|---|
| | ***Continental Europe*** | ***United Kingdom*** | ***Australia*** | ***Japan*** |
| Board size | 11.7 | 9 | 9.6 | 9.27 |
| Number of Independent Directors | 6.5 | 4.6 | 5.07 | 4.6 |
| % ID | 53.42% | 50.49% | 52.62% | 49.94% |
| CEO duality | 30% | 0% | 0% | 20% |
| Number of insiders | 3.3 | 1.53 | 1.4 | 2.13 |
| % Insiders | 28.46% | 17.04% | 14.58% | 23.02% |
| Number of Business Experts | 7.7 | 6.73 | 6.67 | 7.67 |
| % BE | 66.06% | 74.81% | 69.44% | 82.73% |
| Number of Support Specialists | 7.05 | 6.87 | 7.07 | 7.53 |
| % SS | 60.38% | 76.30% | 73.66% | 81.29% |
| Number of Community Influentials | 4.05 | 4.2 | 3.73 | 3.93 |
| % CI | 34.39% | 46.67% | 38.89% | 42.45% |
| ROA | 2.10% | 6.77% | -0.34% | 2.06% |
| Log Sales | 6.92 | 6.28 | 5.99 | 6.83 |
| Leverage | 0.53 | 0.51 | 0.44 | 0.58 |

# Chapter II: Empirical Analysis

## 2.1 Hierarchical linear regression

Once all the parameters for the empirical analysis have been established, the study moved to research these precise variables directly into the board of the selected companies of food sector. Furthermore, financial platforms such as Bloomberg, Thomson Reuters, Market Screener and companies' official annual reports helped to retrieve our data and compare them with the theoretical definition given for each variable.

After collecting and sorting out all the obtained set of data, we proceeded in choosing and developing the best and most appropriate regression model for our analysis, and, thus, the one allowing to put all the variables together and have a higher probability of meaningful results.

From the literature review, we observed that, in our case, the best option is represented by the **hierarchical linear regression** or model with multiple steps. This model will be, mainly, run through the software *SPSS Statistics*, while each final result will be double-checked with other similar softwares, such as R.

For this thesis, three different hierarchical linear regressions will be computed:

1. **General Model** trying to explain the unique dependent variable ROA and composed of two steps:
   - ***Step 1.*** Two control variables (Log Sales and Leverage) are included;
   - ***Step 2.*** All the other Corporate Governance independent variables (e.g. board size, proportion of business experts etc.).

Once we run this model, we will observe whether some independent variables have a positive or negative relation with our ROA, keeping the control variables constant and the focus on the director category labels. In particular, two independent variables of our interest showed a significant relation with the dependent variable:

- ✓ ***the proportion of Business Experts*** is significant for the General Model: $t = -2.533$, $p < 0.05$, and with a negative relation to ROA equal to -0.136.
- ✓ ***the proportion of Support Specialists*** is significant for the General Model: $t = 2.619$, $p < 0.05$, and with a positive coefficient equal to 0.130.

Hence, the other two hierarchical regressions, always related to ROA as dependent variable, are made after the General Model produced its relevant and significant results. We will call for simplicity these two further analyses: Model 1 (Business Experts) and Model 2 (Support Specialists).

More specifically:

2. **Model 1** is constituted of two steps:
   - ***Step 1.*** Two control variables (Log Sales and Leverage);
   - ***Step 2.*** One of the two significant independent variables from the General Model, and, in this case, it is Business Experts.

3. **Model 2** follows the same methodology of Model 1 and will be set up as follows:

- ***Step 1.*** Two control variables (Log Sales and Leverage);
- ***Step 2.*** The other significant independent variable from the General Model, which is Support Specialists.

The peculiarity of Model 1 and Model 2 is that they are structured with three additional sub-models (***a, b and c***), in order to wide our scanning range and include more explanatory variables:

- **Models (a),** where a further step is added:
  - ***Step 1.*** Two control variables (Log Sales and Leverage);
  - ***Step 2.*** Business Expert (Model 1 a) or Support Specialists (Model 2 b) as independent variable;
  - ***Step 3.*** Dummy variables.

- ***Models (b)***, where the dummy variables are substituted with the interaction variables:
  - ***Step 1.*** Two control variables (Log Sales and Leverage);
  - ***Step 2.*** Business Expert (Model 1 a) or Support Specialists (Model 2 b) as independent variable;
  - ***Step 3.*** Interaction terms between Dummy variables and Business Experts or Support Specialists (*int_d_BE* or *int_d_SS*).

- ***Model (c)***: combining model (a) and model (b) and having 4 different steps:
  - ***Step 1.*** Two control variables (Log Sales and Leverage);
  - ***Step 2.*** Business Expert (Model 1 a) or Support Specialists (Model 2 b) as independent variable;
  - ***Step 3.*** Dummy variables;
  - ***Step 4.*** Interaction terms between Dummy and Business Experts or Support Specialists (*int_d_BE* or *int_d_SS*).

## 2.2 Hypothesis Testing

After the hierarchical regressions are developed, the study moves in formulating the Hypothesis Testing for the results of the linear regressions. Moreover, Hypotheses will be used as the way to discover whether the regression computations have meaningful outcomes.

The tests will be defined for each of the above-specified models. In addition, when verifying the hypotheses in the models, we will use the F-Test for the statistical significance of the overall model, since this test is more appropriated for joint hypotheses, while we will adopt a t-test procedure and, thus, the p-value approach, to test the significance of single variables.

To sum up, four tests will be examined:

1. **<u>Test 1:</u> General Model: all independent variables**

→ $y = \beta 0 + \beta 1 * Board\ size + \beta 2 * Board\ Independence + \beta 3 * CEO/Chairman\ duality + \beta 4 * Insiders + \beta 5 * Business\ Experts + \beta 6 * Support\ Specialists + \beta 7 * Community\ Influentials + \beta 8 * Log\ Sales + \beta 9 * Leverage + \varepsilon$

- ***H0: B1 = B2 = B3 = B4 = B5 = B6 = B7 = B8 = B9 = 0***
- ***H1: Bk ≠ 0 for at least one k***

To demonstrate whether we have an explanatory model, we set the above hypotheses. If we reject the null hypothesis, we will state that there is at least one linear relationship existing between one independent variable x (or predictor) and the dependent variable y (or response variable).

2. **<u>Test 2:</u> Model (a): one independent variable and dummies (with no interaction)**

→ $y = B0 + \delta 0 * d1 + B2 * x1 + \varepsilon$

- ***H0: δ0 = 0***
- ***H1: δ0 ≠ 0***

where *δ0* measures the difference in intercepts between dummy Continental Europe, dummy United Kingdom, Dummy Australia and dummy Japan. Hence, if Model 1 (a) and Model 2 (a) are statistically significant, then, we would be able to reject the null hypothesis (*H0*) that financial performance measured by ROA is the same for all the dummies. Consequently, we can state that there is, indeed, at least one difference in the financial performance among the different geographic locations, and, if more than one difference, where this distance is higher.

3. **<u>Test 3:</u> Model (b): one independent variable and interaction terms between *x1* and dummy variables**

→ $y = B0 + B1 * x1 + \delta 1 * d1 * x1 + \varepsilon$

- **H0: δ1 = 0**
- **H1: δ1≠ 0**

where *δ1* measures the difference in the level of company performance (slope) between dummy Continental Europe, dummy United Kingdom, Dummy Australia and dummy Japan.

It is important to highlight that this hypothesis puts no restriction on the difference in intercepts, *δ0.*

So, if Model 1 (a) and Model 2 (b) would represent statistically significant values, then we will reject the null hypothesis that ROA is the same value for all the dummies, and accept the alternative hypothesis (*H1*) that at least one slope (ROA) is different from the others.

4. **<u>Test 4:</u> Model (c): one independent variable, dummy variables and interaction terms between *x1* and dummy variables**

→ $y = B0 + \delta 0 * d1 + B2 * x1 + \delta 1 * x1 * d1 + \varepsilon$

- **H0: δ0 = 0, δ1 = 0**
- **H1: at least one δ ≠ 0**

Here, we are interested in the hypothesis that the average financial performances are identical for all the dummy variables, which have the same level of proportion in the independent variable. This means that *δ0* and *δ1* must both be zero under the null hypothesis.

## 2.3 Regression, Test results and Conclusions

The table below illustrates a summary of all the results of the Hierarchical Regressions for ROA, followed by hypothesis testing and explanations of each outcome.

**Summary results of Hierarchical Regression Analyses for ROA**

| Independent variables | General Model: all variables | Model 1: Business Experts | Model 2: Support Specialists |
|---|---|---|---|
| ***Step 1*** | | | |
| Constant | - 0.003 | - 0.003 | - 0.003 |
| Log Sales | **+ 0.025*** | **+ 0.025*** | **+ 0.025*** |
| Leverage | **- 0.228*** | **- 0.228*** | **- 0.228*** |
| *R Square* | ***0.443*** | *0.443* | *0.443* |
| *F-Value* | *0.000* | *0.000* | *0.000* |
| ***Step 2*** | | | |
| Constant | + 0.043 | + 0.018 | - 0.082 |
| Log Sales | **+ 0.023*** | **+ 0.025*** | **+ 0.020*** |
| Leverage | **- 0.184*** | **- 0.233*** | **- 0.179*** |
| Board size | - 0.002 | | |
| % Independent | - 0.092 | | |
| CEO duality | - 0.005 | | |
| Insiders | + 0.025 | | |
| Business Experts | **- 0.136*** | - 0.029 | |
| Support Specialists | **+ 0.130*** | | **+0.113*** |
| Community Influential | + 0.014 | | |
| *R Square* | *+ 0.590* | *0.446* | *0.515* |
| *Δ R Square* | *+ 0.147* | *0.003* | *0.071* |
| *F-Value* | *+ 0.014* | *0.577* | *0.004* |
| ***Step 3 (a)*** | | | |
| Constant | | + 0.081 | - 0.051 |
| Log Sales | | **+ 0.024*** | **+ 0.018*** |
| Leverage | | **- 0.240*** | **- 0.180*** |
| Business Experts (BE) | | - 0.056 | |
| Support Specialists (SS) | | | **+ 0.123*** |
| dummy Continental Europe (dEU) | | **- 0.042*** | - 0.018 |
| dummy Australia (dAU) | | **- 0.067*** | **- 0.060*** |
| dummy Japan (dJ) | | - 0.030 | **- 0.042*** |
| *R Square* | | *0.548* | *0.606* |
| *Δ R Square* | | *0.102* | *0.092* |
| *F-Value* | | *0.000* | *0.007* |
| ***Step 3 (b)*** | | | |
| Constant | | + 0.040 | - 0.085 |
| Log Sales | | **+ 0.024*** | **+ 0.019*** |
| Leverage | | **- 0.238*** | **- 0.170*** |
| Business Experts | | - 0.002 | |
| Support Specialists | | | **+ 0.159*** |
| interaction_dEU_BE | | **- 0.058*** | |
| interaction_dAU_BE | | **- 0.089*** | |
| interaction_dJ_BE | | - 0.043 | |
| interaction_dEU_SS | | | - 0.031 |
| interaction_dAU_SS | | | **- 0.072*** |
| interaction_dJ_SS | | | **- 0.059*** |
| *R Square* | | *0.545* | *0.598* |
| *Δ R Square* | | *0.099* | *0.083* |
| *F-Value* | | *0.009* | *0.012* |
| ***Step 4 (c)*** | | | |
| Constant | | + 0.041 | - 0.117 |
| Log Sales | | + 0.025 | **+ 0.019*** |
| Leverage | | - 0.240 | **- 0.176*** |
| Business Experts | | - 0.007 | |
| Support Specialists | | | **+ 0.206*** |
| dummy Continental Europe | | + 0.009 | + 0.080 |
| dummy Australia | | - 0.090 | - 0.119 |
| dummy Japan | | + 0.083 | + 0.090 |
| interaction_dEU_BE | | - 0.071 | |
| interaction_dAU_BE | | + 0.034 | |
| interaction_dJ_BE | | - 0.141 | |
| interaction_dEU_SS | | | - 0.139 |
| interaction_dAU_SS | | | + 0.090 |
| interaction_dJ_SS | | | - 0.166 |
| *R Square* | | *0.555* | *0.658* |
| *Δ R Square* | | *0.008* | *0.051* |
| *F-Value* | | *0.812* | *0.036* |

*Note *, relation statistically significant at 5% level (two-tailed)*

First of all, we already observed that the ***General Model*** demonstrated that four independent variables: Log Sales, Leverage, the proportion of Business Experts (BE) and the proportion of Support Specialists (SS) have a significant relation (but of opposite sign for BE and SS) associated with ROA.

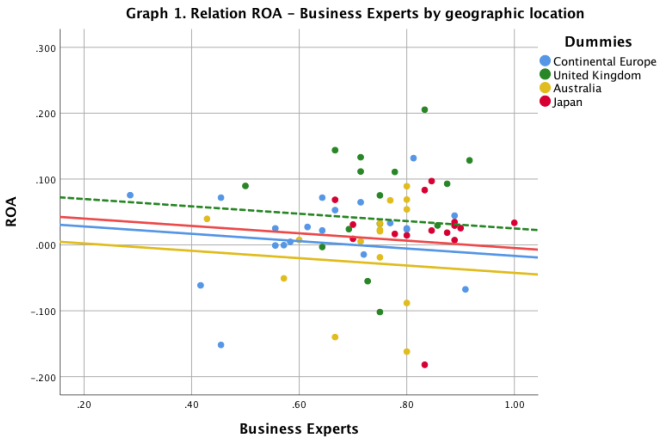
Hence, we can reject the null hypothesis *H0* and accept the alternative *H1* for **Test 1**, stating that there are at least four significant variables with an overall F-Value = 0.014 of the model and $p < 0.05$ for the claimed variables, and supporting that there are some strong linear relationships between the CG independent variables we proposed and the dependent variable, measured by ROA.

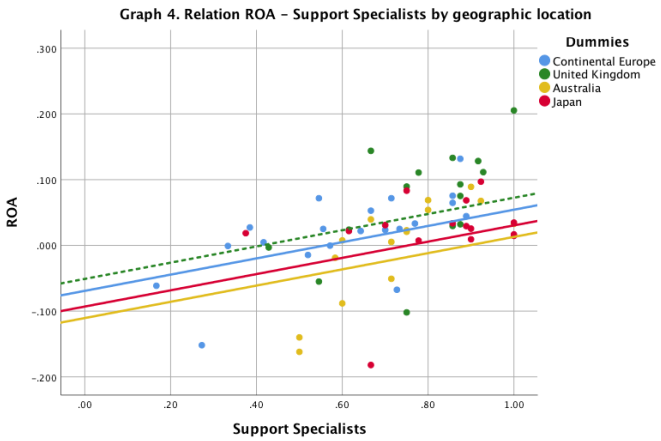
Interestingly, it may be observed that the control variables will assume a statistical significant value for all the further developed models, confirming their right role of moderators in the hierarchical regressions.

Next, we find out that ***Model 1 (a)*** and ***Model 2 (a)*** are both statistical significant and support the alternative hypothesis that there is at least one difference in the financial performance among the different geographic locations (**Test 2**). However, we note that Model 1 and Model 2 still keep a different direction in the relation associated with ROA: Business Experts is negatively related, and Support Specialists is positively.

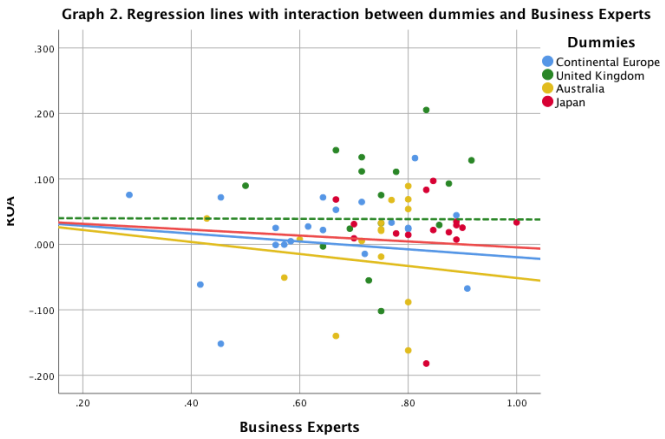
*Graph 1 and Graph 4* below picture the relation between the referred independent variable, Business Experts for Model 1 (a) and Support Specialists for Model 2 (b), associated with ROA and collocated by a geographic location due to the use of dummy variables.

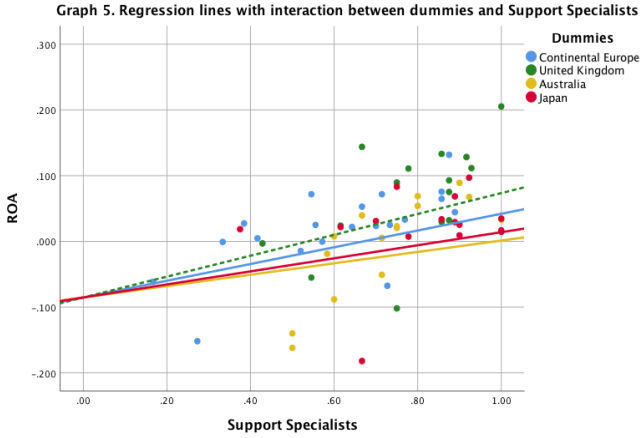
- *Model 1 (a):* dummy United Kingdom represents the highest level of ROA, given the number of business experts, followed, in order, by Japan, Europe and Australia;
- *Model 2 (a):* dummy UK, again, confirmed to be the best performer in terms of ROA, given a proportion of support specialists, but, here, there is a very little distance with dummy Continental Europe; while a bit further, dummy Japan and Australia.



Thirdly, ***Model 1 (b) and Model 2 (b)*** showed the growth and gaps of the slopes, and thus, the intensity of each dummy variable interacting with the independent variable. Furthermore, both the models rejected the null hypothesis *H0* for **Test 3**, affirming that there is at least one interaction being statistically significant and letting the financial performance assume different values according to the different slopes of the regression lines. The same geographical rankings, in terms of ROA, as in Model 1 (a) and Model 2 (a) have been maintained constant and can be observed in *Graph 2* and *Graph 5*, respectively.




Finally, we have **Test 4**, but both the models failed to reject the null hypothesis *H0*. However, some important considerations can still be made since the model is composed of only 65 observations and this, partly, contributed to limit the overall statistical significance. At the same time, it was not possible to increase the size of the sample because, then, the characteristics of companies would have been inconsistent between one another due to many differences regarding the size, the products offered and the CG and financial data.

Hence, by combining the two effects of dummy variables and interactions, we have **two different conclusions**, also described by *Graph 3* and *Graph 6* below:

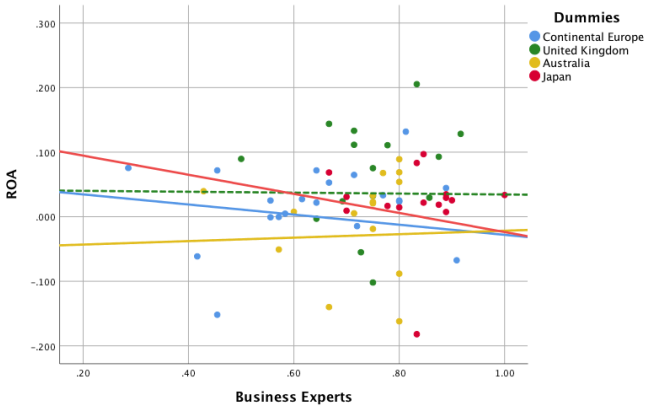
- ***Model 1 (c):*** Japanese companies have a higher effect on ROA from an intercept point of view, but due to the slope of the regression lines, British firms grow faster, reducing this gap when the proportion of business experts in the board of directors gets larger: up to a value of 55%.

  This negative relation made room for further investigations, since it seemed unreal that the larger the number of business experts in a board, the worst its performance. In fact, because our financial data is based on a 3-year time frame, we tried to analyse the various levels of business experts in a smaller sample of our companies over a 5-year horizon. Therefore, we discovered that the board of directors increase its proportion of business experts whenever the financial performance of the company, measured by ROA, is starting to go down. To sum up, since business experts may need some time before improving the poor performance of the corporations they are called to administrate and help, this may be the true reason on the negative relation of Business Experts associated with ROA.

- ***Model 2 (c):*** based on the starting point of the regression lines (coefficients), the effect of the proportion of support specialists on the financial performance is stronger in Japan than in any other country. Then, in order, Continental Europe, United Kingdom and, lastly, Australia. However, based on the growth rate, Australian and British lines have the highest slopes, meaning that after a given amount of support specialists, which is around 50% for UK and 85% for Australia, their ROA will be better than that of Continental Europe and Japan.

  In light of this consideration, since from our sample of data British firms possess an average proportion of support specialists equal to 76.30%, while Australian companies of 73.66%, then 50% represents a truly more feasible threshold, supporting the initial hypothesis that British corporations perform better from a ROA point of view due also to their higher specialized experience.

Graph 3. Regression model with dummy and interaction between dummy and Business Experts




Graph 6. Regression model with dummy and interaction between dummy and Support Specialists