



## Editorial

# Mixed methods research: An opportunity to improve our studies and our research skills



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Mixed methods research is the combination and integration of qualitative and quantitative methods in the same study. Although researchers have combined qualitative and quantitative data for many years, current conceptualizations of mixed methods research did not emerge until the 1980s. Mixed methods research has developed rapidly in these last few years, emerging as a research methodology with a recognized name and distinct identity (Denscombe, 2008), especially in some fields such as education, health sciences, psychology and sociology. In these fields, this methodological approach is recognized as the third methodological movement, along with qualitative research and quantitative research (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2003). This distinctiveness is reflected in the publication of many books focused on mixed methods, in a methodological journal (*Journal of Mixed Methods Research*, Sage) and in a scientific association (Mixed Methods International Research Association, <http://mmira.wildapricot.org/>).

An important aspect regarding mixed methods research is why to use this methodological approach. The use of mixed methods research in business studies may play an important role in the development of our field because results obtained from different methods have the potential to enrich our understanding of business problems and questions. In this regard, mixed methods research may add value and contribute to advance our research topics in the business fields (Molina-Azorin, 2007, 2011, 2012; Molina-Azorin & Cameron, 2015; Molina-Azorin & López-Gamero, 2016; Molina-Azorin, Lopez-Gamero, Pereira-Moliner, & Pertusa-Ortega, 2012).

The overall purpose and central premise of mixed methods studies is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems and complex phenomena than either approach alone (Creswell & Plano Clark, 2007). Better understanding can be obtained by triangulating one set of results with another and thereby enhancing the validity of inferences. Greene, Caracelli, and Graham (1989) point out other important purposes, rationales and advantages of mixed methods research: complementarity (elaboration or clarification of the results from one method with the findings from the other method), development (when the researcher uses the results from one method to help develop the use of the other method) and

expansion (seeking to extend the breadth and range of inquiry by using different methods for different inquiry components).

Another important issue about mixed methods is how to conduct a mixed methods study. There are two main factors that help researchers to determine the type of mixed methods design that is best suited to their study: priority and implementation of data collection. Regarding priority, the mixed methods researcher can give equal priority to both quantitative and qualitative parts, emphasize qualitative more, or emphasize quantitative more. This emphasis may result from the research question, from practical constraints on data collection, or from the need to understand one form of data before proceeding to the next. Implementation of data collection refers to the sequence the researcher uses to collect both quantitative and qualitative data. The options consist of gathering the information at the same time (concurrent design) or introducing the information in phases (sequential design). In gathering both forms of data concurrently, the researcher may seek to compare them to search for congruent findings. When the data are introduced in phases, the sequence relates to the objectives of the research. Thus, when qualitative data collection precedes quantitative data collection, the intention may be first explore the problem being studied and then to follow up on this exploration with quantitative data that are amenable to studying a large sample, so that the results can be applied to a population. Alternatively, when quantitative data precede qualitative data, the intention may be to test variables with a large sample and then to explore in more depth with a few cases during the qualitative phase.

A key aspect of mixed methods research is the integration issue (Fetters & Freshwater, 2015). In order to add value and contribute to advance business research, scholars that use mixed methods research must integrate the quantitative and qualitative parts. Authors of mixed methods studies should consider the question: what synergy can be gained by the additional work of using both qualitative and quantitative methods? This aspect urges researchers to carefully plan their works with intentional choices that can leverage integration. The issue is to produce a whole through integration that is greater than the sum of the individual qualitative and quantitative parts.

Creswell and Plano Clark (2007) pointed out that conducting mixed methods research is not easy, and Bryman (2007) indicated that there are several barriers. Mixed methods studies are a challenge because they require more work and financial resources, and they take more time. Increased time demands arise from the

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time it takes to implement the quantitative and qualitative parts of the study. In addition, mixed methods research also requires that researchers develop a broader set of skills that span both the quantitative and the qualitative. But in my opinion, this aspect must not be considered as a barrier but as an opportunity. Researchers tend to rely on the methods initially learned. When researchers develop expertise in using some methods where they feel comfortable, it is hard to break from that. Extending and sharpening our methodological skills, we can increase the rigor of our conceptual thinking, see new ways to answer research questions, and even identify questions that would not have occurred to us otherwise (Edwards, 2008). And here mixed methods research can play a key role. Because mixed methods research combines and integrates quantitative and qualitative methods, the researcher is motivated to develop a broader set of research skills. Training in mixed methods research can overcome the tendency to rely on known methods and play an important role in widening and extending our repertoire of methods (Mertens et al., 2016).

EJM&BE encourages mixed methods studies, and also pure quantitative and pure qualitative papers. EJM&BE encourages empirical articles that are rigorous and also relevant to business practice. Together with empirical articles, EJM&BE also publishes conceptual/theoretical articles and rigorous systematic literature reviews (qualitative reviews, meta-analysis and bibliometric studies). Works about the use and added value of specific methodological approaches and techniques are also welcome.

I agree with the “paradigm of choices” emphasized by Patton (1990). A paradigm of choices rejects methodological orthodoxy in favor of methodological appropriateness as the primary criterion for judging methodological quality. Thus, this paradigm of choices recognizes that different methods are appropriate for different questions. In any case, as noted above, mixed methods research and a wide repertoire of methods in our methodological toolbox can stimulate researchers to better define and analyze innovative problems and research questions in business research.

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## Article

# The Colombian pharmaceutical industry: Factors affecting export<sup>☆</sup>



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## ABSTRACT

In recent years, companies in the pharmaceutical industry have been confronted with a turbulent environment characterized by dynamism, complexity and uncertainty. To cope with these changes and achieve improved performance, these companies must generate the ability to make appropriate changes in their organizations. For that reason, we use a quantitative methodology linear regression model to investigate the multilevel resources, capacities and institutional aspects that influence the level of exports of companies in Colombia's pharmaceutical sector. The main findings that are highlighted include the significant role of the variables of supply costs, logistics, preview experience and the institutional environment in improving exports in the sector.

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## Introduction

In recent years, companies have experienced a complex, dynamic environment. Permanent changes in customers' needs and preferences have appeared, new products have been introduced, competition has increased, uncertainty has become marked at the time of decision making, and new agents have appeared. The pharmaceutical sector is no stranger to this situation: it is a sector in which it is very difficult to predict the behavior of the environment. For this reason, companies have been forced to work intensively to keep up with the market's changes. One of the pharmaceutical sector's primary characteristics is that its environment contains a large number of agents and components, and new products have been developed as a result of technological progress (Rivera, Avila, López, Garzón, & Flores, 2010).

The pharmaceutical sector is also characterized by its requirement of large investments in research and development (R&D), its products' high renewal and differentiation rates, and the generation

of benefits for companies and patients, the latter through reduced treatment costs and hospitalization days.

These characteristics encourage interactions between supply and demand in a market environment that differs from other industries. On the consumer side, the participation of various agents in the acquisition of goods is noteworthy; on the retailer side, the market power that companies acquire through the establishment of legal monopolies, brand loyalty, and adverse selection is noteworthy. These features allow us to place the pharmaceutical industry in a complex market scenario with multiple failures, creating incentives for state intervention.

In Colombia, the pharmaceutical market features strong interactions between private producers and public-sector distributors because of the existence of a list of generic and essential medicines to which those affiliated with social security are entitled, multiple distribution channels, and a price regulation and market concentration policy that often ignores the particularities of the sector. In addition, the health care reform contained in Law 100 of 1993 modified some of the sector's rules without considering the impact of that change on the overall performance and achievement of the healthcare system.

Sixty-seven percent of the Colombian pharmaceutical sector is in the hands of national companies; international laboratories compose the remaining 33% (ANDI, 2014). The trade balance

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of the Colombian pharmaceutical market is characterized by a greater number of imports than exports because the sector relies on imports from raw materials to finished products. Therefore, Colombia's pharmaceutical sector has very strong international dynamics that are determined by this combination of exports and imports. Colombian companies in this sector must compete with foreign companies. To do so, Colombian companies attempt to cut costs by buying foreign raw materials and supplies.

In this paper, we present the dynamics of the Colombian pharmaceutical sector's export activity. Factors that Colombian companies confront in the pharmaceutical sector are identified, along with their influence in export growth. In addition, we identify resources, capabilities and institutional factors that influence the growth of exports in a quantitative study that achieves a close approximation of the sector's reality. According to the results of the Joint Survey of Industrial Opinions (Encuesta de Opinión Industrial Conjunta—EOIC) conducted by the National Businessmen's Association of Colombia (Asociación Nacional de Empresarios de Colombia—ANDI) among businessmen in the pharmaceutical sector during the third quarter of 2013, numerous problems affect the Colombian pharmaceutical sector. Based on that survey, this study aims to verify whether variables such as productive resources, logistic capacity, previous experience on the international market and the institutional environment influence the sector's export growth. Our hypotheses are supported by resource-based theory. Moreover, institutional theory and the regulatory function of institutions are incorporated as the theoretical basis to support our hypothesis that the institutional environment affects the growth of the sector's exports. This study finds that input costs, logistic costs, previous experience and institutional environment affect the Colombian pharmaceutical sector's exports, highlighting the sector's high dependence on imports of raw materials because of the advantages that other countries offer with respect to prices, leading to the domestic industry's lack of initiative to increase domestic production of raw materials.

### The context of the Colombian pharmaceutical sector

The Colombian pharmaceutical industry is made up of national companies, which control 67% of the domestic market, with international laboratories or subsidiaries controlling the remainder. Nevertheless, these foreign industries have developed production and distribution strategies that have enabled them to reach regions that previously had a minimal industry presence, resulting in increased productive activity.

The Colombian pharmaceutical market is characterized by strong interaction between private producers and public-sector distributors; there is a list of generic and essential medicines to which those affiliated with social security are entitled; there are only two distribution channels, and there is a price-regulation and market-concentration policy that often ignores the sector's particularities (SENA, 2008).

In 1993, the National Health System (Sistema Nacional de Salud) was restructured, creating the General System of Social Security in Health (Sistema General de Seguridad Social en Salud) and incorporating two instruments of drug policy: (1) essential drugs, as the mechanism to select the best drugs for the most common diseases; and (2) generic drugs, as the mechanism to introduce market competition. Therefore, the Colombian drug market is composed of two markets derived from the two drug-distribution channels: (1) institutional, for the members of the social security system; and (2) private. In both cases, there are critical differences in the distribution channels to the final consumer and there are substitution possibilities.

The Colombian pharmaceutical industry has undergone major changes in recent years, particularly after the issuance of Law 100 of

1993. The social-security policy with respect to health that contains this law has increased demand in the sector, especially for generics. This law also defined the role of state regulators in drug-related issues. One of the highest-impact standards for producers is Decree 549 of 2001, which implements Manufacturing Best Practices (Buenas Prácticas de Manufactura—BPM) in all of the laboratories in Colombia, thus enabling the sector to be more competitive and productive (Bustamante, 2007).

Overall, the market for drugs has various classification criteria—e.g., mode of sale, type of products, therapeutic class, and place of manufacture. In Colombia, the pharmaceutical industry is very heterogeneous. It includes the production and import of semi-elaborated pharmaceutical goods for final consumption by humans and animals. The industry directs a very small percentage of its expenditure to R&D expenses both because foreign companies perform their research abroad and because domestic companies can be considered small and medium sized; they do not have enough resources to develop research programs to create new drugs (Bustamante, 2007).

Moreover, the presence of multinational companies in Colombia has declined in recent years. Several have taken their production to other countries that offer greater tax incentives and fewer quality and procedural regulations. This situation has encouraged national laboratories to develop new products that meet domestic demand for medicine (Stepanian & Tirado, 2013), thus transforming the sector into a strong exporter of drugs and an importer of raw materials (Angulo & Mosquera, 2008). Exports of pharmaceutical products have shown a growth trend since 2005, with a slight decrease during 2010 and 2011. In the last two years, although exports have continued to increase, there remains a trade-balance deficit. The sector's strengths are its regulations in line with international standards, freedom of prices, skilled labor, competitiveness, and high-quality products; its weaknesses are instabilities in the health system, counterfeiting and smuggling, and control and surveillance deficiencies (Angulo & Mosquera, 2008).

In recent years, Colombia has been characterized by a turbulent business environment, with continuous changes in customer needs and a resulting emergence of new products, increased price competition and new players in the market. The pharmaceutical sector has been affected by this dynamic; the behavior of its environment has become more unpredictable and companies must not only learn new skills to stay in business but also improve their performance in developing skills and managing their resources to adapt to new environmental conditions (Rivera et al., 2010). This series of problems is reflected in the Joint Survey of Industrial Opinions (Encuesta de Opinión Industrial Conjunta—EOIC) conducted by the National Businessmen's Association of Colombia (Asociación Nacional de Empresarios de Colombia—ANDI) among businessmen in the pharmaceutical sector during the fourth quarter of 2014. The survey results showed a series of problems that affect Colombia's pharmaceutical sector. The primary obstacles perceived by businessmen include high levels of market competition, low demand, the exchange rate, the cost and supply of raw materials, smuggling and unfair competition, and infrastructure and logistics costs. The survey results also showed the presence of positive levels of production and sales, stable inventories and a relatively favorable business climate. One of the major topics of concern is the tax reform being discussed in Congress because a higher income tax represents a substantial burden on companies whose tax capacity is at its limit. Another concern for entrepreneurs involves proposed labor initiatives that could result in slower growth, less investment, less employment and more informality (ANDI, 2014).

Starting with problems specific to the pharmaceutical sector, this study analyzes the effects of the resources available for production, logistics costs, previous experience and institutional environment on the sector's export growth. The following section



thus presents the theoretical framework focused on resource-based theory and institutional theory, along with the hypothesis to be tested.

## Theoretical framework

One of the most notable aspects of today's economy is the new world order of international competition, trade blocs and globalism, which requires companies to participate in international trade, regardless of a company's size. This theoretical framework focuses on analyzing the influence of particular resources, capacities and the institutional environment on export growth.

### *Resource-based theory and internationalization*

Various business characteristics—typically, the possession of certain resources and capabilities that can be exploited in other geographical markets at low costs (Buckley & Casson, 1976)—have a determining effect on export performance. Tallman (1992) states that a company decides to enter a foreign market based on an analysis of its resources and capabilities that identifies its competitive advantage.

Resource-based theory is drawn from the work of Penrose (1959), focusing on the theory of the growth of the firm, which argues that the main function of business is to acquire resources and organize for the purpose of producing goods and services that create profitability. Among these resources, Penrose (1959) highlights the need for personnel with experience and knowledge of the use of other resources. Authors that followed Penrose (1959) defined these resources as either tangible or intangible assets that companies control; these assets can be physical, technological, human, etc. Therefore, companies' competitive advantage will depend on the existence of such assets (Teece, 1980; Wernerfelt, 1984; Barney, 1986, 1991; Peteraf, 1993; among others).

Overall, resource-based theory suggests not only that companies have heterogeneous resources and capabilities but also that the extra benefits obtained by companies are the result either of the possession of valuable resources that constitute their competitive advantage or of the creation of specific capabilities that allow companies to compete more successfully (Fong, 1998). Therefore, this theory assumes that it is necessary to possess distinctive resources that are also "strategic"—that is, resources that are either valuable or rare and difficult to imitate or substitute (Barney, 1991; Peteraf, 1993; Teece, Pisano, & Shuen, 1997)—because if a company possesses these types of resources, it is difficult to find other companies with similar strategies for taking advantage of market opportunities.

When a company's various resources are broken down into categories, Weston and Brigham (1994) indicate that those categories include physical resources (technology, plant, equipment, access to raw materials, infrastructure and other factors that may affect production costs), financial resources (internal or external funding sources) and human-capital resources (classifying employees by their respective competencies, including but not limited to education level, experience, ability to make decisions, ability to adapt, and job skills) (Barney, 1991; Grant, 2006). Similarly, reference is made to organizational resources, organizational structure, levels of authority, planning and control systems, and organizational culture (Barney, 1991; Grant, 2006).

In terms of capabilities, according to Cardona (2011), these organizational routines enable resources to be organized, integrated and complemented. Cardona draws on Grant (2006) to indicate that these routines are fundamental processes to transform operational and administrative practices into capabilities. Hamel and Prahalad (1990) argue that organizational capabilities not only are

distinctive competencies of companies that are important for the achievement of company objectives but also comprise different individual tasks that often require the integration of specialized knowledge.

Wang, Boateng, and Hong (2009) attempt to explain the process of the internationalization of companies from three perspectives, including resource-based theory, suggesting that international expansion can occur when companies possess specific competitive resources that can offset the additional costs associated with entry into a foreign market. Therefore, the overseas expansion of a business is seen as a means of appropriating income from foreign markets using valuable resources, which help reduce the costs and risks incurred by the foreign market's novelty and other differences from the domestic market (Tseng, Tansuhaj, Hallagan, & McCullough, 2007).

Another perspective used by Wang et al. (2009) to explain the internationalization of companies is based on institutions; those authors note that strategic decisions are not only promoted by industry conditions and specific company resources but also reflect the formal and informal constraints that result from a company's institutional framework (Scott, 1995). This viewpoint suggests that every strategic decision is limited by various institutional forces that can either promote or hinder the improvement of resources and capabilities (Dunning & Lundan, 2008, cited by Wang et al., 2009). Even strategies such as internationalization are developed based on the institutional framework of the company's country of origin (Wan & Hoskisson, 2003). Below, the resources and capabilities analyzed in this work are described.

### *Productive resources*

According to Leonidou, Katsikeas, and Samiee (2002), companies must optimally allocate their resources so that they can achieve higher export performance because resource availability enables companies to exploit their opportunities and confront threats from their environment. The determinants of export growth are seen as external and internal influences, and the studies that examine the internal factors are grounded upon resource-based theory (Beleska-Spasova, Glaister, & Stride, 2012). Within these internal influences are operative, financial, and human capital resources (Beleska-Spasova et al., 2012). Operative resources include inputs used to develop organizational processes. Therefore, the possession or lack of material resources affects export activity. Without production resources, companies cannot satisfy the demand of international markets, thus hampering export growth (Arteaga-Ortiz & Fernández-Ortiz, 2010). In general, when the requirements for export activities are incompatible with existing productive resources, companies may experience poor export activity. In addition, the high cost of required inputs can hamper business participation in the international market, thus affecting the implementation of an export strategy (Beleska-Spasova et al., 2012). As a result, the following hypothesis is proposed:

**Hypothesis 1a.** The high cost of productive resources negatively influences the growth of exports.

### *Logistic resources and capabilities*

Logistics represent a portion of the commercial costs of international business activity and are critical for the volume of bilateral trade (Anderson & Van Wincoop, 2004). When referring to logistic costs, freight costs, customs, transaction costs, and documentation (among other things) are included. According to Chang, Kaltani, and Loayza (2009) and Hoekman and Nicita (2008), a country's infrastructure affects trade and export growth. The real costs of trade can be substantially reduced by improvements in physical and logistical infrastructure that increase the volume of international trade. When a country has many suppliers, adequate transportation,

a high-quality logistic infrastructure, several specialized logistic operators, and a suitable cost and time requirement for companies to cross borders, international trade is facilitated because these resources are a major determinant of import and export volume (Hausman, Lee, & Subramanian, 2013). Accordingly, the following hypothesis is presented:

**Hypothesis 1b.** High logistic costs negatively influence the growth of exports.

#### *Previous experience*

Human capital resources arise through training, experience and management vision (Theingi & Purchase, 2011). Thus, managers with higher educational levels, knowledge of foreign markets and experience in international activities contribute to boosting exports (Ibeh & Wheeler, 2005; Maurel, 2009; Stoian, Rialp, & Rialp, 2011). In this sense, Millington and Bayliss (1990) note the role of strategic planning in the process of internationalization and conclude that during the first wave of international participation, companies rely on their market experience and therefore make incremental adjustments. However, as their degree of international experience increases, companies' planning systems formalize their strategic analysis and information search. The growth of international activity continues to the extent that experience can be translated across different markets and among various product groups, enabling companies to use an incremental process within markets (Morgan & Katsikeas, 1997). Therefore, the following hypothesis is presented:

**Hypothesis 1c.** Previous experience positively influences the growth of exports.

We started with resource-based theory to show the influence of the presence of valuable resources and specific organizational capabilities on companies' internationalization decisions. However, there are also environmental conditions that affect that decision. According to Wang et al. (2009), those environmental conditions are related to the institutional forces that are present in companies. For that reason, institutional theory and its influence on internationalization are described below.

#### *Institutional theory and its influence on internationalization*

Institutionalism considers that institutions are operating rules for society and therefore have the ability to guide social processes in all spheres: society, state and the market (Vargas, 2008). Institutional theory states that institutions are created that are capable of guaranteeing trust relationships among parties in conflict, solving problems of collective action, reducing transaction costs, and reducing incentives for corruption, among other tasks that ultimately seek to maintain societal stability (Vargas, 2008).

According to Zucker (1987), institutional theory provides a vision for organizations because organizations are influenced by regulations, usually originating from external sources such as the government but sometimes originating within the organization. Through institutional theory, various perspectives are presented in which the institution is the unit of analysis of economic and political reality. Among these perspectives, we present the most outstanding. Economic institutionalism focuses on studying institutions as a mechanism to make decisions that allow a match between individuals' preferences; therefore, institutions are rules and regulations that enable and constrain the behavior of social actors (North, 1990; Scott, 2001). Economic institutionalism identifies institutions' influence on countries' economic and social performance, where those countries' preferences are explained according to institutional guidelines (Vargas, 2008). The new economic institutionalism does not consider institutions' social character; therefore,

it is recognized that individuals' rationality is determined by their own limits to know all of the possible options for decision-making (Hennings, 2007). Institutional political economy provides a basis for governance because it holds that the institutional norms that act on the behavior of individuals and their decisions are the mechanisms that allow institutions to control those individuals' behaviors, thus generating the logic through which organizations must change (Weimer, 1995). In contrast, the new institutional political economy analyzes the failures and deficiencies that occur in state mechanisms and substantiates economic principles that lead to efficiency.

This study is based on the approaches of the neo-institutionalists, who express the need to study the existing legal system and the means under which individuals' actions are restricted (Laurent, Ochoa, & Urbano, 2004). Government activities can help companies develop competitive advantages to develop in foreign markets those organizational capabilities that they possess in their domestic markets (Westhead, Wright, & Ucbasaran, 2002), which is why all government export-promoting policies and industry regulations are considered external factors that determine companies' export behavior.

The institutional environment that influences the pharmaceutical sector's international trade is analyzed in this paper, leading us to frame this variable within institutional theory when considering the foreign-trade rules established by the State and conditions imposed for foreign trade's development. Moreover, institutional theory suggests that to the extent that a company sees itself as part of the world, it should progressively adopt rules and procedures that give it legitimacy within its field, so that companies that decide to export or import can expand their organizational field, adapting to each country's institutional environment to facilitate their legitimacy in both local and global markets (Hessels & Terjesen, 2007).

#### *The institutional environment*

According to Araujo, Mion, and Ornelas (2012), export growth depends on the quality of a country's institutions of a country: a good institutional environment can advance a distributor's reputation, especially because institutions impose strict restrictions on its behavior. A country's institutional characteristics reflect various dimensions of the national environment framed in laws, rules and regulations that either approve or restrict certain behaviors, which is why institutions determine a company's behavior, including its internationalization activities (Novikov, 2014).

In Colombia, the issue of comprehensive quality control of medicines (whether produced domestically or entering the county) has become a matter of great importance because of the opening of the international market. The group that seeks control includes associations such as Afidro (with its framework for intellectual property protection) and Asocoldro (which advocates for harsher criminal punishment for those who commit smuggling and counterfeiting). State organizations include the INVIMA (with its Drug Surveillance Program) and DIAN (with its policy on the eradication of smuggling). The regulatory framework is based on constitutional principles and the right to enjoy a healthy environment. Other important policies include the following: drug-price regulation; health records; criminal sanctions for product adulteration; and intellectual property protections. However, Colombia's institutions suffer from certain limitations, including a lack of infrastructure to perform monitoring and control functions and to ensure compliance with bioequivalence and bioavailability studies, a requirement that in practice has not been implemented (Valbuena, 2006).

**Hypothesis 2.** A favorable institutional environment positively influences the growth of exports.

**Table 1**  
Sample characterization.

Feature		Domestic	%	Subsidiary	%	Total	%
		<b>103</b>	<b>63.2</b>	<b>60</b>	<b>36.8</b>	<b>163</b>	<b>100.0</b>
<b>Age</b>	0–10	31	30.1	15	25.5	46	28.4
	11–20	25	24.3	17	27.9	42	25.6
	21–30	19	18.4	13	21.3	32	19.5
	31–40	17	16.5	3	5.1	20	12.3
	41 or more	11	10.7	12	20.2	23	14.2
	<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>163</b>	<b>100.0</b>
<b>Size</b>	Small	53	51.5	32	53.2	85	52.1
	Medium	31	30.1	12	20.3	43	26.5
	Large	19	18.4	16	26.5	35	21.4
	<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>163</b>	<b>100.0</b>
<b>Location</b>	Bogota	51	49.5	27	45.4	78	48.0
	Medellin	19	18.4	9	14.5	28	17.0
	Cali	14	13.6	7	12.0	21	13.0
	Barranquilla	10	9.7	6	10.5	16	10.0
	Others	9	8.7	11	17.6	20	12.0
	<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>163</b>	<b>100.0</b>

Source: Own preparation, based on sample data.

## Methodology

This quantitative research uses a database from a 2014 survey of a group of 400 exporting companies in Colombia. All of the pharmaceutical-industry companies were filtered, resulting in a sample of 163 companies. With these data, we intend to analyze some of the variables presented in the Joint Survey of Industrial Opinion (Encuesta de Opinión Industrial Conjunta—EOIC), which is conducted annually by the ANDI. Through a multiple linear-regression model, the influence of these variables on the growth of exports in the sector is established.

The sample is composed of 103 domestic companies and 60 international companies with subsidiaries in Colombia. According to their size, they were classified as small, medium or large depending on the number of workers. Thus, small businesses have 1–50 employees, medium-sized businesses have between 50 and 200 employees and large businesses have more than 200 employees. In the sample, 52.1% are small, 26.5% are medium and 21.4% are large. Most of these companies are located in Bogota (58%), followed by Medellin (17%), Cali (13%), Barranquilla (10%) and other cities (12%, including Cartagena and Bucaramanga). With respect to the age of these companies, 28.4% are between 0 and 10 years of age, 25.6% are between 11 and 20 years of age, 19.5% are between 21 and 30 years of age, 12.3% are between 31 and 40 years of age, and the remaining 14.2% are more than 41 years of age (Table 1).

### Multiple linear regression model

The research question and the assumptions made in this study generate the need to establish a model that enables us to include business and industry variables. Therefore, a multilevel or hierarchical analysis is performed that allows us to include various groups engaging in the individual behavior, an approach that is characteristic of traditional models (Liu & Gupta, 2007). This aggregation of various groups leads to better estimates of standard errors and differentiates the effects at the micro level (in this company research) or the macro level (i.e., the sector), along with the relationships between levels, that is, in this research, the *top-down processes* approach (Klein, Dansereau, & Foti, 1994; Klein & Kozlowski, 2000) is used to analyze influences generated from a higher level to a lower level (i.e., sector to company).

Multilevel models have primarily been used in the social sciences and education because it is clear that society is organized in nested hierarchies (Wu, 1999). This type of social order and the benefits of this type of model are recognized; there has been a sharp

increase in the use of this model in the last decade, although it remains limited (. . .).

Therefore, multilevel models are used in this research because of the existence of possible differences in firm performance caused by variables related to their economic sectors whose influence is not directly revealed by traditional techniques (Snijders, 2011). In other words, such models can identify differences associated with individuals and the groups to which they belong while avoiding a simple statistical aggregation of individuals and subsequent generalizations that assume that all individuals interact with their context in a similar manner (Draper, 1995).

In mathematical terms, it is proposed that the multilevel model can be seen as an extension of the linear model, which explains a dependent variable in response to a group of independent variables as follows:

$$Y = x\beta + \varepsilon \quad (1)$$

Where

$Y = (y_1 + y_2 + y_3 + \dots + y_n)$  is a vector of random answers.

$y_n$ : is the  $n$ th observation of the dependent variable. This variable has the dimension  $(n \times 1)$ .

Moreover,  $X_n$  is the  $n$ th observation of the independent variable in the model.

Thus,  $x = (x_1 + x_2 + x_3 \dots + x_n)$  is a matrix of size  $n * p$  that includes zeros, ones or existing independent variables in the model.

$\varepsilon = (\varepsilon_1 + \varepsilon_2 + \varepsilon_3 + \dots + \varepsilon_n)$  is the error vector containing the unexplained with the independent variables included in the model; in other words, these random errors result in the difference between the observed and estimated values. Additionally, homoskedasticity (equal variance for all values of  $X$ ) is assumed.

Finally,  $\beta = (\beta_1 + \beta_2 + \beta_3 + \dots + \beta_n)$  is the vector of the parameters that reveal the weight of the variable in the equation and the parameters to be estimated.

However, if the existence of the hierarchy or level within the model is established and it is recognized that the individuals at the micro level are clustered at the macro level, then the  $i$ -th individual in the  $j$ -th group is expressed as follows:

$$Y_{ij} = \beta_0 + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \varepsilon_{ij} \quad (2)$$

$$\beta_{0j} = \beta_0 + \mu_{0j} \quad (3)$$

Where:

$Y_{ij}$ : is the response of individual  $i$  in group  $j$ .

$x_{ij}$ : is the explanatory variable in the individual  $i$  in group  $j$ .

$\varepsilon_{ij}$ : is the normally distributed error with constant variance.

$\beta_{0j}$ : is the average of  $y$  and the  $j$ -th group.

$\beta_0$ : is the average of the population.

$\mu_{0j}$ : is the random effect on the  $j$ -th group with variance  $\sigma_{\mu_0}^2$ .

Additionally, if the possibility of having different slopes for each existing group is presented, the following equation is obtained:

$$\text{Level 1 : } \beta_0 + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \varepsilon_{ij} \tag{4}$$

$$\text{Level 2 : } \beta_{0j} = \beta_0 + \mu_{0j}; \dots \beta_{1j} = \beta_1 + \mu_{1j}; \dots \beta_{2j} = \beta_2 + \mu_{2j} \tag{5}$$

with the column vector  $\mu$ :  $\mu = (\mu_{0j} + \mu_{1j} + \mu_{2j}) \sim N(0, \Omega\mu)$ :  $\Omega\mu = \begin{bmatrix} \sigma_{2\mu_0} & & \\ \sigma_{\mu_1 0} & \sigma_{2\mu_1} & \\ \sigma_{\mu_2 0} & \sigma_{\mu_2 1} & \sigma_{2\mu_2} \end{bmatrix}$  ( $e_{0ij} \sim N(0, \Omega e)$ :  $\Omega e = (\sigma_{e_0}^2)$ ).

It is important to note that because the dependent variable is not continuous, a multinomial logistic multilevel analysis is used to capture the response options and the structure of the two levels in the model. In general, if the reference category of the dependent variable is  $g$ , it is specified that

$$\pi_{ij}(s) = P(y_{ij} = 1)$$

$$\text{Log} \frac{\pi_{ij}(s)}{\pi_{ij}(g)} = \beta_0(s) + \beta_1(s)X_{1j} + \beta_2$$

$$(s)X_{ij} + \dots + \mu_0(s); \quad S = 1, 2, \dots, g - 1$$

$$\mu_0(s)j \sim N(0, \sigma_{\mu_0(s)}^2)$$

$$\sum_{g=1}^h \pi_{ij}(h) = 1$$

For this research, we seek to find the model with the best fit based on a theoretical model that contains the relationships that we seek to contrast (Murillo, 2004). For this purpose, 4 steps are proposed:

- Model 1: A model is generated with the control variables.
- Model 2: A model with variables related to the companies' resources and capabilities is created.
- Model 3: A model with the institutional variable associated with the environment is created. In mathematical terms, the final model is expressed as follows:

$$Y_{ij} = \beta_0j + \sum_{n=1}^3 \beta_{ij}x_{nij} + \beta_3x_{3j} + \sum_{n=4}^m \beta_1x_{nj} + \sum_{n=m+1}^l \beta_nx_{nj} + \varepsilon_{ij} \tag{6}$$

Control Variables Resource V. Institutional V.

$$\text{Level 2 : } \beta_{0j} = \beta_0 + \mu_{0j}; \dots \beta_{1j} = \beta_1 + \mu_{1j}; \dots \beta_{2j} = \beta_2 + \mu_{2j}; \dots \beta_{3j} = \beta_3 + \mu_{3j} \tag{7}$$

*Measurement of variables*

To measure the dependent variable Growth of Exports, the survey question that asks whether the company has increased its level of exports in the last 3 years is used. The responses are measured using the Likert scale from 1 to 7, in which 1 is strongly disagree and 7 is strongly agree.

To test the model, control variables such as the following are proposed:

- AGE = Number of years the company has been in the market.
- SIZE = Size of the company (small, medium or large).
- OWNERSHIP = Ownership type (1 = national or 2 = international).
- DSIQUI = Distance in kilometers to its main foreign market.

For independent variables, the following questions were selected. These responses were also measured on a Likert scale from 1 to 7, in which 1 is strongly disagree and 7 is strongly agree.

The resources and capabilities variables are as follows:

- RPROD = Productive resources are measured using the following question: Do you consider that the production costs of the sector are high?
- RLOG = Logistic resources are measured using the following question: Do you consider the sector's logistic costs to be high?
- PREVEX = Previous experience is measured by the average number of years that entrepreneurs in each sector claim to have performed export activities.

The following institutional variable is proposed:

INSTE = Institutional environment is measured using the following question: Do you consider the institutional environment to be favorable for businesses?

**Results**

The estimated multilevel regression model yields the results in Table 2. It should be clarified that before estimating the model, the statistical assumptions of the linear regression are verified, thus validating the absence of distortions in the estimated relationships in a linear regression model and confirming the quality and reliability of the model results (Hair, Anderson, Tatham, & Black, 1999). First, the independence assumption is validated, which estimates either the absence of a relationship between residuals in the evolution of the data or a no-correlation assumption. To this end, we analyze the Durbin–Watson statistic, which provides information about the degree of independence between the residuals, where the residuals must not show any systematic pattern with respect to either the predictions or the independent variables. If the value of the Durbin–Watson statistic is close to 2 (approximately 1.5–2.5), the residuals are independent; if it approaches 4, the residuals will be negatively autocorrelated; and if it approaches 0, the residuals will be positively autocorrelated (Hair et al., 1999). The statistic has a value of 1.444, so the residuals' independence is assumed.

Model 2 enables us to test the first group of hypotheses. A positive relationship between Production Resources and Export Growth in the companies is perceived (Beta: 9.3244; sig.=0.001), which corroborates those hypotheses. Similarly, Hypothesis 1b is proved, showing that the availability of Logistic Resources positively influences the growth of exports of Colombian companies (Beta: 5.987; sig.=0.005). Finally, the positive relationship established in the literature between the Previous Experience and Export Growth is shown (Beta: 10.5756; sig.=0.005). After evaluating model 2 and before evaluating model 3, the regression indicators obtained from model 2 are analyzed to corroborate the explanation based on the variables of the firm within Export Growth, concluding that the variables are significant and relevant within the investigation. Subsequently, model 3 is tested, the institutional variable is incorporated and the hypothesis proposed at this level of analysis is



**Table 2**  
Regression analysis results.

	Model 1	Model 2	Model 3
<i>Variables</i>			
Size	0.00345	0.00422	0.00363
Age	30.3431	30.6786	31.2864
Ownership	1.978	1.934	1.932
Psychological Distance	500	540	560
<i>Resources and capabilities variables</i>			
RPROD ( <i>Hypothesis 1a</i> )		9.3244	9.7854
RLOG ( <i>Hypothesis 1b</i> )		5.987	6.6581
PREVEX ( <i>Hypothesis 1c</i> )		10.5756	11.4009
<i>Institutional variables</i>			
INSTE ( <i>Hypothesis 2</i> )			5.3880
Adjusted R <sup>2</sup>	0.007	0.1317	0.2477
Change in R <sup>2</sup>	–	0.1247	1.16
F	7.86	11.78	9.978

Source: Self-made.

evidenced. *Hypothesis 2* is confirmed, indicating that the institutional environment positively influences Export Growth (Beta: 5.3880; sig. = 0.001).

In summary, these results find that although reports state that the Institutional Environment is a problem that affects the pharmaceutical sector, for the surveyed companies, it is not possible to validate this result, particularly because this sector often must address counterfeiting issues (for example, drugs may contain the incorrect active ingredient or the correct ingredient in incorrect quantities) instead of smuggling (drugs entering illegally). This is because of government regulations of the sector controlling the entry of smuggled drugs.

Export growth is adversely affected by the availability of Production and Logistic resources. For both variables, we find that the higher the costs, the lower the studied companies' export growth. When companies in the Colombian manufacturing sector must purchase expensive supplies, their products became less competitive in foreign markets because the selling price must also be high to recover the seller's costs. For such companies, it therefore will not be profitable to export their products because their competitors' supply costs are low, enabling them to offer low prices. The same is true for logistical costs; if Colombian pharmaceutical companies' cost of placing their products in foreign markets is very high, they lose competitiveness in those markets, that is, it will be unfavorable to export to other countries, especially countries in which the pharmaceutical sector benefits from supplies and logistical costs at competitive prices. Therefore, if pharmaceutical companies have insufficient resources to fulfill their most important needs—e.g., purchasing inputs, labor, acquisition of new assets or replacement of obsolete assets—they cannot continue to engage in export activities because it is probable not only that they will be unable to meet a certain level of production but also that they will not have the capital to bear the additional costs associated with commercialization in other markets.

## Conclusions

The Colombian pharmaceutical market is the fourth-largest market in Latin America. In recent years, the trend in this market has been to import and export products and/or raw materials. The amendment to Law 100 of 1993 was one of the factors that led to a more dynamic market and boosted domestic demand, resulting in higher revenues for companies. The social security system's increased drug coverage has resulted in a boost to the market for generic products; consequently, there has been an annual increase in the import of inputs for manufacturing generic drugs. Similarly,

national companies have been making inroads into foreign markets, especially in neighboring countries, because of their level of competitiveness, production processes and sales strategies.

The results of this study support the conclusion that although logistical costs are high in Colombia, it is still advantageous for companies to continue to import raw materials; the benefits of importing still outweigh the costs of internal production. In addition, Colombia primarily produces drugs of low complexity; for this reason, the market trend is weighted heavily toward importation either of raw materials or of drugs that are not manufactured locally. In this sense, exchange-rate fluctuation is one of the primary factors that can cause changes in supply and therefore would have a negative effect on the exports because as a market importer of raw materials, the Colombian pharmaceutical industry will be limited by economic changes in the countries that export supplies to the Colombian market.

In general, the reason for the high production costs associated with supplies and logistics that affect the export growth of the Colombian pharmaceutical sector is that the value of the drugs is the sum of the costs and margins that comprise the price paid by the final consumer. In addition, a long chain of intermediaries adds costs. Moreover, the pharmaceutical industry must employ qualified professionals given the need to provide products with high quality standards that guarantee individuals' health, thus increasing production costs.

Nevertheless, the sector's high costs—whether caused by imported supplies, skilled labor, or logistics chains—result in the sector's companies prioritizing the ability to cover those costs to reach a level of production that will, at minimum, allow them to remain in the local market. Thus, exports are conditioned to specific products that have a competitive cost advantage, such as natural products (which have boomed because of Colombia's significant biological diversity) or generic pharmaceuticals.

Overall, Colombia lacks advantageous resources and capabilities in the pharmaceutical sector. Despite the industry's technological modernization, it does not attract the investment levels needed to produce highly complex drugs. Because the government must ensure the supply of drugs for the health system, Colombia is forced to become an import-heavy market, dependent on countries with valuable resources and capabilities.

From an institutional point of view, health policies seek to provide greater coverage regardless of product quality, devoting their efforts to increase coverage at any cost instead of investing in knowledge and research to generate a range of drugs. However, at the level of market regulation policies, notable positive results are evident because medicine smuggling controls have increased. The problem that companies often experience in the sector is the growing threat of counterfeiting, which is exacerbated by networks that introduce counterfeit products to the health system through pharmacies, hospitals, distributors or the EPS, which are attracted by the low prices offered. Thus, greater controls and special measures to counteract this problem are required, including continuous inspections of distributors and industry customers to ensure that drugs are stored in compliance with the sanitary conditions and other provisions defined by the Invima, from the composition of the products to the packaging. These controls are necessary not only because of the high level of drug adulteration and counterfeiting but also because of the incorrect usage of legitimate drugs that are sold irregularly or after their expiration, putting at users' health at risk.

Finally, this work enables us to consider some impacts on business, government, academia and even consumers. In the business sector, relevant aspects to assess the advantages and disadvantages of the pharmaceutical sector have been identified, thus enabling it to directly confront the issue of internationalization. Although the focus of this study is some variables that affect international

trade, it is important for future studies to consider other variables involved in the export growth of Colombia's pharmaceutical sector. This need is obvious in the results of goodness of fit, which recognizes that the omission of other variables in the model could explain the export behavior of companies in the pharmaceutical sector.

Next, we issue a call to the academy to continue its research work to address the needs and concerns of the economic sector and to support business success. The disclosure of all of these studies is an opportunity for companies to learn more about their environment and their industry and to identify opportunities, threats, and potential.

The government is another important player because it determines public policy. Therefore, the results of this study enable the identification of the shortcomings and merits of the government's economic policy, thereby boosting the sector and attempting to encourage more export activity to improve the trade balance.

Finally, this study points to the importance of the consumer because the pharmaceutical industry is responsible for providing drugs. For that reason, proper import and export activity involves access to quality medicines at reasonable costs.

Among the primary limitations of this study is its use of a cross-sectional model that belies the long-term evolution of the proposed relationships. That said, this study does facilitate an understanding of this sector's behavior and weaknesses. Moreover, we find that the sample, even though it is representative, is highly limited because of the size of the sector in Colombia. Nevertheless, the sample allows us to establish the main conclusions provided in this section.

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## Article

# Extrinsic and intrinsic factors in the Balanced Scorecard adoption: An empirical study in Portuguese organizations



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Determining factors

## ABSTRACT

In this article we aim to analyze the relationship between a set of organizational extrinsic and intrinsic factors and the adoption of the Balanced Scorecard (BSC) by privately-owned Portuguese organizations (large companies and small and medium enterprises). These factors are related to companies age, the diversity of products and services, the nature of the ownership structure, the internationalization, and the organizational size. As a primary means of data collection was carried out a postal survey through a questionnaire sent to 549 privately-owned Portuguese organizations, with an overall response rate of 28.2%. The results indicate that the degree of diversity of the products/services of the organization, the ownership of foreign groups, and the organizational size are positively associated with the implementation of the BSC. Thus, we conclude that the BSC increases with the degree of diversity of the products/services of the organization, that the Portuguese organizations that use the BSC are mainly owned by foreign groups; and larger organizations are most likely to use this tool.

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## Introduction

The current environment is characterized by economic globalization and internationalization of markets, uncertainty and risk, increased competitiveness, the increase in the range of goods and services offered by companies to their customers, technological development and its impact on shortening the life cycle of products and the introduction of new organizational forms.

All these aspects have led to major changes within companies, as in order to cope with the changes taking place in the environment, they need to make all the processes related to formulation, planning, implementation and strategy control more flexible, facilitating the maintenance and development of competitive advantages (Burns & Vaivio, 2001; Giralt, 2001). Thus, in recent decades, with the aim of improving the link between the strategy and performance measurement, new models and tools for management control have been developed, that combine financial and

non-financial measures among which is the Balanced Scorecard (BSC).

The literature on the BSC is very extensive, and there is a lot of work on the analysis of cases or its use in certain activity sectors (Ferreira, Caldeira, Asseiceiro, Vieira, & Vicente, 2014; Hoque, 2014). The fact is that as in the case of any other management control innovation, the implementation of the BSC is usually associated with the presence of certain organizational environmental characteristics, which make some companies more likely to adopt it than others. However, the vast majority of empirical studies have focused on the generic analysis of the implementation of the BSC, its characteristics and the results of its application (Hoque, 2014), while identifying the factors influencing the adoption of the BSC in organizations is an issue that has been less dealt with. On the other hand, despite the large number of books, articles, etc. which have dealt with the BSC from different perspectives and for different areas and the wide range of Information Technology (IT) solutions that have been developed in recent years, there is a lack of theoretical and empirical studies in Portugal on factors influencing the adoption of the BSC. These findings have led us to ask the following question: What are the factors influencing the implementation of the BSC in private Portuguese companies?

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In light of the above, this article aims to analyze the relationship between various extrinsic and intrinsic factors for organizations and the adoption of the BSC. These factors have been identified within the literature review and are related to the age of the enterprises, the degree of diversity of the products/services offered, the nature of the ownership structure, the degree of internationalization and the organizational size.

In accordance with the objective proposed, the work is structured as follows: initially the theoretical framework is collected and the research hypotheses are defined. On this basis, the methodology and the sample under study are presented, as well as the results obtained and a discussion thereof. Finally, the main conclusions, as well as the limitations of the study and some suggestions for future research are discussed.

### The Balanced Scoreboard: determining factors for its adoption

In the early nineties of the last century, Kaplan and Norton (1992, 1993) conducted a multi-business study motivated by the observation that to evaluate business performance, companies relied mainly on traditional financial measures such as return on investment and payback, and that performance measurement systems did not explain the impact of intangible assets on the performance of enterprises, especially on those technology-intensive ones, suggesting that the financial measures were inadequate in a complex and constantly changing environment and should be supplemented by additional indicators reflecting customer satisfaction, internal business processes and the capacity of the organization to learn and grow.

Therefore, there was the need to develop a tool that incorporated a wide range of more generic and integrated measures, capable of linking long-term financial success to performance achieved from the perspective of customers, internal processes and employees and systems (Kaplan & Norton, 2001). Consequently, the BSC has been proposed as a management tool capable of improving the information system of the company and responding to changes in the environment, providing managers with relevant and necessary information to evaluate the development of the strategy and take decisions, identifying four key areas for any type of organization: learning and growth, internal processes, customers and financial results (Ferreira et al., 2014; Zizlavsky, 2014).

Numerous papers refer to the advantages, strengths and contributions of the BSC for organizations. In the opinion of its creators (Kaplan & Norton, 1992, 1993, 1996, 2001, 2004, 2006, 2007, 2008), the most innovative aspect of the BSC is its capacity to produce strategic learning, providing a global vision of organizational performance and improving the understanding of the objectives as a prior requirement for their achievement.

For Kaplan and Norton (1993), the BSC is not a standard model applicable in the same way to all organizations, but should otherwise be adapted to the particular requirements of their mission, strategy, technology and culture. Therefore, different market situations, product strategies and conditions of competitive environments will involve different applications of this model. Similar statements were made by Leite (2001), who considers that the cause–effect model of Kaplan and Norton is a dynamic system that cannot be indifferent to internal and external contingent factors, and Olve, Roy, and Wetter (2002), who claim that the design and characteristics of the BSC and the process for its implementation will depend on many factors, intrinsic or extrinsic to the organization, whose degree of influence may vary.

Taking into account the objective of this work, we consider that the Contingency Theory provides the adequate framework to

base our empirical study, since it is one of the main theoretical approaches that support studies that try to explain the determinants of the use of different Management Accounting practices (Chenhall, 2003).<sup>1</sup> Thus, applying the assumptions of the Contingency Theory, it can be said that the propensity by an organization to adopt the BSC is contingent regarding its characteristics and the environment in which it operates.

In fact, with the aim of identifying the different factors which influence and condition the implementation and use of the BSC and explain the range of models observed in practice, some authors (Galas & Ponte, 2005; Garengo & Bititci, 2007; Hoque & James, 2000; Speckbacher, Bischof, & Pfeiffer, 2003) have adopted a contingent approach as a reference theoretical framework to deal with this study. In the development of this line of research, possible variables have gradually been identified, denominated contingent or contextual factors that seem to explain the decision of a company on whether to adopt or not the BSC.

While there is no general consensus on what the contextual factors that make certain companies more likely than others to implement the BSC are, in a first approach, and without being exhaustive, we can point out that among the most analyzed factors, there are organizational characteristics such as company size (Hoque & James, 2000; Olve et al., 2002; Sharma, 2002; Silk, 1998; Speckbacher et al., 2003); the strategy (Ittner, Larcker, & Meyer, 2003; Olson & Slater, 2002); the organizational structure (Sharma, 2002) or business culture (Olve et al., 2002), factors related with the characteristics of the industry/market and uncertainty of the environment (Banker, Janakiraman, & Konstans, 2001; Kraus & Lind, 2010; Olve et al., 2002; Sharma, 2002; Speckbacher et al., 2003) and variables linked to the leadership style and personality of management (Wiersma, 2009).

In our case, we tried to combine firstly the interest in seeing whether within Portuguese companies, the results obtained in other countries regarding the influence of certain contextual factors in the adoption of the BSC are confirmed and secondly, the possibility of extending this research to analyze new variables, whose influence has been analyzed in the general framework of systems of management control and performance evaluation, but not in the particular case of the BSC. For this reason, in this work the influence of the following six characteristics are analyzed: (1) the age of enterprises; (2) the degree of diversity of the products/services offered; (3) type of control (family/non-family); (4) the importance of foreign capital in the ownership structure; (5) the degree of internationalization and (6) organizational size (considered this last one a control variable).

The development of the research hypothesis was based on the existing literature on determining factors of management control systems (Chenhall, 2003).

In relation to the first variable under study, the association between the age of the company and its use of accounting/management control systems has been studied by various authors (Dávila, 2005; Gomes, 2007; O'Connor, Chow, & Wu, 2004; Olve et al., 2002).

The main finding of these studies is that the oldest organizations are more likely to adopt management accounting techniques, due to the existence of higher learning (background) of management. Applying these ideas to the degree of adoption of the BSC, it is expected to be higher in older organizations. In this regard, the following hypothesis arises:

<sup>1</sup> The Contingency Theory allowed to introduce in the management accounting research, the study of the influence of the context (external and internal) on the design and use of several techniques and tools of management accounting, becoming due to its great intuitive attraction one of the dominant paradigms for the study of the design of accounting and management control systems (Chenhall, 2003).



**H1.** *The implementation of the BSC is positively associated with the age of organizations.*

Regarding the diversity of products and services offered, different authors like Merchant (1981), Govindarajan (1988), Fisher (1995), Malmi (1999) and Drury and Tayles (2005) consider that the accounting/management control system will become more complex, the greater the number and variety of products/services offered by the company, due to the higher complexity of its operations. Besides, Bjornenak (1997), Malmi (1999), Abdel-Kader and Luther (2008) and Ahamadzadeh, Etemadi, and Pifeh (2011) have observed that the use of management accounting tools, in particular the Activity-Based Costing (ABC) system, is greater in organizations with a higher diversity of products/services. In the particular case of the BSC, Hoque and James (2000) verified a positive relationship between the use of the BSC by the company and the lifecycle stage of its products, so companies that had tendency to use the BSC more, were those that had a higher percentage of new products, that is, the most innovative ones in this field. In accordance with these ideas, the following hypothesis arises:

**H2.** *The implementation of the BSC is positively associated with the degree of diversity of the products and services offered by the organization.*

The form of ownership and the management structure of the enterprise are contingent factors which affect the use of performance control and management systems by the enterprise, formalized as the BSC (Speckbacher & Wentges, 2012). Thus, in general, family businesses tend to make less use of formal systems of performance measurement and management, prioritizing informal control, intuition and personal contacts as opposed to formal plans (Merchant, 1984; Perera & Baker, 2007). In this regard, Speckbacher and Wentges (2012) found that family ownership greatly influences the behavior of small and medium enterprises (SMEs). In particular, these authors argue that the management of enterprises exclusively by their owners is more centralized and is characterized by less use of formal systems of performance management, as owners-managers of small businesses tend to have more informal and personalized management styles. Consequently, they are more likely to supervise their employees' activities and evaluate their performance without using formal measurement procedures (Perera & Baker, 2007).

Therefore, we considered that it would be interesting to see whether family businesses use the BSC less than the rest of enterprises or vice versa, if the BSC is used more in enterprises with non-family control. Thus, the following hypothesis was defined:

**H3.** *The BSC is used more in Portuguese enterprises with non-family control.*

Regarding the importance of foreign capital in the ownership structure, according to Dávila (2005), the existence of foreign investors in the capital of a company is a determining factor in the adoption of management control systems by organizations. In the same vein, Malmi (1999) states that when a company is owned by a foreign group, this will be reflected in the adoption of new accounting and management control techniques by the company. Therefore, we believe that the growth in direct foreign investment can be an additional incentive for Portuguese managers to adopt new strategic management tools.

On the other hand, Jones (1985) refers to the influence of multinational companies on their subsidiary companies as a contingent variable that affects the design and characteristics of the management systems adopted, to the extent that the transfer of cultural values, people and accounting techniques from the parent to subsidiaries often takes place. This idea is shared by Blanco, Maside, and Aibar (2000), who believe that because of their needs in terms

of integration and standardization, it is common for the parent company to transfer their accounting and management control practices to their subsidiaries. Thus, it is expected for the adoption of the BSC to be greater in Portuguese subsidiaries of multinational companies and therefore the following hypothesis has been defined:

**H4.** *Portuguese organizations that use the BSC are mainly property of foreign groups (multinational companies).*

In relation to the degree of internationalization, Cooke (1989) and Lopes and Rodrigues (2007) argue that due to the increased complexity of their operations, companies that are more oriented to international markets tend to have more developed management control systems. In the particular case of the BSC, Banker et al. (2001) observed a greater tendency to use the BSC by companies operating in more competitive markets and facing greater competitive pressures, elements that in our view, characterize companies operating in international markets. On the other hand, in the context of a study on the 250 largest Portuguese companies, Quesado and Rodrigues (2009) found empirically that with regard to the internationalization variable, the difference between companies using and not using the BSC and those that knew and did not know about that tool is not statistically significant.

Thus, we consider that it would be interesting to see whether Portuguese companies that have implemented the BSC are more oriented to international markets. This results in the following hypothesis:

**H5.** *The implementation of the BSC is positively associated with the internationalization of the organization.*

Finally, the size of the organization is a classic contingent variable that affects the design and use of management control and performance evaluation systems. In fact, the relationship between the size and adoption of performance measurement and management systems has received numerous attention in the literature on management accounting (Abdel-Kader & Luther, 2008; Chenhall & Langfield-Smith, 1998; Chenhall, 2003; Dávila & Foster, 2005, 2007; Dávila, 2005; Elmore, 1990; Ezzamel, 1990; Giannopoulos, Hotlt, Khansalar, & Cleanthous, 2013; Hendricks, Menor, & Wiedman, 2004; Hendricks, Hora, Menor, & Wiedman, 2012; Huerta, Contreras, Almodóvar, & Navas, 2010; Kaplan & Atkinson, 1998; Kimberly, 1976; Langfield-Smith, 1997; Libby & Waterhouse, 1996; Machado, 2013; Merchant, 1981, 1984; Otley, 1999; Simon, 2007; Speckbacher & Wentges, 2012; Wenisch, 2004). In this regard, Dávila (2005) states that the larger the company, the greater the implementation of Management Accounting systems. Moreover, previous empirical studies show the positive effect of size on the probability of the company using new management tools. In this sense, most authors believe that when the size increases, coordination and communication problems are higher and therefore management control systems tend to be more formal, complete and sophisticated. In addition, larger companies have more resources available (material and human) for the implementation of management innovations.

As mentioned above, several authors have analyzed the influence of company size on the adoption of the BSC. However, different results were obtained. Some authors found that the adoption of the BSC is significantly and positively associated with the size of organizations (Bedford, Brown, Malmi, & Sivabalan, 2008; Braam & Nijssen, 2004; Hendricks et al., 2004, 2012; Hoque & James, 2000; Pineno, 2004; Speckbacher et al., 2003; Tapinos, Dyson, & Meadows, 2011; Wagner & Kaufmann, 2004), while other studies corroborated that the organization size does not affect the use of the BSC (Hoque, Mia, & Alam, 2001; Quesado & Rodrigues, 2009).

Taking into account these arguments, there was an attempt to verify whether in fact in private Portuguese enterprises there

is a positive relationship between the organization size and the adoption of the BSC. Thus, the following research hypothesis was defined:

**H6.** *The implementation of the BSC was positively associated with the organization size.*

### Methodology, sample and variables

To achieve the objective established, the positivist research paradigm has been used. Thus, a quantitative methodology has been used and we proceeded to survey, by sending a postal questionnaire to a sample of 549 private companies operating in Portugal (the 388 largest Portuguese companies and 161 SMEs classified as excellence-industry SMEs).

In the case of large companies, the database of the 500 largest and best Portuguese companies was used for their identification, which are classified according to their turnover, published in the special edition of "Exame Magazine" and referred to 2007 (Exame, 2008). Regarding SMEs, only those belonging to the industrial sector were selected, which were classified as excellent in 2000 and 2001 (the last two years in which this classification was made). This choice was necessary due to the large number of SMEs in Portugal and their heterogeneity in terms of capacity, size and location. We opted for industrial companies because as Machado (2009) points out, they have more tradition in the use of management accounting systems compared with service companies. In addition, the fact that they have been classified as excellent, allows us to focus the analysis on those that stand out more for their economic-financial management and performance.

The questionnaires were essentially composed of closed questions, mostly dichotomous and/or multiple choice, with the application of nominal and ordinal scales (for example, Likert scales). The questions were grouped into blocks depending on the subject to which they referred. Although to a lesser extent, some open questions were also included to identify the perception of respondents regarding the BSC.

In March 2009, the questionnaire was tested by elements belonging to the study target population and by academic experts on the subject and with extensive experience in designing and conducting research, with the aim of assessing the coherence and relevance of the questions, ensuring that they were not confusing but easy to read and respond. In addition, it was sought to obtain their opinion regarding the submission and interest of the questionnaire, its size, response time and to correct errors in the interpretation of questions, reviewing the language used. This stage proved to be very useful, as the suggestions received were used to improve the clarity, comprehensibility and relevance of the questionnaire.<sup>2</sup>

We decided to send the questionnaires to the controller, financial manager or the person responsible for the accounting in the company, as they are considered the most appropriate because of their role at the decision-making level on the strategy and management of organizations as well as their knowledge of the information on which we want evidence.<sup>3</sup> The first questionnaire was first sent in April 2009 and it was necessary for it to be sent several times, so the data reception period was extended until March 2010.

The questionnaires received were reviewed with the aim of identifying missing values resulting from the errors when filling out the questionnaire or not having answered a/some question/s. The

data collected were processed statistically with the SPSS program (Statistical Package for the Social Sciences; version 17).

The response rate was 28.2% of the total population, that is, 155 responses: 107 large companies (27.6% response rate) and 48 SMEs (29.8% response rate).

In order to analyze if the conclusions obtained in our study can be applied to all private Portuguese organizations, we have carried out an analysis of the representation of the sample<sup>4</sup> based on known values for the total population, such as the activity sector, total assets and number of employees. However, it is important to note that this analysis was more detailed in the case of large companies, as there was information available for the entire sample (both for the responsive sample as for the non-responsive sample). The results showed that there were no significant differences among the companies that replied to the questionnaire and those which did not.

As to the variables, taking into account the hypothesis defined previously, the following proxies have been defined:

**Adoption of the BSC:** according to Malmi (2001), it is difficult to determine whether an enterprise has or not implemented the BSC due to the evolving nature of the BSC. Consequently, following the approach taken by Speckbacher et al. (2003) and Kraus and Lind (2010), we considered the broadest possible definition of the BSC and to evaluate this variable we asked enterprises whether they used some type of measurement system of multidimensional performance in which the indicators were grouped into at least three of the original perspectives of the model proposed by Kaplan and Norton. In this regard, it is important to note that: (1) due to the small number of organizations in the sample that used the BSC and (2) because some of the organizations that stated that they were expecting to implement the BSC in the future indicated that they were already taking the first steps in the process of implementation of the tool at the time of the survey, the data from organizations using the BSC or expecting to implement it in the future (41.7% of organizations) were grouped. Therefore, the dependent variable "BSC" refers to the use of the BSC by the organizations of the sample, taking the value 1, in the case that the organization uses the BSC and otherwise the value 0.

**Age:** the age variable was measured through the age of the organization, i.e., the number of years since the constitution or beginning of its activity. Based on this data, companies were grouped into five age groups: (a) less than 10 years; (b) between 10 and 20 years; (c) between 20 and 30 years; (d) between 30 and 40 years; and (e) more than 40 years.

**Degree of diversity of products and/or services:** it was measured using a 4-point Likert scale in which the companies were asked to classify the number and variety of products/services offered into the following four categories: (a) very high; (b) high; (c) average; and (d) low.

**Type of control (family/non-family):** dichotomous variable (dummy) that takes the value 1 if the owner of the enterprise is also the manager and 0 otherwise.

**Importance of foreign capital in the ownership structure:** dichotomous variable (dummy) that takes the value 1 if the percentage of foreign participation is higher than 50% and 0 otherwise.

**Degree of internationalization:** it was measured based on the turnover in foreign markets, the number of foreign subsidiaries and the percentage of foreign participation in the capital of the company. Based on these data, a new variable "internationalization" was defined, through the use of principal component factor analysis

<sup>2</sup> It is important to note that the answers of interviewees in the pretest were omitted in the subsequent data analysis.

<sup>3</sup> However, in all cases it was requested for the questionnaire to be given to the most suitable person of the organization to respond to the questions.

<sup>4</sup> In this regard, the possibility of a bias in the sample that does not respond should be considered. That is, the organizations that decide not to respond may be significantly different from those that do decide to do so. This fact could pose a problem to extrapolate the results of the test sample to the entire population.

**Table 1**  
Age vs implementation of BSC.

Use	N	Mean	Standard deviation	t-Test	Sig.
Uses or intends to use	43	34.28	22.251	0.492	0.623
No use	62	32.35	17.708		

– PCFA<sup>5</sup> (for more information on how this variable was obtained, see the annex).

**Size:** although the literature suggests several variables to measure the organizational size, in our study the most used variables were turnover, total assets and number of employees. In this case, due to the small number of SMEs using or intending to use the BSC, it was necessary to incorporate the two types of enterprises (large and SMEs). Thus, companies that had previously been grouped under the category of large companies were rearranged in terms of size.

As the three reference variables to calculate the size of the organization are asymmetrical, the respective Napierian logarithms (NapLog) were calculated, and as they are nominal variables, a new representative variable of the organizational size has been defined, denominated “dimension”, by using PCFA<sup>6</sup> (for more information on how this variable was obtained, see the annex).

## Results

This section is intended to test research hypotheses defined according to the appropriate statistical criteria and procedures and present a discussion of the results obtained.

Regarding the first research hypothesis on the influence of the age of the organization on adopting the BSC (H1), the analysis of the normality for the group of organizations that use the BSC was carried out using the K–S test, whose value has led to the acceptance thereof. The *t*-test is not significant (*p*-value = 0.623). Consequently, the research hypothesis defined regarding the existence of a positive association between the variables must be rejected. Thus, according to the results, the age of the organization is not, from a statistical point of view, related to the use of the BSC (Table 1).

In this case, our results, referring to the particular case of the BSC, are in contradiction with those generally obtained for management control systems by Dávila (2005), who observed that the older the enterprise, the greater the use of these systems.

With respect to the hypothesis on the association between the degree of diversity of the products/services offered by the organization and implementation of BSC (H2), the results obtained through the test of independence chi-square (*p*-value = 0.025) indicate that one cannot reject the hypothesis as it stands. That is, the implementation of the BSC increases depending on the degree of diversity of the products/services of the organization. Furthermore, Cramer's *V* test (*p*-value = 0.288) shows a correlation between the variables (Table 2).

To test the third hypothesis, in which it was stated that the BSC is used in Portuguese companies with no family control (H3), the test of independence chi-square was used. The results, which are shown in Table 3 lead us to reject this hypothesis, as the significance

<sup>5</sup> The correlation coefficients of Pearson and Spearman revealed a positive correlation between the variables number of subsidiaries, turnover of foreign markets and percentage of foreign participation in the capital of the company. Thus, the reduction of variables through the PCFA can be considered. Each scale has undergone the process of sample appropriateness of factor analysis and the corresponding reliability analysis (which showed a very low value due to very low correlations between variables).

<sup>6</sup> Since the normality test of the distribution of variables (K–S) and Spearman correlations have significant values (*p*-value < 0.05), we were able to continue with the PCFA.

**Table 2**  
Degree of diversity vs implementation of BSC.

Use		Degree of diversity			
		Low	Average	High	Very high
Uses or intends to use	Cases	4	10	17	15
	% divers.	18.2	34.5	45.9	60
No use	Cases	18	19	20	10
	% divers.	81.8	65.5	54.1	40

*p*-Value = 0.025;  $\chi^2 = 9.366$ ; Cramer's *V* = 0.288.

**Table 3**  
Family control vs implementation of BSC.

Use		Family control	
		Yes	No
Uses or intends to use	Cases	20	28
	% control	39.2	43.8
No use	Cases	31	36
	% control	60.8	56.3

*p*-Value = 0.765;  $\chi^2 = 0.090$ .

**Table 4**  
Implementation of BSC vs origin of capital.

Use		Origin of capital	
		National	Foreign
Uses or intends to use	Cases	23	23
	% origin	30.3	65.7
No use	Cases	53	12
	% origin	69.7	34.3

*p*-Value = 0.000;  $\chi^2 = 12.411$ ; Cramer's *V* = 0.334.

level is greater than 0.05. Thus, no association between the type of control (family/non-family) and the use of the BSC is observed.

In this case, our results do not match those of the study by Campa and Sánchez (2007), who concluded that family and/or single-owner organizations do not value the BSC, as the management and ownership of the company are the same person. However, according to our results, this does not mean that these organizations do not need to increase the planning and implementation of their strategy by adopting formal systems of performance measurement and management, such as the BSC.

To check the fourth hypothesis regarding the relationship between the implementation of the BSC and the importance of foreign capital in the ownership structure (H4), the test of independence chi-square was used, which showed a (*p*-value < 0.01), verifying the association between the origin of capital and the use of the BSC (Table 4). That is, Portuguese companies in which capital of foreign origin has considerable importance in the ownership structure show a higher degree of the use of the BSC.

Furthermore, this result has been confirmed by analyzing the categories to which the company belongs (Table 5), where it was observed that it is precisely subsidiaries of a foreign group that use the BSC the most. In both cases, Cramer's *V* reveals a strong correlation between the variables (*p*-value = 0.334 and *p*-value = 0.329, respectively). Thus, the proposed research hypothesis cannot be rejected.

This result is in line with those results obtained in studies by Malmi (1999), Wanderley, Meira, Souza, and Miranda (2004), Dávila (2005) and Bocci and Mojoli (2006). In our opinion, the results confirm what was stated by Queirós (2004), for whom in Portugal the BSC has been “imported”, especially by multinational companies.

In order to check the relationship between the use of the BSC and the degree of internationalization of the organization (H5), a normality test was performed. Adherence tests to normality, K–S

**Table 5**  
Implementation of BSC vs categories where enterprise is included.

Use	Categories			
	Subsidiary of a national enterprise or group	Subsidiary of a foreign enterprise group	Non-subsidiary	
Uses or intends to use	Cases	6	22	19
	% categories	35.3	66.7	30.2
No use	Cases	11	11	44
	% categories	64.7	33.3	69.8

$p$ -Value = 0.002;  $\chi^2 = 12.208$ ; Cramer's  $V = 0.329$ .

**Table 6**  
Non-parametric test of Mann–Whitney for the use of BSC.

	Internationalization
Mann–Whitney $U$	451.000
Wilcoxon $W$	1354.000
$Z$	−0.441
Level sig. (bilateral)	0.659

**Table 7**  
Dimension of the enterprise vs implementation of BSC.

Use	$N$	Mean	Standard Deviation	$t$ -Test	Sig.
Uses or intends to use	45	0.5312318	0.73675476	2.828	0.006
No use	65	0.0588464	1.01442325		

with correction of Lilliefors or Shapiro–Wilk reveal that for a significance level of 5% normality is not met ( $p$ -value < 0.05). Thus, for the analysis it was necessary to use an alternative to the  $t$ -test for two independent samples. Specifically, the nonparametric Mann–Whitney test was used.

The results presented in Table 6 allow us to conclude that the two distributions do not differ in central tendency (Mann–Whitney test with a bilateral significance level of 0.659). That is, the difference between the use and non-use of the BSC regarding internationalization is not statistically significant, similar to the results in the study by Quesado and Rodrigues (2009).

Finally, with respect to the hypothesis regarding the existence of a positive association between the size of the organization and implementation of the BSC (H6), the  $t$ -test was used, which showed a significant value ( $p$ -value = 0.006), which does not allow to reject the hypothesis defined, i.e., there is an association between the size of the organization and implementation of the BSC (Table 7).

This statistical result leads us to state that as the size of the organizations of the sample increase, so does the use of the BSC.

Even though some authors have proved that the use of a sophisticated measurement system, such as the BSC does not depend on the size of the enterprise (Hoque et al., 2001; Quesado & Rodrigues, 2009), our results are in line with those obtained by the majority of authors who have analyzed the influence of this variable, by observing that the use of BSC is greater in larger companies (Bedford et al., 2008; Braam & Nijssen, 2004; Hendricks et al., 2004, 2012; Hoque & James, 2000; Pineno, 2004; Speckbacher et al., 2003; Tapinos et al., 2011; Wagner & Kaufmann, 2004).

In fact, company size affects the way in which companies design and use management systems because as size increases, their operations become more complex and communication and control problems require greater attention, promoting the use of more specialized, formal and sophisticated accounting management control tools (Ezzamel, 1990; Libby & Waterhouse, 1996; Merchant, 1984), such as the case of the BSC.

In this sense, the empirical evidence that the contingent variable size positively influences the implementation of the BSC can be attributed to increased needs and demands of communication, coordination, control and expertise in these types of enterprises

(Andersen, Cobbold, & Lawrie, 2001). Consequently, larger companies need to control a broader set of issues compared to smaller companies, so they require more sophisticated management control systems.

## Conclusions

Empirical evidence obtained from work carried out regarding this subject has shown that the BSC dissociates from traditional systems of performance evaluation and control, considering the alignment between management indicators and the organization strategy, one of the keys to successful implementation (Hoque, 2014).

Despite the theoretical and practical consolidation of the BSC, there is still no widely disseminated work on the determinant factors of the adoption of the BSC in Portuguese companies. In this sense, the main objective of this study was to analyze the relationship between a set of contextual factors and the adoption of the BSC in a sample of Portuguese companies in the private sector. To do so, six research hypotheses were established which posed the existence of a positive relationship between the adoption of the BSC and six organizational characteristics.

In line with that indicated in the analysis of the results, we have obtained empirical evidence that confirms the association between the implementation of the BSC and three of the analyzed characteristics: the degree of diversity of the products/services of the organization, the ownership of the company by foreign groups and the organizational size. Thus, it is possible to conclude that: (1) implementation of the BSC increases with a greater degree of diversity of the products/services of the organization; (2) Portuguese companies using the BSC are especially those in which a large percentage of their capital is owned by foreign groups; and (3) larger Portuguese companies are more likely to use this tool.

However, we did not obtain empirical evidence that would allow us to corroborate the possible relationship between the adoption of the BSC and the age of the organizations, the type of control (family/non-family) and the degree of internationalization. In our opinion, this result could be due to the characteristics of the sample under study and the research methodology chosen, in the sense that both aspects can distort the results.

On the basis of the results, the research conducted and the results obtained in the study are considered to contribute to knowledge about the implementation of the BSC in companies, which may be interesting for managers who are considering its adoption. On the other hand, some variables referred to in the literature as determinants of the use of other management control tools have been confirmed as such in the specific case of the BSC, while others showed the opposite results within the Portuguese scope.

However, the results of this study should be evaluated based on a set of limitations. The fact that the empirical study has been limited to private Portuguese companies and the small sample size have made the analysis and generalization of the results difficult for the universe of study. Furthermore, we must point out the limitations inherent to conducting a quantitative research through questionnaires, in particular problems of interpretation of questions, and



the fact that the data were collected in 2009 and 2010 may not reflect the current reality.

The results obtained and the limitations encourage us to propose some future research lines. So, for example, it might be interesting to extend the analysis to SMEs from other sectors or expand the analysis by including other variables that could also have some influence. In addition, longitudinal studies could enable to identify evolution trends regarding the determinants of the implementation of the BSC in private Portuguese organizations.

On the other hand, the underlying limitations to a study conducted by a postal questionnaire could be overcome through interviews/case studies, which would enable to obtain more objective and detailed data and enrich the exchange of experiences and individual perceptions on this issue. So, it would be interesting to conduct case studies that would enable to compare cases of success and failure in implementing the BSC, helping to better understand the existing connections between different organizational and environmental variables. In addition, considering the limitation related to the time horizon associated with the collection of data, it would be important to update the empirical study we have conducted, in the sense of checking whether the results remain valid in the current environment.

Finally, in this paper a bivariate analysis was conducted to see whether the adoption of the BSC is conditioned by various contingent factors analyzed considered individually. However, we are aware that the use of the BSC is a complex phenomenon influenced by a wide range of contingent factors, which in turn, influence and condition each other, in such a way that a contextual variable can indirectly influence the adoption of the BSC through its relationship with another variable. In this regard, in order to corroborate and make the results more solid, the relationship between the use of the BSC and potential contextual factors should be checked by performing a multivariate analysis using either hierarchical regressions or structural equation models that enable to contrast different hypotheses simultaneously facilitating their global analysis.<sup>7</sup>

## Annex.

**“Internacionalización” variable:** The appropriateness test KMO was 0.577, indicating that factor analysis is relevant to obtain a factor representing the scale (although the value is not very high). In addition, the Bartlett test took a high value (13.824) and an almost full (0.003) significance level, which indicates a high correlation between the elements that make up the scale. Therefore, the previous values indicate that applying factor analysis is adequate.

Table 8 shows the part of each variable that has remained or is present in the components that were retained (commonalities), the number of factors to retain (total variance explained) and the correlation between each variable and the component (loadings). Thus, a relationship between the variables and the retained factor is observed (although this relationship is not very strong, because the values are not very high for all the variables).

With respect to the total variance explained by the Kaiser criterion, only one factor can be retained, considering that there is only one own value (eigenvalue) greater than 1. The retained component accounts for about 50% of the variation of the original variables, i.e., 50% is represented in the “internationalization” variable.

The weight of each variable, according to the loadings obtained in the factor analysis provides an appropriate measure of the relevance of the factor in each case, reducing the isolated incidence of specific variables. All variables are positively correlated, i.e., the higher the number of foreign subsidiaries, sales to foreign markets

**Table 8**  
Statistics of PCFA.

	Communalities	Loadings
Number of foreign subsidiaries	0.480	0.693
Turnover for foreign markets	0.393	0.627
Percentage of foreign participation in the capital of the enterprise	0.588	0.767

eigenvalue = 1.461; % variation = 48.7.

**Table 9**  
Statistics of PCFA.

	Communalities	Loadings
Log_turnover	0.859	0.927
Log_total assets	0.885	0.941
Log_n.º workers	0.716	0.846

eigenvalue = 2.460; % variation = 82.

and the percentage of foreign participation in the capital of the company, the greater the internationalization of the organization.

Based on the above, it is verified that the PCFA provides a good measure of the level of internationalization of companies, creating a new variable (“internationalization”) consisting of ratings (scores) of these components, which allow to relate the responses provided by each respondent to the variables involved and the component itself.

**“Dimension” variable:** the appropriateness test of the factor analysis of the variables of the study was reasonable (KMO of 0.698). In turn, the Bartlett sphericity test showed a significant statistic ( $p$ -value < 0.01), indicating the rejection of the hypothesis that the correlation matrix is the identity matrix. That is, there is significant correlation between the variables for a significance level of 5%, which allows us to continue with the factor analysis.

In Table 9 high values are observed for all variables, reflecting a very strong relationship with the retained factor, i.e., these items are satisfactorily explained by the solution factor.

With respect to the total variance explained, by the Kaiser criterion, only one factor can be retained (eigenvalue > 1). The retained component explains 82% of the variation of the original variables, that is, 82% is represented in the “dimension” variables.

Regarding the loadings, it is observed that all the variables are correlated positively, that is, the higher the turnover, total assets and number of employees, the higher the dimension of the enterprise. Nevertheless, it is important to highlight that as was foreseen, the lowest recorded value corresponded to the number of employees (0.846) variable.

Based on the above, it is verified that PCFA provides a good measurement of the size of the enterprises, creating a new variable (“dimension”) made up of the ratings (scores) of these components.

To validate the measures, the reliability of the scales (Cronbach's Alpha) was verified. It is worth mentioning how high Cronbach's alpha of the factor (0.890) is, which is more than adequate to ensure internal consistency of the factor.

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## Article

# Social enterprise: Gender gap and economic development<sup>☆</sup>

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## ABSTRACT

Companies created by women represent a substantial part of entrepreneurship. While men outnumber women in entrepreneurship rates, the gender gap decreases in the case of social enterprises. This may be explained by the fact that roles and stereotypes that influence women's behavior will lead to significantly identify with the values promulgated by social enterprises. This greater involvement in social activities leads women to become an essential player for promoting such needed initiatives given the impossibility for public institutions to address all social problems. Therefore in this paper, firstly, we study the gender gap in social and commercial entrepreneurship, distinguishing between enterprises with less than 42 months of activity and those consolidated in the market. Secondly, and aware of the variability of data between countries, a study is conducted using a sample of 48 countries grouped according to their level of development. The results confirm what is stated in the literature, the gender gap is reduced in the case of social entrepreneurship and it is also shown that female participation in social enterprises is influenced by the level of development of the country. These results lead us to highlight the importance of variables such as culture or social norms when explaining female behavior.

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## Introduction

The role of enterprises is considered essential in the economic sphere, as they mobilize resources, create jobs and generate wealth. Moreover, taking into account their contribution to economic growth, enterprises are considered essential in the development of a territory, as they contribute to the rejuvenation of the socio-productive fabric, re-launching regional areas and boosting the innovative process (Santos, 2012).

That is why in the economic, political and social fields a wide range of private and even public policies have been implemented aimed at entrepreneurship (Álvarez, Noguera, & Urbano, 2012). Examples include programs offered by institutions like the United Nations (UN). In particular, the UN has programs to promote entrepreneurship among which are those targeted at the female segment, which pursue greater equality between men and women, reducing gender violence, achieving peace between territories and in general, promoting social change worldwide (Luchsinger, 2015).

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The emergence of measures to support female entrepreneurship is widespread, because the proportion of women who decide to start a business is lower than that of men (Minniti, 2010), being this inferiority more significant as the development level of the country increases (Coduras & Autio, 2013).

These differences have traditionally been attributed to the different motivations that guide men and women. In particular, men are closer to achieving and obtaining economic benefits, while women are closer to pursuing social value (Hechevarría, Ingram, Justo, & Terjesen, 2012; Urbano, Ferri, & Noguera, 2014; Wilson & Kickul, 2006).

Although the commercial enterprise generates social value, this is not in particular its objective, but an indirect consequence of its activity. In the social enterprise, however, the creation of social value is intrinsic to its mission (Dees, 2001; Holmen & Mizzi, 2014), a value which the employer does not want to take ownership for and intentionally creates for others (Santos, 2012).

This fact makes the social enterprise be considered suitable for women in order to align their interests with the roles that have been attributed to them culturally, closely linked to altruism, care and protection of disadvantaged groups (Dietz, Kalof, & Stern, 2002; Mckay, Phillimore, & Teasdale, 2010; Urbano et al., 2014).

Due to the importance for the rest of society, social enterprises are currently being studied by several institutions, such as the European Commission, whose analysis shows that this is a business phenomenon which is currently proliferating and it is increasingly



easier to find examples of social enterprises worldwide (Holmen & Mizzi, 2014).

Although the number of social enterprises is growing and the implementation of female enterprises (Holmen & Mizzi, 2014; Luchsinger, 2015) is being promoted to a greater extent, the data in this regard, show that the importance of women in the rates of social entrepreneurship varies considerably from one country to another, even from one economic group to another (Bosma & Levie, 2010).

Our two research questions arise from these reflections: (1) Is the proportion of women who create businesses higher in the social case? (2) What influence does the level of economic development of the country have on the proportion of women versus men who set up social enterprises?

While the differences between men and women have been widely discussed in the literature on commercial entrepreneurship, there is little research analyzing them from the social enterprise point of view (Nicolás Martínez, 2014).

In order to respond to these two questions, firstly, an analysis is carried out on the influence that being male or female has on the decision to create a company, specifying in the case that the company created has a social objective. Next, how the level of development of the country where the new company is located mediates in this relationship is studied. The research hypotheses are derived from this relationship. Then these hypotheses are contrasted by the study of the gender separation gap. The sample used is made up of 14,931 entrepreneurs in 48 countries, grouped according to their level of development, of these entrepreneurs, 2693 are social entrepreneurs. The sample was obtained from the database of the Global Entrepreneurship Monitor (GEM) 2009. The paper ends with a discussion of the results and the analysis of the implications for research in this area and the applications it has for enterprises at a practical level.

In general, it should be noted that this work makes important contributions to literature. On the one hand, entrepreneurship according to the gender of the individual who sets up the enterprise is studied, verifying that proportionately women create more social than commercial enterprises in all the groups of countries. On the other hand, gender in social enterprises and the level of economic development is also analyzed, noting that as the level of development decreases, women create a larger number of enterprises, both social and commercial, so there is a negative relationship between the level of development of the country and setting up businesses.

## Gender of social entrepreneurship

The literature on gender and entrepreneurship is quite extensive, finding a broad consensus on the fact that men are the ones who start businesses to a greater extent (Eagly, 1987; Langowitz & Minniti, 2007; Mckay et al., 2010; Themudo, 2009).

This greater propensity of the male group is explained by the *social role theory* or its extended version the *gender role theory*, developed by Eagly (1987), in which it is stated that it is not the biological predisposition, but culture that defines socially acceptable behaviors for each gender. While the male role is associated with control or achievement, making them responsible for financial family support, traditionally women are often associated with work in the home, performing household chores and taking care of children and other dependent people. These are the roles and stereotypes that lead to the conclusion that the ideal gender to start and run businesses is the male one (Carter & Rosa, 1998).

Meanwhile, Connell (1990) also supports this argument with his *theory of hegemonic masculinity*, stating that in the business world there is a hierarchical order between men and women, by which

men are seen as the standard and women as the exception to the rule (Godwin, Stevens, & Brenner, 2006).

However, the fact that women have these roles preset and are conditioned by the principles of hegemonic masculinity can cause differences in the way in which they run their businesses, since the objectives that guide their decisions are different from those of men (Langowitz & Minniti, 2007). In particular, there are studies that show that women decide to become entrepreneurs guided primarily by social rather than economic (main motivation of men) objectives (Fernández-Serrano & Liñán, 2014; Urbano et al., 2014).

This fact may explain why women are not only the goal of many social actions, but also key players in social entrepreneurship (Hechevarría et al., 2012). The missions of these types of enterprises are directly related to altruism, care and protection to others, while commercial enterprises pursue to create an economic benefit for the person who started it. This leads to women that create a social enterprise to find a place more adapted to their roles and emotional goals than those starting a commercial enterprise (Dietz et al., 2002; Mckay et al., 2010; Urbano et al., 2014).

Furthermore, while the main objective of the commercial enterprise is the creation of economic benefit, the social enterprise moves away from that goal, focusing explicitly on creating sustainable solutions that create social value through its economic activity (Mair & Martí, 2006). Precisely, social enterprises realign more with the female role due to social objectives, as demonstrated by the work of Themudo (2009) and Hechevarría et al. (2012). Thus Hechevarría et al. (2012) suggest that women focus more on activities related to aid. They are the ones who are most likely to get involved in more volunteer activities, and even the participation of women in the third sector is higher than that of men in countries such as the United States.

In this regard, investigations are focused mainly on UK social enterprises that analyze if women start up social enterprises at a higher rate than commercial enterprises (Harding & Cowling, 2006). In particular, the authors base their study on the analysis of what they call 'gender separation gap'. This tool, also known as gap measures the difference between the percentage of men and women who are involved in the business activity. Its results show that the importance of women increases in the case of social enterprises, so that the gap that separates the entrepreneurship figures between men and women is lower in the social case.

As for Leahy and Villeneuve-Smith (2009), they reached the same conclusion in their research with a sample of individuals of legal age belonging to British social enterprises. Precisely, they claimed that 41.1% of all managers of social enterprises were women, well above the rate observed in the commercial case. Moreover, this fact was also noted when the percentage of owners was analyzed, observing that 26% were women in the social case, while in the commercial case that figure accounted for hardly 14%.

These arguments allow us to affirm that:

**Hypothesis 1.** The gender separation gap is lower in social enterprises than commercial enterprises.

## Gender in social enterprises and economic development

The environment is a key variable when an individual decides to create a company (Hofstede, 1980, 1991, 2003; Shinnar, Giacomini, & Janssen, 2012; Verheul, Stel, & Thurik, 2006). When the participation of men and women in entrepreneurship is studied by analyzing samples from different countries grouped according to their level of development, it can be stated that as the level of development decreases the gender gap also decreases (Kobeissi, 2010; Minniti & Naudé, 2010; Minniti, Allen, & Langowitz, 2006; Van der Zwan, Verheul, & Thurik, 2012).

This fact is motivated by two factors. Firstly, it is considered that the fragile economic systems of these countries with high unemployment figures, high job insecurity and low wages cause women to try to escape poverty, turning to self-employment out of need (Kobeissi, 2010; Minniti & Naudé, 2010; Van der Zwan et al., 2012). Secondly, it should be noted that low levels of efficiency reduce existing entry barriers, which promotes the creation of new companies (Baughn, Chua, & Neupert, 2006; Neupert & Baughn, 2013).

However, the fact is that there are factors that have a negative influence when an individual decides to create a company in less developed countries. In particular, it is noted that access to training is not good, it is difficult to have business relationships with other people or the fact that commercial infrastructures are usually deficient (Kobeissi, 2010).

Along these lines, research conducted by Minniti, Arenius, and Langowitz (2005) states that while it is true that as the level of development of the country decreases, the number of enterprises created by women increases, the relationship between the two variables is non-linear. Specifically, if the highest percentages of business women are in less developed countries and as development increases, female presence decreases, there is a turning point when the presence increases again in economies with higher stages of development (Acs, Arenius, Hay, & Minniti, 2005). Therefore, it is necessary to note that it is possible to find countries with smaller gaps between men and women, due to the fact that high levels of development and a greater number of opportunities favor female entrepreneurship (Baughn et al., 2006; Neupert & Baughn, 2013).

Most research examining the relationship between gender and social entrepreneurship has been conducted with samples from developing countries, showing a smaller gender gap in the social case than in the commercial case (Harding & Cowling, 2006; Leahy & Villeneuve-Smith, 2009). The fact that there is no research on the gap, the social enterprise and levels of development leads to the need to know whether the behavior of the gap depending on gender for the social enterprise is similar to that obtained by the commercial enterprise in the different groups of countries. Therefore, in this study it is stated that:

**Hypothesis 2.** There is a positive relationship between the gender separation gap in the social enterprise and the level of economic development of the country.

## Methodology

### Sample and data collection

In this work, the unit of analysis is the individual and for that purpose, data collected by the GEM project were used. The data were collected in 2009, by telephone or face-to-face interviews with a standardized questionnaire. A representative sample of adults (18–64) was used, resulting in a total of about 160,000 people surveyed in 48 countries (Table 1).

Since 1999, annually, researchers conducting the GEM project have contributed to knowledge on entrepreneurship, by studying the attitudes and aspirations of individuals and the types of activity and environmental characteristics that affect them when starting up enterprises in the 80 countries that make up the GEM project. Their findings help governments, enterprises and researchers when designing and implementing policies and programs aimed at stimulating business start-ups worldwide (Terjesen, Lepoutre, Justo, & Bosma, 2011).

### Method

Formally, the hypotheses are tested by studying the gender separation gap or the gap. This method, used by Bosma and Levie

**Table 1**  
Characteristics of the sample.

Level of development	Countries	Sample size
Underdeveloped countries (stage 1)	Algeria, Guatemala, Lebanon, Jamaica, Morocco, Saudi Arabia, Syria, Uganda, Venezuela and the West Bank and Gaza Strip.	19,203
Developing countries (stage 2)	Argentina, Bosnia and Herzegovina, Brazil, Chile, China, Colombia, Croacia, Dominican Republic, Ecuador, Iran, Jordan, Letonia, Malaysia, Panama, Peru, Rumania, Russia, Serbia, South Africa and Uruguay.	48,405
Developed countries (stage 3)	Belgium, Finland, France, Germany, Greece, Iceland, Israel, Italy, Republic of Korea, Netherlands, Norway, Slovenia, Spain, Switzerland, United Kingdom, United Arab Emirates and United States.	89,747

Source: Compiled by the authors, based on Bosma and Levie (2010).

(2010), measures the difference between the proportion of men and women who have created or run a business in a given territory. To perform this analysis, a cross-tabulation of data through contingency tables between the rates of male and female enterprises according to the different types of enterprises and groups of countries was carried out. The  $\chi^2$  test was also applied, which has given us significant differences between the rates of male and female enterprises for each development level. To do this, the SPSS program was used. With the results of the contingency tables, the gender separation gap was calculated by variation between the rates of male and female enterprises, according to the types of enterprises and economic zones. Specifically, the formula for the variation rate used was as follows:  $\text{Gap} = \frac{\text{Female rate} - \text{Male rate}}{\text{Male rate}} \times 100$

### Measurement of variables

In order to obtain a variable that classifies the enterprise according to whether it was social or not, the methodology used by Lepoutre, Justo, Terjesen, and Bosma (2013) was followed. In particular, to identify the individuals that were involved in the entrepreneurship process, the respondents were asked whether at present they were trying to start a new business, alone or with others, also including being self-employed, as well as the fact of selling any good or service to others. As a result, a dichotomous variable was established, which was classified into (1) for those individuals who responded positively and into (0) for those who answered negatively. To identify individuals in the process of social entrepreneurship, they were then asked if their activity, organization or initiative had social, environmental objectives or sought the benefit of the community. With the results of this question a new dichotomous variable was developed, which was classified with a (0) for the respondents who replied no and one (1) for the respondents who answered yes.

This information also enables to develop the indicator of entrepreneurial activity in a territory, namely the GEM defines it as the total early-stage entrepreneurial activity (TEA). This rate shows the percentage of people between 18 and 64 who started a business

in the last 42 months. In the case of the social enterprise, the indicator is defined as the rate of Social Entrepreneurial Activity (SEA), which shows the percentage of population between 18 and 64 who, in this case, created a social enterprise in the last 42 months.

In addition to these two rates, the GEM also provides two other rates with similar information. Specifically, what differentiates these rates from the ones defined in the previous paragraph is that, in this case, enterprises need to have at least 42 months of activity. As GEM distinguishes between initiatives of less than 42 months (TEA and SEA) and those organizations that were constituted over 42 months ago, it is possible to carry out a study differentiating between enterprises constituted less than 42 months ago and those constituted over 42 months ago. This enables to provide information in order to go beyond what has been analyzed so far in the literature.

Furthermore, to classify the gender of the individuals, a dichotomous variable was used, where men were identified with a (0) and women with a (1).

Regarding the classification of countries according to their level of development, it was carried out following the methodology of the GEM project, through a categorical variable that divides the countries according to their level of development (Table 1). In that sense, the countries that see innovation as the main element that can improve productivity and competitiveness are in stage 3. They are therefore developed countries. In stage 2 are the countries that are in transition between the implementation of efficiency (which is the criterion immediately preceding innovation) and innovation to achieve this objective. Finally, the countries in stage 1 are those with a lower level of development and which still consider the production factors (especially human capital) as the elements that are able to improve productivity and competitiveness. Countries that are in a transition period between the later stage and the one that considers efficiency as the drive to improve productivity and competitiveness are also included in this group.

**Results**

The results are presented in two tables and three graphic representations. The first table, number 2, shows the rates of entrepreneurship based on the level of development of the country and for the total of countries. The next two tables show a

**Table 2**  
Entrepreneurship rates according to the level of development of the country (%).

	Rate of entrepreneurial activity (TEA)	Rate of social entrepreneurial activity (SEA)
Developed countries	5.7***	1.6***
Developing countries	12.3***	2.1***
Underdeveloped countries	16.4***	1.5***
Total	9.0***	1.7***

Source: Compiled by the authors.  
\*\*\* Statistically significant difference  $p < 0.01$ .

comparison of the gender separation gap both for commercial and social enterprises and again distinguishing between economic groupings and the total.

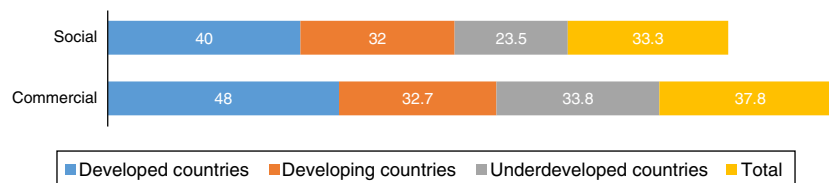
Table 2 gives an overview of entrepreneurship rates of commercial and social enterprises. Regarding commercial rates, it can be observed that they decrease as the economic development of the country increases. This can respond to that when development decreases, there is the need for the population to start a business because the lack of alternative work increases. Less developed countries have worse civil service structures and fewer large companies than developed countries and therefore have a higher proportion of people who choose to start a business as a career. On the other hand, Table 2 shows a high variability in the commercial entrepreneurship rates among the three economic groupings, variability which does not occur in the social case. Although the differences remain statistically significant, they are close to the average of the total countries (1.7). This stability suggests that social entrepreneurship is not affected by the existence of a greater need for the population to start a business in the absence of alternative work in developed countries.

Table 3 and its graphic representation, Fig. 1, provide information on business rates by gender, as well as the gap in rates of male and female entrepreneurship for social and commercial enterprises of between 0 and 42 months of activity. The results support Hypothesis 1. The gender separation gap is lower in social enterprises than commercial enterprises. This is shown by the fact that in developed countries the gap is 40% for the social case and 48% for the commercial case, in developing countries these data decrease

**Table 3**  
Comparison of the gender separation gap according to the type of enterprises and the level of economic development. Enterprise with 0–42 months of activity (%).

	Activity rate for the commercial enterprise (0–42 months)		Activity rate for the social enterprise (0–42 months)		Commercial gap	Social gap
	Male	Female	Male	Female		
Developed countries	7.5***	3.9***	2.0***	1.2***	48.00	40.00
Developing countries	14.7***	9.9***	2.5***	1.7***	32.70	32.00
Underdeveloped countries	19.8***	13.1***	1.7***	1.3***	33.80	23.50
Total	11.1	6.9	2.1	1.4	37.80	33.30

Source: Compiled by the authors.  
\*\*\* Statistically significant difference  $p < 0.01$ .  
 $G = [(FR - MR)/MR] \times 100$ .



**Fig. 1.** Graphic representation of the gender separation gap according to the type of enterprise and the level of economic development. Enterprises with 0–42 months of activity (%).  
Source: Compiled by the authors.

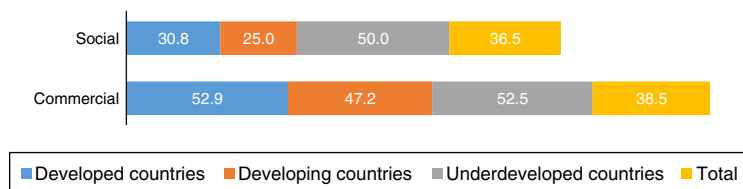
**Table 4**  
Comparison of the gender separation gap according to the type of enterprise and the level of economic development. Enterprise with more than 42 months of activity (%).

	Activity rate for the commercial enterprise (more than 42 months)		Activity rate for the social enterprise (more than 42 months)		Commercial gap	Social gap
	Male	Female	Male	Female		
Developed countries	8.5 <sup>***</sup>	4.0 <sup>***</sup>	1.3 <sup>***</sup>	0.9 <sup>***</sup>	52.94	30.77
Developing countries	10.8 <sup>***</sup>	5.7 <sup>***</sup>	0.8 <sup>***</sup>	0.6 <sup>***</sup>	47.22	25.00
Underdeveloped countries	13.9 <sup>**</sup>	6.6 <sup>**</sup>	0.8 <sup>**</sup>	0.4 <sup>**</sup>	52.52	50.00
Total	5.2	3.2	1.1	0.7	38.50	36.50

Source: Compiled by the authors.

<sup>\*\*\*</sup> Statistically significant difference  $p < 0.01$ .

$G = [(FR - MR)/MR] \times 100$ .



**Fig. 2.** Graphic representation of the gender separation gap according to the type of enterprise and the level of economic development. Enterprises with more than 42 months of activity (%).

Source: Compiled by the authors.

to 32% and 32.7% respectively, while in underdeveloped countries the gaps decrease to 23.5% for social enterprises and 33.8% for commercial enterprises. Hence, it is observed that in all the countries the gap for the social case is lower by about 5 percentage points (pp) than for commercial enterprises.

Table 4 and Fig. 2 offer similar information to that discussed in the previous paragraph, but in this case, for organizations with more than 42 months of activity. Firstly, it is observed that from developed to developing countries the involvement of women in social enterprises increases significantly. This is reflected in the gap between men and women which decreases from 52.94% (commercial enterprise) to 30.77% (social enterprise) in the case of developed countries and 47.2–25% respectively in the case of developing countries. As can be seen, the social gap is lower than the commercial one around 22 pp in both groups. In developing countries, although the social gap is less than the commercial one, the difference is only 2 pp. Therefore it should be noted that, despite the minor difference in this group of countries for companies with more than 42 months of activity, the data in Tables 3 and 4 allow to accept Hypothesis 1.

The information will be analyzed below to see if Hypothesis 2 can be accepted or rejected. In Table 3 for social enterprises of less than 42 months of activity, it is observed that as the level of development of the country increases, the value of the social gap also increases. In particular, the gap in developed countries is 40%, a figure which drops to 8 pp in developing countries (32%), reaching the figure of 23.5% in the group of underdeveloped countries. That is, in total, from developed countries to underdeveloped countries, the gap in the social case drops about 16 pp.

Meanwhile, it is necessary to analyze Table 4 more closely, that collects information on organizations with more than 42 months of activity. Firstly, it is verified that the gap decreases from developed to developing countries by almost 6 pp, from 30.77% to 25.00%, respectively. In contrast, in the group of underdeveloped countries, the gap exceeds almost 20 pp to that obtained in developed countries. In particular, the gap of social enterprises with more than 42 months of activity is 50%, the highest gap for social enterprises of the two tables analyzed.

This fall in the rate of enterprises with more than 42 months of activity also occurs in commercial organizations, where the

gap is 52.52% in underdeveloped countries compared to 47.22% of developing countries. This would prove that although the female population starts up a higher proportion of enterprises in underdeveloped countries, the initiatives created by women in such countries have greater fragility. Or what is the same, these results show the greater weakness of female activity when it comes to securing their enterprises, one out of two women who started a social enterprise was not able to survive more than 42 months.

Therefore, the results in Table 3 corroborate the second hypothesis, while those in Table 4 can only do so partially. In general, it has been observed that there is a positive relationship between the gender separation gap and the level of development of the country in social enterprises. In other words, as the level of development decreases, the gap that separates both sexes also decreases with the exception found in Table 4 for underdeveloped countries, something that happens both in social and commercial enterprises.

This may be because in these countries, women, described as unstable in the labor markets of these countries, decide to overcome certain cultural and social barriers helped by government policies and programs to promote the empowerment of women in these territories (Bosma & Levie, 2010; Terjesen et al., 2011). But despite creating a greater number of enterprises, both social and commercial, in this group of countries, it is a fact that it is much harder to get their organization to survive over time. This may be due to the difficulty that women can have when it comes to interacting with other entrepreneurs, potential suppliers or clients, poor infrastructure or lower financing which prevents their company from growing and consolidating over time (Kobeissi, 2010).

Therefore, the data provided in Tables 3 and 4 and their graphic representations, Figs. 1 and 2, allow us to accept Hypothesis 1, but Hypothesis 2 only partially.

## Discussion and conclusions

The important role of women in entrepreneurship has been highlighted by numerous investigations, as they are considered a key factor in promoting gender equality, reducing gender-based violence, promoting peace between territories and developing the country (Luchsinger, 2015).



This research was prompted by observing that despite the importance women had, they created fewer companies than men (Minniti, 2010). The literature found justification in the more altruistic nature of women and the roles attributed by a patriarchal society, separating them from the more economic nature that a business organization can have (Baughn et al., 2006; Carter & Rosa, 1998; Eagly, 1987; Eddleston & Powell, 2012; Gupta, Turban, Wasti, & Sikdar, 2009; Minniti & Nardone, 2007; Shinnar et al., 2012; Urbano et al., 2014; Wilson & Kickul, 2006).

Based on this idea, there was the need to further the knowledge on the gender of the individual who creates a social enterprise, as this type of organization is more consistent with the roles and characteristics attributed to women. However, some investigations have found that men are to a large extent, the ones that create social enterprises, so this hypothesis could not be accepted (Harding & Cowling, 2006; Leahy & Villeneuve-Smith, 2009).

Therefore, the issue was approached from the hypothesis that at present is being considered. Specifically, the gender separation gap is studied, which shows the differences between men and women who set up an enterprise in a particular territory (Harding & Cowling, 2006; Leahy & Villeneuve-Smith, 2009). Research on this subject showed that the gaps in the case of the social enterprise were smaller than in the commercial enterprise, but it has only been proven with a sample of English companies (Leahy & Villeneuve-Smith, 2009). It was also possible to find research that claimed that a lower level of development favored a smaller gender gap in entrepreneurship. However, the sample of these works was composed exclusively of commercial organizations (Minniti et al., 2005, 2006), so for the social case no studies have been found.

In order to gain more knowledge about social enterprises, in this research two questions were raised: Is the proportion of women who create enterprises higher in the social case? And what influence does the level of development of a country have on the proportion of women versus men, that set up social enterprises?

In this work, responding to the first question, it has been found that, as indicated by the literature on entrepreneurship, it is mainly men who create both social and commercial enterprises. However, what has been observed is that, despite this, the gender gap is smaller in the social case in all groups of the countries studied.

It was also proven that the level of development of the countries determines starting-up businesses by women. Specifically, a positive relationship was observed between lower levels of development and female entrepreneurship (Leahy & Villeneuve-Smith, 2009; Minniti et al., 2005, 2006). In other words, women create proportionally more enterprises in underdeveloped countries and that percentage decreases as the development of the territory in which they live increases. So, the second question posed in this study has also been resolved.

That is why this research contributes to the literature on both commercial and social entrepreneurship, as it has examined the gender of the people who start-up social and commercial enterprises, comparing both types and distinguishing between companies with less than and more than 42 months of activity; furthermore, this study has differentiated according to the level of development of the country in which the enterprise is created, which are all analyzes which so far have not been carried out.

While it is true that a large number of researches have studied the gender of the person who creates an enterprise, most of these have focused on justifying why the man is the one who creates the largest number of enterprises and the role played by economic development in all this (Minniti et al., 2005, 2006). However, it has been more difficult to find research on gender and social entrepreneurship and if we look at the level of development of the country, the fact is that nothing has been found. This work goes beyond what has been done so far, by trying to see if the gender gap decreases as the level of development of the country decreases

and if it is smaller in the social case. To do so, a sample of 160,000 individuals from 48 countries in different stages of development was analyzed. The sample was obtained thanks to the database of the GEM project in 2009.

On the one hand, it shows that the gap is smaller in the social case and that the level of development conditions women when setting up businesses (Baughn et al., 2006; Eddleston & Powell, 2012; Gupta et al., 2009; Minniti & Nardone, 2007; Shinnar et al., 2012; Urbano et al., 2014; Wilson & Kickul, 2006). On the other hand, the analysis of companies with more than 42 months of activity provides additional information. It was observed that the gap of these enterprises was smaller than the gap of enterprises with fewer months of activity, but only for developed and developing countries, indicating that there was greater gender equality in the case of enterprises with longer activity for those two groups of countries.

Therefore, on the hypotheses raised in this paper, the first one may be accepted and the second one only partially, due to the exception found in the female social enterprise with more than 42 months of activity in underdeveloped countries. These results can be explained with the arguments found in the literature, which pointed to the fragile economic systems of these countries, high unemployment, high job insecurity and low wages that encourage women to start-up enterprises (Kobeissi, 2010; Minniti & Naudé, 2010; Van der Zwan et al., 2012) but perhaps to survive over time is not so simple after starting-up the enterprise. Specifically, the discussion by Hofstede (1980, 1991, 2003) could show evidence for this fact, who is an author that says that the differences between countries can be explained not only with cognitive and behavioral variables, but it is also necessary to analyze cultural factors in certain territories, which can also clarify the high levels of variation between regions. So, following Hofstede, the rates of female social enterprises with more than 42 months of activity indicate that other variables condition even more than the level of development in some underdeveloped areas, such as culture or norms of the country in which they live. This fact coincides with results found in the literature, which stated that social and cultural norms of an existing country encouraged or discouraged the individual at the time of starting a business activity (Álvarez, Amorós, & Urbano, 2014; Bosma & Levie, 2010). This is also consistent with the study by Verheul et al. (2006). Specifically, these authors analyze entrepreneurship figures by geographical areas, showing that there are wide variations in the factors that facilitate or hinder men and women to decide to start-up a business depending on the territory.

For researchers there are a multitude of rich lines for future studies on the gender of the person who sets up social enterprises. For an in-depth analysis of this business figure, it would be interesting to analyze other individual variables such as level of education, age, perceived self-efficacy, fear of failure, perceived opportunities, levels of creativity, leadership or social relationships, among others. Furthermore, as the influence of the level of development on the gap is observed, it would also be necessary to analyze the institutional factors that influence social entrepreneurship in different territories, study the gender separation gap in the different countries that make up the sample, but individually according to Hofstede, or perform a cluster analysis that allows to observe another group of countries different to that proposed by the GEM project in terms of level of development.

Like any research, it is not without limitations. Mainly, it is noted that within the various groupings used, there is great variability among the rates of the countries that form them, which could distort the average having worked with. In addition, the study is cross-sectional, analyzing data from 2009, so investigating the evolution of the gap longitudinally has not been possible.

Finally, it should be noted that the findings of this study contribute not only to the literature on entrepreneurship, but also to the scarce literature on the social enterprise, through the gender

analysis of the individual who starts up the enterprise, through an empirical study with which it is possible to generalize the results. Therefore, this research is expected to promote the creation of knowledge about social enterprises both in the scientific field, stimulating work on the issues that condition them, as in the business world, where this kind of business can be seen as an extra job opportunity for any individual, including the female population that is less represented in the entrepreneurial phenomenon. Furthermore, these results have potentially important implications for public policies, because with appropriate measures, such as aids, training, funding, etc., social enterprises can be considered to a large extent the main means for women to participate more in entrepreneurship.

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## Article

# Corporate governance ratings on listed companies: An institutional perspective in Latin America



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## ABSTRACT

The aim of this paper is to analyse whether institutional factors determine the level of corporate governance compliance among major listed companies in emerging markets of Latin America, a region characterized by a poor legal system, highly concentrated ownership structures, and capital markets relatively less developed. The paper used an unbalanced panel data consisting of 826 observations of the highest ranked companies on the stock exchange indices of Argentina, Brazil, Chile and Mexico during the period 2004–2010.

The results provide strong empirical evidence that board independence, ownership concentration and stakeholder orientation affect positively corporate governance ratings, while board size decreases corporate governance compliance in Latin American countries. The study fills a gap in the Latin American literature, providing useful information for determining policies on corporate governance and, in general, for managers and investors of listed companies in Latin America.

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## Introduction

Corporate Governance [CG] is a relevant issue in academic writing and finance and accounting fields due to the chain of financial scandals around the world. CG monitors the effectiveness of management and ensures legal compliance by preventing irregular and improper behaviour. In this sense, leading global institutions such as the Organization for Economic Cooperation and Development [OECD], the International Finance Corporation [IFC] and the World Bank, strongly emphasize the development of different regulations, guidelines and good governance codes around the world. OECD affirms that CG “has implications for company behaviour towards employees, shareholders, customers and banks”. A corporation’s corporate governance structure is an important criterion when investors make investment decisions (Epps & Cereola, 2008). In the case of emerging markets, compliance with good CG practices is an effective substitute when legal environments and regulatory frameworks are weak and highly concentrated ownership structures predominate.

In this context, companies that improve their CG practices could be able of protecting shareholders rights and increase the confidence of investors (La Porta, López-de-Silanes, Shleifer, & Vishny,

2000). As a result, different ratings on CG [CGR] have been proposed by institutions and academics around the world. The construction of a rating or index is beneficial as it integrates the various elements of a firm’s governance system into one number. Although there is no standardized system to measure the compliance on CG, prior research has been developed several CGR mostly for Anglo-Saxon and continental European countries (Gompers, Ishii, & Metrick, 2003; Klapper & Love, 2004). The main objective of the CGR is to assess and compare the companies’ governance score regarding the accepted standards issued by regulatory bodies in a particular institutional context (Al-Malkawi, Pillai, & Bhatti, 2011).

Regarding to factors that affect the CG compliance, prior studies have recognized the institutional framework in emerging countries (Aguilera & Jackson, 2010). Institutional theory integrates a wider understanding related to cultural dimensions and formal factors of the firm in a modern society (Davis, 2005). Therefore, CGR may be notably influenced by institutional factors such as culture, legal structures and financial markets (Creed, DeJordy, & Lok, 2010; Peng, Li Sun, Pinkham, & Chen, 2009; Suddaby & Greenwood, 2005). On the other hand, agency theory points out the conflict of interest between management and owners due to separation of ownership and control. To minimize this divergence and reduce agency costs, this theoretical approach suggests the adoption of internal and external mechanisms of CG by companies (Haniffa & Hudaib, 2006; Tariq & Abbas, 2013). In this study, institutional and agency theories are adopted as the main reference frameworks to

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empirically describe the factors that affect the CG compliance in Latin American listed companies. Formal factors at the macro level (legal system and government initiatives such as CG codes) and at inter-organizational level (board structure, ownership concentration or leverage) play an important role by adopting of CG practices (Boliari & Topyan, 2007; Campbell, 2007).

Latin America is characterized by poorer CG and inferior legal system, highly concentrated ownership structures, and capital markets relatively less developed in comparison to more developed OECD economies (Blume & Alonso, 2007). The conflict of interest between major and minority shareholders reduces overall shareholder value and increases the expropriation of minority shareholders. Our motivation stems from the growing relevance of CG for investor confidence in the region and the absence of prior research in Latin America, which partly stems the scarcity of relevant data (Kabbach de Castro, Crespi-Cladera, & Aguilera, 2012). We pay attention in the institutional context, efficiency and legitimacy of CG mechanisms in an international business environment. In this sense, the question in this study is how institutional and agency theories could identify those formal and informal factors that promote CG compliance in Latin American listed companies?

We contribute to the literature in several ways. First, we propose a CGR which is based on the institutional and regulatory framework of the region. Second, we support our results using a sample of 826 non-financial firms in fourth largest stock exchanges of the Latin American region (Argentina, Brazil, Chile and Mexico), over the period 2004–2010. Third, we identify institutional formal and informal factors may be significant to CG compliance through GMM method addressing the reverse causality problem using suitable lagged values of the explanatory variables as instruments (Blundell & Bond, 1998; Pindado, Requejo, & de la Torre, 2014). Finally, this study may provide useful information for determining policies on corporate governance and, in general, for managers and investors in listed companies. To the best of our knowledge, this is the first study that focuses on Latin America emerging countries combining the institutional and agency theories in a context characterized by a weak legal system and a lower shareholder protection.

The rest of the study is organized as follows. The authors, first presents a review of relevant literature and develop the study hypotheses. Secondly, the data and construction of the CGR are presented. Thirdly, we describe the data and methods of analysis. Fourthly we discuss the main results. Last section concludes.

## Literature review

The compliance on CG can be looked upon from different theoretical perspectives, for instance economic, legal, social and applied finance (Ariff & Ratnatunga, 2008; Tariq & Abbas, 2013). The theoretical foundation can be found in agency theory which points out that higher ownership concentration results in a conflict between majority and minority shareholders, with several well-known cases of expropriation (Jensen & Meckling, 1976). The major problem of this conflict is that minority shareholders are not protected against expropriation by majority and it is mainly due to weak legal structure (enforcement) of countries. Agency theoretical framework has tried to explain the relationship between shareholders and management, seeking the interest's alignment of managers and shareholders with CG mechanisms (Lopes & Walker, 2012). However, agency theory is limited and does not explain the multi-dimensional complexity and character of the CG phenomenon in an international business context (Adegbite, 2015). The conceptual framework of institutional theory is much broader and deeper than agency theory, since accounts for the deeper and resilient aspects of socio-cultural structure, and integrates the process by which organizational schemas, rules, norms, and routines are established

as guidelines for corporate behaviour (Scott, 2004). Furthermore, this theoretical approach is most suitable to explain CG practices in contexts characterized by small stock market, a higher level of ownership concentration in the hands of a few shareholders, and a strong link between CG structures and institutional development (Baixauli-Soler & Sanchez-Marin, 2011). Globerman and Shapiro (2003) observed that formal institutions – regulation, financial markets, transparency and accountability – strengthen the governance structure and attract more foreign investment. However, in these countries, informal institutions play an important role when formal mechanisms prove to be inadequate (Estrin & Prevezer, 2011). The above has caused an increase in the adoption of good governance practices as part of firms' strategy to increase investors' confidence. In the case of emerging markets, the institutional conditions may explain variations in the level of business activity and corporate practices (De Clercq, Danis, & Dakhli, 2010).

The adoption of corporate practices and principles co-evolving with institutions might become institutionalized. Institutionalization implies a certain degree of internalization and cognitive belief in the practice which is quite distinct from decoupling practices (Terjesen, Aguilera, & Lorenz, 2015). The Latin American model of CG is characterized by undeveloped capital markets, weak institutional environments, highly concentrated ownership structures, and lower protection of investors (Chong & López-de-Silanes, 2007; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008). The proliferation of governance codes and adoption of best practices in Latin America – especially in the larger economies of Argentina, Brazil, Chile and Mexico which capture 70% of regional market capitalization (S&P, 2010) – and the creation of institutions like the Latin American Corporate Governance Roundtable as a joint initiative of the International Monetary Fund [IMF], the World Bank, and state and private actors from Latin and OECD countries, promotes a new era on CG in the region (Diamandis & Drakos, 2011). The guidelines issued by the OECD, codes of good governance and the regulations issued in each of these countries have all contributed to raising the CG compliance in issues related to the board of directors, shareholder rights, conflicts of interest, ownership structure and support committees of the board.

Latin American countries have adopted voluntary practices of CG to cover for the limitations of the regulatory framework. Good governance codes and laws prevailing in the region have been based on the “White Paper” and GC principles of the OECD. These CG codes have promoted transparency and market efficiency, the protection of shareholders and effective board of directors monitoring. Particularly, Argentina, Brazil and Mexico have opted for soft laws, through the principle of “comply or explain”. Chile has focused on hard laws and legal enforcement which aim to strengthen the board of directors, auditing committee functions, shareholders rights and reduce conflicts of interest, however there are inefficient self-regulation practices concerning the capital markets (Lefort & González, 2008).

Recent studies have adopted the institutional-agency theories to analyse the factors that influence on CG compliance in different contexts. For instance, Seal (2006) proposes an institutional theory of agency, which may be defined as the analysis of managerial behaviour in giant, widely owned corporations where managerial action is influenced by institutionalized practices that affect corporate practices and performance. This combination of theories establishes managerial behaviour has been influenced and legitimized by the dominant discourse of CG – the agency theory. Institutional theory is defined as a set of formal and informal rules that affect business activity (North, 2005). In this regard, both formal (e.g. government initiatives, laws; Campbell, 2007) and informal institutions (e.g. corporate culture and strategy; Boliari & Topyan, 2007) are regarded as antecedents to action by defining the CG practices. According to DiMaggio and Powell (1983),



institutional theory indicates that firms tend to incorporate external norms and rules into their operations and structures in order to gain legitimacy and social acceptance. Thus, it can be argued that companies may gain acceptance and legitimize their operations by engaging in CG compliance (Ntim, Lindop, & Thomas, 2013). Thereby, all forms of institutions that manage human interactions via cognitive, normative, and regulative processes influence organizational decision-making (Trevino, Thomas, & Cullen, 2008).

### Hypothesis development

Institutional theory emphasizes that legal rules and norms form an important element of national institutional systems (Filatotchev, Jackson, & Nakajima, 2013). The groundbreaking work by La Porta, López-de-Silanes, Schleifer, and Vishny (1998) argue that a common element in differences between countries is the degree of investor protection against abuses by the management team and majority shareholders. The degree of law enforcement creates cross-country differences. For instance, civil laws give investors weaker legal rights than common laws do. The difference in legal protections of investors might help explain why firms are financed and owned so differently in different regions. Schleifer and Vishny (1997) conclude that a very high ownership concentration may be a reflection of poor investor protection. Differences in legal systems have implications for transparency on CG practices, directly or indirectly, with firms in common-law countries disclosing more CG information than those located in civil-law countries (Li & Moosa, 2015). Institutional theory argues that firms tend to incorporate external norms and rules in order to gain confidence and legitimacy in the market (Scott, 1987). Various studies have sought to measure the degree of enforcement, and Leuz, Nanda, and Wysocki (2003) suggested it can be measured through three variables: (a) the efficiency of the judicial system; (b) an evaluation of the rule of law; (c) an index of corruption. Kaufmann, Kraay, and Mastruzzi (2011) proposed a series of governance indicators including the dimensions of regulatory quality, the rule of law and the control of corruption. The Worldwide Governance Index [WGI], on the other hand, published by the WGI (2014), includes six dimensions for 213 economies, assessed for the period 1996–2010: (1) accountability; (2) political stability and absence of violence; (3) governmental effectiveness; (4) regulatory quality; (5) the rule of law; (6) the control of corruption. Hence, our first hypothesis is that:

**Hypothesis 1.** There is a positive relation between the WGI and the CGR in Latin American countries.

The dimensions of CG contained in the codes of good governance and regulatory framework constitutes formal factors that may influence managerial decisions related to the compliance level on CG (Ho & Wong, 2001).

- **Size of the board:** The board should comprise a reasonable number of directors; its size directly affects its functioning and supervisory capacity (Gandía, 2008). Larger boards enjoy greater diversity and tend to have more experienced members, which affects the CGR (Gallego Álvarez, García Sánchez, & Rodríguez Domínguez, 2009; Laksamana, 2008). Various studies corroborate the presence of a positive relationship between board size and the level of CG compliance (Barako, Hancock, & Izan, 2006; Hussainey & Al-Najjar, 2011).

**Hypothesis 2a.** Board size has a positive impact on CGR in Latin America.

- **Composition of the board:** External (non-executive) directors are not part of the company's management team and so are in a better position to monitor management performance (Donnelly & Mulcahy, 2008). They have an added incentive to facilitate supervision by shareholders because their own reputation depends on the

corporate performance (Fama & Jensen, 1983); moreover, they are the most effective agents for maximizing shareholder value (Rouf, 2011). Most studies affirm there is a positive relationship between the independence of the board and CGR (Abdelsalam & Street, 2007; Kent & Stewart, 2008; Samaha & Dahawy, 2011).

**Hypothesis 2b.** There is a positive relationship between the proportion of independent directors and CGR in Latin American countries.

- **COB-CEO duality:** COB-CEO duality refers to the situation in which the same person holds both positions in a company. According to Haniffa and Cooke (2002), separation between the two positions helps improve the quality of supervision and reduces the advantages gained by withholding information, while the concentration of power is associated with reduced transparency and lower quality of CG information (Laksamana, 2008).

**Hypothesis 2c.** There is a negative relationship between COB-CEO duality and CGR in Latin America.

- **The presence of women on the board:** In recent years the issue of gender diversity in business has received considerable research attention. Women provide viewpoints, experiences and work styles that differ from those of their male counterparts (Torchia, Calabró, & Huse, 2011). Among the variables that have been associated with the presence of women on the board is the level of CG transparency, thus increasing the board's capacity to supervise the process of CG transparency and compliance (Gul, Srinidhi, & Ng, 2011). Several studies have suggested that gender diversity is associated with a higher quality of boardroom debate and more effective communication (Hillman, Shropshire, & Cannella, 2007; Huse & Solberg, 2006), thus facilitating greater availability of information to investors.

**Hypothesis 2d.** The proportion of women on the board is positively associated with the CGR in Latin America.

- **Ownership structure:** An important factor shaping the CG system is the company's ownership structure, defined as the degree of concentration that determines the distribution of power and corporate control, or as the proportion of voting shares owned directly or indirectly by senior management, board members or their relatives (Owusu-Ansah, 1998). When the ownership structure is diffuse, greater supervision is needed in order to maintain fair access for minority shareholders. Companies with widely dispersed ownership tend to disclose more information in order to reduce the costs of control by shareholders (Haniffa & Cooke, 2002). Furthermore, this transparency on CG is increased when there are external shareholders (Donnelly & Mulcahy, 2008). Some studies have reported a negative relationship between ownership concentration and the level of information disclosure (Barako et al., 2006; Gandía, 2008; Vander Bauwhede & Willekens, 2008, among others). In companies with large individual shareholders or a high concentration of ownership, information is transferred directly through informal channels, or there may simply be a greater alignment of interests, thus reducing the need to make information public.

**Hypothesis 2e.** There is a negative association between ownership concentration and CGR in Latin American countries.

- **Family-controlled firms:** According to the agency theory, family controlled firms create agency costs. The risk of wealth expropriation from minority shareholders is higher when ownership is concentrated and held by family members (Barontini & Caprio, 2006). In this sense, CG compliance in family firms may become inconsistent with wealth maximization. The combination of ownership and control in family firms could generate and excessive role by the owner through its leadership, which could lead to problems of management entrenchment. Faccio and Lang (2001)

argue that family firms present a poor performance compared to non family firms, while [San Martín-Reyna and Duran-Encalada \(2012\)](#), anticipate problems associated with family firms and composition of directors. Family owners could favour family interests over the firm's interests (e.g. minority shareholders) and have incentives to be engaged in opportunistic behaviours, because of loyalty towards the family ([Schulze, Lubatkin, Dino, & Buchholtz, 2001](#)). Thus we set the following hypothesis.

**Hypothesis 2f.** Family-controlled firms obtain a lower corporate governance rating (CGR) than non-family firms in Latin American listed firms.

Institutional theory suggests that a firm's right to exist is legitimized if its value system is consistent with that of the larger social system of which it is part of, but threatened when there is actual or potential conflict between the two value systems ([Suchman, 1995](#)). Diverse interest groups influence decision-making and the values adopted by the firm ([Donaldson & Preston, 1995](#)). [Bradley, Schipani, Sundaram, and Walsh \(1999\)](#) identified two types of culture in companies: community or stakeholder-oriented culture, with a broad range of members having a legitimate interest in corporate activities, and shareholder-oriented culture, with a contractual outlook, in which companies are viewed as tools for creating shareholder value, and in which other stakeholders have less legitimacy and influence over management. In line with [Simnett, Vanstraelen, and Fong Chua \(2009\)](#), in this study we consider the stakeholder vs. shareholder orientation as a dimension of organizational culture. Under this approach, [Smith, Adhikari, and Tondkar \(2005\)](#) revealed that companies with a stakeholder-oriented approach disclose more information as part of their strategic management approach in order to strengthen relations with stakeholders, while [Basu and Palazzo \(2008\)](#) suggest that companies could improve the credibility of their communication by exposing transparency to questioning through stakeholders. In the same line, [Jansson \(2005\)](#) argues that the stakeholder orientation depends of the governance and ownership structure of the firm and the legal environment.

**Hypothesis 3.** The CGR is higher in firms with a stakeholder orientation than in those oriented towards shareholders.

Research on the relationship between CG transparency and innovation has been limited ([Miozzo & Dewick, 2002](#)). According to [O'Sullivan \(2000, p. 1\)](#), innovation is performed with the aim of increasing product quality and/or lower production costs. Innovation can provide the critical component of a firm's competitive strategy. [Gill \(2008\)](#) found that those companies that follow innovation as a strategy disclose more information to signal commitment to the project, potentially inducing a rival's exit. Inside directors are generally associated to innovative strategies, because they have a better knowledge of the company. As a consequence, detailed information is required to make effective strategic decisions and monitoring ([Zahra, 1996](#)). Competitive pressure might be alleviated when firms that innovate disclose more corporate information to induce rivals to wait and imitate instead of simultaneously invest in innovation ([Pacheco-De-Almeida & Zemsky, 2012](#)). By considering that Latin American countries are characterized by a higher inside director's rate ([Black, Gledson de Carvalho, & Gorga, 2010](#)), we argue that innovation strategy influences the CGR leading to the following hypothesis:

**Hypothesis 4.** Firms with an innovation strategy obtain higher CGR than firms with a no innovation strategy.

### Study methodology

The object of this study is to analyse the CG ratings of those major listed companies in Argentina, Brazil, Chile and Mexico. For

the sample of firms in these four countries, we selected the most representative of each country. According to [Kitagawa and Ribeiro \(2009\)](#) the purposes of analysis, we excluded those in the banking and insurance sectors, because these are more strictly regulated and are subject to greater scrutiny in terms of corporate information disclosure ([Garay & González, 2008](#)). The information needed to construct the index of CG and the set of explanatory variables used was obtained from the annual reports and websites of the selected companies, by means of content analysis. The content analysis could be used to identify the different CG categories as reported by sample firms to distinguish the different levels of compliance, depending on the nature of its business and global environment. Given the qualitative nature of CG disclosure, we perform a content analysis focusing on the volume and intensity of disclosure using the number of words and sentences with to different items of CG categories and sub-categories in order to integrate the CGR ([Lajili & Zéghal, 2005](#)).

For clustering purposes, the companies were ranked according to the Global Industry Classification Standards [GICS], which are widely accepted in the business and academic worlds ([Bhojraj, Lee, & Oler, 2003](#)). Outliers, or extreme values, for the financial variables were identified and analysed, and values above the 99th percentile were assigned the value of this percentile. Values below the first percentile for each variable were truncated in the same way ([Braga-Alves & Shastri, 2011](#)).

Initially, 155 companies were considered, but 20 belonging to the financial sector were excluded as were a further seven for which there was insufficient information for analysis. Thus, the final study sample was constituted of 128 companies. Regarding the number of observations included in this empirical study covering the time period from 2004 to 2010, data were obtained for 101 companies in 2004, 111 in 2005, 116 in 2006, 123 in 2007, and 125 in 2008, 2009 and 2010. A total of 826 observations were obtained for the whole period of analysis. [Table 1](#) shows the composition of the study sample by country. The predominant sectors in these countries are related to materials, consumer staples and utilities.

### Corporate governance rating

Several indices on CG have been developed for Anglo-Saxon and continental European countries ([Gompers et al., 2003](#); [Klapper & Love, 2004](#)). According with institutional theory, the legal and institutional context of each country is a key factor in the selection of the elements of an index ([Hossain & Hammami, 2009](#)). This study proposes a CGR that evidently reflects the nature of emerging Latin American institutional framework, using a combination of information required by the rules and codes of good governance in the selected countries. For instance, codes of good and regulatory framework in Argentina, Brazil and Mexico and Chile. In this study, we glean support for the index from the OECD principles, the codes of good governance in each country, and previous studies in the region.

**Table 1**  
Study sample for the period 2004–2010.

Country	Year							Total observations
	2004	2005	2006	2007	2008	2009	2010	
Argentina	8	8	9	10	10	10	10	65
Brazil	41	46	49	52	53	53	53	347
Chile	24	28	29	31	32	32	32	208
Mexico	28	29	29	30	30	30	30	206
Total observations	101	111	116	123	125	125	125	826

Source: The author.

The overall CGR composed by 43 items, with a maximum value of 100, was obtained by summing four sub-indices: (1) composition and performance of the board, (2) shareholders rights, (3) ethics and conflicts of interest and (4) other information related with CG. In compiling the overall index, each sub-index is weighted as 53, 18, 16 and 13%, respectively (Lefort & González, 2008). Each sub-index was in turn comprised of a series of factors with the same weights (for more detail see Table 2). The composition and performance of the board sub-index captures board independence, mission, functions, structure and effectiveness. Autonomy is established through various factors of board independence, including the COB-CEO duality and the presence of support committees (nominating, remuneration, corporate governance, auditing). Furthermore this sub-index also contains measures of board remuneration, selection, removal or re-election procedures, and disclosure of profile or curriculum of directors including the document that establishes the norms of conduct for the board members. However, most of the items in this category (at least 14 out of 24) are allocated to measures that reflect board independence.

Shareholders rights comprise the second sub-index, the purpose of which is to identify the mechanisms that encourage the alignment between board of directors and managers interests with those of shareholders. For instance, description of shareholding voting process, pyramidal structures that reduce the concentration of control, information of the agenda, shareholders agreements and resolutions proposed for its adoption. The sub-index related to ethics and conflicts of interest attempts to measure conflicts of interests and related party transactions, company operations with its directors and managers, significant transactions between the company and significant shareholders and ownership composition. The final sub-index deals with other related information with CG. It attempts to measure a company's public commitment with good corporate practices. The use of international accounting principles, the services of a recognized auditing firm, sanctions against the management for breach of their CG practices, financial performance disclosure, and practices of good governance, score well in this category. The index allows each element to be equally important and does not distinguish subjective selection of the most influential characteristics (Berglöf & Pajuste, 2005). Nevertheless, we compute a weighted sum of the four dimensions in our calculations.

#### Model specification and measurement of the variables

The following multiple regression model was applied to test our hypotheses. The dependent variable is the proposed CGR. The independent and control variables were determined on the basis of previous studies and are detailed in Table 3.

$$\begin{aligned} \text{CGT}_i = & \beta_1 \text{WGI}_{it} + \beta_2 \text{BS}_{it} + \beta_3 \text{BI}_{it} + \beta_4 \text{Dual}_{it} + \beta_5 \text{Gen}_{it} \\ & + \beta_6 \text{Own}_{it} + \beta_7 \text{Fam}_{it} + \beta_8 \text{Stk}_{it} + \beta_9 \text{Strategy}_{it} \\ & + \sum_{k=1}^k \delta_k x_{it}^k + \lambda_i + \varepsilon_{it} \end{aligned}$$

where

WGI<sub>it</sub> = legal system  
 BS<sub>it</sub> = board size  
 BI<sub>it</sub> = board independence  
 Dual<sub>it</sub> = COB-CEO duality  
 Gen<sub>it</sub> = gender  
 Own<sub>it</sub> = ownership concentration  
 Fam<sub>it</sub> = family-controlled firm  
 Stk<sub>it</sub> = stakeholder orientation  
 Stg<sub>it</sub> = innovation strategy

**Table 2**  
Rating of corporate governance.

<b>I. Composition and performance of the board</b>
Mission of the Board (OECD, 1999)
Main functions of the Board (OECD, 1999)
Board independence
Is there or not COB-CEO duality? If only one person holds both positions (Garay & González, 2008; OECD, 1999; Leal & Carvalho-da-Silva, 2005)
Board structure (external and independent members) (Gandía & Andrés, 2005; Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; OECD, 1999)
Size of the board (between five and nine members as an international recommendation of good governance) (Gandía & Andrés, 2005; Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; Lefort & Walker, 2005)
Rules of organization and operation of the board and its committees (Gandía & Andrés, 2005)
Functions and activities of each member of the board (Gandía & Andrés, 2005)
Selection, removal or re-election procedures (Gandía & Andrés, 2005)
Is there a document that establishes the norms of conduct for the board members? (Gandía & Andrés, 2005)
Are relationships between directors and shareholders of reference disclosed? (Gandía & Andrés, 2005)
Shareholding of the directors (Gandía & Andrés, 2005)
Conditions determining the independence of the board (Gandía & Andrés, 2005)
The company disclosed the profile and/or curriculum of the board members (Gandía & Andrés, 2005)
Does the company disclose whether any independent director occupies a steering position in other companies? (Gandía & Andrés, 2005)
Remuneration of the CEO and board members (Gandía & Andrés, 2005; Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; OECD, 1999)
Support committees for the board (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; Lefort & Walker, 2005; OECD, 1999)
Does the company have a nominating committee?
Does the company have a remuneration committee?
Does the company have a corporate governance committee?
Does the company have an auditing committee?
Are there other additional support committees mentioned above?
Main functions of the committees support on the board
Integration of support committees: Number of executive and independent members
<b>II. Shareholders rights</b>
Description of shareholder voting process (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005)
Pyramidal structures that reduce the concentration of control (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005)
Resolutions adopted at the last Annual General Meeting held (Gandía & Andrés, 2005)
Information about the notice of the meeting (Gandía & Andrés, 2005)
Information of the agenda (Gandía & Andrés, 2005)
Information about the text of all resolutions proposed for its adoption (Gandía & Andrés, 2005)
Shareholder agreements to reduce the concentration of control (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005)
If the company is listed on other international markets (Lefort & Walker, 2005)
<b>III. Ethics and conflicts of interest</b>
Information related to conflicts of interest and related party transactions (Leal & Carvalho-da-Silva, 2005)
If the company is free of any penalty for breach of good governance rules in the stock market on the last year (Garay & González, 2008)
Detail of the percentage ownership of the company from significant shareholders (Gandía & Andrés, 2005)
Company operations with its directors and managers and to what extent such transactions are made in competition (Gandía & Andrés, 2005)
Significant transactions that have occurred between the company and significant shareholders (Gandía & Andrés, 2005)
Does any member of the board held other positions on the boards in companies belonging to the same group (Leal & Carvalho-da-Silva, 2005)
Composition of its shareholders (Gandía & Andrés, 2005; Lefort & Walker, 2005)
<b>IV. Other related information with corporate governance</b>
Does the company use the international accounting principles (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; OECD, 1999)
Does the company use the services of a recognized auditing firm (Big 4)? (Garay & González, 2008; OECD, 1999)
Is the information provided in English?
Sanctions against the management for breach of their corporate governance practices (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005)
Financial situation and performance (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; OECD, 1999)
Practices of good governance (Garay & González, 2008; Leal & Carvalho-da-Silva, 2005; OECD, 1999)

Source: The author.



**Table 3**  
Definition and measurement of the study variables.

Variable	Definition	Expected sign	Source
<b>Dependent variable</b>			
<i>CGTI</i>	CG transparency index (43 items)		Garay and González (2008); Leal and Carvalhal-da-Silva (2005); Chong and López-de-Silanes (2007); Black et al. (2010); OECD (1999)
<b>Independent variables</b>			
<i>Formal institutional variables</i>			
<i>Country-level variables</i>			
WGI	Worldwide Governance Index	+	Kaufmann et al. (2011); Leuz et al. (2003)
<i>Corporate governance dimensions</i>			
Board_Size	Size of the board: natural logarithm of the number of board members	+	Pham, Suchard, and Zein (2011); Ezat and El-Masry (2008); Kent and Stewart (2008); Barako et al. (2006)
Board_Ind	Independence of the board: proportion of external board members to the total number of board members	+	Ezat and El-Masry (2008); Samaha and Dahawy (2011); Kent and Stewart (2008); Willekens et al. (2005); Abdelsalam and Street (2007)
Duality	COB-CEO duality: Dichotomous variable that takes the value 1 if both positions are held by the same person and 0 otherwise	–	Samaha et al. (2012); Haniffa and Cooke (2002); Laksamana (2008); Eng and Mak (2003); Ezat and El-Masry (2008)
Gender	Percentage of female members of the board	+	Huse and Solberg (2006); Hillman et al. (2007); Gul et al. (2011)
Own	Ownership concentration: Percentage of ordinary shares held by the ten largest shareholders	–	Samaha et al. (2012); Donnelly and Mulcahy (2008); Barako et al. (2006); Vander Bauwhede and Willekens (2008); Gandía (2008)
Fam	Family firm: Dichotomous variable that takes the value 1 if family members holding at least 20% of the equity of the company, and 0 otherwise	–	Chi, Hung, Cheng, and Lieu (2015)
<i>Informal institutional variables at the company level</i>			
Stakeholder	Dichotomous variable that takes the value 1 if the company has a stakeholder orientation and 0 if it has a shareholder orientation	+	Simnett et al. (2009); Bradley et al. (1999); Smith et al. (2005)
Strategy	Presence of an innovation or no innovation strategy: dummy variable that takes the value 1 if the firm adopts a strategy of innovation and 0 otherwise	+	Miozzo and Dewick (2002); O'Sullivan (2000); Gill (2008); Pacheco-De-Almeida and Zemsky (2012)
<i>Control</i>			
Lev	Level of indebtedness = long-term debt/total assets	+	Xiao et al. (2004); Jaggi and Low (2000); Willekens et al. (2005); Ho and Wong (2001)
Age	Number of years since the company was founded	–	Hossain and Hammami (2009); Owusu-Ansah (1998)
lnsize	Size of the company: natural logarithm of total assets	+	Hossain and Hammami (2009); Samaha et al. (2012)
ROA	Return on assets, measured as the proportion of net profits to total assets at the end of each year studied	+	Collet and Hrascky (2005); Gallego Álvarez et al. (2009)
Ind	Business sector (Standard Industrial Classification)	?	Gandía (2008)
Year	Dichotomous variable for each of the 7 years analysed		

Source: The author.

$$\sum_{k=1}^k \delta_k \lambda_{it}^k = \text{set of control variables}$$

$\lambda_{it}$  = fixed effects at company level  
 $\varepsilon_{it}$  = error term

#### Control variables

**Leverage.** Companies with higher debt levels are generally under closer scrutiny by creditors, and have greater incentives to disclose more information about their management performance (Samaha, Dahawy, Hussainey, & Stapleton, 2012; Xiao, Yang, & Chow, 2004).

**Age of the company.** The age of the firm can influence the level of corporate transparency, as this represents the company's stage of development and growth (Owusu-Ansah, 1998). Under this premise, younger firms tend to disclose less information than more mature ones, for three reasons: (1) greater transparency can affect their competitive advantage; (2) the cost and ease of information processing and disclosure is greater; (3) the relative absence of such

information. In our study, we expect to find a negative relationship between these two variables (Hossain & Hammami, 2009).

**Size of the company.** Most studies have found that company size positively affects the level of corporate information disclosure (Bassett, Koh, & Tutticci, 2007). Larger companies have certain characteristics that differentiate them from smaller ones, such as the greater diversity of products, more complex distribution networks and greater need for funding from capital markets (Gallego Álvarez et al., 2009).

**Profitability.** Managers disclose more detailed information to ensure the continuity of their positions and remuneration and as a sign of institutional confidence. Inchausti (1997) argues that more profitable companies make greater use of information in order to obtain a competitive advantage, while firms with poor performance may be less transparent. Previous studies mainly reflect a positive relation (Apostolos & Konstantinos, 2009).

**Business sector.** The business sector is another variable that has often been used to account for the amount of information provided by companies (Eng & Mak, 2003). Companies operating in the same sector are believed to disclose similar information in the market, to avoid sending a bad signal to investors (Watts & Zimmerman, 1986).



**Table 4**  
Descriptive statistics on the dependent and independent variables (2004).

Variable	N	Mean	Standard deviation	Minimum	Median	Maximum
<i>CGI</i>	101	0.53	0.17	0.12	0.56	0.81
Argentina	8	0.36	0.16	0.12	0.33	0.61
Brazil	41	0.48	0.18	0.12	0.49	0.79
Chile	24	0.53	0.10	0.37	0.50	0.72
Mexico	28	0.66	0.12	0.28	0.67	0.81
<i>WGI</i>	101	0.59	0.16	0.38	0.52	0.86
<i>Board size</i>	101	9.68	3.69	3.00	9.00	20.00
<i>Board independence</i>	101	0.33	0.22	0.00	0.33	0.73
<i>Duality COB-CEO</i>	101					
Duality	29	28.7%				
No duality	72	71.3%				
<i>Gender</i>	101	0.04	0.07	0.00	0.00	0.33
<i>Ownership</i>	101	0.57	0.18	0.15	0.55	0.99
<i>Family-controlled firm</i>	101					
Family	42	41.6%				
No family	59	58.4%				
<i>Stakeholder orientation</i>	101					
Shareholder	49	74.3%	0.14	0.00	0.24	0.59
Stakeholder	52	25.7%	35.34	1.00	42.00	154.00
<i>Strategy</i>	101					
Innovation	78	77.2%				
No innovation	23	22.8%				
<i>Leverage</i>	101	0.23	1.37	3.23	7.72	11.88
<i>Age</i>	101	48.31	0.08	−0.13	0.10	0.38
<i>Lnsiz</i>	101	7.83				
<i>ROA</i>	101	0.11				

Source: The author.

Companies operating in more politically visible sectors have greater incentives to voluntarily disclose information in order to minimize any political costs (Collet & Hrasky, 2005). The studies that have reported a significant relationship between the business sector and the disclosure of information include Gandía (2008), Bonsón and Escobar (2006) and Nagar, Nanda, and Wysocki (2003).

## Results

### Descriptive analysis of the data

Tables 4 and 5 summarize the descriptive data for the dependent and independent variables for 2004 and 2010 study periods.

In the countries analysed, the CGR increased during the study period; the average value was 0.36 (median 0.33) in 2004 in Argentina, while in Brazil it was 0.48 (median 0.49). For firms in Chile, the average was 0.53 (median 0.50), and in Mexico, 0.66 (median 0.67). Mexico presented the highest index value, followed by Chile, Brazil and Argentina. In 2010 the index showed an increase in the four countries under analysis. For instance, Argentina averaged 0.64 (median 0.66), Brazil 0.72 (median 0.74), Chile 0.64 (median 0.61), and in Mexico, 0.78 (median 0.79). The results suggest a favourable evolution of the formal institutional environment in the region, since the codes of good governance and regulations have increased and revised several times. Differences between countries are mainly due to the codes of good governance of each country, which require of different levels and dimensions of corporate transparency.

Regarding the institutional formal factors, legal system recorded an average value of 0.59 for the WGI, with Chile obtaining the highest value, followed by Brazil, Mexico and Argentina. The explanatory variables related to CG dimensions include the size and composition of the board. The firms analysed had an average of 9.6 directors in 2004 and 10 in 2010. Although there was

no significant variation in the average board size during the study period, we did find that the rules and codes of good governance within each country applied diverse criteria regarding this parameter (recommending 5–9 members in Brazil, a minimum of 7 in Chile, and between 3 and 15 in Mexico, with no recommendation being made in Argentina). Regarding board composition, for the region as a whole the average number of external directors was 0.33 in 2004 and 0.38 in 2010. In Argentina, the corresponding values were 0.20 (median 0.18) in 2004 and 0.31 (median 0.32) in 2010. In Brazil, these values were 0.25 (median 0.21) in 2004 and 0.34 (median 0.33) in 2010. According to Black et al. (2010), the independence of the board is a notoriously weak area in Brazil, with most company boards being composed of representatives of the controlling group. Chile presented an average value for independent directors of 0.38 (median 0.33) in 2004 and 0.38 (median 0.33) in 2010. Finally, Mexican firms had an average of 0.46 (median 0.47) in 2004 and 0.49 (median 0.50) in 2010, and so these companies had the highest proportion of independent directors in our study group, perhaps because the code of corporate governance in this country stipulates a minimum proportion of independent directors (25%), whereas the other countries specify neither their number nor their proportion.

COB-CEO duality was found in 28.7% of the firms analysed in 2004 and in 21.6% in 2010, occurring most frequently in Argentina and Mexico. In these emerging economies in Latin America, there is a growing presence of women on boards of directors. Nevertheless, the total numbers remain far from significant; the highest level of female participation is found in Brazil, but the regional average was barely 4% in 2004 and 5% in 2010.

A clear ownership concentration is observed in the region, although this has been declining in the analysed period. Among the companies examined, the average proportion of shares held by the top ten shareholders was 57% (median 51%) in 2004 and 55% (median 54%) in 2010. With respect to family-controlled variable, we observe that 41.6% of the firms are controlled by families,

**Table 5**  
Descriptive statistics on the dependent and independent variables (2010).

Variable	N	Mean	Standard deviation	Minimum	Median	Maximum
<i>CGR</i>	125	0.70	0.12	0.37	0.74	0.88
Argentina	10	0.64	0.16	0.40	0.66	0.84
Brazil	53	0.72	0.12	0.37	0.74	0.88
Chile	32	0.64	0.08	0.54	0.61	0.86
Mexico	30	0.78	0.07	0.61	0.79	0.88
<i>WGI</i>	125	0.60	0.15	0.42	0.57	0.84
<i>Board size</i>	125	9.94	3.55	3.00	9.00	21.00
<i>Board independence</i>	125	0.38	0.19	0.00	0.33	0.78
<i>Duality COB-CEO</i>	125					
Duality	27	21.6%				
No duality	98	78.4%				
<i>Gender</i>	125	0.05	0.07	0.00	0.00	0.33
<i>Ownership</i>	125	0.54	0.17	0.13	0.54	0.87
<i>Family-controlled firm</i>	125					
Family	59	47.2%				
No family	66	52.8%				
<i>Stakeholder</i>	125					
Shareholder	21	16.8%				
Stakeholder	104	83.2%				
<i>Strategy</i>	125					
Innovation	103	82.4%				
No innovation	22	17.6%				
<i>Leverage</i>	125	0.29	0.15	0.00	0.30	0.68
<i>Age</i>	125	49.95	34.78	3.00	43.00	160.00
<i>lnsize</i>	125	8.72	1.38	5.91	8.66	14.98
<i>ROA</i>	125	0.10	0.08	−0.05	0.08	0.65

Source: The authors.

compared with 58.4% of non-family firms. In 2010, the percentage of family firms increased to 47.2% while non-family companies decreased to 52.8%.

With regard to informal factors, we observed an institutionalization of corporate culture towards a stakeholder orientation. Thus, only 51.5% of these companies were basically stakeholder oriented in 2004, while in 2010 this figure had increased to 83.2%. This trend reflects growing interest among companies in considering a broader range of participants, and this in turn has a bearing on levels of corporate transparency. In respect of the corporate strategy followed by studied firms, predominates innovation strategy (77.2%) compared with no innovation strategy (22.8%) in 2004, while in 2010 the adoption of innovation strategy increased to 82.4% compared with no innovation strategy (17.6%).

Regarding the control variables, the average level of leverage in the region was 23% in 2004 and 29% in 2010, and higher among companies in Brazil, Chile and Mexico. The average age of these firms, from their founding, was 48.31 years in 2004 and 49.95 years in 2010. Firm size, measured by the natural logarithm of its assets, was highest in Brazil, followed by Mexico and Chile. The regional average was 7.83 in 2004 and 8.72 in 2010. Finally, the descriptive statistics for the variable measuring financial performance [ROA] showed that the best performance was obtained in Argentina, followed by Mexico, Brazil and Chile. The overall average for these countries was 0.11 in 2004 and 0.10 in 2010.

#### Bivariate analysis (correlation matrix)

The potential multicollinearity among the explanatory variables was analysed to obtain the variance inflation factor [VIF] and level of tolerance. Table 6 (Panel A) shows the Pearson coefficients for all the study variables. This correlation analysis shows that the CGR is positively and significantly correlated with board size, board independence, COB-CEO duality, stakeholder orientation, size of

the firm and year of study ( $p < 0.01$ , two-tailed test); and leverage ( $p < 0.05$ , two-tailed test).

The CGR is negatively correlated with the WGI and ownership concentration ( $p < 0.01$ , two-tailed test); and corporate strategy and industry type ( $p < 0.05$ , two-tailed test). We also observe that the highest value of the correlation between independent variables and CGR is 0.400 (board size). According to Gujarati (2003) correlations between the independent variables are not considered harmful to the multivariate analysis at least exceeding 0.80.

Panel B shows the coefficients for VIF and tolerance, which must be within the limits proposed by Xiao et al. (2004), i.e. less than 2 for VIF and above 0.60 for the tolerance level. In this line, Neter, Wasserman, and Kutner (1989) proposed that the VIF coefficient should not exceed 10, since that would indicate the presence of damaging multicollinearity. On the other hand, if the average VIF were substantially less than 1 this would indicate that the regression analysis might be biased (Bowerman & O'Connell, 1990). Our study obtained an average VIF of 1.228, which is in line with the values obtained by Hossain and Hammami (2009) and Shan and McIver (2011), who confirmed that their model had no multicollinearity, with VIF values of 1.47 and 1.42 respectively. The VIF was within the recommended limits, while the correlation matrix revealed no major correlation problems among the variables.

#### Analysis of results

Table 7 shows the multivariate analysis results for the proposed hypotheses. First, multiple regression analysis [OLS] with robust estimator (VCE) was performed, including the industry and the year of study as dummy variables, to incorporate their possible effects. Subsequently, we use the GMM system to account for endogeneity of all time-varying explanatory variables (Bloom & van Reenen, 2007; Pindado et al., 2014). We have adopted GMM to control for endogeneity and reduce the risk of obtaining biased results due to correlation between error term and explanatory variables.

**Table 6**  
Correlations and collinearity diagnostics.

Panel A: Pearson correlation coefficients																
	CGTI	WGI	Board size (Ln)	Board composition	COB-CEO duality	Gender	Ownership	Family-controlled firm	Stakeholder	Strategy	Leverage	Age	Size company	ROA	Industry type	Year
CGR	1.000															
WGI	−0.205**	1.000														
Board size (Ln)	0.400**	−0.318**	1.000													
Board composition	0.269**	−0.026	0.199**	1.000												
COB-CEO duality	0.103*	−0.305**	0.214**	0.215**	1.000											
Gender	−0.028	−0.125**	−0.046	−0.122**	−0.069*	1.000										
Ownership	−0.156**	0.069*	−0.139**	−0.220**	−0.150**	0.118**	1.000									
Family-controlled firm	0.003	0.028	−0.019	0.155**	0.200**	−0.073*	0.221**	1.000								
Stakeholder	0.159**	0.116**	−0.014	−0.008	−0.077*	0.086*	0.098**	−0.024	1.000							
Strategy	−0.084*	0.030	0.011	−0.025	−0.016	0.059	0.048	0.024	−0.020	1.000						
Leverage	0.066	0.113**	−0.067*	−0.080*	−0.082*	0.166**	−0.069*	−0.183**	0.155**	0.070*	1.000					
Age	0.020	0.243**	−0.009	0.050	−0.197**	0.070*	0.057	−0.079*	0.150**	0.056	0.099**	1.000				
Size company	0.272**	−0.140*	0.145**	−0.051	−0.056	0.188**	−0.037	−0.324**	0.188**	0.061	0.272**	0.139**	1.000			
ROA	−0.10	−0.167**	0.068	0.004	0.013	−0.018	0.098**	−0.050	0.017	0.046	−0.127**	0.071*	−0.038	1.000		
Industry sector	−0.054	0.089*	−0.056	−0.132**	−0.204**	0.191**	0.237**	−0.222**	0.037	0.027	0.136**	0.008	0.137**	−0.107**	1.000	
Year	0.374**	0.019	0.044	0.078*	−0.04	0.018	−0.056	0.032	0.215**	−0.023	0.128**	0.039	0.210**	−0.106**	−0.010	1.000

Panel B: collinearity diagnostics		
Variance inflation and tolerance factors		
Variable	VIF	Tolerance
(Constant)		
WGI	1.405	0.712
Board size (Ln)	1.239	0.807
Board composition	1.186	0.843
COB-CEO duality	1.292	0.774
Gender	1.140	0.877
Ownership concentration	1.316	0.760
Family-controlled firm	1.402	0.713
Stakeholder	1.129	0.886
Strategy	1.019	0.981
Leverage	1.218	0.821
Age	1.176	0.850
Size company	1.358	0.737
ROA	1.166	0.858
Year	1.128	0.887
Industry type	1.251	0.800

Source: The authors.

\* Correlation is significant at 0.051 level (two-tailed test).

\*\* Correlation is significant at 0.01 level (two-tailed test).

1. The variables are defined in Table 3.

2. The coefficients are based on 826 observations.

3. Independent variable: CGR.

4. VIF = variance inflation.

**Table 7**  
Formal and informal institutional factors on CGR.

Independent variables	Model 1 Pooled data (MCO). Robust estimator (vce)	Model 2 Estimation with GMM
WGI	<b>0.581</b> *** <i>0.200</i>	0.083 0.107
Board size (Ln)	<b>0.069</b> *** <i>0.02</i>	− <b>0.064</b> * <i>0.029</i>
Board composition	<b>0.078</b> *** <i>0.023</i>	<b>0.071</b> * <i>0.034</i>
COB-CEO duality	−0.010 <i>0.011</i>	−0.010 <i>0.017</i>
Gender	− <b>0.240</b> *** <i>0.071</i>	0.040 <i>0.077</i>
Ownership	−0.029 <i>0.025</i>	<b>0.107</b> * <i>0.040</i>
Family-controlled firm	0.001 <i>0.01</i>	−0.034 <i>0.031</i>
Stakeholder	<b>0.034</b> *** <i>0.010</i>	<b>0.027</b> ** <i>0.009</i>
Strategy	− <b>0.034</b> *** <i>0.012</i>	−0.002 <i>0.007</i>
Leverage	<b>0.094</b> *** <i>0.035</i>	−0.012 <i>0.032</i>
Age	<b>0.010</b> * <i>0.005</i>	<b>0.029</b> † <i>0.018</i>
Company size	<b>0.015</b> *** <i>0.004</i>	0.001 <i>0.009</i>
ROA	0.092 <i>0.071</i>	−0.026 <i>0.058</i>
Constant	0.085 <i>0.144</i>	0.147 <i>0.093</i>
Total observations	826	451
R adjusted squared	0.4935	

Source: The authors.

Corrected standard errors are shown in italics.

GMM-type: L(2/.)cgt. Chi<sup>2</sup> = 0.000.

\* Statistical significance: *p* .05.

\*\* Statistical significance: *p* .01.

\*\*\* Statistical significance: *p* .001.

† Statistical significance: *p* .10.

GMM relies on set of “internal” instruments (lags of explanatory variables), eliminating the need of external instrumental variables (Wintoki, Linck, & Netter, 2012). The multiple regression model (Model 1) was found statistically significant ( $p > 0.000$ ). The adjusted coefficient of determination ( $R^2$ ) indicates that 49.35% of the variation in the dependent variable is explained by the independent variables. The coefficients show that statistically significant formal institutional variables in the model are legal system (+), size of the board (+), independence of the board (+), and participation of women on the board (−). The significant informal institutional variables in the model are stakeholder orientation (+) and the innovation strategy (−). Finally, COB-CEO duality and ownership concentration are not significant in this model. Regarding the control variables, leverage (+), age of the company (−) and its size (+) are significant, while profitability does not present any association.

Continuing our analysis, the panel data highlighted problems of heteroscedasticity, endogeneity and correlation. To address these issues, we estimate the model using GMM method, because it is an instrumental variable estimator that embeds all other instrumental variables as special cases (Pindado et al., 2014). Model 2 shows that the positive, statistically significant relations were independence of the board ( $p = 0.05$ ), ownership concentration ( $p = 0.05$ ), stakeholder orientation ( $p = 0.01$ ) and age of the company ( $p = 0.10$ ). We could identify a negative relation between CGR and board size ( $p = 0.05$ ). No significant relationships were found between CGR and legal system, COB-CEO duality, gender, family controlled firm, strategy, leverage, company size and profitability.

The results obtained also suggest that CGR in the energy sector is higher than in other sectors. From 2005, significant differences began to appear in the levels of transparency in the countries analysed. These findings are supported by Archambault and Archambault (2003), who concluded that the decision to adopt and publish corporate information is influenced by informal factors such as culture, regulatory system and the corporate system. Berglöf and Pajuste (2005), on the other hand, suggested that companies' corporate practices depend on the legal environment and practices prevailing in each country, company size and the concentration of ownership. Barako et al. (2006) carried out a longitudinal study using panel data methodology, and found a significant association between the level of corporate transparency and the CG attributes of the company, such as ownership structure and other characteristics. In the same vein, Samaha et al. (2012), studying firms in Egypt, argued that the proportion of independent directors and firm size are two factors that positively affect the level of CG compliance.

In this study, we observed a significant inverse association between the level of CG transparency and independence on the board, and so hypothesis H2a, which predicted a positive relationship between these variables, is rejected. These results are in line with those found by Mak and Kusnadi (2005), who argue that larger boards inhibit the motivation and participation of their members in the strategic taking decisions process, and therefore its impact negatively on the CG compliance.

The results for the CG dimensions show there is a positive and statistically significant (5% level) between independence of their members with CGR; therefore, hypotheses H2b is accepted. These results are aligned with those reported by Samaha et al. (2012) who showed that CGR for listed companies in Egypt increases in proportion with the number of independent directors and company size. In this context, our study shows that diversity in the boards provide the experience and knowledge necessary for adequate performance of their functions, and tend to increase the level of CGR (Ezat & El-Masry, 2008; Gandía, 2008; Kent & Stewart, 2008; Willekens, Vander Bauwhede, Gaeremynck, & Van de Gucht, 2005). The presence of independent members on the board represents a means of control that improves its effectiveness, focusing its attention on the actions of the management team and on ensuring the shareholders' goals are achieved, all of which is reflected in a higher level of CGR (Fama & Jensen, 1983). These consequences have also been reported for the level of CG transparency in other emerging countries (Ezat & El-Masry, 2008; Samaha & Dahawy, 2011).

With respect to ownership concentration, the results show a significant and positive influence on CGR, opposite our established premise. In this sense we have rejected the H2e which suggested a negative relation. According to Haniffa and Cooke (2002), the ownership concentration could reduce the freedom of the management team and lead to a more efficient behaviour such as CG compliance.

Hypothesis 3 regarding to stakeholder orientation has been accepted. Thus, firms with a stakeholder-oriented approach will tend to adopt more CG practices as part of their strategic management and as a process of continuous and interactive communication between the company and its stakeholders (Fasterling, 2012). The significant control variables in the model is the age of the company, with a positive impact on the CGR, a finding that is in line with the results of Hossain and Hammami (2009) and Owusu-Ansah (1998), who argued that younger firms publish less information to maintain their competitive advantage, and also because they have a shorter history to communicate.

Regarding the variables that were not statistically significant, we observed that the legal system is not a determinant factor in CGR in Latin American region. Jaggi and Low (2000) considered the legal system to be the most significant institution affecting business



activity, while Bushman, Piotroski, and Smith (2004) observed a positive relationship between the level of CG compliance and the strength of the legal system. However, in Latin American case this variable is not significant.

The hypotheses rejected concerned the COB-CEO duality (H2c), gender of the board (H2d), the family controlled firm (H2f), strategy (H4), and the control variables of leverage, size and profitability, none of which accounted for the CGR. Previous studies have suggested that in the case of emerging or developing countries the results of this type of analysis could differ from those found in developed economies (Archambault & Archambault, 2003). On the other hand, COB-CEO duality and family controlled firms do not seem to affect the level of CG compliance, which is in line with the results obtained by Ho and Wong (2001), Eng and Mak (2003) and Haniffa and Cooke (2002).

## Conclusions

This study contributes to the literature pertaining to how formal and informal factors promote a higher CG compliance on listed companies of Latin American emerging markets. Most of prior research has focused on developed countries and they have associated institutional factors such as culture, legal system and financial factors with corporate and transparency practices, while agency theory suggest that internal and external dimensions of CG (board of directors, ownership concentration, legal system) could minimize the conflict of interest between majority and minority shareholders in countries where legal system and shareholders' protection is poor (Creed et al., 2010; Peng et al., 2009; Tariq & Abbas, 2013).

This study obtained a comparative study of four emerging economies in Latin America (Argentina, Brazil, Chile and Mexico), and the results indicate a rising trend in CG compliance during the period 2004–2010. Our analysis shows that the variables that affect CGR in this region are the independence of the board, the ownership concentration, stakeholder orientation, and the age of the company. These results are consistent with the findings of Kent and Stewart (2008) and Samaha and Dahawy (2011) who affirm that independent directors promote a higher supervision and control in order to keep their reputation on the market. By contrast, larger boards influence negatively in the level on CG because a greater diversity of opinions may hinder a consensus to adopt corporate practices. Contrary to the proposed hypothesis, our results demonstrated that ownership concentration affect positively the CGR, since the region is characterized by a weak legal system and a poorer protection of shareholders, so ownership concentration becomes a control mechanism to substitute this absence and promotes the adoption of good governance practices (Gandía, 2008; Vander Bauwhede & Willekens, 2008). In the case of informal factors, stakeholder orientation motivates the credibility and transparency on corporate practices in weak legal environments (Basu & Palazzo, 2008). In the case of female presence in the board, family element and legal system were no significant in the analysis, since the institutional framework in Latin America differ from other countries previously studied, both normative and cultural aspects.

Our research also considered the endogeneity problem in the empirical analysis of CGR. The endogeneity problem in this issue is important, for it is highly likely that observable and unobservable institutional factors may affect CG compliance, and some of firm-specific characteristics could influence the rating on CG.

This study has the following limitations. First, the study variables, compiled from the companies' annual reports, inevitably reflected the subjective judgement of the researchers, which could lead to errors of interpretation and of information compilation. Second, the proposed CGR was un-weighted. On the one hand, this

presents the disadvantage that all the index items are awarded the same importance; however, to the best of our knowledge there is no established methodology to assign a single weighting criterion for such an analysis, and the use of an un-weighted index does reduce the problem of subjectivity. Third, we focused on obtaining information on CG and the study variables from three main sources: the companies' annual reports, the CG reports and the companies' websites; thus we did not consider press reports or other communiqués that may be issued by listed companies. Fourth, there is some subjectivity in the selection of the explanatory variables. Given the extensive literature in this field of research and the large number of variables that have been identified, we chose to include those appearing most frequently in previous studies. This limitation is mitigated by the use of panel data methodology and GMM system, which takes into account the problem of omitted variables. Fifth, our study considers only the listed companies with the highest rankings in four Latin American stock markets, and omits companies in other indices and non-listed companies. Nevertheless, we achieved a sufficient number of observations for panel data analysis to be applied.

Despite the above limitations, the results obtained constitute a benchmark for managers responsible for determining CG policies and legislation in the countries under study. These results reflect the current status of the region concerning CG and could help identify the dimensions and elements of CGR that favour regional convergence. Moreover, this paper opens up interesting areas for future research, highlighting the impact of certain ethical values and risk taking behaviour. It would be useful to extend this study to consider the influence of other cultural variables such as the nationality, age, education and experience of company directors or managers on the level of CG compliance, and to analyse other formal institutional factors such as directors' remuneration, the composition of support committees and the frequency of board and support committee meetings. Another area of interest would be to analyse the impact of the rating and its sub-indices on measures of corporate performance or risk, or perhaps the impact of formal and informal institutional factors on these same measures. Furthermore, the study sample could be expanded to include companies listed on the continuous market. An important extension of our work would be to include other countries, both emerging and Anglo-Saxon and Continental countries, and thus incorporate a greater number of country-level variables. Another interesting line would be to carry out a longitudinal study by business sector, to determine the impact of formal and informal institutional factors on a specific area of activity, and at the same time, a larger number of countries might be included.

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## Article

## Valuing brands under royalty relief methodology according to international accounting and valuation standards



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## ABSTRACT

The aim of this paper is to introduce a statistical procedure to value a brand by means of which firms may be able to determine the level of implicit royalty that they would charge for the use of their brand, applying multivariate techniques from market references. The study has been based on a statistical contrast of the royalties paid in Spanish franchises belonging to three different industries: food, health and beauty and fashion. Each industry has been segmented using cluster techniques, and then, through linear discriminating analysis, a model is proposed to explain the royalty paid according to certain economic figures of the companies. The implicit impartiality in the development of the model means that it could be generally accepted by analysts, consultants and companies who need to determine the value of a brand.

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### Introduction: an approach to the problem of intangible assets

In the last three decades some authors, such as Lev (1989, 2000, 2001, 2005), have shown the gradual increase between firms' market value and their book value. Other authors, such as Brown, Lo, and Lys (1999), or Dantoh, Radhakrishnan, and Ronen (2004) also warn about how equity and profits have lost relevance for explaining the market value of American companies. In the Spanish case Sánchez and Espinosa (2005) introduce a measure of the intangible value not explained by financial economic magnitudes of the firms, but paid in the prices of business transactions (around 50%). Rubio, Rodríguez, and Maroto (2013) find for the pharmaceutical and biotechnology sectors that these quantities paid and unexplained are higher than 69%. All these works suggest a change in the business model: this has moved from a system based on industrial

production to another one in which firms base their success on knowledge.

Despite the fact that International Accounting Standard: IAS 38 (2008) forbids the recognition of internally generated intangible assets, in business combinations the International Financial Reporting Standard 3 (2008) states that the purchasing company will have the obligation to identify and measure each one of the assets and liabilities deriving from the operation performed, including even tangible and intangible assets.

Such assets will be quantified by their fair value (IAS 38, 2008; IFRS 3, 2008), which is defined in the IFRS 13 (2011), "Fair Value Measurement", as the amount for which each asset can be exchanged or a liability canceled between the concerned parties properly informed. The transaction must be performed on mutual independence terms, including market expectation and, at the same time, excluding the synergies for a particular buyer.

There is a wide typology of academic and professional intangibles and brand valuation proposals, as well as their contribution to the value creation process for the company, from different areas of expertise. In marketing and management: Kapferer (1992, 2004), Park and Srinivasan (1994), Aaker David (1996, 2000),

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Ratnatunga and Ewing (2008) and Jourdan (2001), and in finance: Smith (1997), Damodaran (2002), Reilly (1999), Lev (2001) are outstanding among others. For its part, the accounting standards, and the guidelines of the International Valuation Standard Council, impose a specific hierarchy in the valuation criteria: market and income methodology. If none of these could be used, then the replacement cost methodology would be applied. So the most important business consulting agencies in the world apply this hierarchy.

The royalty relief is based on the measurement of the license payments, from a market database, which has been saved as a consequence of having the ownership of the asset. The interest of this method is that it can be considered as a market-income methodology. Therefore, the accounting standards place it as the most important compared to the other methods, but there is no such academic methodology that supports its use.

The goal of this paper is dual: on the one hand, applying multivariate techniques from market references, to check whether in the Spanish franchising market the royalties paid are efficient in reflecting enterprises' performance. Then, they could be an important tool for assessing brand. On the other hand, we introduce a statistical procedure adapted to the international standards of accounting and valuation of intangible assets, by means of which any firm could obtain the level of the corresponding implicit royalty from market references and the fair value for the brand.

This paper is organized as follows: after the Introduction, in the second section the theoretical framework and hypothesis, as well as the importance and the problems involved in the calculation of the royalty relief are analyzed. In section three the data and the statistic model are developed. In section four we deal with the applications and results of the model and, finally, the article ends with the conclusions and final remarks.

### Theoretical framework and hypothesis: the importance and the problems involved in the calculation of the royalty relief

Despite the efforts that have been made, there is still a large heterogeneity present among all the methodologies developed (Cerviño, Martínez, de la Tajada, & Orosa, 2005; Salinas, 2007). Specifically, market methodologies involve the use of multiples, which will depend on prices paid in previous transactions. Nevertheless, one problem of this method is the absence of a database about prices paid for individual intangible assets.

Likewise, income methodologies have had greater academic and professional growth. A royalty-saving method is one of the most common typologies, especially used to assess brands and patents, and it is the one that has been introduced in different ways by consultant agencies such as Brand Finance (2000), Whitwell (2013), Intangible Business and AUS Consultants or Consor (Salinas, 2007).

Other income methods frequently employed for intangible assessment are: the multiple periods earning excess of return, incremental cash flow and real options. The first one is built on operating cash flows of the enterprise, and from these, the charges of the other contributory assets (tangibles and intangibles) will be deducted in order to determine the cash flow arising from the excess of return. Authors such as Smith (1997) or Lev (2001) and consulting agencies like Brand Economics (2002) base their proposal on this technique.

Concerning the incremental cash flow method, its main goal is the measurement of the increase of these cash flows due to a price premium in goods and services sold by companies or savings that come from the ownership of the intangible asset. Some academics, such as Damodaran (2002), Reilly (1999) or Fernández (2007) have developed this methodology. Consulting agencies such

as Interbrand<sup>1</sup> or BBDO (2001, 2002), through the division Brand Equity, also have used it in many modalities. Alternatively, the real options method includes uncertainty and risk as variables in the valuation of the assets depending on companies' management capacity. Among the authors who have proposed this technique in diverse variations Myers (1977), Amram and Kulatilaka (2000), Schwartz (2003) and Rubio and Lamothe (2010) are worthy of mention.

The great problem when valuing brands among all the methodologies shown above is to properly delimit the corresponding flow. Brands also include psychological aspects or symbolic constructions in the users' minds on the basis of which future expectations about their functioning will be generated, which is very difficult to measure and capture objectively.

We can define brand value as the incremental utility or added value to the product by brand name (Bigné, Borredá, & Miquel, 2013; Kamakura & Russell, 1993; Park & Srinivasan, 1994). In this sense, Kapferer (1992) proposes a hexagonal brand identity prism reflecting internal aspects: brand physique, personality, culture, and other external ones: relationship, reflection and self-image. Aaker David (1996) concluded a brand measure, called "The Brand Equity Ten", based on aspects such as loyalty, perceived quality, association or differentiation measures, awareness, but also, the behavior on market measures that represent information obtained from market-based information rather than directly from customers: price and distribution indices and market share.

Many times the so called brand strength is used to summarize all the qualitative brand aspects, a score of 0–10 that places a particular brand against the competitors. The strength of the brand is used in model valuation, at the same time being a multiple of the profit corresponding to the brand, such as the Interbrand proposal or, in other cases, it also serves to assign an implicit royalty, like that proposed by Intangible Business Ltd. (Salinas, 2007).

Bello Acebrón, Gómez Arias, and Cervantes Blanco (1994) defines the brand image as "the set of partnerships developed in the imaginative power of the consumer, enabling the brand to reach a higher sales volume than if you do not have a brand name". In this line, some authors have explored the relationship between brand affiliation and firm performance (Park & Srinivasan, 1994), between prices and higher quality brands (Cerviño, 2004; Sivakumar & Raj, 1997), others, in terms of competitiveness (Fernández, 2011), and finally between important brands and shareholder value (Cerviño, 2004; Doyle, 2001). So, it is clear there is a relationship between qualitative brand attributes, and quantitative variables such as prices, market share, and higher profits, then, quantitative variables could also explain the brand value in an impartial form.

For its part accounting standards, specifically the IFRS 13 (2011) explains that "a fair value measurement requires that the valuation technique(s) used should maximize the use of relevant observable inputs and minimize unobservable inputs". It establishes a fair value hierarchy that is categorized into three levels of inputs; level 1 inputs are quoted prices in active markets for identical assets, level 2 are inputs other than quoted prices included within level 1 that are observable for the asset, either directly or indirectly. Level 3 inputs are unobservable inputs for the asset or liability, but these inputs will have to be used to measure fair value whenever relevant observable inputs are not available.

In general, to have an active market for intangible assets is very uncommon. Therefore, since there is not an active market relative to purchase and sale of brands, the accounting standard puts the royalty relief method as the most important compared to the other methods listed above, especially in business combinations, since

<sup>1</sup> Technique described in Motameni and Shahrokh (1998) and in Ratnatunga and Ewing (2008).

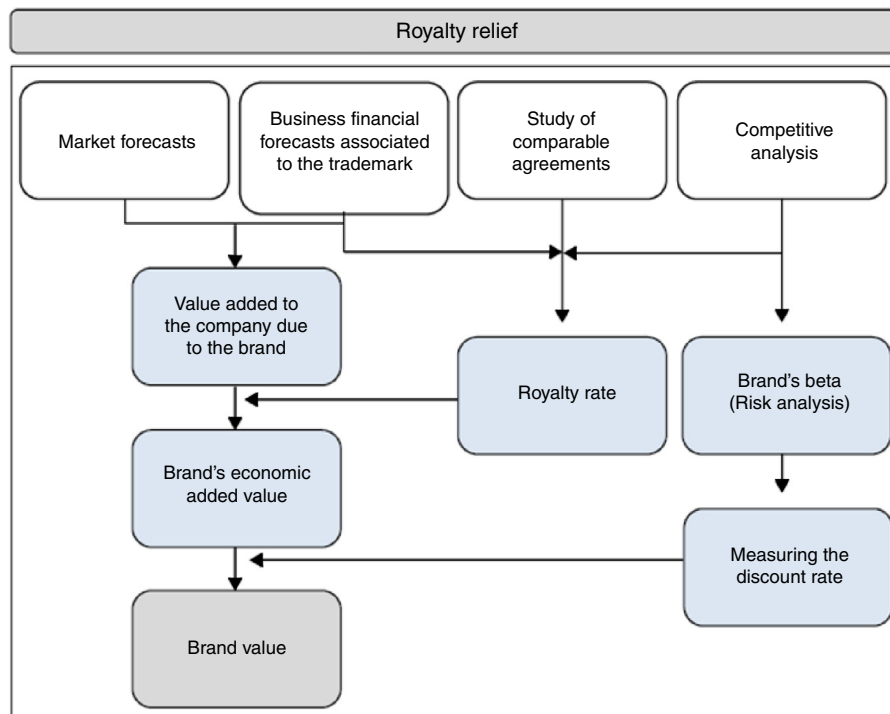


Fig. 1. Royalty according to Brand Finance.

Source: Salinas (2007).

the valued assets must meet the requirements of the accounting standard.

The royalty relief, as detailed in the following image (Fig. 1) consists first of a long run estimation of the company' sales. Second, it is necessary to determine the royalty rate which would correspond to that sales forecast from market databases. Then this rate would be multiplied by the forecast sales and so we find the cash flow corresponding to the brand. Third, it is necessary to determine a proper discount rate which must include the risk associated with the valued asset and, finally, it would suffice to update the cash flows and find the sum of the updated assets whose result would correspond to the brand's value.

Licensing agreements for similar assets generally provide the best basis for determining an appropriate royalty rate. However, the proposed models developed to calculate the proper royalty do not seem to include the impartiality and accuracy required.<sup>2</sup> For instance, according to Salinas (2007), Consor consulting is developing a model based on the licenses of other similar brands. To do this, they start by valuing the brand strength according to 20 determining factors, among which the following are included: profit margins, the state of the brand's life cycle, transferability and its international protection.

For its part, the proposal of Intangible Business Ltd. (Salinas, 2007) also determines the brand strength against competitors through the variables that are shown in Fig. 2. This figure also contains measures related with the strength of the different trademarks that participate in the market.

In this figure the reference competitor, Benchmark, collects an explicit royalty, the market's maximum, and from this the score of the valued brand is obtained. If the score obtained by the valued company is 58 and the market's maximum is 76, with a royalty of

5%, a rule of thumb would suffice to find that the royalty that would correspond to a score of 58 is 3.82%.

As shown in Fig. 2, the variables that nurture the brand strength are not the same in the two models (Conсор Consulting and Intangible Business), and the process seems to lead to the inclusion of large doses of discretion. This is of particular concern when determining their weights, with both lacking an aforementioned mathematical and statistical contrast. The factors or variables could be redundant or even correlated with each other. Thereby the whole process leads to the calculation of a royalty which is probably biased. Finally, the methods assume that the factors and their weights are the same for all industrial sectors, regions or categories, when in fact they may vary.

Nevertheless, statistical techniques have been used in academic brand value analyses; for instance, Punj and Stewart (1983) explained issues and problems related to the use and validation of cluster analysis in marketing research. Perreault, Behrman, and Armstrong (1979) show, across discriminatory analysis, a better understanding of how some groups of customers or items differ as a consequence of some set of explanatory metric variables, such as a set of attributes or performance ratings. Sivakumar and Raj (1997) have proved that higher quality brands are generally less affected by a rise in prices than lower quality brands. Other remarkable researches are those regarding the application of joint analysis,<sup>3</sup> such as Kamakura and Russell (1993), Swait, Erdem, Louviere, and Dubelaar (1993), or the ones about logit regression techniques, as in Green and Srinivasan (1990), Park and Srinivasan (1994) or Jourdan (2001). More recently Chung and Rao (2012) presents a general consumer preference model when it is not easy to consider

<sup>2</sup> The analyzed consulting firms do not indicate that their procedures contain any statistical technique. However, given the opacity of their procedures this fact cannot be ensured.

<sup>3</sup> It is basically a statistical technique that allows us to measure the relative value of each feature of a product, with which we can determine the combination of these features to maximize the probability of their being chosen by the consumer. Its application to marketing was conceived in 1974 by Paul Green, professor in The Wharton School.

Competitors	Recognition	Relevance	Satisfaction	Differentiation	Loyalty	Brand's score
Our own Trademark	63	70	56	63	40	58
Competitor 1	50	60	80	52	45	57
Benchmark	85	90	80	65	62	76
Competitor 2	73	65	50	50	35	55
Competitor 3	80	90	75	62	50	71

Fig. 2. Analysis of the brand's relative strength: Benchmark.

Source: Salinas (2007).

some qualitative attributes of a product or when there are too many attributes. These papers do not make up an overall and quantitative measure of the brand; although they show unequivocally that brand is a differentiating factor that generates and increases utility and consumer loyalty. These aspects allow the enterprise at the same time to increase its prices, market shares, and performance.

With the aim of producing convergence between the academic and the professional environment, a process is proposed that incorporates enough statistical tools to obtain higher accuracy and objectivity in the royalty relief methodology. With this study, the following hypotheses and proposals are analyzed:

- I. The royalties paid can be classified depending on measures about performance of companies: market position, economic profit and the capacity to generate wealth in terms of factors of production employed.

At the beginning of the article several studies (Brown et al., 1999; Dantoh et al., 2004; or Lev, 2000) have been discussed showing the inability of accounting variables to explain the values of intangible assets. We have used cluster technique to discover distinct groups in the enterprises' database depending on performance items mentioned above, and we have checked as to whether groups of cluster match royalties paid.

- II. There is a significant, *II (a)*, and positive, *II (b)*, statistical relationship between the different indicated firms' performance variables and the clusters of royalties collected in each industry.

Many authors (Aaker David, 1996; Park & Srinivasan, 1994), among others, ensured that brand value attributes allow increased sales volume (higher prices or market share), and this is transformed into different measures of enterprise performance. So, it is necessary to know more precisely the way in which performance variables generate value to the royalties groups. Finally, we have checked if:

- III. The behavior of the performance variables of Spanish franchisors is the same or changes for different industries. This fact will reveal whether the royalty model relief is the same or changes for each sector.

We have used linear discriminant analysis (LDA) to evaluate the relationship between the economic variables and the royalties collected across different industries, and to check hypotheses *II (a)*, *II (b)* and *III*.

Having contrasted the above hypotheses we have checked the results of following questions: firstly, the capacity of methodology for predicting what would be the corresponding royalty to a new company of the industry.

Secondly, we examine whether on the basis of the scores generated by the model, the strength of a brand can also be considered compared to the other competitors on the market regardless of the group it belongs to. Finally, we propose a process of brand value, in accordance with Fig. 1, based on the implicit royalty found.

## Data and statistic methodology

The Spanish franchising firms, the explicit royalty, and the number of establishments in each one, have been obtained through specialized web pages<sup>4</sup> (the franchisors are listed in annex 1) from year 2012. In addition, the economic variables: employees, assets, sales, EBITDA (earnings before interest, taxes, amortization and depreciation) and EBIT (earnings before interest and taxes) have been obtained from the System Analysis of Iberian Balances (SABI) data base and represent the average value of each enterprise from three previous years (2009–2011). We have selected three sectors heterogeneous enough among each other to test whether the model works in the same way in each of them: food, health and beauty, and fashion.

The number of enterprises with information about royalties in the web pages was 149 for food, 105 for health and beauty, and 67 for fashion. Of these, all required economic and financial data were provided by only 73 for food, 74 for health and beauty, and 57 for fashion. This represents a cover of 68.18%.

The geographical area is diverse but the major concentration is in Madrid, 26.2%, and in Barcelona with 20.6% with respect to the rest of Spanish provinces. The variables used to build the exogenous items are presented in Table 1. We can appreciate a great heterogeneity in the magnitudes of the Spanish franchise sample.

The exogenous variables are a good representation of the value drivers or performance of firms from the most important points of view suggested in previous studies (Aaker David, 1996; Bello Acebrón et al., 1994; Cerviño, 2004; Park & Srinivasan, 1994; Sivakumar & Raj, 1997): first, market position measured by total establishments, and market share variables, secondly, the ability to generate economic profit from different levels: Gross Operating Margin, and EBITDA Margin. Finally, we have added other criteria regarding the capacity to generate wealth in terms of factors of production employed, as a consequence of scale economies and better competitiveness (Doyle, 2001; Fernández, 2011): Return on Assets,<sup>5</sup> and Employee Productivity:

1. *Total Establishment*, including those that are operated by own firm or by third-parties.
2. *Market Share*, measured from the result of dividing the turnover of each franchise among the total incomes that each industry generates.
3. *Gross Operating Margin*, i.e. the quotient obtained from dividing gross profit (which is at the same time the difference of the sales and the cost of the same) and the turnover obtained for each company.

<sup>4</sup> [www.mundofranquicia.com](http://www.mundofranquicia.com) and [www.tormo.com](http://www.tormo.com).

<sup>5</sup> Others returns measures like ROE (return on equity) are not included because companies in this database are unlisted, so they don't have the market data of equity.

**Table 1**  
Main descriptive statistics.

	Min.	Max.	Mean	Stand. deviation
Total Establishment	1	556	36.1	64.78
Total Assets (mil EUR)	2.76	240,576.00	14,085.74	38,058.80
Employees	1	9679.00	186.1	931.18
Total Sales (mil EUR)	1.15	391,137.48	13,585.85	41,365.23
EBITDA (mil EUR)	-20,907.95	24,266.00	667.4	4364.25
EBIT (mil EUR)	-42,699.01	21,424.00	144.14	4766.16
Valid. number	204			

Source: own elaboration.

4. *EBITDA Margin*, i.e. the quotient between the earnings before interest, taxes, depreciation and amortization (EBITDA) and the figure regarding revenues.
5. *Return on Assets or ROA*, known as the quotient between EBITDA and the net book value of the asset.
6. *Employee Productivity (EBIT/Employee)*, measured as the ratio among the earnings before interest and taxes (EBIT) and the number of employees.

In order to contrast *hypothesis I*, following Punj and Stewart (1983), a K-means clustering analysis, through an SPSS statistical program, has been made to obtain a group classification for each industry, according to clearly defined features that exogenous variables show. In this way, every one of these records the elements of the sample that, on the whole, achieve the maximum distance of its means, also known as centroids.

Once the different groups for each industry have been obtained, to check *hypotheses II (a)*, *II (b)* and *III*, in line with Perreault et al. (1979), a linear discriminating analysis has been performed. The linear discriminating analysis can be considered as a regression technique that establishes linear relationships, where the endogenous variable is a categorical one (determines the groups) and the exogenous variables, being continuous, will help to predict the belonging group. Following Dillon, Goldstein, and Schiffman (1978): “if the assumptions of normality and identical covariance matrices are satisfied, then there is no reason to examine alternatives to Fisher’s LDF (discriminatory functions)<sup>6</sup>”.

To achieve this mathematically, series of canonical equations are going to be generated (the minimum  $\{n - 1, p\}$ ,  $n$  being the number of classification groups and  $p$  being the exogenous variables one) with the aim of discriminating between or separating all the groups as much as possible:

$$D_j = \alpha + b_{1j} * Est + b_{2j} * MShare + b_{3j} * GrossMarg + b_{4j} * EBITDA + b_{5j} * ROA + b_{6j} * Prod + \varepsilon; \\ j = 1, 2, \dots, \min\{n - 1, p\}. \quad (1)$$

For *Est*=Total establishments; *MShare*=Market Share; *GrossMarg*=Gross Margin; *EBITDA*=EBITDA Margin; *ROA*=Return of Assets; *Prod*=Employees Productivity.

These linear combinations of the six variables used must maximize the variance between the groups and, at the same time, should minimize it within groups:

$$VAR(D_j) = \bar{b}'T\bar{b} = \bar{b}'E\bar{b} + \bar{b}'C\bar{b}. \quad (2)$$

<sup>6</sup> In many marketing analyses explanatory variables are usually qualitative, in the sense that each variable takes on a small number of values and the Fisher’s LDF method can introduce distortions. However, in our analysis the explanatory variables are quantitative and tend to fulfill a normal distribution and equal covariance matrices according to The Box’s *M* test.

In Eq. (2),  $\bar{b}$ , is the vector of coefficients;  $T$ , the matrix of total variances and covariance;  $E$ , the matrix of variances and covariance among the groups and  $C$ , the covariance within groups. The vector of coefficients  $\bar{b}$  must maximize the relationship of the variance among the groups regarding the variance within the groups.

Nevertheless, it is necessary also to know the value of the centroids by using the following equation. In the LDA each canonical function explains the relationship between two centroids  $\bar{D}_j$  whose distances are maximized:

$$\bar{D}_j = \alpha + b_{1j} * \bar{Est} + b_{2j} * \bar{Mshare} + b_{3j} * \bar{GrossMarg} + b_{4j} * \bar{EBITDA} + b_{5j} * \bar{ROA} + b_{6j} * \bar{Prod} + \varepsilon; \quad j = 1, \dots, n. \quad (3)$$

The goodness of fit of the methodology for predicting the corresponding royalty for a new company, *purpose one*, has been proved across a confusion matrix. This matrix compares the real classification, which was elaborated using cluster technique, and the one obtained by the linear discriminating function, using this way to check the number of goals that were achieved in each one of the analyzed industries. The mechanism of classification for each individual location depends on the odds of Bayes’ Theorem.<sup>7</sup>

Fisher equations are another way of measuring allocation scores. This classification coincides exactly with the one previously obtained using all the canonical functions and the Bayes rule. To calculate the strength of a brand, *purpose two*, we propose a Fisher score vector which is the result of the scores generated by maximizing the probability of each company pertaining to the most likely cluster. The cumulative probability of these scores  $F(x)$  will represent the brand strength.

## Results

The heterogeneity on firm’s data in each industry has allowed the distinguishing different groups to apply cluster technique. The best classification found is the one corresponding to three groups, called: high, medium and low royalty.

We can highlight in Table 2 the presence of remarkable differences over all magnitudes used, among the cluster of each industry. Specifically, the average royalty collected by the food industry is 5.5% larger in comparison with the health and beauty, and fashion industries, which are 4.56% and 2.56%, respectively. On the other hand, high variability among the means of the groups can be seen: the high royalty group generates exogenous variable values greater than the medium and low range in each sector. In this form the variables, after ANOVA test, show a  $p$ -value lower than 0.01, except for Market Share in the case of the fashion industry. Nevertheless, despite the fact that variables are significant individually in cluster it does not imply that they will be significant in the proposed model.

<sup>7</sup> The probability of belonging to a group given a specific discriminating score  $P(d_i/g_k) = ((p(v) * P(g_k)) / (\sum_{i=1}^g P(d_i/g_k) * P(g_k)))$ ;  $P(g_k)$  is the prior probability of each group and  $P(d_i/g_k)$  is the probability that a score  $d_i$  belongs to a group  $g_k$ .



**Table 2**  
Classification from K-means cluster.

Food	Health and beauty	Fashion		Food		Health and beauty		Fashion	
				Mean	Stand. deviation	Mean	Stand. deviation	Mean	Stand. deviation
Medium royalty: 5.2 No. of cases 43	Medium royalty: 5.2 No. of cases 39	Medium royalty: 3 No. of cases 37	Tot. Establishments	17.91	14.25	19.21	18.11	15.92	11.24
			Market Share %	0.27	0.66	0.78	1.98	0.92	1.37
			Gross Margin %	33.25	16.07	47.52	20.83	32.55	15.79
			EBITDA Margin %	5.2	13.64	10.1	11.67	6.19	9.42
			ROA %	0.07	12.99	7.17	10.31	3.9	11.48
Low royalty: 4.2 No. of cases 11	Low royalty: 3.1 No. of cases 24	Low royalty: 2 No. of cases 18	EBIT/Employee	4.5	27.61	8.84	21	5.07	12.05
			Tot. Establishments	15.91	23.59	24	25.2	80.5	48.05
			Market Share %	0.01	0.02	1.17	3.26	3.56	5.68
			Gross Margin %	-11.51	39.62	21.46	20.17	31.3	9.24
			EBITDA Margin %	-76.09	47.34	-13.57	15.65	3.05	15.91
High royalty: 6.5 No. of cases 19	High royalty: 6 No. of cases 11	High royalty: 4 No. of cases 2	ROA %	-54.54	29.18	-19.15	22.76	1.77	12.37
			EBIT/Employee	-33.43	36.78	-10.12	9.83	6.78	16.29
			Tot. Establishments	158.74	122	199	145.86	75.5	105.36
			Market Share %	4.08	6.2	3.74	7.34	0.96	1.29
			Gross Margin %	49.64	20.54	51.09	22.87	80.93	81.87
Total 73 Royalty: 5.50	Total 74 Royalty: 4.56	Total 57 Royalty: 2.56	EBITDA Margin %	13.95	16.21	13.97	13.7	31.97	11.08
			ROA %	4.92	7.82	16.16	19.81	21.96	27.92
			EBIT/Employee	81.14	323.5	39.99	46.59	327.67	350.37
			Tot. Establishments	54.26***	88.38	47.49**	85.75	38.40***	43.97
			Market Share %	1.22***	3.57	1.35***	3.72	1.75	3.54
			Gross Margin %	30.77***	29.07	39.60***	24.24	33.85***	19.71
			EBITDA Margin %	-4.77***	37.61	3.0***	17.58	6.90***	12.77
			ROA %	-6.90**	25.39	-0.03**	21.44	3.86***	12.58
			EBIT/Employee	18.73**	168.4	7.32**	28.62	16.93**	77.08

Source: own elaboration.

\* Prob  $\leq 0.10$ .

\*\* Prob  $\leq 0.05$ .

\*\*\* Prob  $\leq 0.01$ .

The groups resulting from the clusters, Table 1, basically match those that come from manually classified companies based only on their royalty, which shows that the market is efficient and there is a clear relationship between groups of prices paid and economic characteristics of the enterprises, so *hypothesis I* is confirmed.

To evaluate the importance that each variable possesses specifically in Eq. (1) and to check the *hypothesis II (a)*, we have employed the forward stepwise method in SPSS (Table 3), which consists of elaborating sequential models in which an additional variable is included time after time until they stop providing significance and so, the procedure ends. It should be mentioned that the predictors included are continuously re-evaluated, so that if a variable has not enough discriminating power or is explained by others it is deleted. The method chooses firstly the variable that has the best abilities for explaining the group differences. Afterwards, through the step by which the variable has been selected we can ascertain its importance. This is done by using the global Wilks' Lambda<sup>8</sup> and the *F* statistic.<sup>9</sup> As a consequence of the introduction of each exogenous variable (all of them with a *p*-value less than 0.01) the

Lambda goes down, which means that the discriminating power is improved among the groups.

In the table above it is observable that included-excluded variables change for each industry. For example *Market Share* is dropped from all the sectors. However, in the case of the food industry the *Gross Margin* is also eliminated.

With this method, as in our analysis we have created three groups by industry, we use two canonical functions. Each one of them explains the differences in the behavior of each pair of groups. The canonical correlation in Table 4 measures the association between the discriminating score and the set of exogenous variables. It is very high in all cases: in food D1 has 0.87 and D2 0.71, health and beauty 0.77 and 0.65, and in fashion 0.94 and 0.74 respectively. In this table the test of Wilks' Lambda also compares hierarchically the significance of the two functions obtained. Null hypothesis<sup>10</sup> is rejected to a probability of 100%, so both, D1 and D2, distinguish significantly between groups. Correlations and *p*-value confirm that there is a significant relationship between exogenous variables selected by stepwise method and the groups of royalties, as we indicated in *hypothesis II (a)*.

It is observable that in the food industry, the centroid of the high royalty group is located in D<sub>1</sub> at the positive extreme, whereas the mean of enterprises with medium royalty is in the center of the interval and finally the sign of a low royalty is negative. In this way we can interpret the rest of the values of centroids by canonical functions in the other sectors. So, in Table 4, the first function (D1) explains the differences between the high versus low royalty for food, health and beauty, while the second function, (D2) shows the relationship between the medium and high royalty for food, and it compares the score of a medium value relative to a low one for health and beauty. For its part, in fashion, (D1) accounts for the

<sup>8</sup> Lambda is equal to the quotient between the sum of the square of each group (squared deviations of each data point concerning the mean of the groups or centroid) and the total square sum (squared deviations of each data point concerning the mean of the whole points). The result shows the percentage of the variance is not explained by group differences.

<sup>9</sup> This criteria works in the following way, if the value of *F* is higher than 3.84 (the critical 0.05 significance), the variable will be included, if not, it will be deleted. However, finally, a minimum output value which must be at least 2.71 is required. The *F* statistic as a function of Wilks' Lambda is measured by the following formula:  $\left[ \frac{(n-g-p)/(g-1)}{(1-\lambda_{p+1}/\lambda_p)/(\lambda_{p+1}/\lambda_p)} \right]$  where *n* is the number of elements of the sample, *g* is the number of groups and *p* is the number of exogenous variables. The result gathers the change in the value of  $\lambda$  after the incorporation of every variable in the model. Forward stepwise procedure can introduce those variables which fulfill the requirements of the *F* statistic and also have the lowest value of the Wilks' Lambda statistic. However, if finally it is a minimum level of tolerance, which is defined as  $1-r^2$ ,  $r^2$  being the determination coefficient of the multiple linear regression, in which the dependent variable is the one that has entered in the

final stage and the explanatory ones are those that have entered in previous steps. In this paper the level of tolerance by default using SPSS is 0.001.

<sup>10</sup> Ho implies the model does not distinguish the group means.

**Table 3**  
Results of the variables selection to the stepwise method.

	Food			Health and beauty			Fashion		
	Steps	F ratio	Wilks' Lambda	Steps	F ratio	Wilks' Lambda	Steps	F ratio	Wilks' Lambda
Establishments	2	34.24	0.18***	1	39.31	0.45***	2	30.27	0.16***
Market Share%	Elim	Elim	Elim	Elim	Elim	Elim	Elim	Elim	Elim
Gross Margin%	Elim	Elim	Elim	3	3.85	0.24***	3	36.52	0.09***
EBITDA Margin	1	13.44	0.34***	2	13.72	0.26***	4	16.72	0.08***
ROA%	3	9.14	0.14***	Elim	Elim	Elim	5	10.52	0.05***
EBIT/Employee	4	4.67	0.12***	Elim	Elim	Elim	1	121.85	0.40***

Source: own elaboration.

\* Prob ≤ 0.10.

\*\* Prob ≤ 0.05.

\*\*\* Prob ≤ 0.01.

**Table 4**  
Centroids by canonical functions, standardized coefficients and significance.

	Centroids by canonical functions					
	Food		Health and beauty		Fashion	
	1	2	1	2	1	2
Medium	0.40	-0.79	-0.09	0.80	-0.72	-0.73
High	1.38	1.47	2.60	-0.75	13.80	-0.65
Low	-3.95	0.57	-1.05	-0.96	-0.05	1.57
	Standardized coefficients of the canonical functions					
	Food		Health and beauty		Fashion	
	D1	D2	D1	D2	D1	D2
Tot. Establishment	0.27	0.98	0.82	-0.59	0.23	1.19
Market Share %	-	-	-	-	-	-
Gross Margin %	-	-	0.28	0.37	1.31	-0.69
EBITDA Margin%	0.67	-0.27	0.38	0.71	1.56	0.82
ROA%	0.55	-0.15	-	-	1.06	-0.39
EBIT/Employee	-0.14	0.52	-	-	1.90	-0.22
Wilks' Lambda = 0.12	Wilks' Lambda = 0.49	Wilks' Lambda = 0.24	Wilks' Lambda = 0.57	Wilks' Lambda = 0.05	Wilks' Lambda = 0.46	
Chi <sup>2</sup> (8) = 144.115	Chi <sup>2</sup> (3) = 48.14	Chi <sup>2</sup> (6) = 101.02	Chi <sup>2</sup> (2) = 39.20	Chi <sup>2</sup> (10) = 151.68	Chi <sup>2</sup> (4) = 40.98	
Prob > Chi <sup>2</sup> = 0.000	Prob > Chi <sup>2</sup> = 0.000	Prob > Chi <sup>2</sup> = 0.000	Prob > Chi <sup>2</sup> = 0.000	Prob > Chi <sup>2</sup> = 0.000	Prob > Chi <sup>2</sup> = 0.000	
Correlation = 0.87	Correlation = 0.71	Correlation = 0.77	Correlation = 0.65	Correlation = 0.94	Correlation = 0.74	

Source: own elaboration.

behavior of the high versus medium royalty, while (D2) shows the behavior of the medium versus low royalty.

In general terms there is a positive relationship between the variables and the royalties paid. For example, in the function D<sub>1</sub>, we can see in Table 4 that the food industry shows positive in the following coefficients: total *Establishments*, *EBITDA Margin* and *ROA*. In Health and beauty we can observe a positive sign in *Total Establishments*, *Gross Margin* and *EBITDA Margin*, and in fashion also in *Employee Productivity*. When each one of these variables increases it raises the probability of the enterprise belonging to the high royalty group. However, there are exceptions: *Employee Productivity*, in D<sub>1</sub> for food, or *Total Establishments*, in D<sub>2</sub> for health and beauty, and also for fashion. So we can only partially confirm hypothesis II (b).

*EBITDA Margin* and *Total Establishment* are the variables which explain the differences between the groups in all sectors, and they have the highest coefficients in absolute terms in food and health and beauty. Nevertheless we can check that variables concerning productivity: *Return on Assets* and *Employee Productivity* are only relevant in food and fashion. This fact indicates that each franchise sector collects structural differences and capabilities to create value in the companies.

Then, although it is obvious that in all sectors when the level of royalty rises productivity variables also increases, see Table 2, in the case of health and beauty, this contribution is not as relevant or seems to be explained by other variables. So, in this model it is not possible to use the same quantitative variables and their

corresponding weights for different sectors, confirming hypothesis III.

In this research, a confusion matrix has been used in order to determine the model's goodness of fit, *purpose one*. The number of well classified cases is very high (Table 5) because it is up to 95% for the case of the food industry, 89.2% for the health and beauty industry and, finally 96.5% for the fashion industry. As an illustration, in the beauty and health sector, over all enterprises classified in origin as royalty medium (vertical axis), the proposed model (horizontal axis) has classified the 92.3% in this level, while the rest, 7.7%, in the low royalty.

Below, we illustrate by an example the process to calculate the strength and the value of a brand for the food industry, *purpose two*.

The Fisher equations are:  $F_1$  which represents the medium royalty,  $F_2$  for the low royalty and  $F_3$  explains the higher royalty:

$$F_1 = -1.17 + 0.005 * Est + 0.012 * EBITDA - 0.005 * ROA + 0.00 * Prod + \varepsilon, \quad (4)$$

$$F_2 = -10.851 + 0.007 * Est - 0.134 * EBITDA - 0.174 * ROA + 0.008 * Prod + \varepsilon, \quad (5)$$

$$F_3 = -4.935 + 0.044 * Est + 0.014 * EBITDA + 0.007 * ROA + 0.006 * Prod + \varepsilon. \quad (6)$$

**Table 5**  
Results of the classification: confusion matrix.

		Results of the classification				
Food		Predicted group			Total	
		Medium 5.2	Low 4.2	High 6.5		
Original	Classifies well %	Medium	100.0	0.0	0.0	100.0
	95.9 of the cases	Low	9.1	90.9	0.0	100.0
		High	10.5	0.0	89.5	100.0
Beauty and health		Predicted group			Total	
		Medium 5.2	High 6	Low 3.1		
Original	Classifies well %	Medium	92.3	0.0	7.7	100.0
	89.2 of the cases	Low	8.3	0.0	91.7	100.0
		High	18.2	72.7	9.1	100.0
Fashion		Predicted group			Total	
		Low 2	High 4	Medium 3		
Original	Classifies well %	Medium	0.0	0.0	100.0	100.0
	96.5 of the cases	Low	88.9	0.0	11.1	100.0
		High	0.0	100.0	0.0	100.0

Source: own elaboration.

From the above equations, a  $Pr(g/F)$  probability can be calculated, in other words, if a company obtains a discriminating score  $F$ , then it will belong to  $g$  group. From Uriel (1996) the following formula (the result of which coincides with Bayes' rule considering the priori probabilities of groups as equal), may be applied:

$$Pr(g/F) = \frac{e^{F_g}}{e^{F_1} + e^{F_2} + e^{F_3}} \tag{7}$$

Therefore, if a company  $i$  has, for example, 201 Establishments, an EBIT/Employee equal to 17.04 (in thousands of monetary units), ROA equal to 14.03%, an EBITDA Margin of 18.48%, then  $F_1 = -0.24$ ,  $F_2 = -9.38$  and  $F_3 = 3.95$ . Consequently, applying (7),  $Pr(1/F) = 0.015$ ,  $Pr(2/F) = 0$ ,  $Pr(3/F) = 0.985$ . Then it could be predicted that this company belongs to the third group, or high royalty, because this is most likely, and we obtain at the same time a score  $F_3 = 3.95$ , the largest of the three expressed above.

In this way, a shortlist of three values  $P_{ij} = (P_{i1}, P_{i2}, P_{i3})$  would be assigned for each company,  $P_{ij}$  being the probability of a company  $i$  belonging to the group  $j$ , thus  $X_i$  is the solution of the discriminating score (Eq. (8)):

$$X_i = \left( F_{ij} / P_{ij} = \max_{j=1,2,3} \{P_{ij}\} \right) \tag{8}$$

For each sector, we obtain  $X$ , the Fisher discriminating score vector, a set of solutions (one for each enterprise) resulting from the probability of pertaining to the most likely cluster. In order to determine the companies' brand strength, purpose two, the previous vector must be divided into deciles. The fifth and tenth decile corresponds to the low royalty cluster. The twentieth decile contains two elements which have obtained the highest score in the low royalty group and the rest are those that have obtained the lowest scores in the medium royalty cluster. For its part, the 13th, 15th and 17th deciles include the remaining companies of the medium cluster with successively larger scores and finally, the eightieth, ninetieth and 95th deciles have been set up using these companies that have been classified as high royalty.

Each decile,  $F(x)$ , represents the cumulative probability of these scores or brand strength. It will record, through a score from 0 to 100, the level or strength with which the attributes of any company in the sector add value with respect to the whole sample. Brand strength is represented in Table 6 and Fig. 3 for the food sector, in

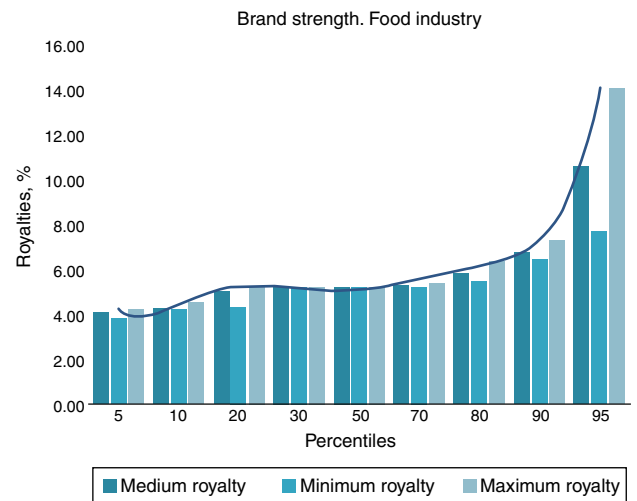


Fig. 3. Percentiles and brand strength.

Source: own elaboration.

which for each percentile the medium, minimum and maximum corresponding discriminating score and market royalty is shown.

In our example, in addition to putting the new company  $i$  within the high royalty cluster, as was indicated before, the strength of its brand against other competitors would be between 90 maximum and 95 minimum deciles because its score ( $X_i$ ) was 3.95. Based on the strengths the royalty rate would be between the maximum decile 90, 7.28% and minimum decile 95, 7.73%.

Once the range of implicit royalty is enclosed the value of the brand may be determined. First, we can calculate the cash-flow corresponding to the brand, or saving royalty ( $SAVING_{royalty}$ ), multiplying sales planned for that product or brand by its implicit royalty. If the projected sales  $i$  are 10 (MM €), the saving royalty would be 728–773 (thousand €). Finally, the financial value of the brand incorporates other parameters, such as the lifetime and the required return of the specific intangible asset for the financial structure ( $K_I$ ). Given that the IAS 36 (2004) provides an indefinite

**Table 6**  
Brand strength expressed as a function of deciles.

	Deciles for 73 elements. Food industry								
	5	10	20	30	50	70	80	90	95
Average $X_i$ decile $j$	-11.05	-10.74	-3.46	-1.15	-1.11	-0.98	0.11	1.94	10.43
Maximum $X_i$ decile $j$	-10.83	-10.70	-1.15	-1.14	-1.07	-0.78	1.18	3.05	18.23
Minimum $X_i$ decile $j$	-11.62	-10.82	-10.54	-1.15	-1.15	-1.07	-0.56	1.32	3.95
Average royalty decile	4.07	4.23	4.98	5.18	5.20	5.26	5.81	6.72	10.59
Maximum royalty decile	4.18	4.49	5.17	5.18	5.22	5.36	6.34	7.28	14.12
Minimum royalty decile	3.79	4.19	4.33	5.17	5.18	5.22	5.47	6.41	7.73
Fischer average cluster	-10.79			-1.07			2.97		
Royalty average cluster	4.20			5.21			6.50		

Source: own elaboration.

life for brands, it is possible to calculate its value from the present value of an income of infinite term, see Eq. (9):

$$BRAND.VA(i) = \frac{SAVING_{royalty}}{K_I} \quad (9)$$

To determine  $K_I$ , the starting point is always the WACC or weighted average cost of capital. This concept also is the mean rate at which the economic structure rewards the financial structure. Therefore the entity could have added a risk premium to the WACC that is estimated to be appropriate based on the economic characteristics of the intangible asset<sup>11</sup>:

$$WACC = W_T * K_T + W_I * K_I \quad (10)$$

From the market remuneration of the tangible elements, we can easily isolate the WACC of the intangible part solving Eq. (10):

$$K_I = \frac{WACC - (W_T * K_T)}{W_I} \quad (11)$$

For example, if enterprise  $i$  has a WACC equal 11%, an enterprise value (EV) equal 17 (thousand €), of which tangible structure ( $W_T$ ) represents 10 (MM €), 58.82%, and the market remuneration ( $K_T$ ), 6%, the intangible rate discount ( $K_I$ ), from (11), give a value equal 18.14%. If the projected sales are 10,000 (thousand €) and the adjusted discount rate is 18.14%, then, applying Eq. (9) the confidence interval corresponding to the value of the brand would be 4012.60–4260.63 (thousand €).

## Conclusions and final remarks

From the described statistical methods: cluster technique and LDA, we have developed a model to determine the implicit royalty for buying or using a brand. Other statistical techniques, such as cluster, discriminating and multinomial logit models, have been widely analyzed in marketing studies, as in Punj and Stewart (1983), Perreault et al. (1979), Kamakura and Russell (1993) or Swait et al. (1993), but only from the point of view of the analysis that certain features confer to the product or to the buyers in order to achieve the best position in the market. However, the suitability of the cluster and LDA for this purpose has never been proved, despite authors like Nomen (2005) or Torres Coronas (2002) warning of the flaws of the royalty methodology and the necessity of including statistical techniques.

After being implemented, we have contrasted all the hypotheses and proposals. Firstly, although authors like Lev (1989, 2000, 2005),

<sup>11</sup> Smith and Parr (2005) assume that the weighted average return on the different assets within the company (denominated WARA) equals the WACC. The required return on intangible assets can be deduced from this equation if we know the rest of the terms. This method has been widely accepted in the process of purchase price allocation in business combination.

Brown et al. (1999), Dantoh et al. (2004) demonstrate the ineffectiveness of accounting variables to explain the value of intangibles, cluster technique proves to be useful for segmenting the companies according to the performance variables used (see Table 2), and, this classification coincides with that made by the market, so we conclude that the market is efficient in assigning royalties based on the variables proposed, *hypotheses I*.

Secondly, in line with Park and Srinivasan (1994), Bello Acebrón et al. (1994), Aaker David (1996) or Cerviño (2004), between others, we have proved (based on statistical tests) that the exogenous economic variables used generate enough discriminating power to explain the different groups of royalties which are collected in the three industries, *hypothesis II (a)* (see Tables 3 and 4), so it is clear that qualitative variables, which make up the brand value: leadership, stability, support or image, among others, when creating a value must be expressed in terms of improvements of companies' income statements, and those affecting the level of royalty.

Specifically, we have found that higher royalties paid depend positively on the market position and the economic profit, measured by number of establishments and EBITDA margin, confirming in part *hypotheses II (b)*. Nevertheless, in the Food and Fashion sector also the royalties paid are explained positively by other productivity variables, employee productivity and ROA. So, the behavior and the relevance of the exogenous variables are different depending on the industry, *hypotheses III* and Table 3, and then it is not possible to use the same model for all sectors.

Finally, the discriminating technique suitably predicts the group to which a new company belongs for all the mentioned industries (Table 5) and, using the scores obtained with the equations of Fisher (Table 6), a ranking of the companies can be created to determine the brand strengths, which is confirmed by their market position with respect to other competitors.

The implications of this research are very important for practitioners and researchers. For consulting firms, the proposed model allows us to determine the flow corresponding to a certain brand, of any non-franchising company, in order to ascertain its value with the rigor and demands that the accounting standard requires. This is particularly the case of IAS 38, IFRS 3 and 13, for example in a business combination. On the other hand, it is important for companies which want to expand through franchises and they need to calculate the level to charge by royalty in line with the market. Finally, from a strategic point of view, the model allows them to calculate the companies' brand strength. This shows the market position of a specific franchisor vis-à-vis the competitors across their economic value drivers, and this would help the companies to carry out strategic plans to increase their brand's value.

This proposal could also be complemented in future research lines with other models which try to find an internal and qualitative perspective of the brand value generation. In fact, it remains a challenge to find the map with the corresponding relationships between qualitative and quantitative variables, thus to achieve a complete knowledge of value brand generation.



**Annex 1.1. Franchising companies: Food industry**

AKRA FRÍO, S.L.  
 ALADA 1850, S.L.  
 ALMA DE CACAO  
 ARROCIERÍAS DE ALICANTE, S.L.U.  
 ARROCIERÍAS DE ALICANTE, S.L.U.  
 AZEITE E VINAGRE, LDA.  
 BAÑOS GARRE, S.L.  
 BEER & FOOD GRUPO DE RESTAURACIÓN  
 BEIRUT KING S.L.  
 BIERWINKEL, S.L.  
 BODEGAS GALIANA ALIMENTACIÓN, S.L.  
 BRASERÍA LOS DUENDES S.L.  
 BRUSTERS RESTAURANTES 2010, SL  
 BURGER KING ESPAÑA, S.L.U.  
 BURGER RICKY  
 CAFÉ DEL MERCADO FRANQUICIAS, S.L.  
 CAFÉS CANDELAS SL  
 CENTRAL DE FRANQUICIAS PANTAIBERIC  
 CHOCOLATES VALOR, S.A.  
 CIA. DALLAS RIB'S, S.A.  
 COFFEE & FOODS  
 COMESS GROUP DE RESTAURACIÓN  
 COMESS GROUP DE RESTAURACIÓN, S.L.  
 COMESS GROUP DE RESTAURACIÓN, S.L.  
 COMESS GROUP DE RESTAURACIÓN, S.L.  
 COREN GRILL, S.A  
 DEHESA SANTA MARIA FRANQUICIAS S.L.  
 DIABLITO FRANCHISING, S.L.  
 DISTRIB. ALIMENT. SURESTE SAU  
 DON ULPIANO FRANQUICIAS S.L  
 DOOPIES & COFFEE, SL  
 DRUNKEN DUCK FOOD, S.L.  
 DUNKIN ESPAÑOLA S.A  
 EL MOLÍ VELL  
 EURO TAPASBAR, S.A.  
 EXPANSIÓN DE FRANQUICIAS, S.L.  
 EXPANSIÓN DE FRANQUICIAS, S.L.  
 FAVORIT COFFEE SHOP, S.L.  
 FOOD SERVICE PROJECT, S.L.  
 FRANCHISINGS KURZ & GUT, S.L  
 FRANQUICIAS LA PIEMONTESE SLU  
 FRANQUIPAN, S.L.  
 FRIENDS & MOJITOS S.L  
 GINOS FRANCHISING, S.L.  
 GRAN PALADAR SL  
 GREEN DEVELOPPMENT  
 GRUPO ALASKA  
 GRUPO RESTALIA  
 GRUPO ZENA DE RESTAURACIÓN, S.A.  
 GRUPO ZENA DE RESTAURANTES S.A.  
 HOSTELOESTE, S.L.U.  
 ILOPEZHIDALGOA  
 INVERSIONES VENESPOR, S.A.  
 INVESANVEL, SL  
 JUNIO 1972 RESTAURACIÓN, S.L.  
 KANIKAMA PROJECT, SL  
 KRUNCH FRANCHISING, S.L.  
 L.N.F. FRANCHISING S.L.U.  
 LA BOHEME  
 LA CUEVA 1900  
 LA SUREÑA  
 LACREM, S.A.  
 LLOGUECATA, S.L.  
 LOS BODEGONES  
 MAC PAPAS, S.L.  
 MATERASTURIAS, S.L.  
 MIGUEL SANCHO S.L  
 MY CREPE, SL  
 O REI DAS TARTAS  
 ODRE Y HOGAZA, S.L.  
 OPEN 25  
 OVERPANI FRANQUICIAS, S.L.  
 PANA-ROM S.L  
 PANSFOOD, S.A. (THE EAT OUT GROUP, S. L.)  
 PARSIN'S, S.L  
 PASTIFICIO SERVICE, S.L.

PECADITOS  
 PIZZA LEGGERA WORLDWIDE  
 PIZZA MARZANO, S.A.  
 POLLO CAPORAL FRANQUICIAS, S.L.  
 RAMÓN Y VIDAL, S.L.  
 RECREATIVOS TORNAJUELO  
 RESENDE, S.L.  
 RESTAURANTES BRUNO, S.L  
 RIGARUSSO ASOCIADOS, S.L.  
 RODILLA SÁNCHEZ, S.L.  
 SAFO MEDITERRÁNEA, S.A.  
 SAMORVARTE Y CAFÉ, S.L.  
 SDAR SRL  
 SERVIFRUIT GOMAB S.L.  
 SPORTS FRANCHISING, S.L.  
 STICKHOYSE BCN, SL  
 TELEPIZZA, S.A  
 TERRA VITAE, SL  
 THE EAT OUT GROUP, S.L. (BOCATTÀ 2000, S.L.)  
 UNIDE  
 URBAN LIFE FOOD COURT  
 VINUS BRINDIS S.L.  
 YUM RESTAURANTS ESPAÑA  
 ZUMO BAR CANARIAS S.L.

**Annex 1.2. Health and beauty industry**

ABANOLIA  
 ACORDE PLUS, S.L  
 ACR WAX COSMETICS, S.L.  
 ACR WAXCOSMETICS, S.L.  
 ACTUAL STHETIC, SL  
 ALDABE S.A.  
 ALDABE, S.A.  
 ALDABE, S.A.  
 ALTA ESTÉTICA SL  
 ASOCIADOS LLONGUERAS  
 BE STHETIC  
 BEN&SULY S.L  
 BENESSERE FITNESS PILATES NUTRICIÓN.  
 BENZAQUEN2, S.L  
 BODY FACTORY FRANQUICIAS, S.L.  
 BYE BYE PELOS, SL  
 C&C CASANOVA S.A.  
 CEBADO, S.A  
 CEFOGA 2000, S.L.  
 CELLULEM BLOCK  
 CENTROS DESESTRES, S.A  
 CENTROS PULSAZIONE INTERNACIONAL, SL  
 CLÍNICA SACHER–MEDICINA ESTÉTICA.  
 CLÍNICAS CAREDEPENT, S.L.  
 CLÍNICAS CETA S.L.  
 CLINICAS PODOLOGICAS  
 CLÍNICAS VIRGEN DE LA PAZ S.L  
 COMPAÑÍA DE SERVICIOS MÉDICOS AMENTA S.L.  
 CONTIFARMA, S.L.  
 CONTOURS EXPRESS IBÉRICA S.L  
 COVALDROPER GRUPO  
 CUERPOS FITT  
 CURVES INTERNATIONAL OF SPAIN, S.A.  
 D ELITE EVENT PLANNERS SL  
 DENTALIS  
 DEPICOOL  
 DEPILINE WAX & COSMETICS S.L.  
 DORSIA CENTRAL DE COMPRAS, SL  
 ECOLOGIC BY LINDA NICOLAU, S.L.  
 ELIMINA EL VELLO  
 EPILAE NORTE, S.L.  
 ESTETICA Y SALUD MASCULINA S.L.  
 ESTETICBODY  
 ETHIA CENTROS MÉDICO ESTÉTICOS  
 EXTENSIONMANIA  
 FITNESS19  
 FK ESTETICA INFANTIL S.L.  
 FRANCK PROVOST  
 GIRÓN & NAVARRO INTERNACIONAL  
 GLOMONT S.L  
 GRUPO ACTUAL ESTHETIC - BIOTHECARE ESTETIKA

### Annex 1.3. Fashion industry

ARZANO, S.L.  
 CALDERÓN FRANQUICIAS, S.L.  
 CÁLLATE LA BOCA  
 CHAQUE S.A.  
 CHICCO ESPAÑOLA, S.A.  
 CITY FINANCE 2011, SL  
 CRYSANNA COLLECTION, S.L  
 CUPPERTON DEVELOPS S.L.  
 DISTRIBUCIONES INTERNACIONALES M.ERCILLA, S.L  
 DIVINA PROVIDENCIA  
 DM2 ESTILO MODA S.L.  
 EIGHTEEN OCTOBER 2001, S.L.  
 EMERGENCIA PERMANENTE, S.L.  
 EMERGENCIA PERMANENTE, S.L.  
 EMPORIO FRANCHISING  
 EVA ALFARO  
 FERNANDEZ-MATAMOROS MAS-SARDA JOSÉ MARÍA S.L.N.E  
 FRANDESIM, S.L.  
 FRANQUICIA LAS LILAS S.L.  
 GLOBAL DE PRODUCTOS ONLINE S.L  
 GOLD SYSTEM MERCADO, SL  
 GROUPE ZANNIER ESPAÑA S.A  
 GRUPO LOVE STORE, S.A.  
 GRUPO OSBORNE S.A.  
 GRUPO ROSA CLARÁ  
 GUBESA CO, S.L  
 IKKS SPORTSWEAR SPAIN  
 INDUSTRIA FRANCO ESPAÑOLA DE MODA, S.A  
 INTERMALLA, S.L.  
 JONAS 3000,S.L  
 JORDI ANGUERA ESPAI I COSTURA SL  
 JULIO MAESTRE, S.L.  
 KARPI CONFECCIÓN, S.L.  
 KIABI ESPAÑA - KSCE, S.A.  
 LA COMPAGNIE DES PETITS  
 LA NÁUTICA SERVICIOS NÁUTICOS, SL  
 LA POUNTY S.L.  
 LA TIENDA DE LOLÍN FRANQUICIAS, S.L.  
 LAPEGAL ARTE LEÓN S.L. BULKA  
 LOURIDO Y REAL S.L.  
 LUXENTER SHOPS  
 MACSONSA  
 MARFA TESSILE, S.L.  
 MEIGALLO  
 MIROGLIO ESPAÑA, S.A.U.  
 NECK CHILD S.A  
 OPI PRENDAS INFANTILES ORCHESTRA S.L.  
 PASARELA CLM S.L.  
 PATRIC SPORT, S.L.  
 PATRICKS S.A  
 PIEL DE TORO  
 PILI CARRERA, S.A.  
 PLATAX ORFEBRES, S.L.  
 POETE S.L.  
 RECSTORE  
 SELCONET, S.A.  
 STAR TEXTIL, SA  
 SUPERDRY  
 SUX TRIT, S.L.  
 TEXTIL TEXTURA, S.L.  
 THIS WEEK  
 VARLION ESPAÑA S.L.  
 WOLFORD ESPAÑA, S.L.

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