

CORPORATE GOVERNANCE AND INNOVATION: A SYSTEMATIC LITERATURE REVIEW

Juan Pablo Gonzales-Bustos*, Ana Beatriz Hernández-Lara*

* Rovira i Virgili University, Av. Universitat, 1 (43204) Reus, Spain

Abstract

The main objectives of this study are two-fold. The first one is to determine the relevance that the academic world has given to the study of the relationship between corporate governance and innovation. The second is to identify the key aspects of this relationship that deserve further investigation, and the models in which the research is recently interested in order to advance in this field. To do so, a systematic literature review was conducted on the relationship between corporate governance and innovation. The findings show that the main topics discussed include ownership concentration and the composition and structure of boards of directors, whose impacts on innovation have been analyzed with scarce consensus. Many academic works have studied these elements of corporate governance separately; however, studies analyzing ownership and board together are becoming more frequent, highlighting the moderating effect of some aspects of government on others, and how their influence depends on contingent factors. To the authors' best knowledge, no similar systematic review has been undertaken on this subject, although such reviews allow us to visualize better the evolution of topics with a long research tradition and identify the main findings and the lines of research open.

Keywords: Corporate Governance, Ownership Structure, Board of Directors, Innovation, Systematic Literature Review

JEL Classification: G3

1. INTRODUCTION

Nowadays business competence is influenced by a turbulent context, characterized by constant and unpredicted changes, where the introduction of new practices into the market, of all kinds, organizational, commercial, financial, institutional or technological, are becoming crucial tools to improve companies' competitiveness and survival. Thus, innovation has become a crucial element for the creation and improvement of competitive advantage in the long term (Becheikh *et al.*, 2006; Johannessen *et al.*, 2001). However, until now, there is not sufficient research to completely understand why companies with similar external conditions show different behavior towards innovation (Belloc, 2012).

Literature on corporate governance offers some useful ideas for the comprehension of innovation in companies (Belloc, 2012), recognizing that businesses differ in the structure and organization of their governance bodies, and that these differences may explain partially, amongst other factors, innovations adopted by them (Barker and Mueller, 2002; Lin *et al.*, 2011). Indeed, within the concept of corporate governance itself lies the implication that it may affect innovation, as far as corporate governance involves all the companies' management bodies with decision-making powers and the distribution of powers amongst them (Fama and Jensen, 1983; Jensen and Meckling, 1976).

Despite the link between different aspects of corporate governance and innovation, and the fact

that its analysis started decades ago (Goodstein and Boeker, 1991), there have been much fewer research studies conducted on this relationship between corporate governance and innovation, than on the relationship between corporate governance and business performance (Shah *et al.*, 2011).

This paper has two objectives. Firstly, it seeks to conduct a systematic literature review (SLR) on the influence of corporate governance on innovation. To the authors' best knowledge, no similar review has been undertaken on this subject, although such a review is advisable when embarking on a line of research that has been analyzed over time using different perspectives. This review methodology allows for the existing literature on this line of research to be identified and systematized, as well as establishes the degree of interest that this topic has generated amongst scientific production in the field of business management. Secondly, a content review of the relevant research was carried out to determine the main findings already established and the lines of research still open.

The goal of these objectives is to contribute to the academic field by determining if the relationship between corporate governance and innovation is an emerging topic or a mature one, which aspects of this relationship have been sufficiently demonstrated, and which others merit further additional research. Overall, this study intends to provide some guidelines about the new models of relationships in the field of corporate governance and innovation.

2. CONCEPTUAL FRAMEWORK

2.1. Innovation

Research on innovation has resulted in a vast literature, mostly motivated by the abstract, wide and multidimensional character of innovation. As a matter of fact, nowadays a consensual theory does not exist that explains all about innovation, its adoption, development and success in organizations (Damanpour, 1987; Gatignon *et al.*, 2002; Johannesses *et al.*, 2001).

The first academic conceptualization of innovation emerged with Schumpeter (1934), who defined innovation as a wide phenomenon that involved any new way of doing things in the economic field. From this concept, innovation could be understood as any change, modification, improvement or creation, independently on its object (product, process, structure, method, etc.) as far as it has been implemented or applied in the market. Thus, innovation involves a process with different stages, where the new ideas must be first created, proved, put into production, and finally, placed on the market, to affect individuals, companies and the whole society (Schumpeter, 1939; Thompson, 1965; Van de Ven, 1986).

At the level of firms and industries, many types of changes can be considered, for example, those that affect their methods of work, their use of factors of production, their outputs to improve productivity and performance, etc.... These multiple changes have raised different categories and types of innovation; such as innovation of products, processes and organizations; technological or non-technological changes; radical or incremental innovations, etc. (OECD, 1997). Given the different nature and extent of the concept of innovation, it becomes necessary to select a subset of all the possible changes in companies for further study. This work concentrates in technological innovation, specifically based on goods, in order to focus in just one type of innovation, with similar patterns and features amongst companies. This choice is based on different reasons. First, previous research has been very interested in R&D as a necessary condition to innovate, since R&D enhances the capacity of firms to innovate, is frequently recognized as one of the most relevant inputs for innovation, and is a starting point for its analysis (Balkin *et al.*, 2000; Dalziel *et al.*, 2011; Kor, 2006). Second, different aspects related to R&D activities have been frequently used as an innovation indicator; for example, R&D expenses or R&D intensity are used to measure the efforts made by companies to innovate (Evangelista *et al.*, 1998; Gugler, 2003; Hitt *et al.*, 1991); the number of registered patents, obtained as a result of R&D activities, serves as measure or innovation outcomes (Alegre-Vidal *et al.*, 2004; Coombs *et al.*, 1996; Griliches, 1990; Hitt *et al.*, 1991). Third, many companies organize their innovation activities through R&D departments in charge of finding new uses for the existent products, improving their fabrication processes, and analyzing the novelties of the competences (Roman, 1968). Forth, there has been relatively little research on innovation in services and organizational innovation in comparison with technological innovation in products (Sirilli and Evangelista, 1998). Fifth, high-

tech companies, responsible for launching radically new products into the market, are especially relevant nowadays due to their high contribution to the global Economy (Balkin *et al.*, 2000).

2.2. Corporate governance

One of the first definitions widely accepted on corporate governance was offered by the Cadbury report (1992) when considered corporate governance as "the system by which companies are directed and controlled" (p. 14). Some adaptations of this first definition have been used later on by most of the corporate governance reports that emerged in other countries, like the Cardon report of Belgium (1998), or the Preda report of Italy (1999), and by other works, like Du Plessis *et al.* (2005) and Monks and Minow (1995).

The main goal of good governance in companies is to protect shareholders and other stakeholders from the managerial discretion. The separation between ownership and control and divergent interests of different stakeholders, make it necessary to adopt governance mechanisms to align stakeholders' interests (Cuervo, 2002). These mechanisms try to reduce agency costs and guarantee an efficient decision-making process that maximizes the company's wealth (Ahlering and Deakin, 2007).

There are multiple corporate governance mechanisms recognized by research, both internal and external (Fama and Jensen, 1983; Jensen, 1993). Amongst the internal mechanisms, the most relevant ones seem to be the board of shareholders, ownership structure, board of directors, and the role of compensation of directors and managers.

This study is focused in the influence of internal corporate governance mechanisms on innovation, specifically ownership structure and board of directors, which emerge as the most frequent topics in corporate governance literature.

3. APPLICABILITY OF A SYSTEMATIC LITERATURE REVIEW INTO CORPORATE GOVERNANCE RESEARCH

A search of works dedicated solely to reviewing corporate governance literature revealed some relevant studies, some of which were undertaken in the last few years and demonstrate the recent interest that this subject has generated at a theoretical level. Amongst these studies, we can highlight, for example, the research undertaken in the fields of accounting and finance, which reviews literature that relates corporate governance with best practices in accounting and auditing (Carcello *et al.*, 2011). Also notable are those studies that were conducted to examine literature on corporate governance within specific business sectors, such as the pharmaceutical industry (Dadfar *et al.*, 2010) or banking (Wang and Xi, 2004). Others undertook reviews of current topics in the field of corporate governance related to the use of data or new information and communication technologies (ICTs) (Schneckenberg, 2009). It is also worth mentioning some papers which review the new regulations and reforms introduced in corporate governance (Beh, 2007) or specific characteristics of governance, such as the relationship between different stakeholders

with decision-making powers and how they integrate with each other (Petrovic, 2008), etc.

These studies constitute reviews on corporate governance. Nevertheless, none of the studies mentioned undertook a SLR on matters related to corporate governance. And more precisely, neither did we find any studies of literature review that jointly analyzed the relationship between corporate governance and innovation. We think that it is interesting to conduct this kind of revision of these two topics considered together, because although academics seem to have been especially interested in analyzing the relationship between corporate governance and the companies' performance, the influence of corporate governance on innovation has also emerged as an interesting topic of research for some decades now. SLR is recommended in order to fully understand previous research on fields that count with a certain tradition, to make clear and order their main topics and conclusions (Moustaghfir, 2008). This kind of literature review avoids some bias and limitations of traditional "narratives" reviews and allows the systematization and visualization of the current state of scientific research into one topic, in our case, the relationship between corporate governance and innovation.

The SLR consists of making a search of the papers that deal with the subject of the research, through the use of explicit and reproducible search criteria. This technique also implies that the processes developed during the search are logged, with the objective of leaving behind a working road-book of the decisions made, as well as the procedures followed, facilitating the replication of future scientific studies in a transparent way (Cook *et al.*, 1997). The search process usually brings up a large number of documents, which are subsequently reviewed according to agreed criteria for inclusion or exclusion, often by a review panel (Moustaghfir, 2008). In this way, the intention is to obtain quantitative information on the relevance of the topic to the research, as well as its development over time.

In the field of business management and administration, Tranfield *et al.*, (2003) and Thorpe *et al.*, (2005) established the criteria for applying an SLR to this field.

Moustaghfir (2008), following the initial proposals of Tranfield *et al.*, (2003), sets out some steps to follow as part of the SLR process in the field of business management, which are: planning the review, identification of keywords, selection of databases, selection of the period of search, selection of studies, data extraction, data synthesis, getting evidence on results and recommendations.

Details are given below on how the most important stages of the SLR in this study were carried out. Some of these stages are methodological by nature, whilst others allow results to be specified and conclusions drawn on the subject of this research.

4. METHODOLOGY

4.1. Identification of keywords

The keywords chosen to use from the outset are related to broad or generic subjects linked to the relationship between the concepts of interest in this

review; on the one hand, there is "corporate governance", "ownership structure", and "board of directors"; and, on the other hand, there is "innovation" and "research and development (R&D)".

The choice of these keywords was due to a variety of reasons. First, there was a need to identify any studies which dealt with the relationship addressed by this paper, regardless of the aspect analyzed, and, to that end, the study started with more generic searches, using the general terms "corporate governance" and/or "innovation". In this way, it was not necessary to take any *a priori* decision on how to limit the search to specific aspects of both topics when, the interest was in obtaining the highest number of articles possible. Second, once the preliminary searches had been done, other general topics also appeared, closely related to corporate governance and innovation respectively. This gave rise to the consideration of other keywords, such as "ownership structure" and "board of directors", in relation to corporate governance; and "R&D", in relation to the type of innovation in which we are interested.

In the case of corporate governance, as far as it emerges from the separation between ownership and control, and the existence of distinct agents with decision-making powers, ownership structure and boards of directors raise as elementary parts of it, both of them being in the cusp of what represents power within the company, and being internal mechanisms of corporate governance (Fama and Jensen, 1983; Jensen and Meckling, 1976). Regarding innovation, research has frequently analyzed R&D as a key indicator of the effort that companies put into innovation and it is frequently used due to the access to R&D data (Wu, 2008).

This review also showed other general issues related to corporate governance and innovation, such as "internal control", "family control", "concentration", "blockholders", "top management teams", "technological innovation", "R&D strategy", "R&D expenses" and "patent", however these new keywords were included in the general concept already considered, and did not add new studies to our review. Following on from this approach to the subject of the study, and given that this paper intends to review the literature pertaining to the influence of corporate governance on innovation and not treat them as separate subjects, different combinations of the keywords mentioned above were used in such a way that each of these combinations would bring together one keyword related to corporate governance and another related to innovation.

4.2. Selection of database

The database selected to do the search was the *Web of Science*. This decision was based on the general acceptance of this database and its high level of prestige in the academic world (Richart-Ramón *et al.*, 2011). Additionally, the *Web of Science* covers a large number of journals specialized in the fields of company administration and management. The *Web of Science* lists two categories of journals that deal with general management topics, these being "business" and "management," where the number of journals has practically doubled during the last decade. Thus, in 1997, the "business" category

appeared in 51 registered journals, which increased to 111 in 2013. The “management” category appeared in 59 registered journals in 1997, which went up to 173 in 2013. Between the two categories, if we exclude the duplication of journals, in 2013 they accounted for 240 academic journals. Our purpose is not to develop an exhaustive search of all the papers that deal with our research subject, but to systematize and visualize the current state of the scientific research about our topic, and we consider that the studies offered by the *Web of Science* database were enough to obtain our goal.

4.3. Search period

The search period started at the beginning of the 1990s, it was when a movement began to reform the control system and to improve the transparency and ethical behavior of companies. From that time, it began to be evident the need for some recommendations related to better governance,

which turned into a movement that led to the appearance of various codes of good governance. The movement started firstly at a European level with the British “*Cadbury Report on the financial aspects of corporate governance*” in 1992, and then a little later extended to an international level. Another factor that favored the development of these codes was the financial scandals of relevant European and American companies, such as Enron (2001), Tyco (2002), Xerox (2002), Ahold (2003) or Parmalat (2003), among others. Thus, the search period was limited to 1990-2014.

The keywords selected were combined into six possible combinations. The search initially produced 272 publications. Eliminating duplications and analyzing the abstracts of these articles allowed us to discount some of the 272 papers, those that were repeated and those that only made a negligible reference to the search criteria. At the end of this evaluation process, 163 papers were included for detailed analysis (Table 1).

Table 1. Keywords’ combinations and number of papers

<i>Search criteria</i>	<i>Results</i>	<i>Number of papers considered</i>
Corporate governance and innovation	57	38
Corporate governance and R&D	17	7
Ownership structure and innovation	121	89
Ownership structure and R&D	24	12
Board of directors and innovation	47	11
Board of directors and R&D	6	6
Total	272	163

Source: Elaborated by authors

5. RESULTS

5.1. Analysis of the evolution in the number of papers and journals on the relationship between corporate governance and innovation

In an attempt to confirm the relevance that research gives to the relationship between corporate governance and innovation, and determine whether it is possible to observe an evolution or a clear trend in its direction, the first analysis involved a count of the number of papers published and the journals that published these papers during the period between 1990 and 2014. The results of the analysis are summarized in Table 2.

As noted in Table 2, one of the first publications in this field dates from 1991. This is the work of Goodstein and Boeker “Turbulence at the top - a new perspective on governance structure changes and strategic change”. Figure 1 shows that, in the first stages of the period under consideration, the number of publications on the subject was low. In 1997, we found five publications, although, from that point on, the number of publications and their frequency dropped again. It was not until 2004 that this tendency began to change, which is an indication of when the study of the relationship between corporate governance and innovation began to acquire interest at an academic level. Most of the

papers, 78.2%, were published over the last nine years. The growth in the number of papers might be also undoubtedly related to the higher scientific and academic research over the last years. However, in relative terms, the percentage of papers on the relationship between corporate governance and innovation in these journals represents 0.11% of the total number of articles published by them in 1991. On the contrary, in 2014, this percentage increased to 1.06%. These data show the low volume of research on the relationship between corporate governance and innovation, but also points out that the evolution is changing, and the interest of research is growing, evidencing a positive trend despite the ups and downs in the publications in the reporting period.

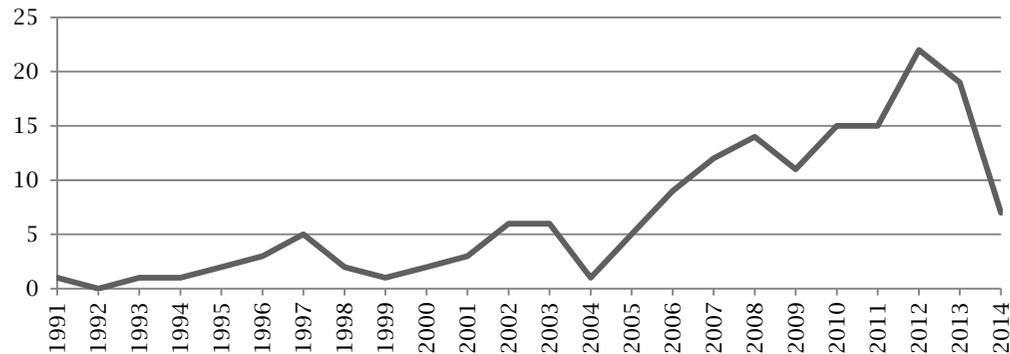
If we analyze the journals in which these papers were published, it is worth noting that their number is relatively small. Of the 240 journals found in the “business” and “management” categories on the *Web of Science* database, only 75 journals published research related to corporate governance and innovation, considered together. On the other hand, only a few journals repeatedly published papers on the relationship between corporate governance and innovation. The most relevant ones are: *Corporate Governance-An International Review*, *Research Policy*, and the *Academy of Management Journal*.

Table 2. Papers on the relationship between corporate governance and innovation from Web of Science database

Título de Revista	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	TOTAL	
CORP GOV-OXFORD																	2	2				2		3	9	
RES POLICY							1			1		1							1	1	2	1				8
ACAD MANAGE J	1					1					1	1	1					1				1				7
J MANAGE STUD													1			1				3						5
J BUS RES							1									1	1	1		1						5
ASIA PAC J MANAG																		1				2	1	1		5
FAM BUS REV																	1		1				2			4
IND CORP CHANGE															1				1		1		1			4
J MANAGE				1											1					2						4
STRATEGIC MANAGE J						1							1				2									4
OTHERS (With three publications)							1	1		1			2	1				2	2		2		2	1		15
OTHERS (With two publications)					1				1		1	1			1	2	2	5		1	5	2	2	2		26
OTHERS (With a publications)			1		1	1	2				1	2	1		1	1	2	1	3	6	5	9	9	1		47
PROC. Of I. CONFERENCE								1				1			1	2	2	1	3	1	2	3	3	0		20
TOTAL	1	0	1	1	2	3	5	2	1	2	3	6	6	1	5	9	12	14	11	15	15	22	19	7	163	

Source: Elaborated by authors

Figure 1. Evolution in the number of papers



Source: Elaborated by authors from data of Web of Science

If we consider the content of the studies, we can appreciate that, although research was basically initially concentrated in North America and England (Driver and Coelho-Guedes, 2012; Lee and O'Neill, 2003), there is an increasing number of papers analyzing companies in other geographical areas. These papers have focused on companies in areas with strong economies like Canada or Australia (Di Vito *et al.*, 2010), or in emerging Asian ones, such as China and Taiwan (Choi *et al.*, 2012; Choi *et al.*, 2011; Lee, 2012; Tsao and Chen, 2012; Van Essen *et al.*, 2012). Research papers have also analyzed companies in countries in continental Europe, such as France, Germany and Spain (Galia and Zenou, 2012; Lehmann *et al.*, 2012; Tribo *et al.*, 2007). Although most of the studies tend to consider companies in specific regions, some of the research also compares how companies operate in different geographical areas and countries (Lee and O'Neill, 2003).

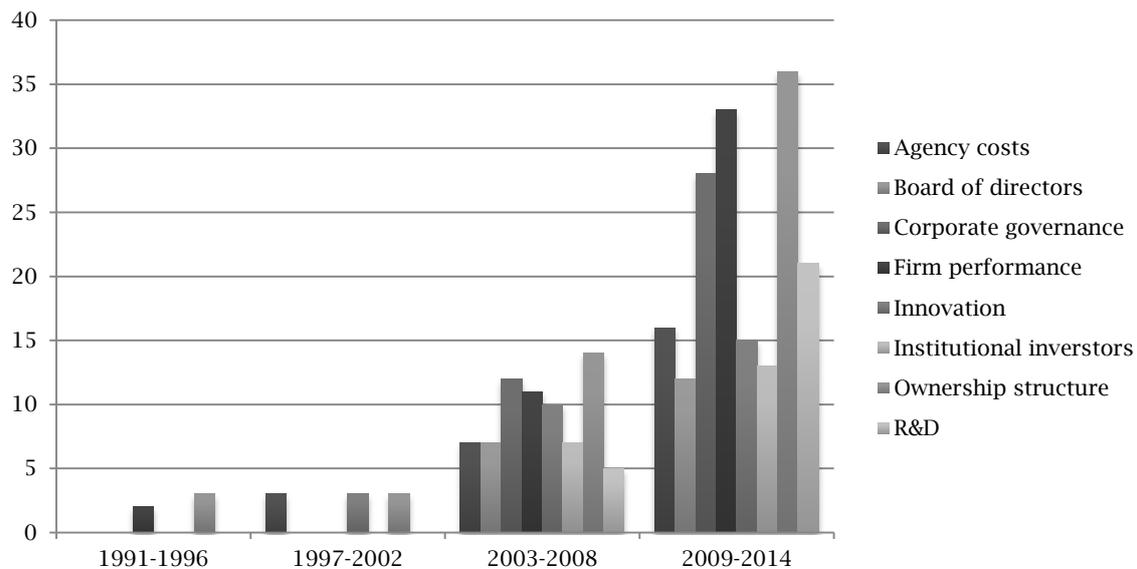
It is, therefore, evident that there is a certain shortage of research focusing on the relationship between corporate governance and innovation. Also noticeable is the lack of specialized journals and the fact that virtually most of the journals that have

published papers on this relationship are North American or British, although these studies increasingly analyze other regions, such as countries with a strong economy, in Asia or continental Europe.

5.2. Main lines of research

A review of the keywords mentioned permitted the identification of eight main subjects, which are: agency costs, board of directors, corporate governance, firm performance, innovation, institutional investors, ownership structure, and R&D (Figure 2). The selection of these main topics was based on an analysis of the keywords specified in the papers. The frequency with which these keywords came up was analyzed and put into order from most to least frequent. Two criteria were used for selecting the keywords: 1) they genuinely reflected the subject of the keywords and not a fringe aspect, and 2) the frequency of occurrence is higher than the average, in this case ten. Applying both criteria enabled the subjects identified to be chosen.

Figure 2. Evolution in the main research topics



Source: Elaborated by authors

As can be seen in Figure 2, the first and second set corresponding to the periods 1991-1996 and 1997-2002 respectively, in this period, the literature was centered in few and quite generic research topics. In the first period (1991-1996) the only two research topics addressed included ownership structure and firm performance. In the second period (1997-2002) the most relevant issues were ownership structure, innovation and agency costs. In the third period (2003-2008) a pronounced increase is noticeable in the number of studies and research topics. Specifically, four new topics appear; we refer to institutional investors, R&D, corporate governance and board of directors. Finally, in the last period (2009-2014) we find works that make reference to the seven keywords mentioned above, with some of them appearing 183 times in the papers of the

period. The analysis of ownership structure is the research topic most relevant in this literature, appearing in more than 20.6% of the studies. Furthermore, it is the most important research topic in all the periods considered and its importance continues to grow.

5.3. State of the art of the relationship between corporate governance and innovation

The analyses of the selected papers paves the way to establishing which theories were most widely used to explain the relationship between corporate governance and innovation, what the most important discoveries have been, and which aspects of this relationship are yet under research.

Regarding the theoretical perspectives used to explain the effects of corporate governance, the agency theory is the one that stands out (Brunninge *et al.*, 2007; Liang *et al.*, 2013; Tsao and Chen, 2012), as evidenced by the fact that “agency costs” is one of the keywords frequently repeated. Amongst its assumptions, this theory reveals the opportunist behavior of individuals concerned only with looking out for their own interests (Eisenhardt, 1989). The divergence of interests affects the firm performance and is especially evident in respect to certain business strategies that involve significant risks, as in the case of innovation (Barroso *et al.*, 2011; Dalton *et al.*, 1998; Zahra *et al.*, 2000).

Despite the relevance of agency theory to explain the relationship between corporate governance and innovation, it is not the only perspective that can be applied. Another relevant theory on this topic is the stewardship theory. According to this theory, the managers' and owners' interests are aligned, so, managers ensure an improvement in the company's situation, considering that this situation is one that can ultimately benefit everyone (Davis *et al.*, 1997).

A review of the literature demonstrates frequent cases in which a contingent approach is adopted and, depending on the situation, assumptions from one theory or another are applied (Lee and O'Neill, 2003; Wu, 2008). Other theoretical perspectives that have also been taken into account, although in a much more marginal way, are the transaction costs theory (Choi *et al.*, 2012), the prospect theory (Zona, 2012), the institutional theory (Chizema and Kim, 2010), the upper echelon theory (Chen *et al.*, 2015), and the resource-based theory (Chen *et al.*, 2010).

As we stated above, the assumptions of these theories have been mostly applied to explain the effects of corporate governance on the companies' performance and results. This is the reason why even in a review on the relationship between corporate governance and innovation, the keyword “firm performance” still appears as one of the most relevant topics of research in this field since the very beginning.

5.2.1. Ownership structure

Ownership structure and board of directors emerge as the most relevant keywords related to corporate governance, especially ownership structure, which is the topic that most frequently appears in the literature that links corporate governance with innovation. In fact, ownership concentration and the existence of large shareholders or “blockholders” is a significant feature of corporate governance in some regions, and the study of its influence on innovation has been seen as a priority. Some studies have demonstrated a positive relationship between a concentrated shareholding and innovation, for example, in respect to R&D investments (Lee, 2012). According to this author, the long-term orientation effect dominates over the risk-averseness effect of ownership concentration. In other cases, the

relationship has been proven negative (Brunninge *et al.*, 2007; Di Vito *et al.*, 2010; Zeng and Lin, 2011). Some arguments supporting this negative relationship has to do with the greater risks supported by shareholders due to the lack of diversification of their portfolio. These studies demonstrate that companies with highly concentrated ownership structures or the presence of controlling minority shareholders turn out to be less innovative (Czarnitzki and Kraft, 2009) or have less R&D intensity (Di Vito *et al.*, 2010). There are also many studies that fail to demonstrate if ownership concentration has significant effects on innovation.

This inconsistency in the results has encouraged researchers to look for other types of relationships. Thus, on the one hand, some authors have put forward a curvilinear relationship, in the form of an inverted ‘U’, whereby, when ownership in the hands of major shareholders grows, its effect on innovation might be positive to start with, but then becomes negative from a certain level (Liu, 2012). It also highlights the compensatory role that can be played by major shareholders who are not the largest individual shareholder, but the second or third, etc., with combined voting rights that can offset the influence of the main shareholder on the matter of innovation (Liu, 2012). However, the vast majority of studies attempt to explain the lack of consensus in the effects of ownership concentration on innovation by analyzing different types of blockholders, given that their profile determines their interests and, therefore, what their influence will be. This accounts for a large amount of literature, mainly concentrated on studying the influence of particular types of large shareholders. Some relevant research on this matter is shown in the following table (Table 3).

The previous table mentions only a few of the studies interested in the influence of different types of large shareholders on R&D and innovation, we have summarized the main findings of these investigations, but this research does not go as far as confirming a consensus into the effects of these large shareholders on innovation. Table 3 also confirms the relevance of one of the keywords highlighted above, “institutional investors”, which emerges as one of the blockholders to which the literature has paid special attention, being possible to distinguish also amongst different kind of institutions, like governmental institutions or financial institutions, because their effects on innovation could be different.

The type of innovation taken into consideration, how it is measured even in the case of R&D (R&D expenditures, R&D outcomes, R&D intensity, the existence or not of an R&D department, etc.) (Di Vito *et al.*, 2010), the contingent factors affecting businesses, and the specific characteristics of the different types of blockholders, often cause relationships to be open to modification which, in many cases, is manifested in different ways.

Table 3. Types of blockholders

<i>Types of blockholders</i>	<i>Authors</i>	<i>Sample</i>	<i>Findings</i>
Institutional investors	Choi et al., 2012 Choi et al., 2011	301 Korean firms (2000-2003) 548 Chinese firms (2001)	Institutional ownership influences positively technological innovation
	Brossard et al., 2013	324 European firms (2002-2009)	Institutional ownership influences positively R&D spending
	Lee, 2012 Singh and Gaur, 2013	424 Korean firms (1999-2008) 16,337 firm-year observations Indian firms (2002-2009)	Institutional ownership has no significant relationship with R&D investments
	Tribo et al., 2007	3,638 Spanish firms (1996-2000)	Institutional ownership, excluding financial institutions, affects positively R&D investments
Government ownership	Choi et al., 2011 Zeng and Lin, 2011	548 Chinese firms (2001) 780 Chinese firms (2000-2005)	Government ownership enhances the number of patents, although with a certain delay Government ownership improves R&D investments
Banks ownership	Tribo et al., 2007	3,638 Spanish firms (1996-2000)	Ownership held by banks influences negatively R&D investments
Family ownership	Block, 2012 Chen and Hsu, 2009 Singh and Gaur, 2013 Chen et al. 2013	154 Northamerican firms (1994-2003) Taiwanese Firms (2002-2007) 16,337 firm-year observations Indian firms (2002-2009) 516 Taiwanese firms (1996-2007)	Family ownership reduces R&D intensity Family ownership positively affects R&D intensity Family firms invest more in innovation than nonfamily firms
Founder ownership	Block, 2012	154 North American firms (1994-2003)	Ownership held by founders has a positive effect on the intensity and productivity of R&D investments
Foreign investments	Lee, 2012 Choi et al., 2011	424 Korean firms (1999-2008) 548 Chinese firms (2001)	Great foreign shareholders have a positive effect on R&D investments Foreign ownership has a positive relationship with innovation
Insider ownership	Choi et al., 2011 Zeng and Lin, 2011	548 Chinese firms (2001) 780 Chinese firms (2000-2005)	Insider ownership reduces innovation and R&D investments

Source: Elaborated by authors

Although most of these studies have analyzed the direct influence of ownership concentration on innovation, there are some authors interested in analyzing the moderating effect that large shareholders can exert. Thus, as an example, Tsao and Chen (2012) believe that ownership concentration can moderate the relationship between internationalization and innovation. Meanwhile, Kim *et al.* (2008) studied how various significant owners can moderate the relationship between lack of financial resources and R&D investment, and they conclude that family ownership has a positive moderating effect while institutional ownership and foreign investors give rise to a negative moderating effect.

5.2.2. Board of directors

The search for the main topics in this research also highlighted the effect that the board of directors has on innovation. These studies basically analyze the structure and composition of the board (Van Essen *et al.*, 2012), which is determined by variables, such as the proportion of directors of different types (executive, affiliated and independent), the existence of duality, demographic characteristics, and the diversity of board members, for example, in terms of age, gender, operational or functional experience, educational background, etc. Most studies consider these board member characteristics in isolation, although an ever-increasing number of authors

consider interrelationships between different bodies with decision-making powers within a company, such as the board of directors and the top management team, indicating that this is not a widely studied research topic (Wu, 2008). Thus, for example, Wu (2008) suggests that the relationships between board members and top management teams have a non-linear effect on the introduction of new products by companies. Brunninge *et al.* (2007), meanwhile, demonstrate that the board and the top management team interact and succeed in affecting strategic change within the company.

Amongst the variables related to the board of directors, the literature has given particular attention to those related to structure, due to the fact that their effects are unclear. As Petrovic indicates (2008, p. 1375) "there are serious doubts about whether it is better that the board is dominated by external members not close to the company or by non-independent directors with valuable inside knowledge." On the one hand, independent directors can control and supervise in a more effective way (Dalton *et al.*, 1998; Zahra *et al.*, 2000). As Kemp points out (2006, p. 60) "external board members see themselves as better guardians and supervisors than board members with a different affiliation to the company as they concentrate exclusively on the financial performance of the organization, which is a very important element for the aforementioned supervision." Thus, a board dominated by internal directors may be less

efficient in supervising managers, which could translate into a lower level of innovation in the case of a management averse to risk. On the other hand, internal board members have valuable operational knowledge of the companies whose management they are involved in, which helps to strengthen the strategic function of the board, given that they can understand the internal workings of the company and the challenges it faces better than independent directors (Nicholson and Kiel, 2007). These arguments indicate that it is not clear whether innovation would improve with a majority of internal or external directors. An important gap is also to analyze in depth not only the direct effect of board's structure on innovation, but also the functions or roles of different directors and their efficiency, and take a better look into the processes inside the board that can explain its effects (Jaskyte, 2012).

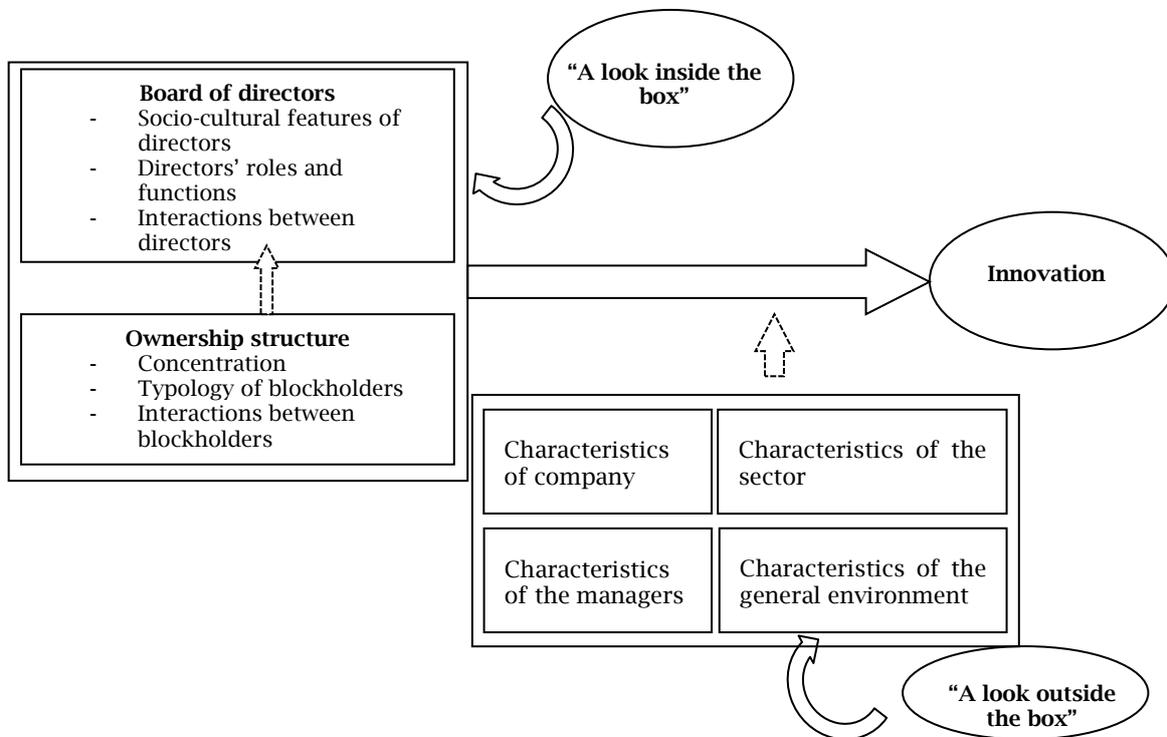
As for duality, the literature yields no conclusive results either. In the presence of duality, the board finds itself in a weak position in relation to the CEO. This can complicate the introduction of new ideas, which foster innovation (Zahra *et al.*, 2000). The centralization of corporate powers and decision-making is generally detrimental to innovation and risk taking as it takes power away from the board and increases managerial discretion (Chen and Hsu, 2009; Dalton *et al.*, 1998; Zahra *et al.*, 2000). Nevertheless, other authors consider that duality favors the elimination of ambiguity in respect to leadership and enhances the legitimacy of a strong leader, avoiding any confusion as to where

the power within the company lies (Dalton *et al.*, 1998; Sanders and Carpenter, 1998). In these cases, if the leader was disposed toward risk taking and in favor of innovative strategies, then duality could be positive.

So, as it has been previously stated, the review of the literature shows that the most common studies are those analyzing specific aspects of corporate governance regarding ownership structure or the board of directors. Nevertheless, recent research considers that simple direct relationships are not appropriate for fully understanding the influence of corporate governance on innovation. More sophisticated analyses are necessary that take into account the different casuistry and typology of the variables to be considered. Furthermore, direct relationships are increasingly enriched through mediation and moderation effects that allow to include in the models situational and contingent factors, as well as more details of the whole process, which could end up explaining the influence of corporate governance on innovation. These new tendencies in research point out the need to consider new conceptual models to better understand this relationship between corporate governance and innovation.

These new models must not only consider the most visible and measurable variables of management, but attempt to develop a more in depth look into other more complicated processes and interrelationships. Figure 3 proposes an example of one of these more detailed models.

Figure 3. New models on the relationship between corporate governance and innovation



Source: prepared by the authors

On the one hand, Figure 3 proposes to take “a look inside the box” on the functioning of corporate

governance. The purpose is not only considering the direct influence on innovation of the most typical

characteristics of governance, related to the typology of directors, their independence, ownership concentration and typology of blockholders, but also the interrelationship between directors and between owners and directors, and the processes that explain their roles and efficiency. Recent research has partially considered some of these interrelationships between ownership structure and the board. It is the case, for example, of the studies that prove that the effects of ownership structure on innovation are affected by characteristics of the board (Brunninge *et al.*, 2007, Chen and Hsu, 2009), or that the effects of the board on innovation are affected by ownership structure (Hernández *et al.*, 2010; 2014). Also, some evidence has been found about the interrelationship of different blockholders, such as institutional ownership and family ownership (Chang *et al.*, 2010; Gomez-Mejia *et al.*, 2014); and the interrelationship between some board's characteristics, such as directors' social capital features and their policy of compensation (Chen, 2014; Chen *et al.*, 2013; Deutsch, 2007). A better understanding of these variables, all their interrelationships and the real configuration and processes inside these bodies of corporate governance will help to understand their influence on innovation.

On the other hand, Figure 3 also proposes to take a "look outside the box" of corporate governance, and to analyze the possible effects of contingent and contextual variables. For example, it would be relevant to consider characteristics of the company like the company's age or size and their degree of complexity (Bertinelli, 2011; Markarian and Parbonetti, 2007; Zona *et al.*, 2013), and characteristics of its management, for example the social capital characteristics of their top managers, like their educational/professional background or their tenure (Chen *et al.*, 2013). Also, the specific industry or economic sector to which the company belongs interacts in the effects exerted by their bodies of governance on innovation (Kang *et al.*, 2007), as well as the characteristics of the environment, like its turbulence (Coles *et al.*, 2008), and the relationships of the company with competitors, suppliers and other kind of stakeholders (Kotlar *et al.*, 2014). All these variables can act as antecedents and as moderator variables affecting the relationship between corporate governance and innovation.

6. CONCLUSION

This study has two main objectives. The first consists of systematizing and visualizing the current situation of scientific research about corporate governance and its influence on innovation. The second attempts to establish what status this research has reached.

To achieve the first objective a SLR was conducted, which to the authors' best knowledge, not has been previously undertaken on the relationship between corporate governance and innovation. We think that it is interesting to conduct this kind of revision, of these two topics considered together, because to systematize and visualize the current state of the art in fields with a certain tradition could be useful to recognize proven by research and overcome models, and to know how to

advance addressing new relationships between government bodies that deserve further analyses.

The analyses carried out showed that most of the research about this subject was undertaken within the last ten years, from 2004, and that the number of studies published is relatively low, especially if compared to the analysis of the influence of corporate governance on business performance and wealth (Tsao and Chen, 2012; Van Essen *et al.*, 2012).

Furthermore, previous research has not achieved consensus on the effects of ownership concentration and the composition and structure of the board of directors on innovation. This could be due to various reasons. On the one hand, it concerns complex variables that are not uniform but rather have underlying typologies that can end up affecting innovation in different ways. On the other hand, there are different theoretical perspectives and assumptions that may explain its influence. This inconsistency in the results encourages the instigation of studies that propose more complex relationships and which examine, through moderating effects, the influence that variables of situation or context might exert; and, through the effects of mediation, all of the relationship processes that may exist between corporate governance and innovation. Thus, it is more and more common to find studies that analyze the interrelationship that may exist between the different variables of corporate governance (interrelationships between blockholders and directors, between managers and directors, between different types of directors, etc.) whose effects on innovation are evident.

Our review does not show a systematic relationship between corporate governance and innovation, although most of the research recognizes that ownership structure and boards of directors affect innovation. This finding underscores the relevance for companies to have good recommendations about the best practices in corporate governance, and the necessity for public institutions to develop codes that improve these recommendations. This kind of research emphasizes that managers are not the only important body in companies for decision-making. There are other important mechanisms to exert power and decision-making that do not act just as rubber stamps; on the contrary, these other mechanisms are necessary to exercise supervision, control, and affect strategic decisions in companies. However, previous research does not offer unique and universal recommendations on the best ownership structure and board of directors to be innovative. Consequently, each company has to look for the best governance practices in its case. For this reason, it is important to figure out the map of factors that affect the company's performance and its innovation.

This research has also limitations. Mainly, the generic search made at the beginning, based on the most analyzed topics of research, allowed us to select specific but also wide topics, like R&D, ownership structure and boards. This selection has influenced the focus of our study, leaving aside very interesting and less studied topics, like other types of non-technological innovation and other types of government not based on boards. This choice also

addressed our search of studies towards big companies, leaving aside more specific kind of companies, such as “gazelles” firms, small fast growing and innovative firms, where the role of the board may be not relevant. In addition, it would be interesting to use some other databases to expand the search, even if it means screening work to avoid duplication. Also, it would be appropriate to consider a greater number of keywords in order to obtain a greater number of articles.

Some of the following guidelines could be useful when establishing future research lines. First, it would be interesting to start searching which are the more innovative companies, and analyze the specific forms of governance used in these cases although they do not respond to the most traditional ones. Second, it might be useful to further investigate and compare different types of innovation, not just technological innovations. Finally, there is an interesting research line about the proposal of new models of relationships in the effects of corporate governance on innovation, which include mediation and moderation effects that better describe these relationships, for example between different corporate governance bodies, like top management teams and boards of directors, or amongst diverse factors and characteristics of a specific governance body in order to better understand its functioning.

This review paper does not make a contribution on an empirical level, but it does seek to contribute from a different point of view, conducting a review with a specific and exhaustive method that permits a valuable guide on an academic level for deciding future lines of research.

REFERENCES

- Ahlering, B. and Deakin, S. (2007), “Labor regulation, corporate governance, and legal origin: A case of institutional complementarity?”, *Law and Society Review*, Vol. 41 No. 4, pp. 865-908.
- Alegre-Vidal, J., Lapidra-Alcami, R. and Chiva-Gomez, R. (2004), “Linking operations strategy and product innovation: An empirical study of Spanish ceramic tile producers”, *Research Policy*, Vol. 33 No. 5, pp. 829-839.
- Balkin, D.B., Markman, G.D. and Gomez-Mejia, L.R. (2000), “Is CEO pay in high-technology firms related to innovation?”, *Academy of Management Journal*, Vol. 43 No. 5, pp. 1118-1129.
- Barker, V.L. and Mueller, G.C. (2002), “CEO characteristics and firm R&D spending”, *Management Science*, Vol. 48 No. 6, pp. 782-801.
- Barroso, C., Villegas, M.M. and Perez-Calero, L. (2011), “Board influence on a firm’s internationalization”, *Corporate Governance: An International Review*, Vol. 19 No. 4, pp. 351-367.
- Becheikh, N., Landry, R. and Amara, N. (2006), “Lessons from innovation empirical studies in the manufacturing sector: Systematic review of the literature from 1993-2003”, *Technovation*, Vol. 23 No. 5-6, pp. 644-664.
- Beh, L.S. (2007), “Reforms of corporate governance in Malaysia”, *Beyond Borders: New Global Management Development Challenges and Opportunities*, Vol. 16, pp. 82-88.
- Belloc, F. (2012), “Corporate governance and innovation: A survey”, *Journal of Economic Surveys*, Vol. 26 No. 5, pp. 835-864.
- Bettinelli, C. (2011), “Boards of directors in family firms: An exploratory study of structure and group process”, *Family Business Review*, Vol. 24 No. 2, pp. 151-169.
- Block, J.H. (2012), “R&D investments in family and founder firms: An agency perspective”, *Journal of Business Venturing*, Vol. 27 No. 2, pp. 248-265.
- Brossard, O., Lavigne, S. and Sakinc, M.E. (2013), “Ownership structures and R&D in Europe: The good institutional investors, the bad and ugly impatient shareholders”, *Industrial and Corporate Change*, Vol. 22 No. 4, pp. 1031-1068.
- Brunninge, O., Nordqvist, M. and Wiklund, J. (2007), “Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams”, *Small Business Economics*, Vol. 29 No. 3, pp. 295-308.
- Cadbury Committee Report (1992), *Report of the Cadbury committee on the financial aspects of corporate governance*. Londres: Gee.
- Carcello, J.V., Hermanson, D.R. and Ye, Z. (2011), “Corporate governance research in accounting and auditing: Insights, practice implications, and future research directions”, *Auditing: A Journal of Practice & Theory*, Vol. 30 No. 3, pp. 1-31.
- Cardon Report (1998), *Corporate governance for Belgian listed companies*, Brussels Exchanges.
- Chang, S., Wu, W. and Wong, Y. (2010), “Family control and stock market reactions to innovation announcements”, *British Journal of Management*, Vol. 21 No 1, pp. 152-170.
- Chen, H. and Hsu, W. (2009), “Family ownership, board independence, and R&D investment”, *Family Business Review*, Vol. 22 No. 4, pp. 347-362.
- Chen, H., Hsu, W. and Huang, Y. (2010), “Top management team characteristics, R&D investment and capital structure in the IT industry”. *Small Business Economics*, Vol. 35 No. 3, pp. 319-333.
- Chen, H.L. (2014), “Board capital, CEO power and R&D investment in electronics firms”, *Corporate Governance: An International Review*, Vol. 22 No. 5, pp. 422-436.
- Chen, S., Bu, M., Wu, S. and Liang, X. (2015), “How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance”, *Journal of Business Research*, Vol. 68 No. 5, pp. 1127-1135.
- Chen, V.Y.S., Tsao, S.M. and Chen, G.Z. (2013), “Founding family ownership and innovation”, *Asia-Pacific Journal of Accounting & Economics*, Vol. 20 No. 4, pp. 429-456.
- Chizema, A. and Kim, J. (2010), “Outside directors on Korean boards: Governance and institutions”, *Journal of Management Studies*, Vol. 47 No. 1, pp. 109-129.
- Choi, S., Lee, S. and Williams, C. (2011), “Ownership and firm innovation in a transition economy: Evidence from China”, *Research Policy*, Vol. 40 No. 3, pp. 441-452.
- Choi, S.B., Il Park, B. and Hong, P. (2012), “Does ownership structure matter for firm technological innovation performance?”, *Corporate Governance: An International Review*, Vol. 20 No. 3, pp. 267-288.
- Coles, J.L., Daniel, N.D. and Naveen, L. (2008), “Boards: Does one size fit all?”, *Journal of Financial Economics*, Vol. 87 No. 2, pp. 329-356.
- Cook, D.J., Mulrow, C.D. and Haynes, R.B. (1997), “Systematic reviews: Synthesis of best evidence for practical decisions”, *Annals of Internal Medicine*, Vol. 126 No. 5, pp. 376-80.

27. Coombs, R., Narandren, P. and Richards, A. (1996), "A literature-based innovation output indicator", *Research Policy*, Vol. 25 No. 3, pp. 403-413.
28. Cuervo, A. (2002), "Corporate governance mechanisms: A plea for less code of good governance and more market control", *Corporate Governance: An International Review*, Vol. 10 No. 2, pp. 84-93.
29. Czarnitzki, D. and Kraft, K. (2009), "Capital control, debt financing and innovative activity", *Journal of Economic Behavior Organization*, Vol. 71 No. 2, pp. 372-383.
30. Dadfar, H., Brege, S., Golizeh, M. and Ghasemi, H. (2010), "Corporate governance in pharmaceutical industry: The case of TAPIC pharmaceutical group", *Proceedings of the 6th European Conference on Management Leadership and Governance*, (October 28-29) Wroclaw, Poland, 83-92.
31. Dalton, D.R., Daily, C.M., Ellstrand, A.E. and Johnson, J.L. (1998), "Meta-analytic reviews of board composition, leadership structure, and financial performance", *Strategic Management Journal*, Vol. 19 No. 3, pp. 269-290.
32. Dalziel, T., Gentry, R.J. and Bowerman, M. (2011), "An integrated agency-resource dependence view of the influence of directors' human and relational capital on firms' R&D spending", *Journal of Management Studies*, Vol. 48 No. 6, pp. 1217-1242.
33. Damanpour, F. (1987), "The adoption of technological, administrative and ancillary innovations: Impact of organizational factors", *Journal of Management*, Vol. 13 No. 4, pp. 675-688.
34. Davis, J.H., Schoorman, F.D. and Donaldson, L. (1997), "Toward a stewardship theory of management", *Academy of Management Review*, Vol. 22 No. 1, pp. 20-47.
35. Deutsch, Y. (2007), "The influence of outside directors' stock-option compensation on firms' R&D", *Corporate Governance: An International Review*, Vol. 15 No. 5 pp. 816-827.
36. Di Vito, J., Laurin, C. and Bozec, Y. (2010), "R&D activity in Canada: Does corporate ownership structure matter?", *Canadian Journal of Administrative Sciences*, Vol. 27 No. 2, pp. 107-121.
37. Driver, C. and Coelho-Guedes, M.J. (2012), "Research and development, cash flow, agency and governance: UK large companies", *Research Policy*, Vol. 41 No. 9, pp. 1565-1577.
38. Du Plessis, J.J., McConville, J. and Bagaric, M. (2005), *Principles of contemporary corporate governance*. Cambridge University Press: UK.
39. Eisenhardt, K.M. (1989), "Agency theory-an assessment and review", *Academy of Management Review*, Vol. 14 No. 1, pp. 57-74.
40. Evangelista, R., Sandven, T., Sirilli, G. and Smith, K. (1998), "Measuring innovation in European industry", *International Journal of the Economics of Business*, Vol. 5 No. 3, pp. 311-333.
41. Fama, E.F. and Jensen, M.C. (1983), "Separation of ownership and control", *Journal of Law and Economics*, Vol. 26 No. 2, pp. 301-325.
42. Galia, F. and Zenou, E. (2012), "Board composition and forms of innovation: Does diversity make a difference?", *European Journal of International Management*, Vol. 6 No. 6, pp. 630-650.
43. Gatignon, H., Tushman, M.L., Smith, W. and Anderson, P. (2002), "A structural approach to assessing innovation: construct development of innovation locus, type and characteristics", *Management Science*, Vol. 48 No. 9, pp. 1103-1122.
44. Gomez-Mejia, L.R., Campbell, J.T., Martin, G., Hoskisson, R.E., Makri, M. and Sirmon, D.G. (2014), "Socioemotional wealth as a mixed gamble: Revisiting family firm R&D investments with the behavioral agency model", Vol. 38 No. 6, pp. 1351-1374.
45. Goodstein, J. and Boeker, W. (1991), "Turbulence at the top: A new perspective on governance structure changes and strategic change", *Academy of Management Journal*, Vol. 34 No. 2, pp. 306-330.
46. Griliches, Z. (1990), "Patent statistics as economic indicators: A survey", *Journal of Economic Literature*, Vol. 28 No. 4, pp. 1661-1707.
47. Gugler, K. (2003), "Corporate governance, dividend pay-out policy, and the interrelation between dividends, R&D, and capital investment", *Journal of Banking and Finance*, Vol. 27 No. 7, pp. 1297-1321.
48. Hernández, A.B., Camelo, C. and Valle, R. (2010), "The effects of board of directors on R&D investments: The case of Spain", *International Journal of Human Resources Development and Management*, Vol. 10 No. 2, pp. 152-165.
49. Hernández, A.B., Camelo, C. and Valle, R. (2014), "Does board member stock ownership influence the effect of board composition on innovation?", *European Journal of International Management*, Vol. 8 No. 4, pp. 355-372.
50. Hitt, M.A., Hoskisson, R.E., Ireland, R.D. and Harrison, J.S. (1991), "Effects of acquisitions on R&D inputs and outputs", *Academy of Management Journal*, Vol. 34 No. 3, pp. 693-706.
51. Jaskyte, K. (2012), "Boards of directors and innovation in nonprofit organizations", *Nonprofit Management and Leadership*, Vol. 22 No. 4, pp. 439-459.
52. Jensen, M.C. (1993), "The modern industrial revolution, exit and the failure of internal control systems", *Journal of Finance*, Vol. 48 No. 3, pp. 831-880.
53. Jensen, M.C. and Meckling, W.H. (1976), "Theory of firm-managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.
54. Johannessen, J.A., Olsen, B. and Lumpkin, G.T. (2001), "Innovation as newness: What is new, how new, and new to whom?", *European Journal of Innovation Management*, Vol. 4 No. 1, pp. 20-31.
55. Kang, H., Cheng, M. and Gray, S.J. (2007), "Corporate governance and board composition: Diversity and independence of Australian boards", *Corporate Governance: An International Review*, Vol. 15 No. 2, pp. 194-207.
56. Kemp, S. (2006), "In the driver's seat or rubber stamp?: The role of the board in providing strategic guidance in Australian boardrooms", *Management Decision*, Vol. 44 No. 1, pp. 56-73.
57. Kim, H., Kim, H. and Lee, P. (2008), "Ownership structure and the relationship between financial slack and R&D investments: Evidence from Korean firms", *Organization Science*, Vol. 19 No. 3, pp. 404-418.
58. Kor, Y.Y. (2006), "Direct and interaction effects of top management team and board compositions on R&D investment strategy", *Strategic Management Journal*, Vol. 27 No. 11, pp. 1081-1110.
59. Kotlar, J., Fang, H., De Massis, A. and Frattini, F. (2014), "Profitability goals, control goals, and the R&D investment decisions of family and nonfamily firms", *Journal of Product Innovation Management*, Vol. 31 No. 6, pp. 1128-1145.
60. Lee, P. and O'Neill, H. (2003), "Ownership structures and R&D investments of US and

- Japanese firms: Agency and stewardship perspectives”, *Academy of Management Journal*, Vol. 46 No. 2, pp. 212-225.
61. Lee, S. (2012), “Financial determinants of corporate R&D investment in Korea”, *Asian Economic Journal*, Vol. 26 No. 2, pp. 119-135.
 62. Lehmann, E.E., Braun, T.V. and Krispin, S. (2012), “Entrepreneurial human capital, complementary assets, and takeover probability”, *Journal of Technology Transfer*, Vol. 37 No. 5, pp. 589-608.
 63. Liang, Q., Li, X., Yang, X., Lin, D. and Zheng, D. (2013), “How does family involvement affect innovation in China?”, *Asia Pacific Journal of Management*, Vol. 30 No. 3, pp. 677-695.
 64. Lin, C., Lin, P., Song, F.M. and Li, C. (2011), “Managerial incentives, CEO characteristics and corporate innovation in China’s private sector”, *Journal of Comparative Economics*, Vol. 39 No. 2, pp. 176-190.
 65. Liu, S. (2012), “The study on the impact of ownership structure on the R&D investment”, *International Conference on Management Innovation and Public Policy*, No. 1-6, pp. 1829-1834.
 66. Markarian, G. and Parbonetti, A. (2007), “Firm complexity and board of director composition”, *Corporate Governance: An International Review*, Vol. 15 No. 6, pp. 1224-1243
 67. Monks, R. and Minow, N. (1995), *Corporate governance*. Cambridge, M.A.: Blackwell Business.
 68. Moustaghfir, K. (2008), “The dynamics of knowledge assets and their link with firm performance”, *Measuring Business Excellence*, Vol. 12 No. 2, pp. 10-24.
 69. Nicholson, G.J. and Kiel, G.C. (2007), “Can directors impact performance? A case-based test of three theories of corporate governance” *Corporate Governance: An International Review*, Vol. 15 No. 4, pp. 585-608.
 70. OECD (1997), *Oslo Manual: Proposed guidelines for collecting and interpreting technological innovation*, (2nd Ed.), OECD Publishing.
 71. Petrovic, J. (2008), “Unlocking the role of a board director: A review of the literature”, *Management Decision*, Vol. 46 No. 9, pp. 1373-1392.
 72. Preda report of Italy (1999), *Rapporto codice di autodisciplina*. Borsa Italiana S.p.A.
 73. Richart-Ramón, A., Martínez-Blasco, M. and García-Blandón, J. (2011), “Research in corporate governance: An analysis through ISI Web of Science”, *Revista Española de Documentación Científica*, Vol. 34 No. 1, pp. 79-101.
 74. Roman, D. (1968), *Research and development management: The economics and administration of technology*, Appleton Century Crofts: Nueva York.
 75. Sanders, W.M.G. and Carpenter, M.A. (1998), “Internationalization and firm governance: The roles of CEO compensation, top team composition, and board structure”, *Academy of Management Journal*, Vol. 41 No. 2, pp. 158-178.
 76. Schneckenberg, D. (2009), “Web 2.0 and the empowerment of the knowledge worker”, *Journal of Knowledge Management*, Vol. 13 No. 6, pp. 509-520.
 77. Schumpeter, J.A. (1934), *The Theory of Economic Development: An inquiry into profits, capital, credit, interest, and the business cycle*, Harvard University Press: Cambridge.
 78. Schumpeter, J.A. (1939), *Business cycles: A theoretical, historical and statistical analysis of the capitalist process*, McGraw-Hill: New York.
 79. Shah, S.Z.A., Butt, S.A. and Saeed, M. (2011), “Ownership structure and performance of firms: Empirical evidence from an emerging market”, *African Journal of Business Management*, Vol. 5 No. 2, pp. 515-523.
 80. Singh, D.A. and Gaur, A.S. (2013), “Governance structure, innovation and internationalization: Evidence from India”, *Journal of International Management*, Vol. 19 No. 3, pp. 300-309.
 81. Sirilli, G. and Evangelista, R. (1998), “Technological innovation in services and manufacturing: Results from Italian surveys”, *Research Policy*, Vol. 27 No. 9, pp. 881-899.
 82. Thompson, V.A. (1965), “Bureaucracy and innovation”, *Administrative Science Quarterly*, Vol. 10 No. 1, pp. 1-20.
 83. Thorpe, R., Holt, R., Macpherson, A. and Pittaway, L. (2005), “Using knowledge within small and medium-sized firms: A systematic review of the evidence”, *International Journal of Management Reviews*, Vol. 7 No. 4, pp. 257-281.
 84. Tranfield, D., Denyer, D. and Smart, P. (2003), “Towards a methodology for developing evidence-informed management knowledge by Means of systematic review”, *British Journal of Management*, Vol. 14 No. 3, pp. 207-222.
 85. Tribo, J., Berrone, P. and Surroca, J. (2007), “Do the type and number of blockholders influence R&D investments? New evidence from Spain”, *Corporate Governance: An International Review*, Vol. 15 No. 5, pp. 828-842.
 86. Tsao, S.M. and Chen, G.Z. (2012), “The impact of internationalization on performance and innovation: The moderating effects of ownership concentration”, *Asia Pacific Journal of Management*, Vol. 29 No. 3, pp. 617-642.
 87. Van de Ven, A.H. (1986), “Central problems in the management of innovation”, *Management Science*, Vol. 32 No. 5, pp. 590-607.
 88. Van Essen, M., Van Oosterhout, J.H. and Carney, M. (2012), “Corporate boards and the performance of Asian firms: A meta-analysis”, *Asia Pacific Journal of Management*, Vol. 29 No. 4, pp. 873-905.
 89. Wang, D.G. and Xi, Y.M. (2004). “The corporation governance of banks”, *Proceedings of the 2004 International Conference on Management Science & Engineering, Harbin*, (August 8-10) Peoples R. China, (1-2), 1798-1803.
 90. Wu, H. (2008), “How do board-CEO relationships influence the performance of new product introduction? Moving from single to interdependent explanations”, *Corporate Governance: An International Review*, Vol. 16 No. 2, pp. 77-89.
 91. Zahra, S.A., Neubaum, D.O. and Huse, M. (2000), “Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems”, *Journal of Management*, Vol. 26 No. 5, pp. 947-976.
 92. Zeng, T. and Lin, H. (2011), “Ownership structure and R&D spending: Evidence from China’s listed firms”, *Chinese Management Studies*, Vol. 5 No. 1, pp. 82-93.
 93. Zona, F. (2012), “Corporate investing as a response to economic downturn: Prospect theory, the behavioural agency model and the role of financial slack”, *British Journal of Management*, Vol. 23, SI, pp. s42-s57.
 94. Zona, F., Zattoni, A. and Minichilli, A. (2013), “A contingency model of boards of directors and firm innovation: The moderating role of firm size”, *British Journal of Management*, Vol. 24 No. 3, pp. 299-315.