

Strategic research groups in business schools and their relation to performance: the Chilean case

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ABSTRACT This research contextualizes how the market of higher education is characterized by being highly competitive. This situation is especially observed in Business Schools, which make decisions that focus on creating an image of academic reputation; for instance, investing resources in research in order to achieve leadership positions at local and international levels. Even when Business Schools offer study programs with a high practical and professional approach, research activities allow them to develop knowledge and be linked with both public and private sectors. In this context, and by using the theory of strategic groups in order to study their research behavior, the Chilean Business Schools that appear in the MBA ranking in Economics in America were considered. The results allow us to identify four strategic research groups, based on the decisions made by the Business Schools in terms of academic production, research team, and academic dissemination. Finally, it describes how the investment made by the Business Schools in research sources has an impact on organizational performance indicators, such as: international recognition, place in the quality ranking and MBA tuition fees.

KEYWORDS performance analysis, Chile, Business Schools, strategic groups, research.

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Grupos estratégicos de investigación en escuelas de negocios y su relación con el desempeño: el caso de Chile

RESUMEN La presente investigación contextualiza cómo los mercados de educación superior se caracterizan por ser altamente competitivos. Esta situación se observa especialmente en las escuelas de negocios, las cuales toman decisiones que se enfocan en la creación de una imagen de reputación académica; por ejemplo, invertir recursos en investigación para ganar posiciones de liderazgo a nivel nacional e internacional. Aun cuando las escuelas de negocios ofrecen programas de estudios con un alto enfoque práctico y profesional, las actividades de investigación les permiten desarrollar conocimiento y vincularse con los sectores privado y público. En este contexto, y recurriendo a la teoría de grupos estratégicos para estudiar su comportamiento en investigación, se consideraron las escuelas de negocios chilenas que aparecen en el ranking MBA de América Economía. Los resultados permiten identificar cuatro grupos estratégicos de investigación, de acuerdo con las decisiones que adoptan las escuelas de negocios en producción académica, equipo de investigación y difusión académica. Finalmente, se describe cómo la inversión realizada por las escuelas de negocios en fuentes de investigación tienen impacto en los indicadores de desempeño organizacional, tales como: acreditación internacional, posición en ranking de calidad y arancel de los programas de MBA.

PALABRAS CLAVE análisis de desempeño, Chile, escuelas de negocios, grupos estratégicos, investigación.

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Grupos estratégicos de pesquisa em escolas de negócios e sua relação com o desempenho: o caso do Chile

RESUMO A presente pesquisa contextualiza como os mercados de educação superior caracterizam-se por ser altamente competitivos. Esta situação observa-se especialmente nas escolas de negócios, as quais tomam decisões que focam na criação de uma imagem de reputação acadêmica; por exemplo, investir recursos em pesquisa para ganhar posições de liderança a nível nacional e internacional. Ainda quando as escolas de negócios oferecem programas de estudos com um alto enfoque prático e profissional, as atividades de pesquisa permitem desenvolver conhecimento e vincular-se com os setores privado e público. Neste contexto, e com base na teoria de grupos estratégicos para estudar seu comportamento em pesquisa, consideraram-se as escolas de negócios chilenas que aparecem no ranking MBA da América Economia. Os resultados permitem identificar quatro grupos estratégicos de pesquisa, de acordo com as decisões que adotam as escolas de negócios em produção acadêmica, equipe de pesquisa e difusão acadêmica. Finalmente, descreve-se como o investimento realizado pelas escolas de negócios em fontes de pesquisa tem impacto nos indicadores de desempenho organizacional, tais como: acreditação internacional, posição em ranking de qualidade e tarifa dos programas de MBA.

PALAVRAS CHAVE análise de desempenho, Chile, escolas de negócios, grupos estratégicos, pesquisa.

Introduction

The globalization of economy has had an impact on higher education sectors (Martensen et al., 2000; Altbach et al., 2009), which have achieved high levels of competition (Gruber et al., 2010; Jain et al., 2013). This situation is explained by the development of the global education market, an increased demand and the continuous reduction of funding from governments (Ivy, 2008; Martensen & Gronholdt, 2009). It is also explained by the international trend towards a more heterogeneous student population (Archer et al., 2003), higher quality control demand levels (Brunner & Uribe, 2007), the emergence and rapid spread of information and communication technologies (Buil et al., 2012), the formation of academic associations (Juarros, 2006) and the growing levels of diversification and privatization of higher education systems (Espinoza & Gonzalez, 2011).

In this scenario, higher education institutions must change rapidly in order to respond to changes in national, regional and global dynamics (Maringe & Gibbs, 2009; de Jager & Gbadamosi, 2010). These institutions are subject to pressure to improve quality levels in the different activities they carry out (Dill, 2007), to innovate constantly, to diversify their structures and to find the most effective ways to deliver their services to customers (Jain et al., 2011). This is not something new for Latin America, since higher education in the region has experienced quantitative growth from the 90's and there were some changes in the sector's public policies (Garcia-Guadilla, 2007).

This is the situation for business schools, which have a dual mission: educate future professionals and create knowledge through research (Warren & O'Toole, 2005). The literature on the subject argues that research has become a strategic decision for business schools, even though some authors state that existing studies lack relevance and practical value (Hambrick, 2007; Burke & James, 2010). Despite this, scientific productivity continues to play an important role in teachers' performance assessments (Shepherd et al., 2009) and business schools accreditation (Stanton et al., 2009). In addition, recent studies confirm empirically the existence of a positive relationship between academic research levels and business schools' reputation (Rindova et al., 2005). Also, a positive relationship between academic research levels and ranking position is suggested (Drnevich

et al, 2011; Thieme et al., 2012; Araya-Castillo & Pedreros-Gajardo, 2014).

In this context, it is necessary to study higher education sectors as well as managers of public policies in a rigorous, practical and functional way (Thieme et al., 2012). This means that the analysis of the competitive dynamics of higher education sectors should focus on management, instead of the traditional view on education or social sciences (Araya-Castillo, 2013; Araya-Castillo & Pedreros-Gajardo, 2014). This conclusion is based on the acknowledgement that the higher education sector has characteristics which are similar to those of a service industry (Gruber et al., 2010; Jain et al., 2013), and that education has similar dynamics among countries, perhaps with the exception of low-income nations (Larrain & Zurita, 2008).

This analysis is relevant for the Chilean market, where business schools participate in a highly competitive environment (Araya-Castillo & Bernardo, 2014). Chilean business schools seek strategic leading positions in the national market, which has a low concentration level. In recent years, a significant part of business schools has sought a leading position through research development or strengthening. This can be seen through the recruitment of academic staff with doctoral degrees, the restructuring of organizational structures (for example, the creation of academic departments), the creation of research centers, scientific production incentives (for example, research bonuses for articles published in ISI Journals), the creation of research journals, the nomination to research funding and the offer of graduate research programs (for example, doctoral degrees), among others. This explains why Chilean business schools are well ranked in terms of research. According to Olavarrieta (2011), two Chilean institutions have the highest rankings in the top ten Latin American business schools in terms of research.

Therefore, it is essential to analyze whether business schools in Chile are effective and efficient in terms of their scientific production. Scientific productivity has remarkable consequences on resource allocation, since business schools invest resources in the recruitment of researchers who devote large part of their workload to knowledge generation. In addition, research results have a direct effect on the position of business schools in prestigious rankings and accreditation processes, and an indirect effect on the students' willingness

to pay. Along with this, business schools have a social function, as they study issues that are relevant for the development of companies and the country as a whole. This is particularly important, as it has been stated that out of all services, the higher education sector is the one that relates most directly to the growth of society and its socioeconomic development (Senthilkumar & Arulraj, 2011).

With this objective, the strategic group theory is used to study Chilean business schools' research decisions and investment. The strategic group theory is applied to obtain some strategic research dimensions, that is, sources of research in which business schools invest their resources. Subsequently, business schools are grouped according to their strategic behavior in the strategic research dimensions. Finally, the productivity of research groups is analyzed. For this purpose, the relationship between the investment of research resources and institutional performance is established.

Literature Review

The university sector in Chile

Structure of the university market in Chile

Currently, the Chilean higher education system includes three types of higher education entities: universities, professional institutes and technical training centers. These institutions differ in terms of the academic certifications that they grant. Universities are authorized to grant all kinds of academic titles and degrees. Professional institutes can only grant professional titles (with the exception of those reserved only for universities) and higher-level technical titles, while technical training centers are only authorized to grant higher-level technical degrees.

The development of the university sector in Chile underwent major changes after the University Law went into force in 1980 (Brunner & Uribe, 2007; Espinoza, 2008; Thieme et al., 2012). The restructuring of Chilean education as a result of the 1980 law opened the sector to private participation. Although the sector had traditionally had considerable participation of non-State institutions, impermeability and lack of potential competitors made the role of the State very important. According to Brunner and Uribe (2007), these changes have been reflected in:

a) the liberalization of control over supply; b) the growth of supply and c) the transfer of the financial burden.

Regarding the first point, it can be seen that between 1980 and 2012 the number of universities that were part of the Chilean university sector went from 8 to 61. The university market is made up of 16 state universities, 9 private ones with contributions from the State and 36 private universities. Because of this, Chile is the country with the highest percentage of private higher education institutions in the world (73.8%), only after South Korea (Brunner & Uribe, 2007).

In regards to the growth of supply, between 1980 and 1990 enrollment went from 119,000 to 245,000 students and in 1998 it increased to 393,000 students. In percentage terms, between 1996 and 2005 total undergraduate enrollment grew by 90% and new enrollment in 2005 was 203% higher than in 1996 (Thieme et al., 2012). The evolution of enrollment in higher education has continued to increase in recent years with over 876,000 students in 2009, which represents about 5% of the Chilean population.

On the other hand, in regards to the transfer of burden of higher education funding, it is estimated that current total spending on higher education is equivalent to 1,5% of the GDP, out of which 0,55% corresponds to the State and the rest to private participants (Brunner & Uribe, 2007). Based on the data published by the 2007 statistical yearbook of the Council of Deans of Chilean Universities, it can be seen that out of the six universities that receive the greater amount of fiscal contributions, five are privately-owned (Zolezzi, 2009).

Along with this, the Chilean higher education sector is characterized by institutions with a high degree of autonomy and institutional diversity (Reich et al., 2011). This explains why sometimes professional institutes and technical training centers offer the same majors as universities (Rodríguez, 2002), even though only universities can grant bachelor, master and doctoral academic degrees, as well as professional titles that require previous undergraduate education (Gonzalez & Schmal, 2005).

In addition, higher education in Chile is seen as a mechanism for socioeconomic ascent (Simbuerger, 2011). It is undergoing an intermediate phase of massification (Larrain & Zurita, 2008) and most research is done by traditional universities (Gonzalez & Schmal, 2005). Also,

universities increasingly focus their efforts on providing the best service levels to satisfy students' needs (Torres & Araya-Castillo, 2010; Araya-Castillo, 2013), since this allows them to achieve their institutional objectives (Thieme et al., 2012; Araya-Castillo & Pedreros-Gajardo, 2014).

These changes strengthened the higher education market with several positive consequences. In fact, currently there is dynamic enrollment, significant private investment in the university system, a better balance in the territorial distribution of the offer (especially in regional public and private universities), a comparatively stronger development of small and medium-sized public universities, a more entrepreneurial attitude from universities, a reduced dependence on "inertial" resources and a relatively high scientific productivity, in the case of universities with research areas (Thieme et al., 2012).

Competitive dynamics of the Chilean university sector

The changes introduced by the 1980 Law substantially changed competition within the higher education sector in Chile and the coordinating role of the State was overtaken by that of the market (Brunner, 2005; Pressacco & Carbone, 2010). This is important for Chile, as a country that has responded to global economy changes with an export-based growth model (Lopez & Yadav, 2010; O'Ryan et al., 2010), which poses certain challenges for its higher education system, such as those related to the education of professionals, as well as research and development levels (Gonzalez & Schmal, 2005).

The changes experienced by the Chilean university sector have promoted a highly competitive market (Torres & Araya-Castillo, 2010; Thieme et al., 2012; Araya-Castillo & Pedreros-Gajardo, 2014). Competition is reflected in a high level of advertising investment by Chilean universities, which in 2007 amounted to US \$77,8 million (OMD, 2008). Advertising spending by the higher education sector in Chile is the second most important nationally, after retail (Brunner, 2009).

This level of competition had an impact on the dynamics of Chilean universities, as they have had to find new ways to compete. Brunner & Uribe (2007) point out that Chilean universities compete in terms of reputation and volume. In a similar perspective, de la Fuente et al. (2010) argue that Chilean universities compete for students,

resources (both human and financial) and reputation, being students the most important. In addition, Thieme et al. (2012) argue that Chilean universities compete based on three strategic variables: scope, reputation and advertising investment. Araya-Castillo & Pedreros-Gajardo (2014) argue that competition between Chilean universities is based on the strategic dimensions of scope, reputation, infrastructure and advertising.

A common point of the previous proposals is that the strategic behavior of Chilean universities responds to Porter's competitive strategies (1980). Chilean universities compete to get volume (scope) or to position themselves as prestigious institutions (academic quality). This responds to Porter's sources of competitive advantage (1980), since universities try to increase enrollment through a competitive cost strategy. Moreover, universities that want to achieve higher reputation levels use a competitive differentiation strategy.

This dynamics characterizes the higher education sector in Chile. Despite being regulated by government institutions, it is defined mainly by market-generated dynamics. Even though the central government plays an active role by establishing quality, funding systems and regulation criteria, institutions themselves must define their strategic guidelines. Therefore, analyzing the Chilean higher education market from a strategic viewpoint is essential, since university success is determined by the interactions of a highly competitive market with little regulation at the central level.

Business schools in Chile

The Chilean business schools market is highly competitive (Araya-Castillo & Bernardo, 2014). In Chile, 54 universities offer the Commercial Engineering program (main undergraduate major in business schools). From 2008 to 2013, the enrollment of students, both old and new, grew annually above 8% on average for Chilean business schools (SIES, 2012, 2013a, 2013b). In 2013, 40,250 students enrolled in Commercial Engineering, according to the National Council of Education. The market is focusing slightly on major regions. In 2008, 56% of the metropolitan region population was studying, and in 2013 it was home to 60% of students. The Bio Bio region maintained an 11% participation level and in the Valparaiso region it fell from 14% to 11% during

the same period. Despite this concentration, it is possible to study at a business school in 13 of the 15 regions. Some of them have costs 40% lower than in the metropolitan region (SIES, 2012, 2013a, 2013b).

In 2008, 85% of the universities offered the Commercial Engineering program (it means that they were business schools), while in 2013, this figure amounted to 95%. An analysis by region shows that competitors increased in ten regions, decreasing in only two of them. This gives us an average of 7,9 institutions by region, one more than in 2008. However, this competition has not been reflected in lower prices. A greater flow of students might probably help to offset those effects, but it is also possible that institutions are choosing differentiation over price competition (SIES, 2012, 2013a).

Business schools compete in the undergraduate, executive education and graduate markets, which can be structured as follows: (1) Economics and business schools. They have public origins and typically offer academic business and economics programs. (2) Business schools associated to universities. They have private origins and depend on a university that they are part of. They only offer business-related academic programs (although some exceptions offer economics programs). (3) Academic departments. They may have public or private origins. They are normally part of an engineering school, since they are small and lack own positioning. (4) Business schools which are not related to universities. They have private origins, they only offer graduate programs and they do not depend on or are part of any university.

In this competitive dynamics, two large groups of business schools can be observed. These groups are characterized by the strategies they follow in terms of selection of their target markets, allocation of resources and specialization, which explains why the competitive strategies of the Chilean business schools respond to the typology proposed by Porter (1980). Business schools may develop sources of competitive advantages in terms of cost leadership or differentiation leadership. In addition, these business schools (especially the ones competing with a differentiation strategy) can focus on a specialization area such as marketing, finance, human resources, entrepreneurship, etc. or search for multidisciplinary leadership in management sciences.

Some public and private business schools are selective when choosing their students, both at undergraduate and graduate level. These business schools hire professionals with graduate education, especially doctoral studies, to develop research projects. They also hire executives with successful careers to get in charge of teaching and therefore connect the university to the private world. Some of these schools, especially those of smaller size, seek leading positions in certain areas of specialization and focus their resources, since they cannot obtain a leading position in all areas of management.

Business schools in this group have expensive academic programs, offer attractive salaries to their faculty, develop or strengthen research and seek accreditation at the international level. In addition, these business schools' strategic plans establish the search for leading positions in national and international rankings. Given the above, business schools can compete successfully in terms of the offer of graduate programs. In some cases, they even have double-degree agreements with American or European universities. This is how they enroll executives with top positions or foreigners as their students. In some cases, business schools in this group teach graduate courses abroad, especially in other countries of Latin America.

On the other hand, a second group of business schools is characterized by focusing on student recruitment. These business schools offer undergraduate programs with a variety of study modes, such as daytime, evening, weekend, blended and online programs. Even though some of these business schools offer graduate programs, this is not the focus of their operation, because students expect to do their graduate studies in other business schools with greater national recognition. In addition, in some cases these business schools have branches in more than one geographic region or teach the same program in different locations of the same city. Considering the above, these business schools do not invest in teachers with graduate studies, do not have a selective student recruitment process, do not have well-developed research areas and operate with a simple organizational structure. Therefore, business schools in this group do not have top positions in national quality rankings and do not even appear in international rankings, which does not allow them to have high tuition costs.

Strategic group theory

Concept and study approach

The strategic group concept was introduced by Hunt (1972), who tried to explain performance differences between companies competing in the white line appliances sector in the United States. The strategic group concept has an imaginary conceptual space between the company and the sector (Cespedes, 1995), since it works as a link between market structure (heterogeneity of the industry) and company behavior (chosen strategic options). From this perspective, a company's performance measured in terms of efficiency and profitability depends on its behavior (Perryman & Rivers, 2011).

Groups appear in an industry because of product-market heterogeneity, the fact that resources are not easily imitable and mobility barriers (Mehra & Floyd, 1998). Mobility barriers are relevant to maintain rates of return over time, since they are the factors that prevent or hamper the entrance of companies from other industries and other strategic groups to the strategic group itself. Industries can be formed by several strategic groups or only one, as long as all companies follow the same strategy (O'Regan et al., 2011). Companies within the same group are expected to have similar resources and strategies and to compete aggressively with one other (DeSarbo et al., 2008).

Some investigations have studied the strategic group concept, mainly from the perspective of industrial organization and the theory of resources and capabilities (Thieme et al., 2012). Industrial organization states that a strategic group is formed by a set of companies within an industry with similar specific resources, which makes them follow common strategies (Porter, 1980). Therefore, the structure of the industrial sector explains the different outcomes observed among companies (Scherer, 1970; Scherer & Ross, 1990).

On the other hand, the theory of resources and capabilities argues that strategic groups are based on the differences in terms of resources and strategic capabilities among companies in the same industry (Cool et al., 1994; Mehra & Floyd, 1998). This explains the companies' heterogeneity of resources and capabilities as the main source of the differences observed in terms of outcome (Barney, 1991; Peteraf, 1993).

Both approaches differ in terms of the elements considered for determining strategic groups. The theory of resources and capabilities uses elements related to the company's strategy (internal elements) and industrial organization (external elements). However, it has been argued that the notion of strategic groups is a midpoint between industrial organization and the theory of resources and capabilities (O'Regan et al., 2011). Several authors argue that the study of strategic groups should consider the strategic dimensions of their own scope, which must contain both external (product-market) and internal elements (corporate resources) (Cool & Schendel, 1987; Aaker, 1988).

In this line of research, the concept of strategic group is defined as a set of companies competing in an industry of similar combinations of scope, areas of market activity and commitment of resources (Cool & Schendel, 1987). Therefore, when we talk about strategic variety we refer to differences in the behavior of companies and also to their resources and capabilities (Gonzalez & Ventura, 2007).

However, and despite the fact that research on strategic groups has been relevant in the field of strategic management (Thomas & Venkatraman, 1988), some authors argue that strategic groups are only statistical artifacts (Cool & Schendel, 1988; Barney & Hoskisson, 1990). For this reason, other studies have proposed the setting of strategic groups through the cognitive approach (Reger & Huff, 1993; Spencer et al., 2003), which emphasizes the importance and the role of individuals in business strategic decision-making processes (Garces, 2005).

According to this approach, strategic groups, rather than being a strictly economic objective problem (whether external or internal), exist previously on the minds of executives and managers in charge of strategic decision-making (Thomas & Carroll, 1994). This implies that managers or executives categorize or group their competitors in a cognitive way (forming their strategic groups), and their viewpoints are relatively homogeneous within the same industry (Bogner et al., 1993). Therefore, it might be said that the similarity of mental models will make companies take similar actions, since they have similar thought structures (Hervas et al., 2006).

However, the use of cognitive maps to determine strategic groups has been criticized (Garces & Duque, 2007). These authors argue that in this

process it is not possible to avoid bias, which explains the lack of agreement on the schemes that should be used (Flavian & Polo, 1999). Therefore, it is possible to say that there is no consensus on the theoretical approach to be used for studying strategic groups.

Strategic groups and performance

One of the main topics in the field of strategic management has to do with the reasons that make companies reach different performance levels (Rumelt et al., 1994). This is how the impact of belonging to a business performance group has been a central topic in the literature on strategic groups (Hervas et al., 2006; Pereira et al., 2011). However, the available empirical evidence is contradictory, because some studies have found significant performance differences between strategic groups (Oustapassidis, 1998; Coombs et al., 2004; Dikmen et al., 2009), while others have not achieved conclusive results (Peteraf & Shanley, 1997; Zuñiga-Vicente et al., 2004; Claver et al., 2006).

Result inconsistency can be attributed to different factors. Firstly, there is no consensus yet on the strategic dimensions that should be considered to obtain strategic groups (Dikmen et al., 2009). Secondly, it is argued that result inconsistency is given because strategies cannot be easily imitated due to mobility barriers (Shah, 2007). Thirdly, the difference of results could be explained because the performance obtained is determined by market conditions, such as maturity or concentration level (Shah, 2007). Fourthly, contradictory results can be explained by the different performance measurements used and the number of strategic groups established (Claver et al., 2002).

Despite these criticisms, the strategic group concept has emerged as an analytical construct with practical usefulness (Gonzalez, 2001). The division of the industry into strategic groups provides an analysis tool to explore in detail the nature of competition in industrial sectors. It provides a greater variation level than the analysis of one single company and it also allows for more specific data than aggregate sector analyses.

Nevertheless, in the literature on strategic groups there are no studies that analyze research decisions by business schools. The closest study refers to the application of the strategic group theory to higher education markets. These works have been done in Spain (Hernangómez et al.,

2007), Germany (Warning, 2004, 2007) and Chile (Thieme et al., 2012; Araya-Castillo & Pedreros-Gajardo, 2014). Research dimensions in the business school market can be determined with the strategic group theory. Business schools are grouped according to their positioning (or investment) in the different dimensions. This is relevant for decision makers at business schools, since they can recognize institutions with a research behavior similar to their own and assess the impact of research investment on their organizational performance.

Methodology

This work analyzes the research behavior of business schools in Chile, according to the strategic group theory. Research on strategic groups can be classified into three main lines: 1) identification of the strategic groups; 2) analysis of performance differences among groups and 3) study of the temporal stability of groups (Lee et al., 2002). Araya-Castillo (2014) adds the determination of strategic variables to this classification.

In this context, strategic variables that characterize the research behavior of business schools are studied, strategic research groups are determined and performance is analyzed. This research work assumes that company performance is determined both by market structure and its supply of resources and capabilities. Therefore, a strategic group is understood as the set of companies competing in an industry with similar combinations of scope, areas of market activity and commitment of resources (Cool & Schendel, 1987).

There is no consensus in literature on the methodology to be used for strategic group formation (Araya-Castillo, 2014). However, it is argued that using multivariate methodologies is more useful for the development of empirical research (Hatten & Hatten, 1987). The most frequently used methodology in strategic group configuration has two stages: determination of the strategic variables through an exploratory factor analysis and the subsequent obtaining of strategic groups through cluster analysis (Hervas et al., 2006).

The sample is made up by the eleven Chilean business schools included in America Economía's MBA ranking in 2011, which analyzes the top 42 business schools in Latin America. In addition, information from the web pages of the business schools which are part of the sample was used. It

is not possible to work with the whole group of business schools because most of the information about the higher education market in Chile corresponds to aggregated data for universities and it is not broken down by faculties, locations or types of studies.

With the information gathered, a factor analysis of principal components with varimax rotation was applied (Hair et al., 2005). This analysis allowed the authors to obtain the strategic research dimensions followed by competing business schools in Chile. However, even though the analysis of principal components is appropriate, it does not guarantee that the results obtained are statistically significant (Araya-Castillo; 2014). For this reason, the validity and reliability of strategic dimensions was examined (Nunnally, 1978).

Once the strategic dimensions of market research used by business schools in Chile were determined, the different business schools were classified into groups through a K-mean clustering analysis (Malhotra, 2004). With this procedure, relatively homogeneous groups of business schools were obtained, as groups of business schools that follow different strategies were identified. To validate the classification obtained, a one-way ANOVA test was used to find significant differences among groups for all variables (Malhotra, 2004).

In addition, the relationship between strategic research groups membership and business school performance was analyzed (Hervas et al., 2006), to verify if strategic research variables correlated with result variables. In this context, a Pearson correlation analysis was used to evaluate whether dispersion of results between groups outperformed significantly dispersion within groups (Hervas et al., 2006).

Results

Strategic dimensions of research

According to the factor analysis of principal components with varimax rotation (Hair et al., 2005), the strategic research dimensions followed by competing Chilean business schools are: 1) academic production, 2) research team, and 3) academic dissemination. The principal component analysis is appropriate (with a 95% reliability level), because the KMO value (0,610) in the sample adequacy test meets the condition

of being greater than or equal to 0,5. In addition, associated probability (0,000) on the Bartlett test (p-value) is lower than the 0,05 significance level (Malhotra, 2004.)

Table 1 shows that the set of variables meets the requirement of having common variance with the component (extraction communality) at a minimum of 0,5 (Hair et al., 1998). In addition, it is possible to see that the three components explain an 88,964% of the total variance, which meets the minimum requirement of 60% (Malhotra, 2004). Along with this, the load of each variable with the component (factor loading) meets the required minimum of 0,4 (Larwood et al., 1995).

Factor 1 (strategic research dimension 1) has been called "academic production", as it is formed by the number of cases, ISI papers, full-time professors, papers in other databases and books. These variables make reference to strategic decisions made by business schools to increase their research products. On the other hand, factor 2 (strategic research dimension 2) has been called "research team", because it is formed by the number of part-time and full-time professors with a Ph.D. degree. These variables are related to business schools' investment in human capital with research skills and competences. Finally, factor 3 (strategic research dimension 3) has been called "academic dissemination", since it is composed by the number of academic journals. Business schools have academic publications in order to position themselves as institutions that generate and catalyze knowledge.

Content and discriminant validity types were analyzed (Nunnally, 1978). Content validity was guaranteed with the confirmation of strategic variables through the analysis of previous studies and comments from five experts and four business schools directors (Deng & Dart, 1994). Concerning discriminant validity, a correlation analysis between the factors obtained (strategic research dimensions) was carried out, making sure that correlation coefficients are null in all cases (Garcia & Ruiz, 2007). Convergent validity could not be measured because sample size does not allow for a confirmatory factor analysis through structural equations (Hair et al., 2005).

Keeping this in mind, the statistical validation of strategic dimensions through unidimensional analysis was proposed. The academic production and research team dimensions were the only ones analyzed, since the academic dissemination dimension has only one variable. The results

TABLE 1. Strategic research dimensions in business schools

DIMENSION	VARIABLES	FACTOR LOADING	EXTRACTION COMMUNALITY	OWN VALUES	EXPLAINED VARIANCE (%)	CUMULATIVE VARIANCE (%)
1 Academic production	Cases	0,924	0,870	2,538	36,263	36,263
	ISI Papers / Full-time teachers	0,829	0,933			
	Papers in other databases	0,681	0,788			
	Books	0,640	0,834			
2 Research team	Part-time Ph.D. professors	0,961	0,946	2,230	31,858	68,121
	Full-time Ph.D. professors	0,839	0,912			
3 Academic dissemination	Academic journals	0,971	0,944	1,459	20,843	88,964

Source: Own elaboration.

allow us to conclude that strategic dimensions have some degree of unidimensionality, since the KMO values of each dimension are greater than or equal to 0,5 (Malhotra, 2004) and variance values are above 60% (Hair et al., 1998). Moreover, indicators (items) have factor loads higher than the 0,4 required minimum (Larwood et al., 1995). Regarding the reliability analysis, it is possible to say that there is internal consistency in the constructs used to measure the academic production dimension, since Cronbach's alpha value is greater than the 0,6 required minimum (Hair et al., 1998). There is also internal consistency in the constructs used to measure the research team dimension, since the Pearson test indicates that the correlation is significant at a 99% reliability level (p-value is 0,000).

Establishing strategic research groups

After the theoretical and statistical validation of the strategic research dimensions, four strategic research groups were formed. Table 2 shows the composition of these strategic research groups, based on a K-mean clustering analysis (Malhotra, 2004). The analysis is appropriate, since in the One-Way ANOVA test the probability (0,000) associated to the Bartlett test (p-value) is less than the 0,05 significance level for each of the dimensions considered (Malhotra, 2004).

Research group 1 is composed by Universidad Adolfo Ibañez' Business School. Universidad Adolfo Ibañez' Business School has the first position in America Economía's MBA ranking (2011).

TABLE 2. Strategic research teams

RESEARCH TEAM	BUSINESS SCHOOL	ACADEMIC PRODUCTION	RESEARCH TEAM	ACADEMIC DISSEMINATION
Group 1	Universidad Adolfo Ibañez	2,11824	0,03363	-0,87151
Group 2	Pontificia Universidad Católica, Universidad Alberto Hurtado and Universidad de Talca	0,23867	-0,87445	1,05223
Group 3	Universidad de Chile	0,07436	2,54944	1,31995
Group 4	Universidad del Desarrollo and Universidad Diego Portales	0,60491	0,05412	-0,90512
Group 5	Universidad Técnica Federico Santa María, Universidad de Santiago, Universidad Gabriela Mistral and Institute for Executive Development (IEDE)	-1,02961	-0,01699	-0,44873

Source: Own elaboration.

This business school has the highest score in terms of academic production, which is important because it does not have the highest score in the research team dimension. According to this, it is possible to say that Universidad Adolfo Ibañez' Business School is productive in terms of scientific production.

Concerning research team 2, it comprises the business schools of Pontificia Universidad Católica de Chile, Universidad Alberto Hurtado and Universidad de Talca. According to America Economía's MBA ranking (2011), business schools of Pontificia Universidad Católica de Chile, Universidad Alberto Hurtado and Universidad de Talca have the 6th, 20th and 21st positions, respectively. This group is characterized by above average scores for academic production and dissemination, as well as low values for the research team dimension. Business schools belonging to this group are characterized by not having many faculty members or teachers with doctoral studies.

Research group 3 is composed only by Universidad de Chile's Business School. According to America Economía's MBA ranking (2011), Universidad de Chile's Business School has the 9th position. This business school is characterized by having the highest scores in the research team and academic dissemination categories, despite low scores in terms of academic production. This indicates that Universidad de Chile's Business School does not have suitable levels of scientific production.

Furthermore, research group 4 consists of Universidad del Desarrollo and Universidad Diego Portales' business schools. America Economía's MBA ranking (2011) gives Universidad del Desarrollo and Universidad Diego Portales' business schools the 16th and 18th positions respectively. These business schools have the lowest scores in terms of academic dissemination. Additionally, they have the second highest score in terms of academic production and research team.

Finally, research group 5 comprises business schools of Universidad Técnica Federico Santa María, Universidad de Santiago, Universidad Gabriela Mistral and IEDE. According to America Economía's MBA ranking (2011), business schools of Universidad Técnica Federico Santa María, Universidad de Santiago, Universidad Gabriela Mistral and IEDE have the 17th, 22nd, 37th and 39th positions respectively. This group is characterized by the lowest scores in terms of academic

production and below average values in terms of research team and academic dissemination.

Performance analysis of research groups

Once the strategic research groups were formed, the relationship between investment in the sources of strategic research dimensions (academic production, research team and academic dissemination) and market results (Association to Advance Collegiate Schools of Business (AACSB) accreditation, European Quality Improvement System (EQUIS) accreditation, Association of MBAs (AMBA) accreditation, America Economía's MBA ranking 2011 total index and MBA tuition) was analyzed. With this analysis, the performance of business schools in terms of their strategic decisions and resource allocation can be studied. Table 3 shows the resulting correlations between business schools' resource allocation in the strategic research dimensions and the results obtained from these investments.

From Table 3 it can be seen that the research team and academic dissemination dimensions do not have an impact on international accreditation. However, it is possible to conclude that strategic research variables of the academic production dimension have a positive correlation with the AACSB accreditation. This may indicate that having a good academic team and academic journals does not guarantee successful completion of the accreditation process, because business schools must use those resources to demonstrate results in terms of scientific production.

It can also be seen that the academic production and research team dimensions have an impact on the position of business schools in America Economía's MBA ranking (2011). This is important because the academic production and research team dimensions are related given that the research team is comprised of Ph.D. scholars. Therefore, a business school with a consolidated research team can be expected to have good academic dissemination scores. The academic dissemination dimension has no impact on the position of business schools in this ranking.

Finally, the academic production and research team dimensions have an impact on MBA costs. Through these dimensions, business schools can generate an image of academic reputation. Likewise, academic reputation allows business

TABLE 3. Relation between strategic research variables and performance results

		AACSB	EQUIS	AMBA	MBA RANKING 2011 TOTAL INDEX	MBA COSTS
Cases	Pearson correlation	,639*	,297	,256	,708*	,517
	Sig. (bilateral)	,034	,375	,448	,015	,103
ISI papers / Full-time professors	Pearson correlation	,760**	,154	,394	,886**	,783**
	Sig. (bilateral)	,007	,651	,231	,000	,004
Papers in other databases	Pearson correlation	,148	-,215	,552	,295	,189
	Sig. (bilateral)	,665	,525	,078	,379	,577
Books	Pearson correlation	,517	-,360	,584	,579	,522
	Sig. (bilateral)	,103	,277	,059	,062	,100
Full-time Ph.D. professors	Pearson correlation	,599	-,067	,326	,638*	,650*
	Sig. (bilateral)	,052	,844	,328	,035	,030
Full-time Ph.D. professors	Pearson correlation	,397	-,162	,283	,255	,489
	Sig. (bilateral)	,226	,634	,399	,449	,127
Academic journals	Pearson correlation	,085	,285	-,184	,153	,120
	Sig. (bilateral)	,803	,395	,588	,654	,726

*: The correlation is significant at 0,05 (bilateral).

** : The correlation is significant at 0,01 (bilateral).

Source: Own elaboration.

schools to generate brand loyalty, which, in turn, generates the perception that the MBA program offered is a specialty product. When the MBA program is perceived as a specialty product, business schools may charge higher fees, since students are more willing to pay for it. The academic dissemination dimension does not have an impact on MBA costs.

Conclusions, limitations and implications

Business schools can invest their resources in two different areas: teaching and research. Investment of resources in teaching has a direct effect on the results of business schools, since student satisfaction can be measured. Degrees of satisfaction are related in a positive way to student behavior in aspects such as retention, loyalty and willingness to pay. However, the impact of resource investment in research on business schools' results is more difficult to measure.

The investment of resources in research has an indirect effect on business schools' results. Business schools that emphasize research activities are characterized by teams of researchers, a relatively complex organizational structure,

research incentives, research programs and research funding nominations, among other initiatives. Thanks to this, business schools can improve their position in national and international rankings, which also allows them to get a better reputation. When business schools have a good reputation, the costs of their academic programs can be higher (for example, MBAs), because brand loyalty is generated. This turns study programs into specialty products that students will be more willing to pay for.

In this context, it is important to study the research behavior of business schools in Chile. With this objective, the strategic group theory was applied, because it is assumed that the research performance of business schools depends on the market's research dynamics and their own behavior (that is, resources, capabilities and strategies). Because of this, decision makers at business schools determine their research plan based on market dynamics and the characteristics of their own institutions.

In this article, the behavior of the eleven Chilean business schools included in America Economía's MBA ranking in 2011 was studied. The results allow us to conclude that the strategic research dimensions that determine business schools' behavior are academic production, research team and academic dissemination.

Business schools are grouped into four categories, according to their position in the strategic research dimensions. In addition, it can be concluded that the investment of resources in research has an impact on business schools' performance in terms of their international accreditation, their position in the quality ranking and their MBA costs. Also, academic production has an impact on international accreditation, quality ranking position and MBA costs. The research team has an impact on the position of the business school in the quality ranking and its MBA costs. Meanwhile, academic dissemination does not have an impact on business schools' performance indicators.

This study has some limitations. First, business schools' research dynamics change among countries or markets. Therefore, it is not possible to establish a generic set of competitive or strategic research dimensions. Second, validity and reliability of the results are determined by the information available. The results obtained could have had a greater degree of practical validity if more information was available. Third, the sample comprises only eleven business schools, instead of the 54 operating in the country. Fourth, future research should focus on analyzing temporary consistency of the strategic research groups obtained. Despite this, the study is a contribution to literature, because it allows decision makers to analyze research behavior in business schools from a strategic perspective and not only from the point of view of education or social sciences. In addition, the strategic group theory is applied to a market that had not been studied by researchers before. On the other hand, this study can be replicated in other countries of Latin America and the world. In that case, the same methodology used for analyzing the Chilean business schools market should be used.

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