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Reliability and validation model for a Porter´s competitive forces "threat of new entrants": Findings from banking industry in Colombia

Modelo de fiabilidad y validez de la fuerza competitiva de Porter "amenaza de entrantes potenciales": hallazgos desde el sector financiero colombiano

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Abstract

This document proposes a model focused on validating one of the five competitive market forces done by Michael Porter; punctually the force of Threat of new Entrants in "entry barriers" category. This, looking for discussing from the empirical evidence, the pertinence and current validity of Porter´s theoretical foundations, regarding the competitive performance of meso-sectors or industries. The proposed model provides empirical evidence of entry barriers structure for Colombian Banking sector, based on data collected in 2015, which also allows us to explore the timely relevance of each conceptual factor in that sector. To achieve this aim, a statistical model supported by a confirmatory factorial analysis (CFA) was developed to analyze the validity of each proposed factor, and demonstrate that selected variables for (i) capital requirements, (ii) access to distribution channels and (iii) product differentiation factors, evidence a higher level of internal reliability, while factors like (i) scale economics, (ii) changing costs and (iii) government policy, showed unacceptable coefficients. As main findings, research shows that

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scale economics is a factor that generates the greatest contribution to the model, which evidence that any banking institution manages to overcome or affect this factor, it would also directly affect the factors of product differentiation, costs changes and access to distribution channels. Regarding the least impact factor on model structure, results shows that government policies as select one, because its impact on the competitive strategy can be effective in the medium and long term.

JEL code: C63, G21, L16M, M16
Keywords: Porter's five forces; Financial sector; Competitive strategy; Barriers to entry; Confirmatory factor analysis

Resumen

El presente documento propone un modelo enfocado en validar una de las cinco fuerzas competitivas del mercado desarrolladas por Michael Porter; específicamente la fuerza denominada Amenaza de Entrantes Potenciales en la categoría de "barreras de entrada", con el propósito de discutir desde la evidencia empírica, la pertinencia y validez actual de los fundamentos teóricos del este autor, respecto del desempeño competitivo de los meso-sectores o industrias. El modelo propuesto provee evidencia empírica de la estructuración de barreras de entrada del sector financiero colombiano, a partir de datos recolectados en el año 2015, los cuales permite adicionalmente, explorar la pertinencia puntual de cada factor conceptual en dicho sector.Para esto, se desarrolló un modelo estadístico soportado en un análisis factorial confirmatorio (AFC), para analizar la validez de cada factor propuesto y evidenciar que las variables seleccionadas para los factores (i) requisitos de capital, (ii) acceso a los canales de distribución y (iii) diferenciación del producto presentan alto grado de confiabilidad interna, mientras los factores de (i) economías de escala, (ii) costos cambiantes y (iii) política gubernamental muestran coeficientes no aceptables.Como principales hallazgos, se evidenció que el factor que mayor contribución genera al modelo es el de economías de escala, lo que demuestra que, si una entidad financiera logra superar o afectar este factor, afectaría también de forma directa los factores de diferenciación del producto, costos cambiantes y acceso a canales de distribución. El factor que menos afectaciones genera en la estructura del modelo son las políticas gubernamentales, debido a que su impacto a la estrategia competitiva puede ser más a mediano y largo plazo.

Código JEL: C63, G21, L16M, M16
Palabras clave: Fuerzas Competitivas de Porter; Sector financiero; Estrategia competitiva; Barreras de entrada; Análisis confirmatorio

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Introduction

Even when the main theories on competition and competitiveness of organizations date from reflections proposed in the second half of the 20th century, the study of the causes, factors, and relationships that lead these organizations to obtain greater performances in comparison with their direct competitors remains an ongoing problem, one that is of interest for the development of organizations. In this context, the behavior of the sector influences the formulation and achievement of organizational goals. These organizations, in order to survive and improve their performance, must face increasingly turbulent environments, given the complexity and uncertainty of the competitive environments (Rivera, 2010).

With innate space being the strategy for the study of greater performance, academics have proposed models, definitions, debates, and numerous researches on the subject in recent decades. One of the most representative works, which delimits a good part of the origins of the study of the business strategy, is the one developed by Chandler. McCraw (2008), who explains that the strategy is the means to establish organizational purposes and action and resource allocation plans that determine the basic long-term goals of a company. For his part, Andrews (1987) argues that the pattern of a company's objectives must define well the type of business it wants to be and the path it must follow to achieve it. On the other hand, Hofer and Schendel (1978) argue that the objectives of a company are achieved in the extent that the current and future interactions with its environment are consolidated. Porter (1979, 1982, 2008) provides a model to achieve a sustainable competitive advantage through the suitable response to opportunities, environments, and external threats or to the internal strengths and weaknesses of the companies. Birger Wernerfelt (1984) proposes a theory based on the resources or advantages that characterize companies, capitalizing on their relative strengths. Henry Mintzberg (2006) states that there is no standard mode to treat companies, as each one requires a unique direction, strategy, and special decision-making, which make it impossible to plan a common strategy. Nelson and Winter (2002) explain that the evolution of companies must consider the changes of the global economy, as well as global policies and regulations in order to position itself amid its competitors.

These proposals outline the main sources of prosperity for a company, which, in addition to the internal performance of the company, the dynamic of the environment, and the competitive properties of the sector to which each company belongs, influence both the group of competitors as well as the nation in which it operates. For this reason, it is important for companies to consider that the position in their sector depends on their internal organization, on analyzing their advantages within said sector, and on defining the position that they want to strengthen within it.

In this same line, Porter (2008) has posed the analysis and comprehension of the competition as the main function of the strategies in the industrial sectors, strategies that are characterized by the presence of competitive rivalry. In it, the consequences of the long-term profitability of a market or of a market segment are defined, which govern industrial competition (Dobbs, 2014).

Thus, the analysis of companies allows understanding and explaining organizational strategies as sectoral. According to Porter (1982), the structures of the sectors offer a framework where companies compete, configuring an environment to guarantee their long-term stability and restrict access to other companies. Some environments seem to be more stimulating for the advancement of the sectors, and this carries out a crucial role in the success of companies, determining the economy of a nation since it is the behavior of a *whole* (Porter, 1982).

In this sense, the competitive strategy using Porter's five forces for competitor analysis (1979) is one of the first models that addresses, in a timely manner, the factors related to the environment in which the companies operate, implying the integration of the competitors (Pulgarín and Rivera, 2012). Thus, these forces shape the strategy as a fundamental part for decision-making and are what allow the formulation of competitive strategies for the creation of structures favorable to both new and current competitors (Porter, 2008).

Porter's proposal of the five forces for competitor analysis poses that there are five factors or forces for the competitors present in a group of companies that comprise a sector and that follow the same or a similar strategy throughout the strategic dimensions. These dimensions are: (i) specialization, (ii) brand identification, (iii) direct relationship with customers, (iv) selection of channels, (v) quality of the product, (vi) technological leadership, (vii) vertical integration, (viii) cost position, (ix) service, (x) price policy, (xi) leverage, (xii) relationship with the matrix company, and (xiii) governmental relationship (Porter, 1982).

Porter stands out due to his theoretical contribution concerning the competitive environment of a sector and its relationship with business strategies. The author states that the understanding of the forces identifies the origin of profitability of a sector and allows anticipating the competition as a starting point to develop the strategy of a company (Porter, 1979).

The forces determined by Porter (1979, 2008) are:

- Threat of new entrants: the presence of new competitors in the market will depend on how high or low the barriers to entry of a sector are, given that the existence of new competitors in the market exercises pressure over the necessary factors to compete (prices, costs, and investment); this in turn generates a constraint in the potential profitability of the sector.
- Bargaining power of suppliers: the suppliers can exercise bargaining power against the participants in a sector by influencing the prices, costs, or quality of their goods or services, through market dominance by a small part of them.
- Bargaining power of customers: the customers have bargaining power in the strategic sector in which they compete, forcing lower prices and bargaining for better product quality or services, generating competition in the sector and influencing in its profitability.

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• Threat of substitutes: substitute products are those that perform the same function as the previous product in the industrial sector. Therefore, in a general sense, companies in a sector compete with companies that offer substitute products, so that the potential yields of the sector are limited, affecting prices and costs.
• Industry rivalry: the intensity of the rivalry between the existing competitors is due to the fact that the companies in an industrial sector feel the pressure or see the opportunity to improve their position within the sector.

Porter's set of forces (1982) has important implications: (i) a rapid growth sector is not always profitable, (ii) through mergers and acquisitions, it must be determined how competitors can be eliminated, (iii) governmental policies have a crucial role in the forces and said forces can help understand the key influences in the sector to create a favorable structure for itself and enable everyone to profit. Thus, Porter's forces are used as a tool to carry out an analysis of the environment of the organization using the basic factors that determine the profitability and attractiveness of a sector, that is: prices, costs, and investment requirements (Morales, Medina and Martínez, 2013).

This study is based on the measurement of the competitive force *Threat of new entrants*, given that among the five forces this one can have the greatest influence in establishing restrictions on the participation of new companies in a particular sector (Porter, 1979). This force is explained based on the idea of *Barriers to entry*, that is, the set of factors that comprise an obstacle for new companies to access a sector, generating risk in the entry of new actors that seek to begin production and sale of products or services. Said factors are: (i) economies of scale, (ii) product differentiation, (iii) capital requirements, (iv) changing costs, (v) access to distribution channels, and (vi) governmental policies (Porter, 1979).

The objective of this study is to obtain empirical proof of the relationships of the theoretical factors, departing from the hypothesis that all of the factors observed and proposed by the *Barriers to entry* force contribute to the explanation of the sector. More specifically, however, it focuses on differentiated contributions, given that the actors are not homogeneous and prioritize their own capabilities when competing.

To guarantee the validity of the factors, that is, the degree in which the selected variables measure the observed factors, a *confirmatory factor analysis* (CFA) is used. Once the validity of these factor relationships is guaranteed, a characterization of the financial sector institutions is carried out find out how these have prioritized their competitive strategies.

This study is framed within the context of the Colombian financial sector, which, for 2013, according to the Superintendency of Industry and Commerce, had 51 companies from the three large groups that comprise the Colombian financial system (credit institutions, financial services companies, and other financial institutions).

This study intends to be a contribution that allows describing and providing empirical evidence of the relationships of the theoretical factors observed and proposed by the competitive force *Threat of new entrants*, which is explained in this study based on the idea of *Barriers to entry*.

It should be noted that, in the bibliographic revision carried out, no scientific articles were found that implement validation models of only this force in the financial sector; however, various studies were found that implement Porter's five forces in industrial sectors, such as airlines (Kling, 1995), the hospital industry (Autrey and Thomas, 1986), or the ecotourist sector (Shiunn, Han and Ru, 2011), among others.

This document is structured as follows: first, the contextualization of the financial sector is presented; second, the factors of the force *Threat of new entrants* proposed by Porter are detailed, which are explained based on the idea of *Barriers to entry*; third, the materials and methods used to develop this study are described; fourth, the main results are shown; fifth, the conclusions and recommendations are presented.

Contextualization and target population of the study

Evolution of the financial sector in Colombia

The financial system is of great importance to the economic growth of a country, since it facilitates the transference of financial resources and contributes to the movement of savings, the creation of liquidity, and the diversification of risk. For this reason, a country needs the creation and expansion of institutions and mechanisms that serve to support the growth and investment process (Cortés and Luna, 2014).

In 1923, the Colombian financial system was characterized by the development of an exercise directed to the multibank, stimulated mainly by commercial and private banking. Subsequently, during the 1960s, 1970s, and 1980s it was characterized by its response to the needs and interests of a labor-union nature, based mainly on the encouragement of some economic sectors, such as agriculture and livestock, commercial, industrial, construction, and commercial goods and services sectors (Urrutia and Caballero, 2005; Sarmiento and Cristancho, 2009). In this manner, the Colombian financial system was considered as universal banking in the case of acquisition and as specialist banking in the case of loans (González, García and Murillo, 2014).

With the 1991 Constitution came changes in the regulation in Colombia in order to promote a financial system that is more competitive and open to the foreign market (Sarmiento and Cristancho, 2009). In this manner, in the 1990s an important reform to the financial system is launched, characterized by: (i) the relaxation of rules and deregulation of the system, (ii) a trend towards multibank and diversification of the sector, and (iii) the modification of the

regulation and monitoring systems (González, García and Murillo, 2014).

Between 1990 and 2011, the Colombian financial sector was one of the most transformed organizationally speaking, which is a consequence of the different mergers, alliances, integrations, and administrative and legal structures (González, García and Murillo, 2014; García and Gómez, 2009). However, due to the 1998 crisis, the growth being generated in the Colombian financial structure stagnated, reducing the number of financial institutions due to some of them disappearing and others transforming in order to survive (Azuero, 2004).

An example of the aforementioned is the structuring of some public institutions, such as the Caja Agraria and the creation of the Agrarian Bank; the intervention of the Central Mortgage Bank (BCH for its acronym in Spanish) and of the State Bank; the disappearance of the Ecuadorian, Andean, and Pacific Bank; the intervention of the Uconal and Bancoop cooperative banks; the intervention of Granahorrar and Banco Selfin; as well as the mergers of some savings and housing institutions with banks, such as Concasa with Banco Cafetero, Ahorramás with Banco AV Villas, and CAV Colpatria with CAV Corpavi in Banco Colpatria (Arango, 2006). The economic recovery of the banking system took place in the 2000-2007 period. This was a scenario in which different mergers and acquisitions occurred (Sarmiento and Cristancho, 2009). Some examples are: the merger of Conavi and Bancolombia, Suramericana and Corfinsura, Colmena and Caja Social, among others (Anif, 2006).
Currently, the Colombian financial system is comprised by three large groups that include different institutions differentiated by their function (Bancoldex, 2006; Uribe, 2013). These groups are:

- Credit institutions: organizations that provided the captured resources to the public mainly through loans.
- Financial services institutions: their main function is to provide financial assessment specialized in the administration of resources.
- Other financial institutions: comprised by special official institutions: (i) capitalization companies (that stimulate savings through capitalization plans and periodical draws) and (ii) insurance companies that fulfil an important function in the financial market as institutional investors, although they are not legally financial institutions.

Current situation of the financial sector

Despite the fluctuation of the Colombian and global economy, as well as of the financial sector, this is one of the bastions of the national economy, as it has become a system of institutions with continental presence. The aforementioned is thanks to an independent central bank

model (Banco de la República), the support for savings banks (Fogafín), a control agency (Superfinanciera), and a growingly specialized regulation (Dinero, 2015).

For the first-half of 2017, the assets of credit institutions (CI) show rather low growth rates as consequence of the deacceleration of the Colombian economy. The aforementioned is evidenced in the decrease between June 2016 and June 2017 of 1.1 percentage points in the ratio between the assets of the CI and the Gross Domestic Product (GDP) of Colombia. By August 2017 the CI assets added up to COP 598 trillion, of which 70.7% correspond to the portfolio and 17.8% to investments. Furthermore, the annual real growth of the portfolio for August 2017 was at 1.3% growth, generated mainly by the microcredit portfolio. Nevertheless, the credit risk indicators showed deterioration in all modalities (commercial, consumer, housing, and microcredit portfolios), reaching a level of 9.7% in August 2017, the highest level observed since November 2003. On the other hand, the indicators of quality for arrears were at 5%, the highest level since November 2009 (Banco de la República, 2017).

Regarding the investment of the CI, their growth rate has shown negative levels since April 2016; however, in August 2017 it reached levels of zero. Nevertheless, its composition has remained stable.

Concerning the liabilities of the CI, as of August 2017 it stood at COP 516.9 trillion, with an annual real growth of 0.4% (considered low with respect to its historical levels). On the other hand, the worth of the CI stood at COP 81.2 trillion with a real decrease of -2.8% for August 2017, a constant that has been observed since October 2016 (Banco de la República, 2017).

In relation to these institutions, as of August 2017 the return on equity (ROE) indicator fell to 10.8% with a decrease of 4.7 percentage points in the same period, and the return on assets (ROA) indicator fell 1.5% with a decrease of 66 basis points in the last six months; indicators not seen since the beginning of 2003. Said indicators were mainly affected by the growth in provisions generated by the increase in credit risk. The liquidity risk analysis shows that, in said year, the credit institutions have adequate levels of liquid resources to comply with their short-term obligations, where the technical and basic solvency indicators increased, reaching 16.4% and 11.3%, respectively (Banco de la República, 2017).

In regard to the non-banking financial institutions, in August 2017, an annual real growth of 8.0% of the total of their assets was observed, standing at COP 78.3 trillion and representing 5.1% of the total assets of the Colombian Financial System. Said increase was mainly due to the insurance companies and brokerage firms. Concerning the investments in these institutions, they focus mainly on the local market of private debt (41.8%), public debt (28.6%), and equity instruments of national issuers (19.2%). As for the profitability indicators, these have been stable, remaining close to their historical averages, which have not been affected by a materialization of the market risk (Banco de la República, 2017).

According to the above, the financial sector has shown a slight deacceleration; however, it continues showing stable liquidity and profitability indicators, making it attractive for new investors.

Nevertheless, some fears do manifest in the sector, among which is the risk of portfolio deterioration, derived from an economic deacceleration and the over indebtedness of the clients, the volatility of the exchange, and the uncertainty in the inflation target (Gómez, Mariño and Pacheco, 2016).

The financial sector and the factors of the force threat of new entrants

The entry of new competitors to any economic sector is a natural process framed in the conditions of the free market. Their entry derives mainly from the profitability they perceive and that is being obtained in the sector or the profitability that could be obtained through the competitive advantage they could implement in the structures of the current sector (Ballarín, 1985).

It should also be noted how the Latin American financial sector is structured, the rules that regulate it, its institutional weaknesses, and the need to reinforce it to deepen and improve it (as is the case in developed countries), establishing a distinction between the rules applied to this market in countries such as Colombia or Chile, and a developed country. This was the case in the 1980s when, in Latin American countries, due to their reduced institutional capacity, it was not possible to put forth strong proposals for the financial sector, with social and political factors being an obstacle in the development of the sector and, consequently, of the nations (Farnelli, 1998).

Barriers to entry can be one of the main variables in the decision-making process of companies and, consequently, of the financial sector, among others. Particularly given that the understanding and study of this variable defines the competition and market access for new competitors, since in order to have an increase in the financial sector it is necessary to have greater efficiency and a high profit rate. For this reason, the so-called *barriers to entry*—(i) concentration of the sector and growth, (ii) control of superior techniques, (iii) economies of scale or product differentiation, and (iv) diversification—define and imply competitive advantages that entail additional costs of entry for the sector. This is why, sometimes, entry becomes unreachable, because there is the need to mobilize capital in the long-term (Cardero and Domínguez, 1982).

In this section, the six factors proposed by Porter are explained; these constitute the force *Barriers to entry*, defined within the framework of the financial sector, which, as explained previously, promotes the economic growth and development of a country, in addition to being an oligopolistic sector that by its nature restricts the entry or exit of competitors.
The six factors proposed by Porter are:

Economies of scale

These consist in reducing the unitary cost of production, which allows increasing the production volume within a particular period (Puiu, 2010; Aguilar, 2014). In this manner,

economies of scale describe the behavior of costs according to a variation in the products and other variables related to size (i.e., number of subscribers or network length) (Revollo and Londoño, 2010). This factor entails an obstacle for companies that want to enter the sector, given that from the start they are competing at a disadvantage due to production costs.

In the financial market, this factor is related to the geographical coverage of the services it offers. Therefore, banking institutions, as units of production, depend on their size and means: number of offices, branches, and agencies they have available (González, 1981).

Product differentiation

This factor is framed in the existing loyalty between clients and company, generating an obstacle to enter the sector due to the associated costs entailed by developing new loyalty for new products. In the financial sector, products are differentiated through the decisions to geographically ramify markets and through prices in the interest rates of deposits and loans, as well as by the preference given to consumers through rates, local products, ATM networks, and the option for remote access (Lozano and Morales, 2009).

Capital requirements

These are mainly associated with the need of companies to finance projects that require costly investments that cannot be financed just with their own resources alone. This implies that the sustainable growth of companies is conditioned by dividend policies.

Changing costs

These are associated to the advantage a company has in providing a lower unitary cost due to reasons other than the economy of scale. Sometimes they are associated to privileged access to raw materials, however, as indicated by Ballarín (1985), the main phenomenon that affects this factor is the experience curve, which consists on decreasing the unitary cost of a product each time the total accumulated product doubles. This factor is established as a barrier to entry due to the difficulty it entails for new companies, given that, although these may have sufficient financial and technological resources, they must reach the accumulated production of the leading company. An example of this situation are advertising costs, due to new banks having to cover these costs in order to take over a part of the market (Herrera and Bernal, 1983).

Access to distribution channels

This factor is linked to commercial restriction, as distribution channels are limited in their coverage capabilities (Ballarín, 1985).

Regarding the financial sector, due to globalization and the use of technology, the use of mobile banking is increasing more and more—along with its corresponding acceptance by the clients. The objective of the sector is for traditional transactions to shift online in order to increase the number of services and the availability of content (Baptista and Olivera, 2016).

Thus, the financial services of small branches continue being important in the distribution channels of the sector, and new technologies directly influence the channels and become a competitive model; although this phenomenon is mediated by the change in attitudes and the motivations of the clients with regard to the use of electronic banking (Byers and Lederer, 2001).

Governmental policy or governmental relations

These are the restrictive regulations contemplated to access free competition in the markets. In the financial sector this is a very important factor, due to how the governmental regulations strengthen the sector and prepare it for the different crises of the system, such as the one that occurred in 2008 (Herrera and Fronti, 2014). Said crisis originated in the United States, where it dates back to September 2001, with the decline of the stock market and the low interest rate policies that supported it; thus, the subprime mortgage market evolved to take advantage of the low interest and along with the so-called securitization led to an enormous increase in real-estate debt, causing a drop in housing prices as well as an increase in foreclosures (Cobarsí-Morales, Canals and Ortoll, 2013).

For this reason, the advances in regulation in the last eight years have been important; however, policies must still regulate aspects such as: reduction of the sector, much more restrictive limits to retributions, limitation of risk appetite, tax havens, reorganization of the international financial system, bank union, standardized rates, among others (Días, 2013).

Regarding the Colombian context, the following factors can be highlighted: (i) coverage of financial services in the country on credit institutions, (ii) contact points, defined as the channels through which the different financial products can be accessed, given that their evolution indicates that they went from 10,526 branches in 2008 to 45,116 in June 2013, representing an increase of 329% in five years. In this regard, it should be noted that this growth managed for the concentration of banking correspondents of credit institutions in Bogota in 2013 to extend to new municipalities and departments (Superintendency of Industry and Commerce, 2013).

The indicator of accessibility to banking services, understood as the number of adults with at least one financial product with regard to the total number of adults at the national level,

went from 58% in 2010 to 66.5% in 2012, especially microcredit, followed by consumer credit and credit cards (Superintendency of Industry and Commerce, 2013).

Methodology

This study departs from the hypothesis of whether the force *Threat of new entrants* proposed by Porter can contribute to the explanation of the lateral dynamic of the financial sector. Based on this hypothesis, the initial exercise consisted in constructing the database for the year 2015 through the observation of the results or performance statements, the balance sheets closing as of December, and the information reported by the institutions of the financial sector. With these elements, the analysis of the databases of Superfinanciera, Bloomberg, and news bulletins published by institutions observed in this study was carried out. For this, the identification of the universe of financial institutions was considered, in which, according to the Financial Superintendency, a total of 51 institutions are registered: 25 banks, 5 financial cooperatives, 16 finance companies, and 5 financial corporations. Subsequently, a completeness of information exploratory analysis was carried out, with which it was sought to verify that at least 60% of the information was available for each institution, resulting in 50 usable institutions. Table 1 shows the variables included for the estimation of the model and the relations expected within the model are shown in Figure 1.

The criteria for each of the variables used for each factor were based on the definitions of the previously mentioned factors, that is: (i) for an economy of scale, variables related to costs as a production variable, assets as measurement of company size, and interest rate as measurement of production were selected; (ii) for product differentiation, variables that allowed measuring client loyalty towards the company were selected; (iii) for capital requirements, variables that allowed measuring company capital to invest in new projects were selected; (iv) for changing costs, variables that allowed measuring company coverage and its financial efficiency were selected; (v) for access to distribution channels, variables that allowed measuring company coverage were selected; (vi) for governmental policy, variables that measured liquidity and market risk were selected.

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Table 1
Variables used in the estimation of the model

Factors	Variables	Justification	Measurement
Economies of scale	Operating expenses	Described in relation to the total operating costs or expenses and relate to production.	Operating expenses of the company at the national level reported in the result statement consulted as of December 2015.
	Total assets	Select the assets of financial institutions as measurement to determine their size, due to the fact that banking institutions, as production units, depend on their size.	Total assets of the company at the national level reported in the general balance consulted as of December 2015.
	Interest rate	Interest rate used as production measurement of the financial institutions.	Weighted average interest rate of the products offered and the amount traded, reported to the Financial Superintendency as of December 2015.
Product differentiation	Number of employees directly linked	Determine the size of the institution and its coverage.	Number of employees directly linked, reported to the Financial Superintendency as of December 2015.
	Number of complaints regarding the services offered by the institution	Determine the quality of the products and services offered by the financial institutions.	Number of complaints reported to the Financial Superintendency as of December 2015.
	Number of offices	Determine the coverage of the products offered.	Number of offices, including branches at the national level, reported to the Financial Superintendency as of December 2015.
Capital requirements	Portfolio and gross leasing	Establish the needs of investment and financial backing of the institutions to respond to the portfolio and balances of the products offered.	Portfolio amount and gross leasing reported in the financial statement to the Financial Superintendency as of December 2015.
	Portfolio and default leasing		Portfolio amount and default leasing reported in the financial statement to the Financial Superintendency as of December 2015.
	Portfolio deterioration		Portfolio deterioration reported in the financial statement to the Financial Superintendency as of December 2015.

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Changing costs	Coverage indicator by rating	Determine financial resources required to cover the quality of the portfolio.	Provisions of portfolio and leasing, and of rated portfolio B, C, D, and E. They include general provisions.
	Traditional coverage indicator		Provisions of portfolio, leasing, and default portfolio. They include general provisions.
	Results of the exercise.	Establish the efficiency in the financial results with regard to the revenue and management costs and expenses, and also as a measure of the competitive advantages in costs that are not easily available to other entrant companies.	Amount of utilities or losses reported to the Financial Superintendency as of December 2015.
Access to distribution channels	Number of clients with term deposits	Determine the coverage of the financial institutions, as well as measure the ease of access to their products (accessibility to banking services).	Number of active clients with term deposits reported to the Financial Superintendency as of December 2015.
	Number of clients with savings accounts		Number of active clients with savings accounts reported to the Financial Superintendency as of December 2015.
	Number of clients with checking accounts		Number of active clients with checking accounts reported to the Financial Superintendency as of December 2015.
Governmental policy	Solvency ratio	Measure the risks of the institutions regarding a crisis of the financial system, due to the fact that governmental policies intend to control and decrease crisis risks.	Value of the technical equity divided by the value of the weighted assets by level of credit and market risks, reported to the Financial Superintendency as of December 2015.
	Market risk		It is the contingency in case of losses due to variations in the market price of a financial asset, as a result of the positions maintained in and out of balance, reported to the Financial Superintendency as of December 2015.

Source: Own elaboration.

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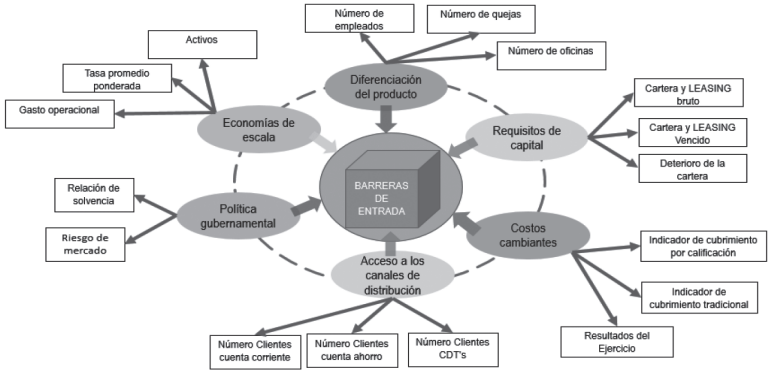

Figure 1. Factors of the force *Barriers to entry*.

Source: Own elaboration.

Note: The lines indicate the nature of the links, thus objects or relations with dotted lines entail indirect relations, whereas continuous lines entail direct relations.

Model

The CFA is used in this study in order to confirm whether the factors proposed by Porter for the force *Threat of new entrants*, explained based on the idea of barriers to entry, are adequate to explain the behavior of companies of the financial sector. This technique is useful due to its flexibility, since its main advantage is establishing relations between the proposed variables.

For its implementation, a theoretical framework was established for the phenomenon in order to provide a clear and consistent justification. Subsequently, the structure of the theoretical framework was represented using a path diagram and a set of equations that allow addressing the proposed hypothesis.

This technique is efficient with regard to other methods, as it allows determining the effects of the variables observed in the factor and how these effects relate as a whole. As indicated by Bentler and Weeks (1980), the usage of a statistical model that groups different techniques is linked to the need to build models with less restrictions.

As indicated by Aldas-Manzano (2005), the general model for the CFA of the proposed financial sector is indicated using the following equation:

$$X = \Lambda_x \xi + \delta$$

http://dx.doi.org/10.22201/fca.24488410e.2018.1796

Where:

$$X = vector\ of\ q \times 1\ of\ observed\ variables$$
$$\Lambda_x = matrix\ of\ q \times n\ coefficients$$
$$\xi = vector\ of\ n \times 1\ of\ factors$$
$$\delta = vector\ q\ x\ 1\ of\ errors$$

As indicated by Cruz (2011), this model considers the following assumptions:

- The random errors are not correlated to the factors.
- The expected value of the observed variables is zero.

To evaluate the fit quality of the model, the following criteria, recommended by Aldas-Manzano (2005) and Hair, Anderson, Tathan and Black (1999), were used: the chi-squared statistical test is the only one that represents the statistical significance index, which seeks to prove the null hypothesis. The difference between the covariance matrices of the population and the covariance matrix of the model is zero. Understanding that this difference is rather small, the model reproduces the behavior of the observed data (Yuan, Hayashi and Bentler, 2007).

Due to the sensitivity of the chi-squared statistical test, the following tests must also be considered:

Root mean square error (RMSE), where the values below 0.08 are indicative of a good fit of the model.

Goodness of fit index (GFI), which provides information on the variability explained by the model. This index has a range between 0 and 1, where 1 is a perfect fit and 0 is the lack of fit. It is considered acceptable with a value of 0.90 or higher.

Standardized Root Mean Square Residual (SRMR), where the expected values must be below 0.10 to be considered acceptable.

Additionally, the following were used as increasing measures of fit: (i) the Normative Fit Index (NFI), which measures the proportional reduction of fit by going from a null model to the original model. This index must be above 0.95 to obtain a good fit[1]; (ii) the Non-Normative Fit Index (NNFI), which compares the fit by degrees of freedom (a good fit must be above 0.97[2]); (iii) the Comparative Fit Index (CFI), which reflects the good fit of the model for values close to the unit (a good fit must be above 0.97[3]).

Once the validity and reliability of the proposed model was proven, the characterization of the financial institutions was carried out in order to identify the main groups or types generated within the sector, as well as how these relate through the observed factors.

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[1] However, it can be accepted if it is above 0.90
[2] However, it can be accepted if it is above 0.95
[3] However, it can be accepted if it is above 0.95

For this purpose, the strategy proposed by Morineau, Lebart and Piron (1995), consisting in first carrying out a factor analysis according to the nature of the data and subsequently implementing a classification based on a hierarchical cluster through the Ward method, which is useful to identify the number of classes to comprise, as well as their centers of gravity. Next, making use of the previous results, the companies are consolidated through the k-means method, and finally a characterization of each of the classes is done.

For its implementation, the algorithm proposed by Pardo and Del Campo (2007) was used, which is implemented in the R language FactoClass library. To characterize the classes, the cluster.carac function, available in the aforementioned library, was used. This, through the use of the t-test for mean differences, evaluates whether the means generated within a class are statistically different to the population or global means, thus allowing to identify which variables positively or negatively characterize each class.

The factor method implemented is the Principal Component Analysis (PCA) technique, which is useful to reduce the quantitative variables, allowing to group them into new variables with the least loss of information possible.

For its empirical implementation the following algorithm was used:

The first step consisted in implementing the PCA method for the reduction of variables and the generation of new factors. This process allowed to generate a common framework, in addition to being useful to highlight the relevant information of the variables. All of the dimensions were used for the selection of the factors to be retained, given that, as stated by Pardo and Del Campo (2007), the use of all the factors is convenient for the treatment of small tables.

Subsequently, a hierarchical analysis was carried out using the Ward method, in which the creation of four classes was identified. Finally, the consolidation of the classes was carried out through a K-means procedure, taking the centers of gravity of the previously generated classes as a starting point.

Results

Estimation of the validity and reliability model

To estimate the validity and reliability model of the force *Barriers to entry*, the internal consistency of the observed variables was first validated through Cronbach's Alpha coefficient, which allows observing the degree of reliability of the variables involved in a single factor, and through a correlation analysis (Table 2).

Those variables that presented correlations or coefficients with values below 0.50 were eliminated. By observing all the variables of the proposed model, it was evidenced that those

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selected for the factors of capital requirements, access to distribution channels, and product differentiation showed a high degree of internal reliability.

On the other hand, the factors of economies of scale, changing costs, and governmental policies showed unacceptable coefficients, just as the theoretical model was structured; therefore, to make this coefficient more robust, the variables that did not contribute to the structure of the observed factor were eliminated.

For the factor of economies of scale, the variable of weighted average interest rate did not contribute to the explanation of the factor, thus it was eliminated to allow increasing the coefficient to 0.98.

The factors of governmental policy and changing costs showed low coefficients in the selection of variables, therefore, they were loaded with one variable that presented the highest contribution, resulting in the variables of market risk and exercise results, respectively.

Table 2

Internal consistency

Factor	Standardized Cronbach's Alpha
Economies of scale	0.51
Product differentiation	0.93
Capital requirements	0.99
Changing costs	0.22
Access to distribution channels	0.90
Governmental policies	0.28

Source: Own elaboration.

Subsequently, the factor validity of the model was estimated using the CFA of the "Lavaan" library, available in software R. The maximum likelihood method was used for its estimation, due to its utility in small samples (Taborga, 2013). Table 3 shows the global fit indicators for the proposed theoretical model.

Table 3

Global fit

X^2	Df	P value	AIC	CFI	GFI	NNFI	SRMR	RMSEA
229.712	52	0,000	1181.70	0,834	0.679	0,76	0,039	0,267

Source: Own elaboration.

http://dx.doi.org/10.22201/fca.24488410e.2018.1796

The global fit indicators show that the chi-squared test is significant, which indicates a bad fit to the model; however, this statistic is sensitive to the sample size, as such it is observed that the GFI statistic has a value of 0.679, which indicates a weak fit to the model, and that the SRMR is within the range to consider a good fit. By observing the incremental fit measures, it is evidenced that they have weak fits, although close to the expected ranges of a good fit. Similarly, the parsimonious statistics were validated, comparing them by entering new factors, which allows determining that it is model that best fits the data.

By observing the covariances between the constructs, it is evidenced that these have high and significant covariances within a range of -1 to 1, which indicates that there is no divergence between the factors.

By observing the effects of the variables on the force and their relationship with statistically significant factors, the following results were obtained:

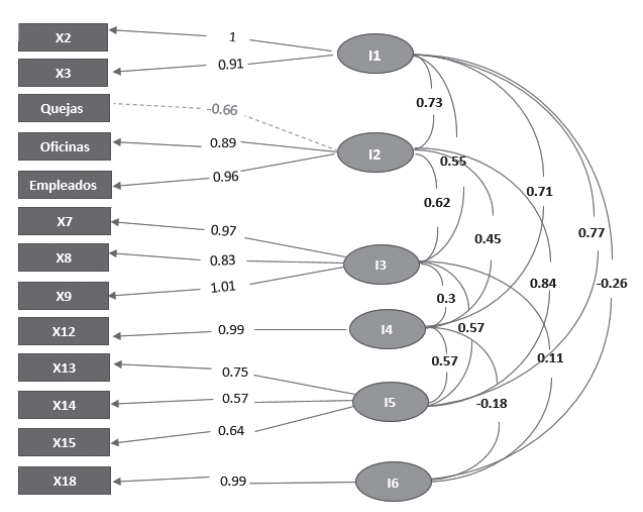

Figure 2. Results of the CFA for the actors of the force *Barriers to entry*.

Source: Own elaboration.

Note: the dotted line in red signifies negative weights.

Economies of scale: the assets and operating expenses show a positive contribution to the explanation of this factor. This means that if the production factors increase, these will better contribute to the economies of scale. By observing their relationship with the other factors, they show positive relationships close to 70% with regard to product differentiation, changing costs, and access to distribution channels.

Product differentiation: the variable that better contributes to the structure of this factor is that of employees and number of offices, which, due to an additional unit, improves this factor by 0.96 and 0.88 points, respectively. On the other hand, the variable of complaints shows a negative effect on this factor, where for every additional complaint the score of product differentiation decreases by 0.65 points. By observing its relationship with the other factors, it is evidenced that those with which it maintains a high positive relation are economies of scale and access to distribution channels; the other factors show a significant relationship below 50%.

Capital requirements: the selected indicators allow to explain the contributions of this factor in an adequate manner, maintaining a close relation to a unit, meaning that the changes in a monetary unit of any of these variables generates a close change to a unit in the score of this factor. By observing its relationship with other factors, it is evidenced that the strongest relationship is shared with the product differentiation (62%) factor, that is, changes in this factor also affect the capital requirements. The other factors show a significant relationship below 50%.

Changing costs: by observing this variable in the results of the exercise, a contribution of 0.99 units to the explanation of this factor can be observed. Additionally, it is evidenced that this variable is highly related to the factor of economies of scale, with a relationship of 70%; the other factors show a significant relationship below 50%.

Access to distribution channels: of the observed variables, the greatest contribution to the financial institutions for an increase in access to distribution channels is the creation of checking accounts, followed by the placement of term deposits, and finally savings accounts. Its highest relationship is observed with economies of scale, being close to 70%; the other factors show a significant relationship below 50%.

Governmental policies: of solvency show a close relationship to a unit, with a positive relationship. By observing its relationship with the other factors, it is evidenced that it is the one that contributes the least to the explanation of the model, however, it negatively affects the relationship with economies of scale by 25%.

Based on the aforementioned results, it can be stated that the Confirmatory Factor Analysis (CFA) used in this study corroborates that the factors proposed by Porter in the model of *Barriers to entry* are adequate to explain the behavior of companies of the financial sector, where the fact of economies of scale presents the highest relationship with all of the other factors, indicating that making changes in its structure entails changes in the other factors.

Similarly, it explains that the factor with the least affectations to the structure of the model is that of governmental policies, which could be due to the fact that changes in governmental policies are reflected at a medium or long-term in the competitive strategies.

Observations in the sector

In order to evidence the different competitive strategies of financial institutions and departing from the assumption that there is a high market concentration in few institutions, a characterization analysis of the strategies implemented in the market and their evaluations of each observed factor is carried out.

Below, the main characteristics of the groups or classes obtained are presented. Annex 1 gives a detailed list of the institutions that comprise each class.

Class 1: This group is comprised by three financial institutions characterized by maintaining the highest average values in all the variables; it stands out mainly for having above average indicators in the sector in the following: number of clients with checking accounts, portfolio, and gross leasing; number of offices and assets; best average results of the exercise.

These variables are mainly related to the factors of access to distribution channels, capital requirements, product differentiation, and changing costs.

Class 2: This group is comprised by eight financial institutions. These institutions are characterized by presenting above average indicators in the sector with regard to number of clients with savings account and term deposits, which relates to the factor of access to distribution channels, in addition to exceeding the average amounts of portfolio deterioration related to the factor of capital requirements.

Another important characteristic of this group is the high number of average complaints, which is in negative relation with the factor of product differentiation.

Class 3: This group is comprised by a single financial institution, which is characterized by presenting the highest operating expenses, highest portfolio amounts and default leasing, and highest portfolio deterioration with regard to the sector average.

Class 4: This group is comprised by 38 financial institutions. These institutions are characterized by presenting indicators below the average amounts of the sector. They have the lowest portfolio deterioration, lowest assets, and a low number of clients with savings accounts, in addition to maintaining few assets.

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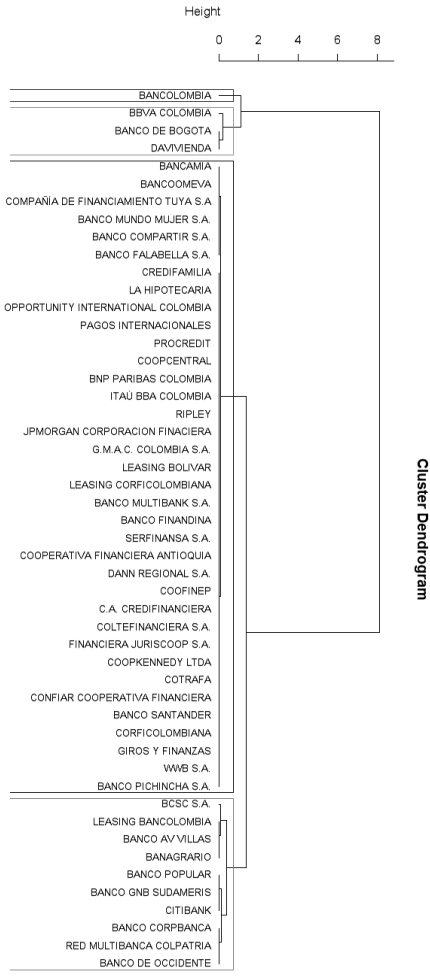

Figure 3. Dendrogram of the hierarchical classification using the Ward method.

Source: Own elaboration.

Conclusions

According to the results obtained using the CFA on the model proposed by Porter, analyzing the Colombian financial sector for the data of the 2015 period, it can be stated that:

This model, observed through the empirical evidence, presents relatively acceptable fits, meaning that its results can be used to carry out statistical inferences. To continue exploring, more variables and having new information available for the sector to be analyzed is recommended.

By studying the relationships between factors, it was evidenced that the factor of economies of scale is the one that contributes the most to the model, directly affecting the factors of product differentiation, changing costs, and access to distribution channels, that is, if a financial institution manages to directly affect its economies of scales, these would in turn affect the behavior of the other previously mentioned factors.

The second greatest relation between factors was observed between product differentiation and access to distribution channels, evidencing that changes in the former entail changes in the latter. For future studies it would be recommended to observe if, over time, there is a degree of causality between these two factors.

Finally, the factor that causes the least affectations to the structure of the model is governmental policies, which could be due to the fact that changes in governmental policies do not cause immediate modifications, but rather are reflected at the medium or long-term in the competitive strategies.

Once the validity of the model was carried out, a characterization of the sector was done, which evidenced the existence of four (4) possible groups separated by their intensity in the implementation of competitive strategies. The institutions that comprise them maintain similar strategies, with the following advantages standing out:

Class 1: the institutions belonging to this group guide their strategies towards the promotion and development of the factors of access to distribution channels, capital requirements, product differentiation, and changing costs.

Class 2: these institutions guide their strategies towards the promotion and development of the factors of access to distribution channels and product differentiation; however, they are affected by the number of complaints received, which, as indicated in the CFA results, will directly affect the two factors, given their high relationship.

Class 3: the institutions of this group guide their strategies towards the promotion and development of the factors of economies of scale and capital requirements.

Class 4: finally, this group comprises the financial institutions placing below the sector average, which seek to compete through strengthening their capital requirements, economies of scale, and access to distribution channels.

Based on these findings, some criteria can be established that will be useful for institutions that want to compete and enter the financial market: (i) have a large working capital to cover the operating expenses and assets, and to be able to reach new clients in order to obtain favorable results in economies of scale, due to the high costs required; (ii) use new technologies, such as the internet and other platforms, to broaden coverage and attract new clients; (iii) manage the collection portfolio in a more innovating manner; (iv) reduce the number of complaints, since the whole sector reports a high level of nonconformism by the clients.

It can be concluded that, even when the implementation of the proposed model evidences

that the sector concentrates in few institutions, as they managed to place within the six factors of the force *Threat of new entrants* proposed by Michael Porter, these institutions show evidence to confirm that their concentration limits market competition. On the contrary, they indicate that there are different competitive strategies oriented to overcome all the barriers to entry and generate a framework that possibly limits the access to new competitors.

As a suggestion for future studies, it is recommended to have a greater development time, increase the sample size of the financial institutions through a longitudinal analysis that allows capturing the developmental effects of the sector, and perhaps include one or two of the forces proposed by Porter in order to influence an improvement in the goodness of fit statistics and in the discriminatory capacity of the factors.

References

Aguilar, G. A. (2014). Economías de escala en la industria microfinanciera: un análisis aplicado al caso peruano. *El Trimestre Económico*, 81(3), 747-778. DOI: http://dx.doi.org/10.20430/ete.v81i323.129

Andrews, K. R. (1987). *The concept of corporate strategy*. New York: Homewood Irwin Custom Publ. Primis Custom Publishing.

Aldas-Manzano, J. (2005). Análisis Factorial Confirmatorio. hompson (Ed.), Analisis Multvariante Aplicado.

Arango, M. (2006). *Evolución y crisis del sistema financiero colombiano*. Bogotá: CEPAL.

Asociación Nacional de Instituciones Financieras (Anif) (2006). Fusiones y adquisiciones en el sector financiero colombiano: análisis y propuestas sobre la consolidación bancaria (1990-2006). *Estudios Reforma Financiera*, Bogotá, Ministerio de Hacienda y Crédito Público.

Autrey, P. y Thomas, D. (1986). Competitive strategy in the hospital industry. *Health Care Management Review*, 11(1), 7. Doi: https://doi.org/10.1097/00004010-198601110-00002

Azuero, F. (2004). ¿Se justifica la banca pública? Fallas del mercado financiero y fallas de la banca pública. *Economía Colombiana*, 304-305, p 44-51.

Ballarín, E. (1985). *Estrategias competitivas para la banca*. Barcelona (España) Ariel 1985.

Banco de Comercio Exterior de Colombia (Bancóldex) (2006). Régimen financiero colombiano. Estudio régimen legal colombiano 2006. Recuperado de: http://www.bancoldex.com/documentos/268_6capitulo_iv_sistema_financiero.pdf

Banco de la República (2017). Reporte de estabilidad financiera septiembre de 2017. *Banco de la República*. 1692-4029. 1-103.

Baptista, G. y Oliveira, T. (2016). A weight and a meta-analysis on mobile banking acceptance research. *Computers in Human Behavior*, 63, 480-489. Doi: https://doi.org/10.1016/j.chb.2016.05.074

Bentler, P. M. y Weeks, D. G. (1980). Linear structural equations with latent variables. *Psychometrika*, 45(3), 289-308. Doi: https://doi.org/10.1007/bf02293905

Byers, R. E. y Lederer, P. J. (2001). Retail Bank Services Strategy: A Model of Traditional, Electronic, and Mixed Distribution Choices. *Journal of Management Information Systems*, 18(2), 133-156. doi: http://dx.doi.org/10.1080/07421222.2001.11045686

Cardero, M. y Domínguez, L. (1982). Grupo financiero y crisis actual del capitalismo. *Revista Mexicana de Sociología*, 44(3), 887-926. doi: 10.2307/3540163.

Cobarsí-Morales, J., Canals, A., & Ortoll, E. (2013). LA INFORMACIÓN COMO BIEN ECONÓMICO: REFLEXIONES SOBRE LA CRISIS FINANCIERA DE 2008. *El Profesional De La Información*, 22(4), 346-352. doi:10.3145/epi.2013.jul.11

Cortés, R. A. y Luna, Y. H. (2014). Impacto del desarrollo del sistema financiero en el crecimiento económico en países emergentes durante el periodo 2001-2011. *Equidad y Desarrollo*, (22), 99-120. https://doi.org/10.19052/ed.3252

Díaz, M. L. (2013). La reforma del sistema financiero un año después del rescate: un éxito, pero ¿para quién? *Boletín De Estudios Económicos*, 68(209), 225-262. Recuperado de: http://search.proquest.com/docview/1458280317?accountid=50434

Dinero (2015). El sector financiero colombiano en su mejor momento tras 150 años. *Dinero*. Recuperado de http://www.dinero.com/edicion-impresa/pais/articulo/panorama-del-sector-financiero-colombia/214721

Dobbs, E. (2014). Guidelines for applying Porter's five forces framework: a set of industry analysis templates. *Competitiveness Review*, 24 (1), 32-45. Doi: https://doi.org/10.1108/cr-06-2013-0059

García, A. F. y Gómez, J. E. (2009). Determinantes de las fusiones y adquisiciones en el sistema financiero colombiano 1990-2007. *Revista de Economía del Rosario*, 12(1), 45-65. Doi: https://doi.org/10.32468/be.550

Gómez, E.; Mariño, J. E. y Pacheco D. (2016). Encuesta de percepción sobre riesgos del sistema financiero. *Banco de la República*. 1-10.

González, C. H.; García, M. y Murillo, G. (2014). Cambio institucional y organizacional en el sector financiero colombiano: 1990-2010. *Innovar*, (54), 27. Doi: https://doi.org/10.15446/innovar.v24n54.46428.

González, H. E. M. (1981). Economías de escala y concentración bancaria: el caso de México. *Monetaria*, 4(1), 73-97.

Fanelli, J. (1998). Liberalización financiera y cuenta de capital: observaciones sobre la experiencia de los países en desarrollo. *Desarrollo Económico*, 38(149), 339-364. doi: 10.2307/3467383.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1999). Análisis multivariante (Vol. 491). Madrid: Prentice Hall.

Herrera, P. y Fronti, J. G. (2014). Impacto del crédito gubernamental en el sistema financiero. *Revista Finanzas y Politica Economica*, 6(2), 247-268. Doi: https://doi.org/10.14718/revfinanzpolitecon.2014.6.2.2

Herrera, S. y Bernal, O. (1983). Producción, costos y economías de escala en el sistema bancario colombiano. *Ensayos Sobre Política Económica*, (3), 7-36. Doi: https://doi.org/10.32468/espe.301

Hofer, C. W. y Schendel, D. (1978). *Strategic Formulation: Analytical Concepts*. St. Paul, MN: West.

Kling, J. A. & Smith, K. A. (1995). *Identifying strategic groups in the U.S. airline industry: An application of the porter model. Transportation Journal*, 35(2), 26. Recuperado de: https://mv-ezproxy-com.ez.urosario.edu.co/docview/204586515?accountid=50434

Lozano, A. V. y Morales A. J. (2009). Deregulation and product differentiation in the banking industry. *Banks and Bank Systems*, 4(4), 36-47.

McCraw, T. K. (2008). Alfred Chandler: His Vision and Achievement. The Business History Review, 82(2), 207-226. Doi: https://doi.org/10.1017/s0007680500062723

Mintzberg, H. (2006). Las cinco Ps de la Estrategia. En *O processo da estratégia. Conceitos, contextos e casos selecionados* (pp. 24-29), Porto Alegre: Bookman.

Morales, L.; Medina, E. y Martínez, K. (2013). La rentabilidad del sector industrial de la construcción en Hermosillo, Sonora, a partir del análisis holístico de las cinco fuerzas competitivas de Porter. *Revista Global de Negocios*, 1(1), 39-45. Recuperado de: ftp://ftp.repec.org/opt/ReDIF/RePEc/ibf/rgnego/rgn-v1n1-2013/RGN-V1N1-2013-4.pdf

Morineau, A.; Lebart, L. y Piron, M. (1995). *Statistique exploratoire multidimensionnelle*. Paris: Dunod.

Nelson, R. R. y Winter, S. G. (2002). Evolutionary Theorizing in Economics. *The Journal of Economic Perspectives*, 2, 23- 25. Doi: https://doi.org/10.1257/0895330027247

Pardo, C. E. y Del Campo, P. C. (2007). Combinación de métodos factoriales y de análisis de conglomerados en R: el paquete FactoClass. *Revista Colombiana de Estadística*, 30, 231–245.

Porter, M. (1979). How competitive forces shape strategy. *Harvard Business Review*, 57(2), 137-145. Doi: https://doi.org/10.1007/978-1-349-20317-8_10

Porter, M. (1982). *Estrategia competitiva: técnicas para el análisis de los sectores industriales y de la competencia*. México DF: Compañía Editorial Continental.

Porter, M. (2008). Las cinco fuerzas competitivas que le dan forma a la estrategia. *Harvard Business Review*, 86(1), 58-77.

Puiu, S. (2010). The model of the five competitive forces on romanian retail market. *Annals Of The University Of Petrosani Economics*, 10(1), 289. http://upet.ro/annals/economics/pdf/2010/20100129.pdf

Pulgarín, S. A. y Rivera, H. A. (2012). Las herramientas estratégicas: Un apoyo al proceso de toma de decisiones gerenciales. *Revista Criterio Libre*, (16), 89-114. Doi: https://doi.org/10.18041/1900-0642/criteriolibre.2012v10n16.1165

Revollo, D. y Londoño, G. (2010). Análisis de las economías de escala y alcance en los servicios de acueducto y alcantarillado en Colombia. *Desarrollo y Sociedad*, (66), 145. Doi: https://doi.org/10.13043/dys.66.5

Rivera, H. (2010). Cambio estratégico para entornos turbulentos. *Investigación y Reflexión*, (1), 87-117. DOI: https://doi.org/10.18359/rfce.2283

Sarmiento, J. A. y Cristancho, L. A. (2009). Evolución del sistema financiero colombiano durante el período 1980-2007. *Investigación y Reflexión*, (1), 25.

Shiunn, M.; Han, Y. y Ru, Y. (2011). A study of the key success factors of the ecotourism industry in Taiwan. *African Journal of Business Management*, 5(2), 627-640. doi: oi:http://dx.doi.org.ez.urosario.edu.co/10.5897/AJBM10.735

Superintendencia de Industria y Comercio (2013). Estudio sobre sector financiero – tarjetas de crédito en Colombia.

Taborga, C. E. (2013). Efecto de los métodos de estimación en las modelaciones de estructuras de covarianzas sobre un modelo estructural de evaluación del servicio de clases. *Comunicaciones en Estadística,* Junio 2013, Vol. 6, No. 1. Doi: https://doi.org/10.15332/s2027-3355.2013.0001.02

Uribe, J. D. (2013). El sistema financiero colombiano: estructura y evolución reciente. *Revista del Banco de la República*, (1023), 5– 7.

Urrutia, M. y Caballero, C. (2005). *El impacto del sector financiero en el crecimiento*. Bogotá: Asobancaria.

Wernerfelt, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal*, 5(2), 171-180. Recuperado de: http://www.jstor.org/stable/2486175

Yuan, K. H.; Hayashi, K. y Bentler, P. M. (2007). Normal theory likelihood ratio statistic for mean and covariance structure analysis under alternative hypotheses. Journal of Multivariate Analysis, 98(6), 1262-1282. Doi: https://doi.org/10.1016/j.jmva.2006.08.005

Annex

"Table A1"

Class 1	Banco de Bogotá, Davivienda y BBVA Colombia.
Class 2	Banco Popular, Banco de Occidente, BCSC S.A., Banco AV Villas, Banco Corpbanca, Red Multibanca Colpatria, Leasing Bancolombia, Banagrario.
Class 3	Bancolombia.
	Bancamia, WWB S.A., Bancoomeva, Banco Finandina, Coopcentral, Banco Mundo Mujer S.A., Banco Compartir S.A., Citibank, Banco GNB Sudameris, Procredit, Banco Falabella S.A., Banco Pichincha S.A., Banco Santander, Banco Multibank S.A., Corficolombiana, JPMorgan Corporación Financiera, BNP Paribas Colombia, Itaú BBA Colombia, Giros y Finanzas, Serfinansa S.A., Compañía de Financiamiento Tuya S.A, Coltefinanciera S.A., Dann Regional S.A., Pagos Internacionales, Credifamilia, Financiera Juriscoop S.A., GMAC Colombia S.A., Opportunity International Colombia, Ripley, La Hipotecaria, Leasing Corficolombiana, Leasing Bolívar, C.A. Credifinanciera, Cooperativa Financiera Antioquia,
Class 4	Coopkennedy Ltda, Coofinep, Cotrafa, Confiar y Cooperativa Financiera.