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Traditional factors of corporate governance and profitability of commercial banking in Mexico

Factores tradicionales de gobierno corporativo y rentabilidad de la banca comercial en México

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Abstract

The aim of this paper is to study the impact of a corporate governance index on the profitability of a sample of listed banks in Mexico, during the period 2007-2017. The index includes the corporate governance functions considered basic or traditional. In particular, two panel data models are estimated: a) a dynamic one, using a system GMM estimator combined with Roodman procedure for reducing the number of instruments; and b) a static one, using random effects. The evidence presented in this paper shows that advances in accomplishing recommended practices of corporate governance do not enhance the profitability of banks. When sub-indices composing general index are analyzed, we find evidence about the relevance of auditing functions and compensation and evaluation activities, suggesting that banks only attach importance to some factors of corporate governance.

JEL code: C23, G21, G34, O54
Keywords: Corporate governance; Bank profitability; Business groups; Dynamic panel-data; Latin America

Resumen

El objetivo del presente trabajo es estudiar el impacto de un índice de gobierno corporativo sobre la rentabilidad de una muestra de bancos que operan en el mercado bursátil de México, durante el periodo 2007-2017. El índice estudiado agrupa las funciones básicas o tradicionales del gobierno corporativo. En particular, se estiman dos tipos de modelos de panel: a) dinámico, mediante un estimador del tipo system GMM combinado con el procedimiento de Roodman para reducir el número de instrumentos; y b) estático, de efectos aleatorios. La evidencia aquí presentada indica que el cumplimiento de las prácticas recomendadas de gobierno corporativo en general no beneficia la rentabilidad de los bancos. Al analizar los subíndices que componen el índice general, se encuentra evidencia de cierta relevancia en las funciones de auditoría y las actividades de evaluación y compensación, sugiriendo que los bancos sólo le otorgan importancia a algunos factores del gobierno corporativo.

Código JEL: C23, G21, G34, O54
Palabras clave: Gobierno corporativo; Rentabilidad bancaria; Grupos económicos; Modelos dinámicos de datos en panel; América Latina

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Introduction

In the last twenty years, there has been a growing interest in the study of the institutional arrangements that define the ownership and control structure of companies; these arrangements are called corporate governance. This interest includes the analysis of the possible positive impacts of certain corporate governance practices on companies and markets. According to Levine (2004), corporate governance assumes a central role in banks because of its impact on other industries. Bank governance mechanisms and practices that facilitate the efficient allocation of capital contribute to stimulating the growth and productivity of companies accessing credit.

The Basel Committee on Banking Supervision has recognized the importance of corporate governance and—following the principles issued in 1999 by the Organization for Economic Co-operation and Development (OECD)—published in the same year a guide to help banking supervisors promote the adoption of good corporate governance practices. The most recent revisions of the principles made by the OECD and the Basel Committee were presented in 2015 and have focused on strengthening the functions of the boards of directors, emphasizing equal treatment of all shareholders, and improving risk management (OECD, 2015; Basel Committee on Banking Supervision, 2015).

Unlike other countries during the last international financial crisis, there were no commercial banks in Mexico that were close to bankruptcy, and, of the total number of banks in the system in those years, only two of them reported significant losses.[2] This relative soundness of the banks established in Mexico has been attributed to the improvements that followed the banking crisis of the second half of the 1990s in Mexico, both in the capitalization of banks and in the supervision carried out by regulatory authorities (Castañeda, 2014). However, in recent years, some major banks have had corporate governance problems. For example, in 2014, Banamex (now Citibanamex, a subsidiary of Citigroup), one of the largest banks in the Mexican system, had a breach of 400 million dollars due to credits granted to a company called Oceanografía, which used the expected payments of contracts agreed with the Mexican oil company Pemex as collateral. After the credits were given, it was discovered that a significant part of the accounts receivable from the oil company were fraudulent. For this reason, the president of the banking regulatory authority in Mexico, the National Banking and Securities Commission (Spanish: Comisión Nacional Bancaria y de Valores, CNBV), publicly stated that this bank did not have the necessary controls to avoid this problem and that one of the main concerns of the financial authorities is the lack of compliance with aspects related to the corporate governance of banks.[3] In the end, the CNBV gave the bank a fine of nearly 2 million dollars.[4]

This example indicates that certain poor corporate governance practices have adverse effects on the profitability of the banks, in addition to the negative impacts that may exist for the rest of society due to inefficient credit allocation. Can it then be inferred that good corporate governance practices have a favorable effect on the profitability of banks? International academic literature provides contrasting evidence on banking systems in other countries. For example, studies focusing on the past international financial crisis, such as Grove *et al*. (2011), Aebi *et al*. (2012), and Dedu and Chitan (2013), point out that the association between corporate governance and bank performance may not be robust, significant or even negative. Doidge *et al*. (2007) state that in emerging economies the improvements in corporate governance indices are owed more to the institutional characteristics of each country than to measures adopted at the company level, so the latter would be expected to have little significant impact on the profitability of the companies themselves. There are even some studies for non-financial companies in Mexico where there is no significant effect of corporate governance practices

[2] These banks were Banco Fácil and Banco Walmart de México; both banks are no longer in business.
[3] See the press release by González and Román (2014).
[4] The fine was of almost 30 million pesos, an amount equivalent to 2 million dollars at the time. See the press release by Estañol (2015).

on profitability (Machuga and Teitel, 2009; Price *et al*., 2011; and Macias and Roman, 2014). Will something similar happen in the Mexican banking system?

This study aims to examine the impact of a corporate governance index on the profitability of a sample of commercial banks participating in the Mexican stock market during the 2007-2017 period. This index includes the functions considered essential or "traditional" in the corporate governance of financial or non-financial companies; that is, the functions of the shareholders meeting, the board of directors, audit, evaluation, compensation, finance, and planning activities. There are no studies of these traditional functions in the banks established in Mexico or other banking systems in Latin America. For this reason, this study has two main contributions: first, the study of this subject in the banking sector, a field that is practically unexplored in Mexico; and, second, the study of the Mexican case, which is interesting because its banking system groups national and foreign banks and presents contrasting corporate governance schemes. Furthermore, this study presents advantages in the econometric estimation regarding studies of other countries when taking into account the literature on banking profitability. Based on this type of research, the proposal is to examine the effects of corporate governance in a dynamic panel model. In general, research that studies the impacts of corporate governance on bank profitability omits the dynamic character of the bank profitability function, which may impair the reliability of the results obtained.

The evidence presented here indicates that the general compliance with the recommendations regarding traditional corporate governance practices does not have a material impact on the profitability of banks participating in the Mexican stock market. This result suggests that banks do not attach sufficient importance to specific components of corporate governance, and when they declare that they comply with them, the intention is to satisfy the disclosure requirements demanded of them by their participation in that stock market. For example, there may be boards of directors or board committees that do not meet a sufficient number of times, or that are composed of members who do not have the due technical training or experience. However, there is evidence that some subsets of these traditional practices have some impact on the performance of banks, such as audit, evaluation, and compensation functions. These functions focus on the internal control of banks and the design of incentives for those who operate them. The results may indicate that there is selective behavior in the actual compliance with recommended practices.

Section two of this article summarizes some contrasting elements in the current corporate governance of commercial banking in Mexico. Section three reviews the literature on the relationship between bank profitability and corporate governance, starting from the agency theory approach. Section four explains the database. Section five explains the models to be estimated, the estimation techniques employed, and the advantages of using such models and techniques. Section six presents the econometric results. Section seven outlines the conclusions.

Corporate governance in the current banking system in Mexico

As is well known, two years after the re-privatization of Mexican commercial banking in 1991-1992, an acute macroeconomic crisis arose, which in turn triggered a banking crisis. The process of intervention and rescue of a large part of the banks by the federal government led to various mergers and concluded in 2000-2002 with the sale of the five largest banks to foreign banks.[5] At the same time, in the 25 years since the re-privatization, several dozen small-scale banks have entered the market, most of them with domestic capital. Two Mexican-owned banks have grown during this period and are now among the largest in the market.[6] By December 2017, the seven large-scale banks accounted for 78% of the system assets; the five foreign-owned holding 62% of the system assets.

[5] BBVA-Bancomer, Santander, Citibanamex, HSBC, and Scotiabank.
[6] One of these two banks is Banorte, which proceeds from the stage prior to re-privatization. The other is Inbursa, founded in 1993. Both are part of business groups.

The forms of corporate governance are contrasting between domestically owned and foreign-owned banks. As with large domestic non-financial corporations, Mexican banks have a high concentration of ownership, mainly in families. This type of concentration of ownership is reflected in the control and operation of these types of banks, as the presence and decisions of the majority shareholders prevail in the boards of directors and senior management. Of the banks created after the re-privatization, fifteen of them belong to some nationally owned business groups whose main activities are outside the financial sector.[7] These business groups are networks of family-controlled enterprises. The networks of companies usually include unrelated businesses, although the agglomeration of these businesses results in synergies, including those of a financial nature achieved mainly from banks.

Conversely, foreign-owned banks follow control and operation schemes based on the decisions of executives detached from the ownership of the bank. This type of corporate governance is expressed in the boards of directors, comprised of executives from the country of origin of the bank and Mexican executives.[8] These directors control the banks according to the guidelines laid down in their respective parent companies. Although obvious, it is noteworthy that foreign-owned banks do not have links of ownership with non-financial companies, as is the case with banks integrated into business groups.

Corporate governance and profitability

According to agency theory, when ownership and control are separate, agency problems refer to the need to align objectives between shareholders and senior management; this alignment of objectives implies the generation of incentives and the need to incur monitoring costs (Jensen & Meckling, 1976). Conversely, when there is no separation between ownership and control, agency problems refer to the alignment of interests between majority and minority shareholders (Shleifer & Vishny, 1997); in this case the problem of coordination between ownership and control is resolved, but possible opportunistic behaviors on the part of majority shareholders are latent, especially when dealing with family-owned companies (Morck & Yeung, 2003), and even more so when the bank is part of a business group (Chavarín, 2016).

The adoption and disclosure of corporate governance practices allow markets to observe and perceive the differences between the policies followed by different companies, including those that allow them to solve possible agency problems. According to Claessens and Yurtoglu (2013), companies with better corporate governance practices would find easier access to capital at lower costs, because they provide an environment of greater certainty for investors, as well as greater confidence that controlling shareholders will not expropriate the cash flows of the company. According to Chong and López-de-Silanes (2007), better-governed companies are expected to be operated more efficiently, probably because they have better mechanisms to deal with changing conditions or new market opportunities. It is possible to think that these companies would be able to produce a greater return on the investment made. The above is the hypothesis to be followed in this study, that advances in corporate governance practices are reflected in a better performance of the banks.

The literature review conducted for this research did not find any study that estimated the possible impacts of corporate governance on profitability indicators of commercial banks in Mexico. The literature on this country has focused on non-financial companies listed on the Mexican Stock Exchange, such as the studies by Chong and López-de-Silanes (2007), Ruiz and Steinwascher (2008), Machuga and Teitel (2009), Price *et al*. (2011), San Martín *et al*. (2012), San Martín and Durán (2012 and 2015), Macías and Román (2014), Watkins (2015), and Watkins *et al*. (2016). In general, the results of these studies demonstrate that better corporate governance generates better company valuations and returns, and that

[7] With the exception of Banorte, which comes from the stage prior to re-privatization.
[8] With the exception of Citibanamex, a subsidiary of Citibank, whose board of directors has been dominated by Mexican businessmen, acting as guests.

concentration of ownership favors company performance. The exceptions are the works of Machuga and Teitel (2009), Price *et al*. (2011), and Macías and Román (2014), who did not find a significant effect between corporate governance and profitability for the 1998-2002 and 2000-2004 periods (in the last two studies), which was when companies began adhering to the Code of Best Corporate Practices.

In the international literature, there is a considerable body of empirical work that has estimated the relationship between government variables and profitability for banks. For example, the studies of Barth *et al*. (2007), Spong and Sullivan (2007), Adams and Mehran (2008), Burki and Ahmad (2010), Westman (2011), Chitan (2012), Erkens *et al*. (2012), Hanafi *et al*. (2013), Love and Rachinsky (2015), Salim *et al*. (2016) and Dong *et al*. (2017) cover a variety of countries. In specialized literature on banks, as with studies done for non-financial companies, although most of the studies report a direct relationship between good corporate governance practices and measurements of valuation and profitability, there is also research that presents weak or inconclusive evidence in this regard. As mentioned in the introduction, this is the case of the studies of Grove *et al*. (2011), Aebi *et al*. (2012), and Dedu and Chitan (2013), focused on the past international financial crisis; the first two in the United States and the third in Romania. It is noteworthy that much of the literature refers to traditional aspects or standards of corporate governance, such as those studied here. These aspects have to do with the general functions developed by the shareholders meeting, the board of directors, and the committees that perform the activities of audit, evaluation, compensation, finance, and planning. Here, such functions as "traditional" or "standard" are highlighted as opposed to the risk management variables that some recent literature has incorporated into the study of bank corporate governance, such as Battaglia and Gallo (2015).

Database

The size of the sample was determined by the availability of questionnaires with information on the corporate governance practices of banks, as explained in section 4.1. As the study period is 2007-2017, all those banks that responded to at least one of these annual questionnaires were considered. In the end, questionnaires were applied to 26 banks.[9] It is important to note that the conclusions drawn in this article are only valid for this sample of banks, although this sample represented 94% of the total system assets in 2017. The beginning of the study period was 2007 due to changes in the accounting criteria of banks in previous years, especially in 2006, which modified how the net profits of banks were calculated, affecting profitability measures.[10] As explained in the following sections, these measures of profitability represent the dependent variables of this study.

Construction of corporate governance indices

For this research, corporate governance indices were constructed from questionnaires that measure whether companies (in this case banks) voluntarily adhere to the corporate governance guidelines established in a Code of Best Corporate Practices, which in turn follows the principles suggested by the OECD. This code was formulated in 1999 by the Business Coordinating Council, a body representing private companies in Mexico. Companies that issue debt or shares on the Mexican Stock Exchange are required to respond to the questionnaire linked to the code.

Of the questionnaires answered by the companies, the questions that could not be answered by yes or no were omitted, such as those that implied detail or explanation, although these types of questions are very few. For other questions answered by a number or periodicity, a range or value was established to indicate whether the recommendation of the code

[9] The banks included in the sample are the following: Actinver, Afirme, Azteca, BBVA Bancomer, BanCoppel, Banorte, Banregio, Banco Base, Banco del Bajío, Citibanamex, Compartamos, Consubanco, Credit Suisse, HSBC, Inbursa, ING Bank, Interacciones, Invex, Ixe, JP Morgan, Monex, Multiva, Santander, Scotiabank, Ve por Más, and Volkswagen Bank.
[10] See Del Ángel *et al*. (2006) and CNBV (2007).

was fulfilled. In the end, 121 questions were considered for the 2007-2009 period, and 137 for the 2010-2017 period.[11] In order to create the index, each response to the questionnaire indicating compliance with a recommendation of the code was assigned one point. The index was standardized between 0 and 1, dividing the total number of positive responses by the total number of questions in the questionnaire. For example, this same strategy was followed by Chong and López-de-Silanes (2007) and Macías and Román (2014) to construct an index for non-financial companies. Furthermore, five subindices were constructed that coincide with the five parts that deal with the questionnaires, and that refer to the traditional functions or standards of corporate governance:

i) Shareholders meeting. - It focuses on the planning and organization of meetings and the provision of information to shareholders.
ii) Board of directors. - Some functions that stand out include the definition of the strategies of the company, the appointment and evaluation of senior executives, the promotion of equal treatment conditions for all shareholders, the disclosure and transparency of information, the approval of relevant transactions, the establishment of mechanisms for risk management, and the composition and structure of the board itself, as well as its operation.
iii) Audit function. – This function includes the supervision and analysis of the external audit, the definition of internal control guidelines, the analysis and evaluation of transactions with related parties, the supervision of the policies and criteria used in the preparation of financial information, and the supervision of compliance with the mechanisms established for risk control.
iv) Evaluation and compensation functions. - These refer to the development of criteria for appointing, evaluating, compensating, removing or succeeding senior directors; the development of criteria for compensating directors; the analysis of criteria for compensating staff; and the drafting of the code of ethics of the company.
v) Finance and planning functions. - These consist of the design of guidelines for the determination and monitoring of the strategic plan of the company, the evaluation of investment and financing policies, the monitoring of the annual budget, and the evaluation of risk management mechanisms.

As with the general index, the subindices were standardized between 0 and 1. To the extent that the indices approach the value of 1, this means that the bank complies with a greater part of the recommendations of the Code of Best Corporate Practices.

During the period of study of this research (2007-2017), information was available to construct the indices indicated for twelve banks integrated to a business group, nine foreign banks, and five independent domestic banks. The seven large scale banks of the system are in this sample. Of the total twenty-six banks included in the sample, some of them do not present information for all the years of study.

Dependent and control variables

[11] The questionnaire contains 78 numbered questions for the 2007-2009 period and 84 numbered questions for the 2010-2013 period. However, in each case, several questions have subparagraphs that can be considered separate questions. For that reason, 121 and 137 questions are considered in this analysis for the two periods of study, respectively. In the 2014-2017 questionnaires there are also 84 initial questions, but items that break down the information further into 4 questions were added; however, the decision was to align these questions with those of the questionnaires for the years 2010-2013.

The information on the rest of the variables came from the components of the CNBV information portfolio. Some missing information for certain banks came from their annual reports submitted to the Mexican Stock Exchange.

The dependent variables included in the analysis are i) return on average capital, a variable known internationally as ROAE, and ii) return on average assets, known as ROAA. It is important to note that in the case of Mexican banks, it is not possible to include valuation measurements, such as Tobin's q, because almost none of the banks issue shares in the stock market; most of them participate in that market by issuing debt.

The international literature on the determinants of bank profitability suggests that the following factors must be controlled in a function of profitability (Athanasoglou *et al*., 2008; Flamini *et al*., 2009; Bolt *et al*., 2012; Dietrich and Wanzenried, 2014; among others): size, capital adequacy, liquidity, credit risk, total risk exposure, non-interest income, operating expenses, and market concentration. The description of the variable used to measure each factor is below:[12]

1) *Size*. – Measured by means of the natural logarithm of the number of branches of each bank. The commonly used measure is the natural logarithm of total assets, but this last variable had high correlations with the capital adequacy variables (correlation: -0.4137, p = 0.0000), market concentration (0.4536, p = 0.0000) and administration expenses (-0.3431, p = 0.0000). Correlations are significantly reduced with the change of variable (with capital: 0.0905, p = 0.1903; with market concentration: 0.3425, p = 0.0000; with administration expenses: 0.2738, p = 0.0001). The natural logarithm of the number of branches and the natural logarithm of total assets have a correlation of 0.6417, p = 0.0000.

2) *Capital adequacy*. - The capital over assets ratio was considered. This variable measures the capacity of banks to manage the business as a whole, including their capacity to grant loans.

3) *Liquidity*- The ratio of credit to deposits was included. This ratio measures the proportion of liquid assets held by banks, as well as their capacity to provide funds for asset growth.

4) *Credit risk.* - The provision ratio for credit risks was used over total loans. This variable measures the ability of the bank to absorb losses given that provisions offset the impaired value of certain loans as well as past-due interest.

5) *Total risk exposure*. - The ratio of risk-weighted assets to total assets was included. This variable makes it possible to control risk differences between banks since the variable that measures credit risk only reflects the implementation of past credit decisions.

6) *Administrative expenses*. - The ratio of administrative expenses to total assets was included. This variable measures the non-financial expenses of banks, mainly the payment of salaries, materials, information systems, and rents.

7) *Non-interest income*. - The ratio of non-interest income to total operating income was included. These revenues do not arise from the collection of interest and consist basically of the net balance of commissions, tariffs, and other income.

8) *Market concentration*. - Market shares in credit and deposits, as well as Herfindahl credit and deposit indices, were initially considered; however, these measurements presented very high correlations with the size variable. For this reason, it was decided to include the credit dominance index,[13] which has a much lower correlation with that variable. This dominance index measures the concentration of each bank in the credit market.

In some of the estimates explained in section 5, the variables "affiliation to a business group" and "foreign-owned capital" were also included and constructed as binary variables. In the first case, a value of 1 was assigned to banks linked to a Mexican business group. In the second case, a value of 1 was assigned to banks with a majority of foreign capital. These

[12] Several of the above factors included information from Van Greunin and Brajovic-Bratanovic (2009).

[13] The dominance index is calculated from the following expression: $R_D = \sum_{i=1}^{n} \left(\frac{\alpha_i^2}{R_H}\right)^2$, where α_i is the market participation (credit) of the company *i* and R_H is the Herfindahl index of the industry.

two variables reflect distinct aspects of bank corporate governance, and the purpose of their inclusion is to observe whether there is any significant effect due to certain banks belonging to a business group, or because other banks are foreign-owned. Table 1 presents the descriptive statistics of the variables included in the econometric analysis.

The correlations between dependent variables, the general corporate governance index, and control variables were also estimated. These correlations are important because they make it possible to identify variables that may cause multicollinearity problems within the models to be estimated. In this case, the capital variable has a very high and significant correlation with total risk exposure (0.7248, p = 0.0000) and, to a lesser extent, with administrative expenses (0.4406, p = 0.0000). The rest of the correlations between variables are of a much smaller magnitude. For reasons of space, the correlation table is not presented, but it can be requested by e-mail.

Table 1
Descriptive statistics of the variables used in the econometric analysis

Variable	*Observations*	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
ROAE	211	0.1258	0.1399	-0.6739	0.6550
ROAA	211	0.0164	0.0500	-0.3371	0.2323
Log (number of branches)	211	4.6636	2.4521	0.0000	7.6980
Number of branches	211	527.9005	628.0410	1.000	2204.0000
Capital/Assets	211	0.1295	0.0963	0.0257	0.5663
Deposit/Credit	210	1.5031	2.1261	0.0000	18.6099
Provision for credit risks/Credit	211	0.0363	0.0312	0.0000	0.1656
Risk-weighted assets /Assets	211	0.6689	0.2716	0.1142	1.5668
Administrative expenses/Assets	211	0.0605	0.0782	0.0030	0.3805
Non-interest income / Total operating revenues	211	0.3522	0.5329	-4.1690	3.0559
Credit Dominance Index	211	0.0141	0.0469	0.0000	0.2762
Affiliation to a business group	211	0.4265	0.4957	0.0000	1.0000
Foreign capital	211	0.4028	0.4916	0.0000	1.0000
General corporate governance index	205	0.8433	0.0953	0.5298	0.9830

Source: Author's calculations.

Models to estimate

Due to the type of database, estimation options represent variants of panel data models. Since these are bank profitability functions, dynamic and static panel models can be considered. Dynamic specifications are necessary because previous research on the banking profitability function in Mexico has demonstrated that the first lag of the profitability variable taken as an independent variable is significant (Garza-García, 2012; Chavarín, 2015). Moreover, this type of specification allows some bank variables to be treated as endogenous variables, as documented in the literature on the subject and explained below. On the other hand, static models offer the advantage of being able to include a more significant number of explanatory variables without generating a concern about the excessive number of instruments, as happens in dynamic models.

First, the following dynamic panel model is proposed:

$$profitability_{it} = \delta_0 profitability_{i,t-1} + \delta_1 corporate\ governance\ index\ or\ subindex_{it} + \boldsymbol{x}'_{it}\boldsymbol{\beta} + \boldsymbol{w}'_{it}\boldsymbol{\gamma} + \alpha_i + \varepsilon_{it}\ , \quad (1)$$

where:

α_i = panel-level effects

$\boldsymbol{x}'_{it}$ = exogenous variable vector: $X_1, X_2, \ldots, X_k$

$\boldsymbol{w}'_{it}$ = vector of endogenous and predetermined variables: $W_1, W_2, \ldots, W_m$

ε_{it} = error.

Equation (1) is used to estimate the impact of the overall corporate governance index and then in another set of regressions to measure the individual influence of the corporate governance subindices. As for the characteristics of this equation, according to Berger *et al*. (2000) and Goddard *et al*. (2004), if the coefficient of lagged profitability is significant it indicates that the profitability function is not in long-term equilibrium, and that this may be caused by barriers to entry and other obstacles to competition, or by opacity of information or sensitivity to possible economic shocks. On the other hand, according to Berger (1995), capital has an endogenous behavior within the function of profitability, since an increase in profits allows an increase in the capital ratio, mainly because those banks that expect to perform better transmit that information to the public by increasing their capital. In turn, credit risk can be modeled as a predetermined variable, as banking regulators set specific standards for the level of provisions for credit risks (Athanasoglou *et al*., 2008). Equation (1) represents these two variables with vector $\boldsymbol{w}'_{it}$.

The correlations between the variables were considered for the variables included in each regression. As mentioned above, the capital variable has a very high and significant correlation with total risk exposure and, to a lesser extent, with administrative expenses. In the regressions of section 6, these correlations are taken into account to define the variables to include in vector $\boldsymbol{x}'_{it}$, in a way that avoids multicollinearity problems.

To estimate equation (1), the Arellano-Bover/Blundell-Bond estimator, also called system GMM, was applied. This estimator has some advantages over the Arellano-Bond estimator, specifically greater precision and better properties for finite samples, although it has the disadvantage of using considerably more instruments. This increase in the number of instruments presents a problem since the database is not large. That is why the following strategy was employed: First, an estimate was made with as few instruments as possible, that is, setting at one the number of lags to use as instruments in all variables. Even so, regressions were obtained with more than 60 instruments (unreported results), since the standard methodology of the Arellano-Bover/Blundell-Bond estimator considers an instrument for each period, variable, and lag. Second, the previous regressions were re-estimated, considering only one instrument for each variable and lag (see Table 2). This variation, described by Roodman (2009),[14] makes it possible to collapse the number of instruments used to a minimum. According to this author, this procedure—in small samples—makes it possible to avoid the bias that arises as the number of instruments grows.

Moreover, as with the standard estimator, the consistency of the results depends on the satisfaction of two conditions: (i) that the error term has no serial correlation, and (ii) that the set of instruments used is valid. As stated in section 6, regressions made with the standard estimator do not meet the second condition, while those made with the collapse

[14] David Roodman is also the author of the collapse procedure for the number of instruments for the statistical package Stata, which was used in this study to estimate the equations.

instrument by Roodman do. Third, all regressions presented were corrected for small samples resulting in t-values for standard errors, while the F-test was applied for each regression.

A significant advantage of using GMM-type estimators is that they have the additional benefit of solving endogeneity problems. Endogeneity problems have always been a concern in corporate governance studies, as independent variables may be omitted that could have some correlation with other included independent variables. The traditional strategies followed to solve the possible presence of endogeneity have been the inclusion of a good set of control variables, the use of instrumental variables, and the removal of fixed effects in the regressions. GMM type estimators, by design, use instrumental variables and transform the data to remove fixed effects. Furthermore, they allow for the modeling of explicitly endogenous and predetermined variables and also give a particular treatment to the lagged dependent variable used as an independent variable. A limitation in the use of this methodology is that there are no other instrumental variables exogenous to the model that could be effective in the treatment of endogeneity. However, the study tried to model the corporate governance index as endogenous, although the basic results were not modified.

On the other hand, the following static models are also proposed to contrast the results obtained using the dynamic model (equation 2), but above all to observe whether there are differentiated effects on the performance of specific corporate governance functions by banks affiliated to business groups, or foreign-owned banks (equation 3):

$$profitability_{it} = \alpha_i + \delta_0 corporate\ governance\ index\ or\ subindex_{it} + \boldsymbol{x}'_{it}\boldsymbol{\beta} + \boldsymbol{r}'_{it}\boldsymbol{\delta} + \varepsilon_{it} \quad (2)$$

$$profitability_{it} = \alpha_i + \delta_0 group\ affiliation_{it} + \delta_1(group\ affiliation_i * governance\ subindex_{it}) + \boldsymbol{x}'_{it}\boldsymbol{\beta} + \varepsilon_{it}, \quad (3)$$

where:

α_i = random individual specific effects

$\boldsymbol{x}'_{it}$ = vector of banking control variables: $X_1, X_2, \ldots, X_K$

$\boldsymbol{r}'_{it}$ = vector of non-banking control variables: $R_1, R_2, \ldots, R_L$

ε_{it} = idiosyncratic error

A version of equation (3) is also proposed but with the foreign-owned capital variable instead of the business group affiliation variable. From equation (3) an exclusion restriction test can be carried out to assess Ho: $\delta_0 = 0, \delta_1 = 0$, which expresses that there is no statistical difference from the direct impact of the group affiliation variable (or foreign capital, if applicable) and its indirect effect through its interaction with the respective corporate governance subindex. Ho must be rejected to prove that there is a different impact of the subindex studied as a result of the bank belonging to a business group (or being a bank with foreign capital). It is noteworthy that equations (2) and (3) were estimated with the random effects technique, which makes it possible to include invariant variables over time, such as group affiliation and foreign ownership capital.

Results

The standard Arellano-Bover/Blundell-Bond estimator assessed the first equation (1), but for space reasons, the results are unreported. These regressions used between 43 and 61 instruments, which is an excessive number compared to the number of cross-sectional units (26). This number of instruments impairs the Sargan and Hansen tests to the extent that the latter presents values so good (p = 1,000) that they are implausible (Bowsher, 2002). This problem diminishes the validity of the results.

Subsequently, equation (1) was re-estimated using the instrument collapse procedure by Roodman, as revealed in the regressions in Table 2. Unlike the previous case, the results were obtained with an average of only 12 instruments and presented plausible and correct values for the over-identification tests of restrictions. In these estimates, the main result is that the corporate governance index is not significant, although its sign is positive as is expected. The result is maintained even by modeling the corporate governance index as endogenous within the model (unreported results). This result indicates that greater compliance with recommended corporate governance practices does not have a significant effect on the profitability of banks, perhaps because banks do not attach sufficient importance to certain components of corporate governance, and when they declare that they comply with them, they intend to satisfy the disclosure requirements demanded of them by their participation in the stock market. For example, there may be boards of directors or board committees, that do not meet a sufficient number of times, or that are composed of members without the necessary technical training or experience. This would result in some of the functions of the governing bodies not benefiting the performance of the banks. Alternatively, in a similar result for non-financial companies in Mexico, Macias and Roman (2014) point out that market participants would not be recognizing the compliance of the Code of Best Corporate Practices as significant progress.

In general, the set of results for the rest of the variables included in the regressions in Table 2 reinforces the consistency of the estimates. First, the coefficient of the lagged dependent variable is positive and significant, as expected, indicating that past period profitability is a very important influence on current profitability. Second, the liquidity ratio is negative and significant, indicating that a higher proportion of liquid assets is associated with a lower rate of return. Third, non-interest income is positive and significant, indicating that for banks operating in Mexico, the collection of commissions and fees is an important source of profitability. Fourth, most of the other variables, although not significant, exhibit the expected signs: size, a positive sign; administrative expenses, a negative sign; market concentration, a positive sign; total exposure to risk may have any of the signs; affiliation to a group, a negative sign. Only the capitalization and credit risk variables display signs opposite to those expected in some of the regressions. A time variable was included to see if there was a possible temporal tendency within the model, which, if ignored, could affect the results of the serial correlation and validity tests of the instruments. However, in no case was this variable significant, and therefore it was not added in the definitive regressions. The same regressions of Table 2 were made taking as dependent variable the return on average assets (ROAA), but for reasons of space the results are not reported: in all these regressions the coefficient of the general corporate governance index is positive, but it is not significant in any of them.

Model (1) was then re-estimated, now including the corporate governance subindices as independent variables. These coefficients were estimated one by one in the regressions, as was the overall index. Due to the increase in instrumental variables, there was no joint estimation of the subindices. Table 3 presents the results of this set of regressions. These regressions feature positive coefficients for the five subindices included: shareholders, board of directors, audit, evaluation, compensation, finance, and planning functions, although only the audit and finance and planning functions were significant.

Table 2
Dynamic panel regressions with the Roodman instrument collapse procedure including the general corporate governance index as an independent variable

Variable	Dependent variable: ROAE			
ROAE t-1	0.4887***	0.4050***	0.3352**	0.4099***
	(0.1703)	(0.1136)	(0.1414)	(0.1371)
Log (number of branches)	0.0286	0.0190	0.0032	0.0121
	(0.0209)	(0.0181)	(0.0169)	(0.0219)
Capital/Assets	0.0830	-0.2401	-0.2524	
	(0.8921)	(0.5667)	(0.5249)	
Deposit/Credit	-0.0075**	-0.0074**	-0.0070**	-0.0091***
	(0.0032)	(0.0030)	(0.0032)	(0.0019)
Risk-weighted assets /Assets				-0.1375
				(0.1009)
Provision for credit risks/Credit	1.2157	0.3207	-0.2906	0.0939
	(0.9486)	(0.6158)	(0.8517)	(1.2481)
Administrative expenses/Assets	-0.6275			
	(0.4047)			
Non-interest income/Total operating income	0.0206*	0.0224**	0.0224**	0.0218*
	(0.0109)	(0.0104)	(0.0099)	(0.0122)
Credit Dominance Index	0.2062	0.2134	0.2137	0.1630
	(0.1390)	(0.1492)	(0.1564)	(0.1813)
Group affiliation			-0.1656	-0.0532
			(0.2339)	(0.2161)
General corporate governance index	0.2864	0.2010	0.1543	0.1432
	0.1715	(0.1489)	(0.1554)	(0.1247)
Constant	-0.3301	-0.1648	0.0536	0.0123
	(0.2342)	(0.1379)	(0.2933)	(0.2390)
Number of observations	173	173	173	173
Number of instruments	13	12	12	11
F	6.28	8.82	20.91	57.78
Prob > F	(0.000)	(0.000)	(0.000)	(0.000)
Arellano-Bond test (first order)				
z	-2.71	-3.16	-3.10	-3.15
Prob > z	(0.007)	(0.002)	(0.002)	(0.002)
Arellano-Bond test (second order)				
z	1.15	0.79	0.63	0.73
Prob > z	(0.252)	(0.430)	(0.528)	(0.467)
Sargan test				
chi^2	5.65	4.49	3.43	0.93
Prob > chi^2	(0.130)	(0.213)	(0.180)	(0.335)
Hansen test				
chi^2	2.94	1.32	1.18	0.60
Prob > chi^2	(0.401)	(0.723)	(0.553)	(0.438)

Robust standard errors between parentheses
* Significant at 10% according to t-tests
** Significant at 5% according to t-tests
*** Significant at 1% according to t-tests
Source: Author's calculations.

These results reveal that, although the general index is not significant, certain parts of it do present some relevance manifested in the performance of the banks themselves. Specifically, there is a certain relevant impact on the activities linked, on the one hand, to the supervision and analysis of external audit, internal control mechanisms, transactions with related parties, the generation of financial information, and the control of risks; on the other hand, to the activities related to the definition of systems for the appointment, compensation, removal, and succession of senior directors. Concerning the

rest of the variables of the regressions in Table 3, the main results of Table 2 are maintained, even improving the coefficients of the capitalization variable, since in all cases, the expected positive sign was given.

Furthermore, considering the static model described by expression (2), there is also evidence of a positive effect of the general corporate governance index on the profitability of banks. However, it is only significant when the dependent variable is ROAA, as demonstrated in Table 4. The above indicates that, from a static point of view, the results do not change concerning those of the dynamic model when the dependent variable is ROAE, and only a certain relevance of compliance with recommended practices is present when using the other dependent variable.

Table 5 displays the results of the corporate governance subindices obtained from the static model (2), taking ROAA as the dependent variable, as with this variable, some significance was observed in the general index. The coefficients for the board of directors, audit tasks, evaluation, compensation, finance, and planning functions, were positive, with the first three being significant.[15] However, only the results of the audit subindices (columns 1 and 2) and evaluation and compensation (columns 3 and 4) are displayed because their significance coincides with that obtained in the dynamic model. Both models (dynamic and static) present a particular relevant impact of the activities linked, on the one hand, to the internal control of banks and, on the other hand, to the design of incentives for those who operate them.

Table 3
Dynamic panel regressions with Roodman instrument collapse procedure including corporate governance subindices as independent variables

Variable	Dependent variable: ROAE				
ROAE t-1	0.4708* (0.1669)	0.4602** (0.1754)	0.4436** (0.1734)	0.4962*** (0.1682)	0.4440** (0.1770)
Log (number of branches)	0.0316 (0.0206)	0.0308 (0.0233)	0.0320 (0.0208)	0.0318 (0.0203)	0.0332 (0.0221)
Capital/Assets	0.2589 (0.9809)	0.2876 (0.9508)	0.2369 (1.0136)	0.0231 (0.8753)	0.1951 (0.9725)
Deposit/Credit	-0.0068* (0.0037)	-0.0073* (0.0035)	-0.0072** (0.0034)	-0.0077** (0.0031)	-0.0074** (0.0034)
Provision for credit risks/Credit	1.2138 (1.0063)	1.2580 (1.0726)	1.2688 (1.0268)	1.3445 (1.0121)	1.1280 (0.9968)
Administrative expenses/Assets	-0.6721 (0.4308)	-0.6854 (0.4708)	-0.6691 (0.4474)	-0.6011 (0.3943)	-0.5974 (0.4211)
Non-interest income/Total operating income	0.0246** (0.0098)	0.0242** (0.0095)	0.0210* (0.0110)	0.0193** (0.0109)	0.0255*** (0.0088)
Credit Dominance Index	0.2575* (0.1325)	0.2782** (0.1305)	0.2765** (0.1230)	0.1329 (0.1707)	0.2889** (0.1483)
Shareholder function subindex	0.0841 (0.0787)				
Board function subindex		0.0972 (0.1916)			
Audit function subindex			0.1754* (0.1049)		
Evaluation and Compensation Functions subindex				0.1203* (0.0668)	
Finance and planning functions subindex					0.0029 (0.0211)
Constant	-0.1911 (0.1538)	-0.2035 (0.2263)	-0.2759 (0.1645)	-0.1769 (0.1346)	-0.1206 (0.1139)

[15] The shareholder functions subindex was not significant and had a negative sign, contrary to what was expected, unlike the one obtained in the dynamic model.

Number of observations	173	173	173	173	173
Number of instruments	13	13	13	13	13
F	3.73	2.48	16.72	8.80	4.40
Prob > F	(0.006)	(0.040)	(0.000)	(0.000)	(0.002)
Arellano-Bond test (first order)					
z	-2.72	-2.68	-2.50	-2.71	-2.71
Prob > z	(0.007)	(0.007)	(0.012)	(0.007)	(0.007)
Arellano-Bond test (second order)					
z	1.17	1.14	0.58	1.37	1.05
Prob > z	(0.244)	(0.254)	(0.562)	(0.171)	(0.292)
Sargan test					
chi^2	4.30	4.16	5.04	5.53	4.87
Prob > chi^2	(0.231)	(0.245)	(0.169)	(0.137)	(0.181)
Hansen test					
chi^2	3.18	3.01	2.60	2.25	3.10
Prob > chi^2	(0.364)	(0.391)	(0.457)	(0.522)	(0.376)

Robust standard errors between parentheses
* Significant at 10% according to t-tests
** Significant at 5% according to t-tests
*** Significant at 1% according to t-tests
Source: Author's calculations.

Table 4
Random-effects regressions including the general corporate governance index as an independent variable

Variable	Dependent variable: ROAE		Dependent variable: ROAA	
Log (number of branches)	0.0104 (.0091)	0.0146 (0.0127)	0.0033* (0.0019)	0.0047 (0.0034)
Capital/Assets	-0.3894 (0.4436)	-0.2803 (0.3836)	0.0641 (0.1644)	0.0975 (0.1441)
Deposit/Credit	-0.0030*** (0.0010)	-0.0029*** (0.0010)	-0.0002 (0.0002)	-0.0001 (0.0003)
Provision for credit risks/Credit	-0.7000 (0.4554)	-0.4854 (0.5518)	-0.2350 (0.1889)	-0.1530 (0.2431)
Administrative expenses/Assets		-0.4172 (0.7533)		-0.1498 (0.2467)
Non-interest income/Total operating income	-0.0024 (0.0333)	-0.0028 (0.0324)	-0.0086 (0.0098)	-0.0087 (0.0095)
Credit Dominance Index	0.2608** (0.1277)	0.1895 (0.1864)	-0.0038 (0.0421)	-0.0345 (0.0782)
Economic group affiliation	-0.0628 (0.0465)	-0.0665 (0.0501)	-0.0150* (0.0090)	-0.0166 (0.0109)
General corporate governance index	0.1542 (0.1406)	0.1670 (0.1559)	0.0755* (0.0408)	0.0831* (0.0515)
Constant	0.0322 (0.1212)	0.0084 (0.1487)	-0.0547 (0.0376)	-0.0647 (0.0505)
Number of observations	202	202	202	202

Wald chi^2	153.43	132.75	26.07	15.99
Prob>chi^2	(0.0000)	(0.0000)	(0.0010)	(0.0671)
R^2 Within	0.0702	0.0873	0.0125	0.0405
R^2 between	0.1952	0.2016	0.5068	0.3998
R^2 Total	0.0241	0.0124	0.2346	0.1256

Robust standard errors between parentheses
* Significant at 10%
** Significant at 5%
*** Significant at 1%
Source: Author's calculations.

The static model of equation (3) was also introduced to measure the possible differentiated effect of corporate governance subindices on group affiliated banks or foreign-owned banks. If such differentiated effects exist, this will indicate that selective compliance with specific corporate governance functions would be different depending on the type of bank. Table 5 reveals the case of the evaluation and compensation functions subindex (columns 5 and 6), which is the only one that presents evidence of differentiated effects in those banks linked to a business group (column 5). That is, the direct effect of the group affiliation variable and its indirect effect through interaction with the evaluation and compensation subindex are statistically different from zero. This effect was corroborated by dividing the sample by bank types. When equation (2) is estimated only for group affiliated banks, and the evaluation and compensation subindex is included as an independent variable, its coefficient is positive and significant at 1% (unreported results). This combination of evidence is not present for any subindex analyzed with foreign-owned banks. The differentiated effect found in group affiliated banks may be due to the fact that in this type of bank the control of the organization is centralized in the decisions of the majority shareholders, who can more easily establish a prudent compensation policy, as they are more interested in controlling the revenue streams of the banks and their possible synergies with other businesses.

Finally, a static panel model was estimated as a test of robustness, similar to the one in equation (2), but considering the independent variables to be lagging a period to reduce the possible endogeneity effects between these variables and the error term. With this variant, none of the regressions (unreported results) showed that the coefficient of the general corporate governance index or the subindices of each specific function—using both dependent variables—were significant. In other words, there is agreement with the result of the general index, although not with all the specific indices. Another robustness test consisted in estimating a model in first differences (unreported results). When used as an ROAE dependent variable, all the coefficients of the subindices were positive, but only the audit coefficient and the evaluation and compensation coefficient were significant, as displayed in Table 3 and Table 5. The regressions presented in tables 2-5 were also re-estimated, but the years of the financial crisis (2008, 2009) were eliminated (unreported results), and the results obtained were very similar to those previously presented.

Table 5
Random-effects regressions including corporate governance subindices as independent variables

Variable	Dependent variable: ROAA					
Log (number of branches)	0.0037* (0.0021)	0.0035* (0.0020)	0.0040* (0.0021)	0.0038* (0.0020)	0.0039** (0.0016)	0.0035** (0.0015)
Capital/Assets	0.0513 (0.1693)	0.0703 (0.1787)	0.0750 (0.1592)	0.0964 (0.1655)	0.1264 (0.1432)	0.1125 (0.1574)
Deposit/Credit	-0.0003 (0.0002)	-0.0001 (0.0001)	-0.0004* (0.0002)	-0.0002* (0.0001)	-0.0004 (0.0003)	-0.0002 (0.0002)
Provision for credit risks/Credit	-0.2360 (0.1840)	-0.2674 (0.1965)	-0.2116 (0.1820)	-0.2380 (0.1921)	-0.2151 (0.1600)	-0.2630 (0.1796)

Non-interest income/Total operating income	-0.0095 (0.0099)	-0.0099 (0.0098)	-0.0085 (0.0095)	-0.0090 (0.0094)	-0.0068 (0.0092)	-0.0079 (0.0095)
Credit Dominance Index	-0.0551 (0.0636)	-0.0189 (0.0734)	0.0340 (0.0334)	0.0728 (0.0510)	-0.0217 (0.0423)	0.0336 (0.0495)
Business group affiliation	-0.0168* (0.0102)		-0.0138* (0.0084)		-0.0764*** (0.0211)	
Foreign capital		-0.0005 (0.0164)		-0.0030 (0.0152)		0.0449 (0.0304)
Audit function subindex	0.0650* (0.0356)	0.0674* (0.0421)				
Evaluation and Compensation Functions subindex			0.0415** (0.0211)	0.0434* (0.0230)	0.0062 (0.0066)	0.0902** (0.0350)
Group* Evaluation and Compensation subindex					0.1065*** (0.0317)	
Foreign capital* Evaluation and Compensation subindex						-0.0788** (0.0401)
Constant	-0.0479 (0.0346)	-0.0579 (0.0396)	-0.0225 (0.0182)	-0.0300 (0.0199)	-0.0059 (0.0144)	-0.0593 (0.0219)
Number of observations	202	202	202	202	202	202
Wald chi^2	28.58	38.18	40.01	36.10	36.42	45.28
Prob>chi^2	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R^2 Within	0.0112	0.0093	0.0214	0.0186	0.0577	0.0291
R^2 between	0.5138	0.5942	0.5410	0.5824	0.6081	0.6496
R^2 Total	0.2161	0.2535	0.2535	0.2897	0.3059	0.3293
Exclusion Restrictions test chi^2						
Prob > chi²					13.00 (0.0015)	4.31 (0.1159)

Robust standard errors between parentheses
* Significant at 10%
** Significant at 5%
*** Significant at 1%
Source: Author's calculations.

Conclusions

The evidence presented in this article indicates that general compliance with recommendations linked to basic or traditional corporate governance practices does not generate a material impact on the profitability of banks participating in the Mexican stock market. This result suggests that banks do not attach sufficient importance to certain components of corporate governance, and when they declare that they comply with them, they intend to satisfy the disclosure requirements demanded of them by their participation in the stock market. Aspects that are only apparently fulfilled do not make a real contribution to the mechanisms that can improve the performance of a bank. Authors such as Macías and Román (2014) find that non-financial companies established in Mexico apparently comply with certain recommendations of the Code of Best Corporate Practices, but in essence, this is not the case. For example, a certain percentage of directors considered independent is met because they are not linked in an equity or operational function to a particular company. However, some of them are part of a broad network of corporate interests that support the decisions of controlling shareholders. Aspects of this nature could be occurring in the banking sector.

However, there is also evidence that some subsets of traditional practices do have an impact on bank performance, such as auditing, evaluation, and compensation functions. These functions focus on the internal control of banks and the design of incentives for those who operate them. According to the Basel Committee, some of the areas considered as priorities for improvement by banks after the recent international financial crisis relate to these two functions. In particular, the following needs are identified: a) an internal audit function with sufficient authority, independence, resources, and access to the board of directors; and b) the adoption of sound compensation practices aligned with prudent risk-taking schemes (Basel Committee on Banking Supervision, 2010). The significance of these two functions suggests that the banks established in Mexico are indeed focusing efficiently on these recommendations. Moreover, there is evidence of a differentiated impact on the evaluation and compensation functions subindex, which is especially significant in banks linked to business groups. In this type of banks, the control of the organization is centralized in the decisions of the majority shareholders, who can more easily establish a prudent compensation policy, since they are more interested in the control of the income flows of the bank and the possible synergies with other businesses.

The set of results obtained in this study suggests a selective compliance of banks with basic or traditional corporate governance practices. Given this pattern of behavior, it is interesting to delve deeper into the study of other additional functions of bank governance, such as the specific functions of risk governance, related to the recent recommendations of the Basel Committee on Banking Supervision (2015). This research agenda is pending for Mexico and the rest of Latin American countries.

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