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Corporate Governance and Iranian Banking Economic Value Added

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Abstract

Added over the period 2006-2018. We focused on different proxies of corporate governance indicators, such as the Directors' Effectiveness, the Transparency and the Disclosure, Responsibility. Basel Principles have been used to make corporate governance indicators and Stern & Stewart and Chew (1995) method have been used to make banking economic value added. We used the PCA method to choose important indicators. The results of PCA estimation identified ten important variables affecting banks' economic value added. Due to the importance of banks' age in creating economic value-added, banks are divided into two classes according to age. The GMM method is used to estimate the models. Eight models were designed to examine the impact of different corporate governance measures on the banking economic value added. The results indicated that corporate governance indicators were significant in explaining changes in the Iranian banking economic value added. The result also shows that according to the banks' age, the effectiveness of the board structure is greater than others. This illustrates the importance of board structure more than other criteria.

Keywords: Corporate governance, Age, Economic value added, GMM method

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Introduction

Banks have an important role in the amplification of systemic risk. So after the financial crisis of the last two decades in particular the Asian crisis of the '90s and the recent global financial crisis, the governance systems adopted by banking firms and the Basel Committee in 1999 issued, Principles of corporate governance.

Banks differ from other financial institutions in some characteristics such as the size and complexity of the organizational structure(Hermalin and Weisbach, 2003), information asymmetry, lack of the stakeholder's capability to supervise, the role of banks as intermediaries and the role of banks to protect the right of the depositors, guarantee the solidity of the payment system and decreasing the systematic risk (Belhaj and Mateus, 2016) so the corporate governance structure in them is different from other financial institutions.

There are two groups of studies on the relationship between corporate governance and performance. One group of studies examined the effect of corporate governance on the performance of non-financial institutions and the second group examined the effect of corporate governance on the performance of banks(eg, Andres and Vallelado, 2008; Adams and Mahran, 2008; Caprio et al, 2007). Most of the studies in the second group focus on banks in European and American countries(eg. Staikouras, 2007; Conyon and Peck, 2010), and there are few studies in developing countries. On the other hand, in the second group of studies, profitability criteria such as return on assets and return on capital have been used as performance criteria. This study focuses on the relationship between corporate governance and the economic value added of Iranian banks and seeks to strengthen studies in developing countries.

We use different proxies of governance such as the Directors' Effectiveness, the Transparency and the Disclosure, Responsibility and their impact on bank performance over the period 2006-2018. In addition, we used banking economic value added as a bank performance index, instead of ROA and ROE.

The study contributes to the dedicated literature in several ways. Firstly, the cumulative influence of the internal governance framework on bank performance is analyzed. Secondly, the study completes other studies examining governance by adding other variables such as the risk of banks and a combination of asset and liability. Third, we make a good corporate governance indicator that is one of the corporate governance indicators for each bank that are more than the mean of a sample and otherwise, it is zero.

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Forth Given the importance of banks' age in adherence to corporate governance principles, the age of banks is also considered in examining the impact of corporate governance on the economic value added of banks.

The paper is organized as follows: session 2 and 3 present the theory of banking economic value-added, theoretical and literature review which includes pieces of evidence related to the relationships between corporate governance and bank performance in general, In session 4 we describe our sample, variables and model specification, The empirical result has been explained in session 5. finally, the last session presents the findings and discussion.

Theoretical foundation

1. Relationship between Corporate Governance and Bank Performance

Following the financial crisis of 2008, the importance of implementing corporate governance in banks as the most important financial institutions has become increasingly apparent. Due to the different nature of business models in banks, and the requirements of prudential regulations, banks have a different framework in corporate governance (Claessens & Yurtoglu, 2013). There are various theories about the relationship between corporate governance and the performance of banks, including Agency theory and Stakeholder theory.

Financial institutions require the separation of ownership and management. Agency theory helps to this separation. Separation of ownership and management has several consequences, improving shareholder control on managers 'decisions, matching managers' motivations with shareholders, and day-to-day decision-making power. (Jensen & Meckling, 1976; Fama & Jensen, 1983). Separation of ownership and management creates the problem of Agency theory, including increasing the desire of managers to pursue personal interests instead of the interests of shareholders. Agency theory controls the performance of managers by supporting the delegation of authority and the concentration of control on management and the use of incentives, reporting, review and audit and the implementation of codes and policies (Ibitamuna, et al, 2018).

According to Stakeholder theory by Sundaram and Inkpen (2004) states that shareholders play a key role in implementing corporate governance. According to this theory, small shareholders along with large shareholders can participate in important issues such as mergers, liquidations and changes in business strategy and monitoring the performance of managers through their voting rights (Ibitamuna, et al, 2018).

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However, a variety of factors could prevent small shareholders from effectively exerting corporate control. Such as information asymmetry between managers and small shareholders, lack of sufficient skills of small shareholders to monitor the performance of managers, multiple shareholders and different and sometimes conflicting goals (Ibitamuna, et al, 2018).

2. Banking Economic Value Added

The focus on economic profit was first articulated by Marshall in 1890 (Kyriazis & Anastassis, 2007, pp. 71–72) and then the EVA model was thoroughly applied by Stern Stewart & Company consultant group for the first time, in the nineties (Stern, 1985; Stern, Stewart, & Chew, 1995; Stewart, 1994).

EVA is one of the best techniques that measure the true economic profit of a firm (Nikhil, 2009). This indicator is used to select the composition of the portfolio and measure the performance of banks. Unlike traditional profitability criteria such as EBIT and EBITDA, this measure can measure net profit and correspond to maximizing shareholder wealth (Grant, 2003, pp. 1–2; Kyriazis & Anastassis, 2007, p. 72).

EVA is one of the indicators for measuring performance, measuring the value of the firm and a suitable tool for financial institution management decision making (Stern, Stewart and Chew, 1995). A clear example of the application of the EVA indicator in American companies can be examined, which in many cases has increased the wealth of shareholders (Kyriazis & Anastassis, 2007, p. 72).

In these companies, Bonuses and incentive pay are given to managers who have been able to generate more long-term dividends than the cost of capital. Thus, by accounting for both the cost of debt and equity capital, EVA gives managers the incentive to act like shareholders when making corporate investment decisions (Grant, 2003, p. 2).

Despite the traditional indicator that requires comparative analysis, EVA alone is reliable (Kosalathevi, 2013, p. 1).

EVA has also gained popularity in the investment community. Indeed, "buy-side" investment firms use EVA in their stock selection, portfolio construction, and risk control processes. EVA is also used to analyze performance (Grant, 2003, pp. 2–3).

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Economic value added helps banks to differentiate activities that create value-added from activities that damage the value of the bank. It also helps bankers implement strategies that create value-added for banks (Kleiman, 1999).

Economic value added helps banks managers to prefer long-term goals to short-term goals. In addition, it is a good criterion for evaluating the performance of managers and determining the amount of salary and rewards (Grant, 1996).

Performance measurement in banking that reflects managerial achievement is usually conducted by aims to encourage activities or strategies to improve economic value (value-added activities) and to dispose of those damaging the value (non-value added activities). The relevance of a bank's performance measurement rate with profitability is through EVA. EVA is a new concept to assess banking financial performance and it is relevant because EVA can measure managerial performance (achievement) based on value-added creation at a certain period (Pompong, 2015, pp. 9–10).

The use of Risk-Adjusted Return on Capital (RAROC) and Economic Value Added (EVA) of financial institutions is accompanied by an emphasis on the Basel Committee in defining capital requirements. In the experimental literature, there is little guidance on the optimal allocation of capital, especially in cases where there is asymmetric information (Stoughton & Zechner, 2007, p. 313).

Research Background

Different indicators have been used in different articles to measure corporate governance. Like the number of members in the board (Agbaeze and Chinedu Daniel, (2018), Oyerinde (2014), Kamrul, (2017), Andres and Vallelado, 2008),

board size, executive and non-executive board members(Ibitamuna, et al (2018), Salim et al (2016), Peni and Vahama (2012), Adams and Mehran (2005, 2008)), the independent director’s size(Kamrul, 2017), the board size and composition, the gender diversity and the CEO duality (Belhaj and Mateus, (2016), Ulussever (2016), Bayrakdaroglu, et al (2012), Andres and Vallelado, (2008)), board directors, executive director remuneration, the number of executive/ “inside” directors (Rose ,2016), committee meetings (Salim et al, 2016), the corporate structure, the structure of committees, the risk management and the internal control framework and the institutional

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transparency(Dedo and Chitan, 2013), the quality of the corporate governance(Bubbico et al ,2012), Ownership concentration, Foreign ownership (Bayrakdaroglu, et al ,2012), Caprio et al ,2007).

Also, different indicators have been used in different studies to measure performance. Like profit after tax(Agbaeze and Chinedu Daniel, ,2018), interest rate margin (Ibitamuna, et al (2018), Oyerinde ,2014), profit level and Return on Asset (ROA),(Ibitamuna, et al, 2018), Belhaj and Mateus, (2016), Ulussever (2016), Dedo and Chitan (2013), Peni and Vahama (2012), Andres and Vallelado, 2008), ROE (Belhaj and Mateus, ,2016), Oyerinde (2014), Dedo and Chitan, 2013), Peni and Vahama (2012), Andres and Vallelado, 2008), credit risk exposure (Rose ,2016), efficiency (Salim et al ,2016), market value of the financial institutions (Bubbico et al, 2012), economic value added (EVA), market value added (MVA) and cash value added (CVA) (Bayrakdaroglu, et al ,2012), Tobin's Q(Adams and Mehran (2005, 2008)).

The results of the study on the effect of board size, gender, the meeting of the committee on the profitability of banks (ROA, ROE, Net interest margin, Tobin's Q) are different in different studies, so that in some cases Agbaeze and Chinedu Daniel, (2018), Kamrul, (2017), Belhaj and Mateus, (2016), Salim et al (2016), Oyerinde (2014), Dedo and Chitan (2013), Adams and Mehran (2005, 2008)) There is a positive relationship between the size of the board and the net interest margin ROA and ROE Large board of directors with more female members led to better bank performance In contrast, in some studies such as Ibitamuna, et al (2018), Bayrakdaroglu, et al (2012), Peni and Vahama (2012) this relationship is negative. On the other hand, some studies indicate there is a U-Shaped relation between bank performance and board size(Andres and Vallelado, 2008).

The relationship between the board composition and the CEO duality and profitability indicators is different in different studies. Belhaj and Mateus, (2016) stated that there is no significant relationship between the two. but in Ulussever (2016), Dedo and Chitan (2013), there is a negative relationship between the risk closure index and CEO related variables. But the relationship between executive director remuneration and credit risk is positive and the relationship between the number of executive/ "inside" directors and credit risk is negative(Rose (2016)).

Other studies such as Ulussever (2016) indicates a positive relationship between the financial disclosure index and board structure variables, and the profitability of banks. Some studies indicate there is a positive relationship between corporate governance and Market Value (Bubbico et al (2012)),

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Sample, Variables and Model Specification

Sample

This paper examines the effect of corporate governance (Directors' Effectiveness, Transparency and the Disclosure, Responsibility) on Iranian bank Value-added economy. Related studies have been conducted in European countries (eg, Belhaj and Mateus, 2016; Rose, 2016; Dedo and Chitan, 2013)and the United States(eg, Peni and Vähämaa, 2011; Adam and Mehran, 2003), and there are few studies on developing countries, especially Iran. This study has tried to fill this gap. The study period of this article is 2006-2018.

In our research, we use secondary data for corporate governance indicators and financial statement for other indicators. We restrict our sample to Private Banks. Because in the Iranian banking system, the Circular number 96/51935 at 1396/02/24 has been issued only for implementation in private banks and nongovernmental credit institutions. This Circular is not intended to apply to state-owned banks, given the current status of state-owned banks, including the mechanism for appointing senior managers of those banks and other statutory requirements related to the structure of state-owned banks.

In the case of private banks that were previously credit institutions, the age of the bank has been calculated since the credit institution became a bank. Because before becoming a bank, some of the requirements of banks that have been complied with in recent years, such as IFRS, principal of corporate governance was not observed and access to their data before becoming a bank, especially in the area of corporate governance was not possible.

Also, data related to bank value-added economy are calculated using the Stern & Stewart and Chew (1995) model.

Variables

1. Dependent Variable

The bank economic value added is the dependent variable in this study. Following the previous empirical researches (e.g., Bayrakdaroglu, et al, 2012; Andres and Vallelado, 2008; Caprio et al. 2007) we employ this indicator. The basic form, suggested by Stern & Stewart and Chew (1995), the equation is as follow:s

$$EVA= NOPAT– Cap \times WACC$$

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Where,

NOPAT: net operating profit after taxes

Cap: Invested capital = Equity + long-term debt at the beginning of the period

WACC: weighted average cost of capital = Ke*E/ (E+D) + Kd (1-t)*D/ (E+D)

Where Ke = required return on equity and Kd (1-t) = after tax return on debt

And (WACC* capital invested) is also known as a finance charge.

2. Explanatory variables

The explanatory variables in this study are related to Directors' Effectiveness, Transparency and the Disclosure, Responsibility and total corporate governance indicator. Based on Ghasemi Aliabadi et al (2017), the following stages have been passed for these indicators:

Study the theoretical basis of corporate governance with regard to library research, with the aim of achieving common principles that can be used to evaluate and compare different banks. At this stage, all related literature including books, internal and external articles, databases, international journals (ex. OECD topics), Basel articles, sustainability committee, corporate social responsibility, etc. have been studied.

Study all existing documents relating to or containing regulations, standards or obligations of corporate governance principles in the banking system. Some of these documents are commonly used articles for private banks, Basel texts on the implementation of corporate governance, corporate governance guidelines for Islamic financial services, the directive of the Stock Exchange for corporate leadership, the method of obligations for nongovernmental credit institutions, the method for professional qualification of managers in financial institutions, etc.

Find a benchmark as well as elements to evaluate the level of corporate governance observance and create a model for it.

Introduce specific indicators whose value can be used to calculate the Banks' corporate governance index.

Finally, we designed Good corporate governance indexes. Thus, a virtual variable was designed that if the good corporate governance indicators were better than the average of private banks, this variable is equal to one and otherwise it is equal to zero.

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3. Control variables

Besides these two types of measures (dependent and independent variables), we following previous studies introduce a set of control variables in the table (1).

Table 1. Definition of the variables

Variables	Indicators	Definition
Credit risk	Non-performing loan to total loan loan loss reserve on total non-performing loan net charge off to total loans loan loss provision over total loan	A non-Performing loan is the sum of past due facilities, delayed facilities, doubtful facilities
Liquidity risk	Liquid assets to total asset Liquid assets to Short term Liabilities Liquid assets to deposits Loan to total assets Loans to (deposit+ short term (liabilities Bank's loans –customer deposits)) to Total assets	Liquid assets are the sum of a liquid asset, Due from other banks and participation securities. Short term liabilities are the sum of Current deposit, Demand deposit, Short term deposit, due to the central bank and due to other banks.
Asset combination	Liquid asset to total asset Due from Central bank to total asset Due from other banks to total asset Investments to total asset Fixed assets to total asset	
Liability Combination	Due to the Central bank to the total liability Due to other banks to the total liability Deposit Escape to the total liability Investment Total deposit to the total liability Capital to the total liability	
Combination of Income	Interest income to total income Non-Interest income to total income	
Combination of Expense	Interest expenditure to the total expense Non Interest expenditure to the total expense	
Banking Industry	Zscore Concentration Bank size Bank age Cost to Income	Concentration is the share of total assets of the 5 large banks to the total assets of the banking network. Bank size is the logarithm of

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	Interest Margin	the asset. Interest margin is the Loan interest rate – deposit interest rate.
Size of financial intermediaries	Credit to the private sector to GDP M2 to GDP Currency to GDP Stock market capitalization (Percent (of GDP	
Bankruptcy	Net worth to assets	Net worth is Asset - Liability
Capital adequacy	Capital adequacy	Capital to Weighted assets
Asset Quality	Building loan to total loan Industry loan to total loan Services loan to total loan Loan loss reserve total loan	
Earning	ROA ROE Non-Interest expense to total Income	ROA is Net profit to total asset ROE is Net profit to Capital
Sensitivity to Market risk	Sensitivity to interest rate Sensitivity to Exchange rate	Sensitivity to the interest rate is the interest-rate-sensitive assets gap that this is the difference between interest rate sensitive assets and interest rate sensitive liabilities. Interest rate-sensitive assets are the sum of due from other banks, due from the central bank, loan and facilities. Interest rate-sensitive liabilities are the sum of due to the central bank, due to other banks, investment deposit. Sensitivity to Exchange rate is the ratio of open currency status for total currencies.
Management Quality	Immovable property to capital Investments to capital Loan to deposit	
Macroeconomics	Inflation GDP Growth Stock price Exchange rate Deposit interest liquidity Investment Industry value-added	

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	Services value-added Export and Agriculture Value added Building Value added Oil Value added	

Z score is:

$$\text{Zscore}_{ti} = \frac{\text{capital adequacy}_{\text{ti}} + \mu_{\text{roati}}}{\sigma_{\text{roai}}} \quad (1)$$

Which *zscor* is Banking stability, μ_{roa} is mean of ROA, σ_{roa} is Standard deviation of ROA

4. Selection variables with Principal Component Analysis (PCA) Method

In this paper, banks are divided into two groups based on their economic value added above or below the average in the banking network. For this purpose, we define a virtual variable (evad) that if the bank has an economic value-added above the average of the sample under consideration, the virtual variable is one, otherwise is zero. After calculating the financial ratios as independent and control variables in 2006-2018, the most important indicators were selected by PCA method and Tests of Equality of Group Means. After comparing the mean and standard deviation of the surveyed banks, the most important variables in predicting the economic value added of banks were selected using the Wilks' Lambda statistic and the degree of importance of the selected indicators was expressed using the structural matrix. Then, the discriminate equation is extracted and then the accuracy of the discriminate model is examined. The results show that the 10 variables (Due from Central bank to total asset, Bank Size, loan loss provision over total loan, Loan to total assets, loan loss reserve on total non -performing loan, loan loss provision to total loan, Total deposit to total liability, Non- performing loan to loan, Interest income to total income, Deposit interest) are the most important criteria in predicting economic value added. This result emphasizes that credit risk, liquidity risk, and combination of asset and debt portfolio, business model (interest income) are the most important factors affecting the Iranian Banks 'economic value added.

Implementation of the PCA Model and The required tests are attached as an appendix (appendix 1) to the Iranian Journal of Finance.

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Model specification

Since the research model (eq. 2), the dependent variable appears as a lag on the right side of the equation, we are faced with a dynamic panel data model. The general form of a dynamic pattern in panel data is as follows:

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

Which Y_{it} is the dependence variable, X_{it} is independence variables, μ_i is cross-section error factors and ε_{it} is cross-section error term ith factor in t. When in the panel data model, the dependent variable appears on the right side, OLS estimators are no compatible (Arellano and Bond, 1991). Then we must use 2SLS (Anderson and Hsiao, 1982) and the Generalized Method of Moments (Arellano and Bond, 1991). The 2SLS estimation may yield large variances for the coefficients due to the difficulty in selecting tools, and the estimates are not statistically significant. Therefore, the two-step GMM method proposed by Arellano and Bond has been proposed to solve this problem.

$$Y_{it} - Y_{it-1} = \alpha(Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + (\epsilon_{it} - \varepsilon_{it-1}) \quad (3)$$

That is, the first is differentiated to eliminate the effects of the cross-sections or μ_i respectively from the model and in the second step, the residuals in the first step are used to balance the variance-covariance matrix. In other words, this method creates variables called instrument variables to have consistent and unbiased estimates (Baltagi, 2005).

GMM estimator compatibility depends on the validity of the assumption of the serial correlation of error and tools. We use Arellano and Bond(1991), Arellano and Bover (1995) and Blundell and Bond (1998) tests. Arellano and Bond (1991) is a Sargan (J-Statistic) test that tests the validity of the tools. J-Statistic has a χ^2 distribution. Arellano and Bover (1995) is a Serial Correlation Test that tests Second-Order Serial Correlation in First-Order Differential Error term.

In this test, the GMM estimator is consistent when there is no second-order serial correlation in the error terms from the first-order differential equation. Non-rejection of the null hypothesis of both tests provides evidence for the assumption of serial correlation and validity of the instruments. The GMM estimator is consistent if there is no second-order serial correlation in the error terms from the first-order differential equation.

In this paper, we have used the GMM because one way to control the endogenousness of variables is to use a tool variable. A tool will have the necessary power when it has a high correlation with the desired variable while

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it does not have a correlation with the error components. However, it is very difficult to find such a tool. One of the advantages of GMM is that it allows us to use the interrupt of these variables as a convenient tool for endogenous control. The GMM method can take into account the dynamics of the studied variable in the model and can be used in time series, cross-sectional and panel data. It can also cause alignment in the model by using intermittent dependent variables. The main advantage of this method is that all regression variables that are not correlated with the perturbation components (including intermittent values of the dependent variable and explanatory variables) can be potentially instrumental variables. On the other hand, this method is a good choice for panel data with a short time series. In addition to the above, this type of model can typically be used if the dependent variable is at the nominal level, and is also theoretically dynamic. As can be seen in the results of the unit root test, the economic added value of banks is non-stationary (see appendix 2).

Results

1. Unit root Test

There are several unit root tests such as Levin, Lin, Chu, (2000), Im, Pesaran, Shin, (2003), Fisher-ADF, Fisher-PP (Philips and Peron). We use all of themm (Table (10)). At 5%, all of the Variables except Economic Value Added, loan loss provision to total loan, Bank size, Credit to the private sector to GDP, Non-Interest expense to total Income, Deposit interest are stationary in Level and Individual Intercept. Loan loss provision to total loan, Bank size, Credit to the private sector to GDP, Non-Interest expense to total Income are stationary after 1st difference and Individual Intercept. Deposit interest is stationary after 2nd difference and Individual Intercept. The result of the Unit root Test is attached as an appendix (appendix 2) to the Iranian Journal of Finance.

2. Co-integration Test

Because of non-stationary variables, we use three types of Panel Cointegration tests, Pedroni (1999), Kao (1999) and Johnsen Fisher (2000). At a 5% level of significance, all co-integration tests reject the null hypothesis and there is a long-run relationship between dependent and independent variables. Details results are attached as an appendix (appendix3) to the Iranian Journal of Finance.

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3. F- Limer Test

These models can be estimated after confirming the existence of co-integration between variables without worrying about the problem of false regression. Before estimating the model using GMM, we used the F- Limmer test to choose between Panel data methods and Pooled method. The null hypothesis is the pooled model. According to the calculations of this study, the null hypothesis is rejected and these models need to be estimated using panel data.

In this paper, 8 models are designed, in all of them, the dependent variable is the economic value added of banks. Explanatory variables are corporate governance indexes (see table 2) and Control Variable is selected according to Table (1). In these 8 models, Control Variables are common, but Explanatory Variables (Corporate Governance Indexes) are different. Table (2) introduces the Corporate Governance Indexes in every model. The general structure of the models is described in Equation (4).

$$Eva_{it} = f(CGI_{it}, CV_{it}) \quad (4)$$

Where Eva_{it} is the economic value added of the banks, CGI_{it} is the corporate governance indexes according to Table (2) and CV_{it} is control variables according to Table (1).

$Eva_{it} = f(\text{board's structure effectiveness} * \text{age}_{it}, CV_{it})$	Model(1)
$Eva_{it} = f(\text{transparency and disclosure} * \text{age}_{it}, CV_{it})$	Model(2)
$Eva_{it} = f(\text{Responsibility} * \text{age}_{it}, CV_{it})$	Model(3)
$Eva_{it} = f(\text{Total Corporate governance} * \text{age}_{it}, CV_{it})$	Model(4)
$Eva_{it} = f(\text{board's structure effectiveness}_{it}, CV_{it})$	Model(5)
$Eva_{it} = f(\text{transparency and disclosure}_{it}, CV_{it})$	Model(6)
$Eva_{it} = f(\text{Responsibility}_{it}, CV_{it})$	Model(7)
$Eva_{it} = f(\text{Total Corporate governance}_{it}, CV_{it})$	Model(8)

Whereas the age of a bank contributes to the creation of appropriate corporate governance structures, in this paper private banks are divided into two groups: banks less than 5 years old and banks over 5 years old. For this purpose, a dummy variable(age) is defined, whereby the dummy variable takes one if the bank is more than 5 years old, otherwise, it gets zero. Then corporate governance criteria are multiplied on this dummy variable and the first four models are designed. We used a corporate governance index without a multiplied dummy, in the second four models.

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Table 2. F- Limer Test

Models	Corporate Governance index	Cross-section F	Cross-section Chi-square
1	board's structure effectiveness*age	3.509682 (0.0183)	11.360213 (0.0099)
2	transparency and disclosure*age	2.021920 (0.0161)	6.691007 (0.0024)
3	Responsibility*age	2.316853 (0.0506)	7.632961 (0.0542)
4	Total Corporate governance*age	1.798692 (0.0528)	5.972512 (0.0130)
5	Good board's structure effectiveness	2.191537 (0.0542)	7.233742 (0.0548)
6	Good transparency and disclosure	1.288380 (0.0230)	4.311632 (0.0297)
7	Good Responsibility	3.356882 (0.0221)	10.889945 (0.0123)
8	Good Total Corporate governance	3.190582 (0.0272)	10.375766 (0.0156)

Research findings

The results of the model estimation are presented in table 15. The numbers in () the statistics t and the numbers inside [] are probabilities.

As stated, the first condition for using the GMM model is that the number of observations in the cross-section (N) is greater than the length of the period (T). Given that in the present study, the number of banks is 17 more than the desired number of years (12), so this condition is met. The other two conditions relate to two basic hypotheses of consistency of GMM estimates. First, the set of instrument variables must be valid, that is, they must not be correlated with error statements. This hypothesis was tested using the Sargan and Hansen tests. As can be seen in Table (3), for each Instrument Rank model, it is specified separately that the Sargan test and its associated J statistic, which have a chi-square distribution with degree of freedom equal to the number of overly definite constraints, are the test. The null hypothesis is that the residuals are correlated with the instrumental variables at the 99% confidence level, and therefore indicates the validity of the instrumental variables used and, consequently, the validation of the results for interpretation. Second, the absence of second-order autocorrelation (AR (2)) in residuals must be confirmed. According to the information presented in Table (3), this hypothesis is also tested using the Arlando-Bond serial correlation test and 99% certainty is confirmed. Therefore, it can be said that the models are suitable and do not

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have a specified bias.

A survey of corporate governance measures indicates that the older a bank is, the greater the effectiveness of corporate governance. So that there is a positive relationship between the productivity of corporate governance criteria and the dummy variable of bank age and the economic value added of banks (in Models 1, 2, 3 and 4). As can be seen, as banks age, the effectiveness of the board structure is greater than others.

As the age of the bank increases, due to the increasing experience of managers and employees, the principles of corporate governance are better observed than before, and observing the principles of corporate governance helps to improve the economic value added of banks. The effect of bank age on the economic value added of banks is indirect. For this reason, this index is not considered as an independent variable. So, its interaction with corporate governance indexes is considered.

On the other hand, the study of the effect of good corporate governance also shows the positive relationship between good corporate governance measures and the economic value added of banks. The better the corporate governance performance of the criteria under consideration, the greater the economic value added to the bank. Among the various criteria of corporate governance, the good effects of the board structure has the most positive effect on the economic value added of banks.

Examination of other measures affecting the economic value added of banks indicates that the higher the loan loss reserve and the higher the loan loss provision the banks are exposed to higher credit risk and will have to increase their reserves to cover the risk. Therefore, the resources that could be allocated to earning assets are blocked in the bank, thereby reducing the operating profit and economic value added of the banks. As shown in Table 1, there is a negative relationship between these two variables and the economic value added of banks.

Bank deposits are one of the most important sources of financing. Thus, as the ratio of Deposit to total Liabilities increases, the supply of banks' facilities will increase, and on the other hand, if loan increase, the bank's profitability will increase and the bank's economic value-added.

Due from the central bank is one of the least risky assets and if it increases can increase, the economic value added of banks. Investigating the effect of bank size on economic value added indicates that the larger a bank, the greater the bank's ability to generate value-added. Larger banks have a

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greater market share in attracting resources and supplying monetary assets.

The higher the interest rate on the deposit, although it attracts more resources, it reduces net interest income and the economic value added. As can be seen in Table 3. There is a negative relationship between the deposit interest rate and the economic value added of banks.

Table 3. Results- Effect of Corporate governance on Banking Economic Value added

Independent variables	Model(1)	Model(2)	Model(3)	Model(4)	Model(5)	Model(6)	Model(7)	Model(8)
board's structure effectiveness*age	1.97 (4.56) [0.0000]	…….	…….	…….	…….	…….	…….	…….
transparency and disclosure*age	…….	7.8 (9.10) [0.000]	…….	…….	…….	…….	…….	…….
Responsibility* age	…….	…….	4.29 (5.91) [0.0000]	…….	…….	…….	…….	…….
Total Corporate governance*age	…….	…….	…….	4.14 (1.96) [0.0145]	…….	…….	…….	…….
Good board's structure effectiveness	…….	…….	…….	…….	3.84 (3.14) [0.0000]	…….	…….	…….
Good transparency and disclosure	…….	…….	…….	…….	…….	1.29 (1.81) [0.0027]	…….	…….
Good Responsibility	…….	…….	…….	…….	…….	…….	3.09 (1.91) [0.0239]	…….
Good Total Corporate governance	…….	…….	…….	…….	…….	…….	…….	1.54 (1.72) [0.0387]
Loan loss reserve to non-performing loan	-1.10 (-3.55) [0.0273]	-1.26 (-2.53) [0.0555]	-9.77 (-1.84) [0.0406]	-1.35 (-2.70) [0.0171]	-8.02 (-2.26) [0.0279]	-9.75 (-1.86) [0.0076]	-1.40 (-1.82) [0.0509]	-6.24 (1.98) [0.0221]
loan loss provision to total loan	-7.75 (-1.87 [0.0168]	-7.073 (-1.68) [0.0452]	-1.15 (-1.85) [0.0308]	-8.90 (-1.74) [0.0855]	-1.02 (-1.81) [0.0747]	-8.41 (-1.65) [0.1021]	-7.28 (-1.80) [0.241]	-1.03 (-1.86) [0.0665]
Deposit to total	-4.55	2.48	-2.61	1.50	3.14	1.52	2.35	1.29

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Liabilities	(-1.70) [0.0494]	(1.72) [0.0385]	(-2.86) [0.0056]	(5.82) [0.0000]	(1.83) [0.0553]	(1.82) [0.0426]	(1.92) [0.0452]	(1.65) [0.0512]
Loan to total assets	6.81 (1.87) [0.0332]	3.35 (5.87) [0.0345]	2.57 (1.72) [0.0889]	5.07 (5.82) [0.0000]	2.59 (1.95) [0.0237]	4.30 (1.72) [0.468]	1.04 (1.97) [0.0102]	4.10 (1.63) [0.0547]
Due from central bank	6.73 (1.81) [0.0384]	4.67 (4.51) [0.0361]	8.49 (1.76) [0.0512]	5.28 (1.92) [0.0183]	3.01 (1.74) [0.0619]	4.43 (1.94) [0.0277]	7.24 (1.66) [0.0683]	4.18 (1.93) [0.0319]
Bank size	8.47 (2.94) [0.0252]	1.64 (2.29) [0.0168]	1.61 (4.18) [0.0001]	1.79 (2.38) [0.0198]	7.75 (1.78) [0.0781]	1.12 (2.90) [0.0050]	5.82 (1.98) [0.0363]	1.11 (2.68) [0.0092]
Deposit interest	-7.75 (-4.99) [0.0000]	-4.81 (-4.11) [0.0184]	-1.24 (-2.30) [0.0002]	-3.83 (-2.38) [0.0198]	-4.59 (-4.44) [0.0000]	-3.69 (-1.93) [0.0261]	-4.88 (-1.79) [0.0292]	-1.04 (-1.83) [0.0188]
Interest Income to total Income	3.18 (2.35) [0.0229]	1.12 (1.78) [0.0657]	1.41 (4.39) [0.0005]	2.06 (1.78) [0.0796]	2.22 (1.91) [0.0602]	1.83 (1.69) [0.0953]	6.28 (1.95) [0.0529]	2.09 (1.92) [0.0581]
AR(1)	0.34 (6.20) [0.0000]	0.36 (4.42) [0.0000]	0.98 (21.01) [0.0000]	0.51 (5.034) [0.0000]	0.56 (4.87) [0.0000]	0.54 (5.16) [0.0000]	0.74 (7.45) [0.0000]	0.56 (5.52) [0.0000]
AR(2)	0.025 (0.65) [0.5923]	0.47 (0.80) [0.1033]	0.71 (0.14) [0.5212]	0.68 (0.90) [0.3786]	0.30 (0.35) [0.9888]	0.83 (0.34) [0.7916]	0.59 (0.71) [0.6817]	0.67 (0.19) [0.8407]
C	-7.08 (-2.75) [0.0077]	-6.87 (-3.30) [0.0015]	-2.99 (-1.95) [0.0684]	-7.80 (-3.36) [0.0013]	-6.86 (-2.91) [0.0049]	-6.25 (-3.035) [0.0035]	-5.78 (-1.59) [0.1159]	-6.53 (-2.76) [0.0075]
R-Squared	0.55	0.67	0.83	0.42	0.45	0.49	0.55	0.48
D-W	2.05	2.13	2.30	2.58	2.48	2.58	2.20	2.55
J-Statistics	10.97	14.25	14.68	12.45	14.12	16.51	17.26	15.55
Prob(J-Statistics)	0.35	0. 53	0. 55	0. 31	0. 78	0. 35	0. 27	0. 49
Instrument Rank	18	19	21	22	21	21	21	21

Conclusion

Banks, as intermediaries of funds, have always played an unparalleled role in every country's economy, but playing this role, alongside 'safeguarding the interests of depositors, 'safeguarding the trust and confidence of banks', on the one hand, increasing complexity in Banks operations and their sensitivity to the

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liquidity crisis have created complex conditions for balancing the interests of all stakeholders in a bank. One of the best ways to balance is to improve corporate governance in banks.

In this regard, the Basel Committee, in its latest Capital Agreement, also known as Basell 3, cites corporate governance as one of the requirements for establishing and enhancing the stability and soundness of credit institutions. Financial markets, optimizing the allocation of resources, preventing banks from liquidity crisis and bankruptcy.

Given the importance of corporate governance's impact on banks' performance, it is necessary to examine this effect. One of the criteria for evaluating banks' performance is measuring the economic value added of banks. Economic value added is a measure of performance that correctly calculates how a bank's value can be increased or eliminated. This measure represents the residual profit after deducting capital costs. It considers economic value added (EVA) as a benchmark, the cost of equity opportunity and the time value of money. In other words, economic value added (EVA) is an effective measure of the quality of management policies and as a reliable indicator of how the bank's value will grow in the future.

Given the importance of this issue, this paper examines the effect of corporate governance on the economic value added of banks. For this purpose, Ghasemi Aliabadi et al (2017) method was used to measure corporate governance criteria by applying Basel principles. This is a case study of Iranian private banks because according to the structure of state-owned banks and based on Iranian Circular corporate governance, corporate governance principles apply only to private banks. Stern & Stewart and Chew (1995) method was also used to measure economic value added.

The contribution of this article compared to other similar articles is that in this paper a good criterion of corporate governance is designed and the effect of individual measures of corporate governance is designed to combine a criterion. On the other hand, due to the importance of the age of banks in the implementation of corporate governance principles, banks are divided into age groups of banks less than 5 years old and banks over 6 years old.

The most important criteria affecting banks' economic value added were selected using the PCA method. After performing the unit root test, the stationary variables were tested. Then, by performing appropriate tests, five models were examined to examine the effect of corporate governance criteria on the economic value added of banks. The results show that there is a positive relationship between corporate governance criteria and the economic value

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added of banks. The older a bank is, the greater the effectiveness of corporate governance measures on the economic value added of banks, and the study of the effect of good corporate governance measures using T statistic shows that the structure of the board of directors is more effective than other criteria on the economic value added of banks.

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