# Application of Economic Value Added in the Banking Sector of Iran

**Azam Ahmadyan[1]**                    **Rasool Khansari[2]**

Economic Value Added, or EVA is one of the popular tools that bankers can use to measure the financial performance of their bank. EVA helps management to conduct internal goal-setting. The long-term goal is preferred than short-term implications. It measures the company's financial performance based on the residual wealth calculated by deducting its cost of capital from its operating profit, adjusted for taxes on a cash basis. It helps to capture the real economic profit of a company. The main objective of this study is to examine the Iranian banks' financial performance based on EVA which is the modern concept introduced to evaluate the performance of banks. Data are collected for the study, which consisted annual reports of the banks from 2006 to 2017 (12 years). Private banks selected in this study were associated with increased non-performing loan to total loan, reduced capital adequacy, reduced profits and increased inefficiencies. All of these factors have led to reduction not only in the economic value of banks but also the negative EVA of selected banks. Banks are encouraged to identify unnecessary activities and reduce the cost of providing services to improve the economic value added of banks.

**Keywords:** Performance Measurement, Economic Value Added, Iranian Banking System.
**JEL Classification***: G21, L25, O53

## 1 Introduction

Among the various financial institutions, banks are a fundamental component and the most active players in the financial system (Dhanabhakyam & Kavitha, 2012). A bank is a financial intermediary that channels funds from surplus units, the depositors, to the deficit units, the borrowers, in the process gaining from the spread of the different interest charged. The banking sector is considered to be a valuable source of financing for most businesses. By the scope of its functions, banks are the key to the economic growth of any economy.

---

[1] Department of Banking, Monetary and Banking Research Institute, Tehran, Iran; Azam_ahmadyan@yahoo.com (Corresponding Author)
[2] Monetary and Banking Research Institute, Central Bank of Iran; r.khansari@gmail.com

Further, banks are a fundamental component of the financial system and are also active players in financial markets (Guisse, 2012). Banks have control over a large part of the supply of money in circulation. Through their influence over the volume of bank money, they can influence nature and character of production in any country (Al Karim & Alam, 2013, p. 66).

Present time banks are facing steep competition, technological changes, and innovation. Banks their internal as well as external environments are becoming more complex. In this dynamic condition, the managers must be able to anticipate changes and their impact and take appropriate measures to deal with changes. Effective management helps to provide better services and expand their activities. The managers do strategic planning for bank performance. Therefore, they need creativity, innovation, and intuition (Kosalathevi, 2013, p. 1).

Several economic crises took place in recent years, primarily caused by the poor management of the banking sector. The latest global recession is an example of a financial disaster that occurred for the failure of the banking business. So, the government of any country must have a deep concern about the performance of all banks. The supervisory authority creates smooth and efficient atmosphere for fund flow and payment system. Supervisory authority measures the performance and assess the strength and weakness of banks and takes necessary actions (Al Karim & Alam, 2013, p. 66; Lima, Castro Junior, Júnior, & Gaio, 2014, p. 88).

So far, different measures have been introduced to measure the performance of firms, including banks. Economic Value Added, or EVA is one of the popular tools that bankers can use to measure the financial performance of their bank. It's an economic profit measure that subtracts the capital cost from operating profit generated in an enterprise. EVA helps management to conduct internal goal-setting such that the long-term goal is preferred than short-term implications. For investment, EVA guides the decision of accepting a project (capital budgeting decision) and evaluating the regular performance of management (performance assessment). EVA assists in the achievement of value added activities. Besides, EVA also helps to prepare a proper payroll system or incentive compensation where management can act as owner (Pompong, 2015, p. 10).

Our main goal of this study is to examine the Iranian banks' financial performance based on EVA which is the modern concept introduced to evaluate the performance of banks. So, the paper proceeds as follows. The next section presents the performance measurement and risk-adjusted-performance (RAP) measures, including EVA. Section 3 examines the

banking system in Iran and latest statistics about Iranian banks. Section 4 survey some related literature. Section 5 considers the methodology and model that we estimated for the Iranian banking system, and Section 6 presents our conclusions.

## 2 Background

### 2.1 Performance Measurement

Advancement of the nature of business and management performance has pushed the need to build a more effective and structured financial measurement. Effective performance measurement is believed to be of crucial importance in ensuring the successful implementation of an organization's strategy. The result of the performance measurement will help the managers to produce effective decision-making processes, whether at the operational or strategic level (Kosalathevi, 2013, p. 1).

The role of managers in any company is wealth creation and maximization through the adequate allocation of resources. To fulfill this function, managers use different indicators, known as performance measures like financial ratios. Then these measures are used in different perspectives, from a shareholder's point of view, from other parties interested in the evaluation of the financial position of the company, etc. In the case of banks, according to different studies neither any of the financial ratios can serve as the best estimator for their financial strength. The challenge for empiric modern finance is the identification of a new, more advantageous measure than the financial ratios.

The value of a bank represents the sound and the financial position in the long run. So the importance and value-based management represents a critical process which is based on economic value, used widely from academics and practitioners. For bank financial evaluation purposes, we must consider two aspects: first, the methods used for financial evaluation, and second, their adaption according to the features of the banking system to be evaluated. The most critical dimensions of financial assessment for banks are profitability and risk. So these dimensions must be reflected in the evaluation measure to be used (Barbullushi, 2015, p. 2).

The so-called value creation is the opportunity cost of the capital gains for shareholders created by enterprises that are greater than its capital cost. Here the value creation mainly refers to the Economic Value Added (EVA). In the banking industry, the performance evaluation method using value creation as the core index has generally been accepted by banks in many developed countries, but it is only at the early testing stage in developing countries.

Therefore, learning from experiences of the western banking industry, the new performance evaluation method is introduced using value creation as the core index and connecting the EVA with traditional financial evaluation index to establish an original performance evaluation method for commercial banks. It is an important practical significance for raising business performance and enhancing the competitiveness of banks in developing countries (Xin'e, Ting, & Yuan, 2012, pp. 379–380).

## 2.2 RAP Measures

A risk-adjusted performance (RAP) measure is a profitability measure that jointly takes into consideration the margin or profit produced by a business and its capital at risk (CaR). Perhaps the most well-known RAP measure is RAROC (Risk-Adjusted Return on Capital), which can generally be defined as the ratio between the profit and CaR for a given business area/unit. RAROC expresses expected gain as a percentage of economic capital. The formulation of these two input variables is quite specific.

$$\text{RAROC} = \frac{\text{Profit}}{\text{CaR}} \tag{1}$$

Another frequently used performance measure is Economic Value Added, EVA®. The original EVA, developed by Stern, Stewart, and Co (1995). for nonfinancial companies, was defined as

$$\text{EVA} = \text{NOPAT} - \text{WACC} \times \text{Invested Capital} \tag{2}$$

Where NOPAT stands for net operating profit after taxes and WACC is the weighted average cost of capital, which is multiplied by the capital invested in the firm (or division). A positive EVA reflects that the company is increasing its value to its shareholders, whereas a negative EVA indicates that it is diminishing its value to its shareholders.

In the case of banks, it is usually applied in a variant, where only the cost of equity capital times capital at risk is deducted, and EVA is calculated as

$$\text{EVA} = \text{Profit} - (K_e - R_f) \times \text{CaR} \tag{3}$$

where $K_e$ is the target return for equity capital, and the deduction of the risk-free rate is motivated by the fact that capital at risk is only ideally allocated but not invested in the business unit or business area.

Table 1

*The Strengths and Weaknesses of Various Performance Measures*

| Performance Measure | Strengths | Weaknesses |
|---|---|---|
| 1. Direct inspection of the financial statements | • Reveals trends<br>• Comparison of absolute sizes | • Does not permit a ready assessment of efficiency<br>• Biased by size differences<br>• Book, not market, values<br>• Influenced by GAAP choices<br>• Backward, not forward, looking |
| 2. Financial ratios | • Adjusts for size differences (a relative, not absolute, measure)<br>• Provides comparative measures of efficiency and growth | • Based on the book, not market, values<br>• Influenced by GAAP choices |
| 3. Earnings per share (EPS) and price/earnings ratios | • Widely-used measures of performance<br>• Linked to the market price of the stock | • EPS influenced by GAAP choices<br>• EPS is not a cash flow<br>• P/E difficult to interpret<br>• Sensitive to the choice of the observation period |
| 4. Total returns to investors | • Cash flow-based<br>• Market value-based<br>• Permits benchmarking vs. other investments | • Sensitive to the choice of the observation period<br>• Needs to be risk-adjusted |
| 5. Risk-adjusted performance (RAP) measures | • Risk-adjusted<br>• Permits benchmarking<br>• Theoretically linked to market values<br>• Logically appealing<br>• Increasingly widely used | • Influenced by GAAP choices<br>• Ignores latent option values |

Source: Authors' survey

Indeed, the "excess return" measured by RAROC above the cost of capital is EVA. Many banks use either of these measures or variants of these measures. While some have developed different acronyms, in most cases the underlying measures are only slight modifications either of the return-on-capital idea underlying the basic RAROC or of the concept of the value-added over the cost of risk capital implied in EVA (Baer, Mehta, & Samandari, 2011, p. 3; Fraker, 2006, p. 2; Saita, 2007, pp. 195–207).

Banks need to reward performance and give employees the right incentives. Traditional metrics such as P&L performance or return on assets create perverse incentives to increase risk exposures, especially when the reward for excellent performance exceeds the penalty for bad. Risk-adjusted performance (RAP) measures normalize financial performance by the amount of risk undertaken. Because of this, the best practice uses RAROC or EVA to evaluate performance at the same level of granularity with which economic

capital can reliably be estimated. This system rewards decisions that generate the highest return over time (Baer et al., 2011, p. 7). There is a range of criteria with which to compare the performance of the two firms. Table 1 reflects on the strengths and weaknesses of those measures.

One of the aims of RAP measures is to serve as targets in a management-by-objectives framework, which should be able to influence business unit manager behaviors in the right direction. In practice, their hopefully positive effects (and sometimes even their adverse and unpredicted side effects) may be stronger or weaker, depending on whether RAP measures represent the only or the main criteria for evaluating performance or are just a part of a more complex performance evaluation mechanism. In practice, the bank has to decide whether performance evaluation should be based on financial performance only, as measured by a single RAP measure, as opposed to being based on a more qualitative judgment on a diversified scorecard of different elements (Saita, 2007, p. 212).

## 2.3 Economic Value Added

Although, 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), a similar concept had been contemplated by economists for many years before that. It was the famous economist Alfred Marshall in 1890, who first spoke about the notion of economic profit, in terms of the real profit that a company makes when it covers, besides the various operating costs, the cost of its invested capital (Kyriazis & Anastassis, 2007, pp. 71–72).

EVA is one of the best techniques that measure the actual economic profit of a firm (Nikhil, 2009). Many firms have adopted this technique to make decisions regarding a portfolio selection and to measure firm performance (Teitelbaum, 1997). This financial metric, registered then as a trademark, gained early acceptance from the corporate community because of its innovative way of looking at the firm's real profitability. Unlike traditional measures of profit—such as EBIT, EBITDA, and net operating income—EVA looks at the firm's "residual profitability," net of both the direct cost of debt capital and the indirect cost of equity capital. In this way, EVA serves as a modern-day measure of corporate success because it is closely aligned with the shareholder wealth-maximization requirement (Grant, 2003, pp. 1–2; Kyriazis & Anastassis, 2007, p. 72).

According to Stern, Stewart, and Chew (1995), EVA is not just another performance measure but can be the central part of an integrated financial

management system, leading to decentralized decision making. Thus, the adoption of EVA should indirectly bring changes in management, which in turn can enhance firm value. Several US companies (e.g., Coca Cola, AT&T, Briggs & Stratton, Quaker Oats, etc.) which have adopted EVA as the basis of management performance measurement, have experienced a significant increase in their shareholders' wealth (Kyriazis & Anastassis, 2007, p. 72). Unlike conventional corporate performance measures that require comparative analysis with similar companies in the industry, the EVA can stand on its own (Kosalathevi, 2013, p. 1).

Large firms like Coca Cola, Diageo, Lilly (Eli), Guidant, and SPX have used EVA as a guide to creating economic value for their shareholders. Bonuses and incentive pay schemes at these firms have been built around the manager's ability (or lack thereof) to generate positive EVA within the firm's operating divisions. Positive payments accrue to managers having divisional operating profits that on balance exceed the relevant "cost of capital," while negative incentive payments may occur if the longer-term divisional profits fall short of the overall capital costs. 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).

EVA has also gained popularity in the investment community. The June 1996 Conference on "Economic Value Added" at CS First Boston and the "roll out" of Goldman Sachs' EVA research platform in May 1997 is a testimony to this exciting development. Indeed, "buy-side" investment firms like Global Asset Management and Oppenheimer Capital use EVA in their stock selection, portfolio construction, and risk control processes. Other large investment firms are taking a serious look, and EVA is also making meaningful inroads in the world of global performance analytics (Grant, 2003, pp. 2–3).

The presence of EVA helps bank owners to give reward for value-added activities (Kleiman, 1999) and to dispose of the activities that damage or reduce bank value. Value-added activities are separated from non-value added activities based on value-added assessment. It is expected that bank owners will support management to take actions or to choose value-added strategies because these will allow banks to operate well.

EVA helps management to conduct internal goal-setting such that the long-term goal is preferred than short-term implications. For investment, EVA guides the decision of accepting a project (capital budgeting decision) and evaluating the regular performance of management (performance assessment). EVA assists in the achievement of value-added activities.

Besides, EVA also helps to prepare a proper payroll system or incentive compensation (Grant, 1996) where management can act as owner.

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).

Banks and other financial institutions have sought to base their capital allocation processes on shareholder value concepts such as Risk-Adjusted Return on Capital (RAROC) and Economic Value Added (EVA) in recent years. Some of the motivation for these approaches has come from the initiatives of the Basel Banking Committee in defining international capital requirements. There is a variety of versions of these concepts that have been adopted, and the academic literature has provided limited guidance on the optimal form of such capital allocation mechanisms, especially when there are multiple divisions subject to agency problems of asymmetric information (Stoughton & Zechner, 2007, p. 313).

## 3 Banking System in Iran

"Sepah Bank" was the first Iranian bank established in 1925 to settle the financial affairs of the army and serve as its pension fund. Other institutions such as "Iran Mortgage" in 1926 and "Melli Bank" in 1928 followed. Some foreign banks such as the French-English "Ottoman Bank" and the "Iran-Russia Bank" opened their branches in Iran to facilitate international trades.

"Melli Bank" circulated Iranian notes in 1932 and while serving as a commercial bank took the duties associated with a central bank. It also turned into the government treasury and included the tasks of preserving the balance of payments, regulating credits and supervising banking activities in its article of association and practically took the form of a central bank. Then in 1930, the economic authorities decided to design the comprehensive monetary and banking law and establish the central bank of Iran.

Iranian banking system went through upheavals after the Islamic Revolution in 1979. Outstanding debts, asset devaluation of private banks, and slump of banking activities led to economic stagnation. To preserve the rights of depositors and national assets, safeguard deposits and savings, and strengthen the flow of finance towards industries, the government nationalized

Iranian banks. Simultaneously, several banks were merged, and six commercial banks (including Refah, Melli, Saderat, Tejarat, Mellat, and Sepah) and three specialized banks (namely Agriculture, Maskan, and Sanat & Madan) emerged out of 9 banks.

The wave of modern technologies transformed the face of the Iranian banking system since the early 1980s. Comprehensive banking automation scheme was officially introduced in 1993 to optimize banking activities in the field of informatics. Moreover, following the 3rd Five-Year Development Plan, the law of private banks was passed in 2000, and numerous banks and financial institutions appeared among which the private banks of Parsian, Saman, Eqtesad-e-Novin, Pasargad, Karafarin, Sarmayeh, Day, Sina, and Ayandeh can be named.

Following the policies of Article 44 of the Constitution all public banks, save for Melli, Sanat & Madan, Agriculture, and the Exim bank were privatized, and their ownership, management, structure, and administration status were transformed. The emergence and fast growth of private banks helped to create a competitive environment in the areas of deposits, facilities, modern banking, e-banking, transparency, diversification of products and services, and customer tribute. They played a significant role in the circulation of funds using electronic instruments. The new developments have thoroughly modified the banking environment of the country. Iranian private banks have made significant steps in the implementation of internet banking, corporate banking, and specialized banking, as well as the establishment of 7/24 branches and mobile banking services. They moved towards core banking and thanks to the force of competition, pushed public banks to follow the same direction (Nili, 2014, pp. 179–180).

Currently, 32 banks that are active in the Iranian banking network can be categorized into four peer groups:
− Public banks: Melli, Sepah, Postbank, and Qard-al-Hasaneh Mehr Iran,
− Specialized banks: Maskan, Keshavarzi, Sanat & Madan, Tose'ah Saderat, and Tose'ah Ta'avon,
− Private banks: Eqtesad Nonvin, Pasargad, Parsian, Karafarin, Day, Saman, Sarmayeh, Sina, Ayandeh, Shahr, Ghavamin, Ansar, Hekmat Iranian, Gardeshgari, Khavar-e Miyaneh, Qard-al-Hasaneh Resalat, and Iran Zamin,
− Privatized banks: Saderat, Mellat, Refah, and Tejarat.

Tables 2 shows an overall view of the asset size of the banks in Iran as well as the growth and market share of banks that are currently active in the banking industry.

Table 2
*Assets, Market Share and Growth of Iranian Banks in 2017*

| Bank Name | Assets (Million USD) | Annual Growth Rate (%) | Market Share (%) |
|---|---|---|---|
| Mellat | 64,781 | 11.9 | 10.8 |
| Melli | 73,140 | 14.1 | 12.2 |
| Maskan | 41,063 | 3.4 | 6.9 |
| Saderat | 52,275 | 11.9 | 8.7 |
| Tejarat | 40,609 | 6.0 | 6.8 |
| Agriculture | 28,069 | 14.5 | 4.7 |
| Parsian | 26,569 | 17.6 | 4.4 |
| Sepah | 33,662 | 14.1 | 5.6 |
| Pasargad | 22,459 | 7.3 | 3.8 |
| Eqtesad-Novin | 12,091 | -10.9 | 2.0 |
| Sanat & Madan | 16,151 | 33.3 | 2.7 |
| Refah-Kargaran | 21,785 | 14.2 | 3.6 |
| Saman | 9,061 | 10.3 | 1.5 |
| Ansar | 10,483 | 22.6 | 1.8 |
| Sina | 5,383 | -2.2 | 0.9 |
| Ayandeh | 33,335 | 32.4 | 5.6 |
| Sarmaye | 6,407 | 12.1 | 1.1 |
| Shahr | 22,338 | 35.7 | 3.7 |
| Exim bank | 7,753 | 17.6 | 1.3 |
| Karafarin | 4,694 | 2.7 | 0.8 |
| Ghavamin | 26,658 | 15.3 | 4.5 |
| Day | 6,810 | -11.9 | 1.1 |
| Qard-al-hasan Mehr | 3,668 | 47.7 | 0.6 |
| Tose'eh-Ta'avon | 3,311 | 10.0 | 0.6 |
| Post Bank | 2,858 | 33.1 | 0.5 |
| Gardeshgari | 7,470 | 30.1 | 1.2 |
| Iran Zamin | 6,503 | 22.0 | 1.1 |
| Hekmat Iranian | 1,299 | 9.7 | 0.2 |
| Khavar-e Miyaneh | 2,782 | 17.2 | 0.5 |
| Qard-al-hasan Resalat | 3,872 | 22.9 | 0.6 |
| All Banks | 597,571 | 13.6 | 100 |

Source: (IBICBI, 2018)

In terms of the top jurisdictions for Islamic banking assets, Iran has retained its position as the largest market, accounting for 34.4% of the global Islamic banking industry in 2017 (IFSB, 2018, p. 3). While the inflation rate dropped from 11.9% in March 2016 to 9% in March 2017, the banking sector continued its strong growth performance. It has increased its deposit base by 23.5% in the year to 2Q2017, contributing to a 15.6% expansion in assets and 21.6% growth in financing during the same period while continuing a trend of

double-digit growth rates in the country's assets, financing and deposits throughout the analysis period(IFSB, 2018, p. 13).

In the following, the most critical performance indicators of Iranian banks are reviewed. We survey capital adequacy, efficiency, non-performing loan to total loan, and net interest margin for selected private banks.

The capital adequacy covers the potential losses arising from the loans related to off-balance sheet activities of banks is very important. In our country, according to Article 3 of the Capital Adequacy Regulations, the minimum capital adequacy ratio for all banks and credit institutions (both governmental and non-governmental) is set at 8%. Following these regulations, the Central Bank of the Islamic Republic of Iran may, in cases where international standards or the need to maintain the health of banks and credit institutions, may set a higher ceiling for all or some of the banks and credit institutions. In this report, the ratio of capital to risk-adjusted assets is used as a capital adequacy indicator. To determine the weights of assets, the capital adequacy regulation dated 2003 has been used.

As can be seen, in Table (3) capital adequacy in most private banks is less than 8%. Pasargad, Sina, and Karafarin banks have capital adequacy of over 8%. Although the capital adequacy of more than 8% in these banks indicates that these banks are more stable than other banks and have unused resources that could hurt their profitability. Lowering the adequacy of capital in other private banks from the standard will significantly increase the risk of this banking group in times of unexpected losses, such as decreasing asset quality. The study of the components of capital adequacy in this banks shows that when banks have experienced an increase in capital adequacy, although the total amount of risk assets exceeds risk-free assets, the growth of risk-free assets (total assets, claims from the central bank and claims from banks) was higher than the growth of risky assets (concessional loans). The change in banks' approach to risk assets to less risk-side assets improves capital adequacy but also hurts the bank's profitability. On the one hand, increasing capital adequacy has a positive impact on banking health, but a decline in profitability harms soundness and economic value-added.

Table 3

*Capital Adequacy (%) of Iranian Banks*

| Bank Name | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egthesad Novin | 6.97 | 4.39 | 4.72 | 6.58 | 7.23 | 7.57 | 7.61 | 6.68 | 5.56 | 4.46 | 5.63 | 4.62 |
| Ansar | ….. | ….. | ….. | ….. | 4.40 | 6.97 | 6.03 | 6.49 | 5.62 | 5.83 | 6.23 | 8.33 |
| Parsian | 6.57 | 6.40 | 6.71 | 7.06 | 7.60 | 7.79 | 7.42 | 6.88 | 5.04 | 5.78 | 7.05 | 7.79 |
| Pasargad | 19.65 | 12.61 | 10.77 | 10.18 | 17.51 | 17.68 | 15.62 | 13.61 | 14.62 | 14.10 | 14.97 | 14.09 |
| Ayande | ….. | ….. | ….. | ….. | 51.93 | 37.87 | 14.84 | 8.48 | 6.81 | 4.31 | 5.33 | 5.88 |
| Day | 4.79 | 4.38 | 5.77 | 5.92 | 5.69 | 7.33 | 6.77 | 5.20 | 4.74 | 4.15 | 4.24 | 4.11 |
| Saman | 67.84 | 34.22 | 17.57 | 14.30 | 11.59 | 8.09 | 6.68 | 5.51 | 3.82 | 3.17 | 3.34 | 3.77 |
| Sarmaye | 3.55 | 7.88 | 9.01 | 8.03 | 9.39 | 12.18 | 9.34 | 9.67 | 9.22 | 8.38 | 8.52 | 8.29 |
| Sina | 5.25 | 8.01 | 10.28 | 11.32 | 13.67 | 16.60 | 15.57 | 13.99 | 13.28 | 12.65 | 12.82 | 12.33 |
| Karafarin | ….. | ….. | ….. | ….. | 38.10 | 64.61 | 47.79 | 33.16 | 22.43 | 13.78 | 14.33 | 17.79 |
| Hekmate Iranian | ….. | ….. | ….. | ….. | ….. | 32.33 | 15.59 | 10.07 | 4.72 | 4.79 | 4.72 | 4.79 |
| Tejarat | 5.37 | 5.74 | 5.48 | 5.76 | 5.55 | 6.06 | 5.84 | 8.41 | 6.50 | 6.34 | 6.58 | 6.70 |
| Saderat | 11.62 | 9.60 | 10.06 | 8.95 | 4.93 | 5.72 | 2.94 | 10.02 | 8.66 | 7.16 | 7.74 | 8.16 |
| Mellat | 5.29 | 4.20 | 4.41 | 3.73 | 3.62 | 5.89 | 4.66 | 4.96 | 5.27 | 4.48 | 4.72 | 4.15 |

Source: (IBICBI, 2018)

In this paper, the cost/income ratio is used as an indicator of inefficiency. As you can see, the inefficiency ratio has risen in the period under review. The uptrend is indicative of increasing costs in the banks that will hurt their economic value added. Among private banks, the Pasargad and Parsian banks have the highest proportion of cost-to-income. In recent years, these two banks have expanded their investments in infrastructure to improve e-banking, and the cost of human resources and administrative requirements in these two banks has been more than the other banks. This event is expected to hurt its economic value-added.

Table 4
*Efficiency (%) of Iranian Banks*

| Bank Name | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egthesad Novin | 78.81 | 87.10 | 87.50 | 86.20 | 81.81 | 79.16 | 79.07 | -3.52 | 87.21 | 89.77 | 89.93 | 87.78 |
| Ansar | ….. | ….. | ….. | ….. | 66.39 | 61.59 | 67.73 | 72.15 | 75.99 | 77.53 | 78.51 | 75.45 |
| Parsian | 85.61 | 84.32 | 82.29 | 83.29 | 78.62 | 73.30 | 78.16 | 77.88 | 814.78 | 758.63 | 779.97 | 628.36 |
| Pasargad | 59.98 | 62.04 | 74.93 | 74.13 | 65.75 | 68.61 | 68.07 | 70.97 | 81.16 | 86.95 | 811.56 | 869.52 |
| Ayande | ….. | ….. | ….. | 104.81 | 50.04 | 82.09 | 98.94 | 96.87 | ….. | 99.01 | 89.02 | 99.66 |
| Day | ….. | ….. | ….. | ….. | 43.83 | 32.25 | 57.38 | 78.30 | 80.77 | 95.10 | 76.85 | 97.64 |
| Saman | 90.97 | 87.50 | 83.67 | 77.34 | 73.66 | 79.69 | 80.33 | 80.88 | 86.85 | 88.80 | 85.23 | 79.15 |
| Sarmaye | 22.04 | 64.52 | 55.05 | 76.70 | 71.82 | 85.85 | 77.53 | 86.31 | 94.31 | 96.32 | 95.62 | 87.25 |
| Sina | 92.73 | 92.35 | 78.27 | 74.66 | 68.42 | 70.37 | 77.40 | 70.39 | 81.62 | 82.03 | 84.35 | 81.26 |
| Karafarin | 79.09 | 76.31 | 64.85 | 62.01 | 56.67 | 53.23 | 59.89 | 65.98 | 72.26 | 77.40 | 75.66 | 78.36 |
| Hekmate Iranian | ….. | ….. | ….. | ….. | 3.23 | 10.27 | 25.51 | 50.63 | 46.60 | 59.95 | 56.42 | 69.23 |
| Tejarat | 90.97 | 82.47 | 64.29 | 62.23 | 53.85 | 58.12 | 74.10 | 75.42 | 81.04 | 80.57 | 85.29 | 85.76 |
| Saderat | 24.17 | 27.06 | 19.66 | 77.65 | 84.21 | 97.94 | 87.57 | 92.13 | 96.61 | 95.08 | 96.99 | 97.09 |
| Mellat | 95.53 | 90.75 | 90.16 | 89.30 | 64.66 | 68.73 | 64.46 | 53.86 | 73.52 | 74.41 | 75.51 | 76.69 |

Source: (IBICBI, 2018)

In this section, to the importance of examining performance, the nonperforming loan ratio is used. This ratio shows that a few percents of the net of the actual loan (whether current or non-current) have not been collected and that the customers of the bank or credit institution have failed to repay the percentage of all loans. The value of this indicator and its timing reflects the level of bank credit risk and generally reflects the adequacy and efficiency of the credit policies (asset quality and management) of the bank.

As shown in Table 5, nonperforming loan to total loan in Iranian private banks is more than 5%. Even in some banks, this ratio is more than ten or twenty percent. The uptrend of this benchmark in private banks reflects the ineffectiveness of their credit policies. An increase in this ratio will hurt the profitability and economic value of banks in the coming periods.

Table 5
*Nonperforming loan to loan (%) for Iranian Banks*

| Bank Name | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egthesad Novin | 0.49 | 10.39 | 13.71 | 22.03 | 30.13 | 23.10 | 17.58 | 17.01 | 15.18 | 18.18 | 17.95 | 18.88 |
| Ansar | ….. | ….. | ….. | ….. | 4.65 | 4.54 | 3.59 | 2.43 | 3.27 | 5.38 | 5.42 | 6.32 |
| Parsian | 8.49 | 15.37 | 19.42 | 35.90 | 29.78 | 28.92 | 27.31 | 33.17 | 39.58 | 39.67 | 38.69 | 39.54 |
| Pasargad | 0.00 | 1.55 | 6.14 | 10.84 | 5.30 | 5.93 | 6.02 | 6.12 | 5.74 | 5.83 | 6.32 | 6.58 |
| Ayande | ….. | ….. | ….. | ….. | 1.98 | 4.95 | 9.91 | 5.47 | 5.56 | 2.49 | 3.25 | 5.35 |
| Day | ….. | ….. | ….. | ….. | 0.00 | 5.70 | 1.72 | 3.22 | 9.07 | 8.36 | 8.69 | 9.36 |
| Saman | 4.19 | 13.08 | 20.67 | 21.83 | 19.96 | 41.39 | 38.71 | 31.90 | 26.59 | 22.26 | 25.32 | 26.34 |
| Sarmaye | 9.14 | 1.70 | 11.97 | 26.93 | 24.28 | 27.24 | 22.09 | 27.08 | 47.19 | 38.56 | 39.56 | 40.23 |
| Sina | 6.79 | 7.17 | 10.63 | 13.69 | 14.25 | 15.83 | 13.27 | 11.97 | 8.11 | 8.08 | 7.25 | 8.48 |
| Karafarin | 14.25 | 8.11 | 19.76 | 23.49 | 17.69 | 16.72 | 19.51 | 14.50 | 12.37 | 12.86 | 11.23 | 12.56 |
| Hekmate Iranian | ….. | ….. | ….. | ….. | 0.00 | 0.00 | 0.18 | 2.10 | 5.29 | 2.57 | 3.25 | 4.25 |
| Tejarat | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19.19 | 16.76 | 26.28 | 21.41 | 15.02 | 16.35 | 17.25 |
| Saderat | 26.11 | 28.17 | 17.18 | 17.21 | 8.17 | 9.58 | 8.44 | 6.96 | 7.10 | 4.86 | 5.23 | 6.87 |
| Mellat | 0.00 | 0.00 | 0.00 | 18.83 | 9.55 | 10.97 | 8.49 | 7.47 | 7.03 | 5.20 | 6.32 | 7.23 |

Source: (IBICBI, 2018)

# 4 Related Literature

There are many research studies that support the positive reaction around using EVA technique (for example, O'Byrne, 1997; Lehn & Makhija, 1997; Zimmerman, 1997; Al-Jafari, 1997; Tully, 1998, 1999; Walbert, 1994; Biddle, Bowen, & Wallace, 1999; Prober, 2000; Machuga, Pfeiffer, & Verma, 2002; Torrez, Al-Jafari, & Juma'h, 2006). At the same time, there are several studies that show different reaction (for example, DeVilliers & Auret, 1997; Wallace, 1997; Biddle, Bowen, & Wallace, 1997; Turvey, Lake, van Duren, & Sparling, 2000; Chen & Dodd, 2001; Fernandez, 2001; Haspeslagh, Noda, & Boulos, 2001; Bhattacharyya & Phani, 2004).

Although there is an extensive literature analyzing the EVA information content in the industry and service sectors (for example, Biddle et al., 1997; Chen & Dodd, 2001; Clinton & Chen, 1998), there is a very small number of papers that studying the information content of EVA, or using EVA as a performance measure in banking sector.

EVA as a profitability measure in banks and other financial institutions was introduced by Uyemura, Kantor, and Pettit (1996). Since then many

authors have been dealing with this tool, and if EVA is mentioned as a profitability measure in financial institutions (usually as an alternative to widely used RAROC), other authors and publications are referring to this article (Křečková, 2018, p. 236).

Kimball (1998) reviews the use of economic profit to evaluate performance in the banking sector. He concludes that banks need to be prepared to create and apply multiple specialized performance measures.

Verma (2000) used market value-added to examines the bank's performance in India and found that Indian banks have been able to create shareholders' wealth.

Fogelberg and Griffith (2000) argue that accounting performance measures for banks do not accurately assess shareholder value creation; instead, they only indicate average profitability. They explain that the advantage of EVA is that it is a dollar-based value and thus, EVA maximization correlates with wealth maximization, while Uymura et al. (1996) find that EVA is strongly correlated with market value-added.

Girotra and Yadav (2001) found that EVA has an information content when comparing it with Return on Equity (ROE), Return on Net Worth (RONW), Return on Capital Employed (ROCE) and Earnings per Share (EPS).

Tortella and Brusco (2003) test the market reaction to the introduction of the EVA management technique and observe that EVA introduction does not generate significant abnormal returns. They also analyze the effects of the leading company variables: profitability, investment, and cash flow variables. The results show that EVA adoption provides incentives for the managers to increase firm investment activity, and affects positively and significant cash flow measures.

Li & Weidong (2003) comprehensively analyzed the whole value creation ability of the banking industry at that time with EVA return index.

Abu-Alula and Haddad (2004) examine the relationship between EVA, and refined economic value added (REVA), and abnormal returns in Jordan. Using a sample of 21 industrial companies, the results show a significant positive relationship between both EVA and REVA with abnormal returns.

Millar (2005) is the only study that compares EVA with the better-known performance measures, ROAA and ROAE, for 16 British banks over the period 1998-2003. He uses the LBS definition of EVA. Millar finds that on average, the UK banks add value over this period, which could be due to low yields on 10 years government bonds and a period of relatively strong economic growth in the UK, which boosted banks' profits.

Fiordelisi (2007) developed a new measure of shareholder performance, where a bank producing the maximum possible EVA is defined as "shareholder value-efficient."

Popa et al. (2009) argued that EVA could be an essential tool that bankers can use to measure and improve the financial performance of their bank. They emphasize the advantages of EVA by comparing to other performance indicators. Since EVA takes the interest of the bank's shareholders into consideration, the use of EVA by bank management may lead to different decisions than if administration relied solely on other measures. They investigate the Romanian banking systems to compare the advantages of EVA to other means of bank performance such as return on assets (ROA), return on equity (ROE), net banking income and the efficiency ratio, which do not consider the cost of equity capital employed.

Shubita (2010) examined the information content of EVA, residual income, and accounting earnings for 39 Industrial companies in Jordan. The results show that net income outperforms EVA and residual income. Despite the extended amount of literature on EVA implementations on firms, there is a lack of banking EVA applications. This paper employs accounting and economic measures to explain variations in stock returns by testing if the relationship between EVA and stock returns is more significant than that of ROA, ROE, and Capital Adequacy Ratio (Haddad, 2012, pp. 7–8).

Teker et al. (2011) employed EVA measurement as a performance indicator for Turkish banks. EVA value of each bank per year is computed and ranked, using data covering the period 2006 to 2010. They argue that the results and ranking of banks convey critical information to decision-makers. The results indicate that although a bank that reports a high amount of net income and ROE may not create sufficient amount of economic profit.

Haddad (2012) using multiple pool regression model, examined the relationship between EVA, ROA, ROE, and capital adequacy ratio. His conclusion was a positive and significant relationship between EVA and stock returns in Jordanian Banks.

Xin'e et al. (2012) made the evaluating indicators dimensionless with the extreme value processing method to obtain full score and sequence of the performance for the sample commercial banks. They finally concluded that it is essential and practical to replace traditional indicators with EVA indicator in the performance evaluation of commercial banks.

Kosalathevi (2013) examined the impact of EVA on Financial Performance in selected private banks in Sri Lanka from 2006 to 2012. The

results revealed that there is a relationship between EVA and ROE, and EVA has an impact on financial performance.

Al Karim & Alam (2013) measured the performance of selected private sector banks (five) in Bangladesh through extensive use of financial metrics from 2008 to 2012 and created a regression model to predict the future financial performance of those banks. Three indicators namely, Internal-based performance measured by Return on Assets, Market-based performance measured by Tobin's Q model (Price/Book ratio) and Economic-based performance measured by EVA has been used to measure the financial performance of the selected banks.

Owusu-Antwi et al. (2014) investigated the determinants of banks' profitability in Ghana for the period 1988 to 2011 using EVA to measure performance. The result of the study suggested EVA as the best measurement as against the standard accounting measurement, namely; ROA.

Pompong (2015) analyzed the influence of EVA, on asset-liability management (ALM) in commercial banks of Indonesia based on the information of goodness of fit index. The study does not show the excellent result on criteria evaluation because the hypothesized model is unidentified (identification problem) information matrix is failed to present and also unable to explain causality relation between variables.

Radić (2015) developed a new, specifically tailored measure of the EVA approach, based on the shadow price of equity, to account for specific characteristics of the Japanese banking system. This measure is then used in a dynamic panel data model as a linear function of various bank-risk, bank-specific, and macroeconomic variables. This study finds that cost-efficiency gains, credit risk, and bank size are the most critical factors in explaining the shareholder value creation in Japanese banking. Cost efficiency changes are also found to influence cost of equity capital significantly.

Křečková (2018) compare ex-ante profitability of a bank´s clients from medium-sized enterprises segment calculated according to EVA, with the results calculated according to the RAROC measure The results show that using EVA tool instead of RAROC measurement, could help bank´s relationship managers and branch managers focus on those clients creating more substantial value added than others.

## 5 Methodology and Model

Iranian financial system consists of banks, non-bank financial institutions, insurance companies, leasing companies, pension and investment funds, etc. The banking network represents about 90% of the financial system. It is

apparent the importance of the banking sector, considering that it is the primary financing source for economic operators. Recently there are realized some studies in respect of banking sector for profitability measurement, competitiveness, efficiency, etc. Since Iran is a developing country when implementing the EVA concept, there are some restrictions mentioned.

First, some of the banks that operate in Iran are not listed in the capital market (including Tehran Stock Exchange or Over the Counter market), so no activity allows evaluating the market prices for their shares, or the measures based on them. To measure the economic value-added, we focused on only 16 of 32 banks which are listed on the Iranian capital market (TSE or OTC). The banks selected for this analysis are Saderat, Mellat, Tejarat, Eqtesad Nonvin, Pasargad, Parsian, Karafarin, Day, Saman, Sarmayeh, Sina, Ayandeh, Ansar, Hekmat Iranian, Gardeshgari, Khavar-e Miyaneh. For each of the banks the analysis was focused on a period of twelve years, to evaluate the trend and realizing a comparison between them.

Second, some of the listed banks haven't enough liquidity, and there are no fair market prices for them. So we have to choose the banks that have enough market data for EVA analysis, such as Shahr, Iran Zamin, Ghavamin, Gardeshgari, Khavarmiane, Refahe Kargaran.

In this section, we will present the methodology. The basic form, suggested from Stern & Stewart and Chew (1995), the equation is as follow:

$$EVA = \text{NOPAT} - \text{Cap} \times \text{WACC} \tag{4}$$

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 = $K_e * E / (E+D) + K_d (1-t)*D/ (E+D)$ where $K_e$ = required return on equity and $K_d (1-t)$ = after-tax return on debt and (WACC* capital invested) is also known as a finance charge.

For each of the banks, the analysis was focused on a period of twelve years, to evaluate the trend and realizing a comparison between them. So let's begin with the calculations of the components of economic value-added.

For NOPAT accounting adjustment, the data from the annual reports of each of banks have been used. These data are presented in Table 6.

Table 6
*Net Operating Profit after Taxes (Billion USD) for Iranian Banks*

| Bank Name | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egthesad Novin | 0.078 | 0.10 | 0.18 | 0.21 | 0.30 | 0.44 | 0.44 | 0.53 | 0.36 | 0.24 | 0.36 | 0.24 |
| Ansar | ….. | ….. | ….. | ….. | 0.10 | 0.16 | 0.20 | 0.26 | 0.32 | 0.31 | 0.32 | 0.31 |
| Parsian | 0.19 | 0.32 | 0.33 | 0.39 | 0.55 | 0.73 | 0.79 | 0.82 | 0.11 | 0.26 | 0.11 | 0.25 |
| Pasargad | 0.079 | 0.16 | 0.23 | 0.33 | 0.60 | 0.98 | 0.13 | 0.15 | 0.12 | 0.11 | 0.12 | 0.11 |
| Ayande | ….. | ….. | ….. | -0.0005 | 0.11 | 0.075 | 0.012 | 0.12 | 0 | 0.10 | 0.0091 | …… |
| Day | ….. | ….. | ….. | ….. | 0.022 | 0.080 | 0.12 | 0.14 | 0.23 | 0.16 | 0.23 | 0.16 |
| Saman | 0.0260 | 0.0512 | 0.0439 | 0.0787 | 0.13 | 0.0841 | 0.12 | 0.20 | 0.10 | 0.050 | 0.098 | 0.055 |
| Sarmaye | 0.0454 | 0.046 | 0.055 | 0.066 | 0.088 | 0.012 | 0.14 | 0.12 | 0.022 | 0 | 0.020 | 0.0092 |
| Sina | 0.022 | 0.029 | 0.048 | 0.070 | 0.11 | 0.16 | 0.19 | 0.48 | 0.23 | 0.22 | 0.23 | 0.22 |
| Karafarin | 0.049 | 0.074 | 0.11 | 0.16 | 0.18 | 0.24 | 0.27 | 0.33 | 0.37 | 0.26 | 0.36 | 0.26 |
| Hekmate Iranian | ….. | ….. | ….. | ….. | 0.0078 | 0.013 | 0.049 | 0.044 | 0.039 | 0.033 | 0.038 | 0.035 |
| Tejarat | 0.11 | 0.31 | 0.27 | 0.33 | 0.45 | 0.57 | 0.59 | 0.91 | 0.49 | 0.60 | 0.49 | 0.60 |
| Saderat | 0.089 | 0.090 | 0.41 | 0.36 | 0.75 | 0.49 | 0.60 | 0.69 | 0.73 | 0.83 | 0.73 | 0.83 |
| Mellat | 0.070 | 0.19 | 0.27 | 0.37 | 0.65 | 0.70 | 0.14 | 0.21 | 0.18 | 0.12 | 0.18 | 0.12 |

Source: (IBICBI, 2018)

As may be seen, Mellat is the most stable bank if we refer to the absolute values of profit while the worst is Sarmaye. So for this last one, we don't expect to have a positive economic value added since it reflected a loss in 2013-2017. So Value of profit of all of the banks, have been reduced in 2006-2017. It is because of situation of Iranian Economy. Economic growth has been reduced, inflation and exchange rate have been increased in this period. On the other hand, Central Bank cut the profit rate of deposits and loans in favor of product sector.

The decline in economic growth has reduced the ability of producers to repay their obligations. Since one of the sources of profitability of banks is the repayment of the principal and the subsidiary of the Loan, it has declined by reducing the repayment of the banks' profitability loan. Increasing inflation and exchange rates have led to the withdrawal of deposits from banks and their entry into other financial markets. It has reduced the ability of banks to provide loans as one of the most profitable resources. On the other hand, with the boom of different markets, investment in other markets has increased, which has led

to increase in bank profitability instability. Expected value added is likely to decline as banks become less profitable.

Another critical component is the invested capital. In case of financial companies, such as banks capital includes shareholders' equity, all kinds of reserves and the capitalized financial result. Invested capital is equity plus long-term debt at the beginning of the period.

The more the capital of banks, the more stable funding. So banks have less liquidity risk. As you can see, this element has been an uptrend in the period under study. Mellat, Tejarat and Saderat banks that were first state-owned and in the 80s were privately owned, have the most capital. The Pasargad Bank, as a privately owned bank, has more capital than other private banks. Therefore, these four banks are more stable than other banks.

Table 7

*Invested capital (Billion USD) of Iranian Banks*

| Bank Name | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egthesad Novin | 3.31 | 5.69 | 8.32 | 9.50 | 10.47 | 14.11 | 18.41 | 24.50 | 29.72 | 33.22 | 29.72 | 37.22 |
| Ansar | 0 | 0 | 0 | 0 | 5.20 | 6.05 | 8.20 | 11.34 | 15.42 | 16.72 | 15.43 | 18.72 |
| Parsian | 10.35 | 13.84 | 16.45 | 19.57 | 23.21 | 25.22 | 29.29 | 34.57 | 43 | 52.56 | 43 | 59.56 |
| Pasargad | | | | | | | | | | 47 | 38.87 | 50.01 |
| Ayande | 1.91 | 4.89 | | 10.91 | 31.38 | 18.56 | 24.24 | 31.58 | 38.86 | 51.16 | …… | ….. |
| Day | 0 | 0 | 8.37 | 0.02 | 0.56 | 2.37 | 5.92 | 20.35 | 0 | 16.83 | 9.005 | 19.84 |
| Saman | 0 | 0 | 0 | 0 | 0.3490 | 1.08 | 3.436 | 6.80 | 0.90 | 20.22 | 17.05 | 24.22 |
| Sarmaye | 1.84 | 2.73 | 0 | 3.91 | 5.36 | 7.31 | 9.52 | 14.10 | 17.04 | 12.72 | 6.69 | 13.73 |
| Sina | 0.55 | 0.99 | 3.37 | 2.09 | 3.13 | 2.96 | 3.97 | 6.45 | 6.68 | 14.62 | 13.32 | 15.62 |
| Karafarin | 1.80 | 2.30 | 1.26 | 3.10 | 4.40 | 6.10 | 8.03 | 9.93 | 13.32 | 9.24 | 9.12 | 9.64 |
| Hekmate Iranian | 1.45 | 1.96 | 2.65 | 3.032 | 3.39 | 4.55 | 5.89 | 7.94 | 9.12 | 2.81 | 1.69 | 2.22 |
| Tejarat | 0 | 0 | 2.767 | 0 | 0.23 | 0.28 | 0.76 | 1.14 | 1.68 | 67.53 | 57.59 | 62.53 |
| Saderat | 7.80 | 10.04 | 0 | 16.25 | 20.90 | 25.26 | 32.70 | 48.07 | 57.59 | 86.10 | 67.63 | 85.10 |
| Mellat | 1.95 | 1.96 | 12.64 | 2.42 | 23.38 | 29.05 | 35.65 | 54.14 | 67.63 | 94.98 | 69.61 | 96.98 |

Source: (IBICBI, 2018)

The third essential component refers to the cost of capital. Since we include deposits in the invested capital, so we calculate the weighted average cost of capital. The basic form of calculating the WACC is adapted for banks in the

way that WACC is equivalent to the $R_e$. But here we need to calculate share of deposit and equity in debt and calculate expected return of equity ($R_e$).

We used the CAPM model for calculating $R_e$ that has been proposed by Treynor (1961), Sharpe (1964) and Lintner (1965). Its form is presented below:

$$R_e = R_f + \beta (R_m - R_f) \tag{5}$$

where, $R_f$: risk-free rate, $R_m$: market return, and $\beta$: beta coefficient.

This approach has some limitations; it offers in our case the best approximation of the required rate of return for shareholders. First, this approach requires to choose the risk-free rate between the rates of treasury bills or those of government bonds. As there is no real risk-free rate in some studies, the treasury bills interest rate is used, and in some others the long-run government bonds interest rate is used. The last one usually is more stable in the long run (Damodaran, 1999). As the treasury bills are more liquid than treasury bonds, they are evaluated frequently during the year so in this manner reflecting better the concept of the risk-free rate. But in Iran we have not treasury bill so actually, in this study is used the treasury bonds interest rate. So we used the treasury bond interest rate from 2006-2017 with maturity of twelve months as a simple average among all auctions realized for this maturity in each of these years. In Iran treasury bonds interest rate is fixed at 20 percent.

Second, the formula (5), requires to determine the beta coefficient and the market premium. For beta estimation purposes, we referred to day to day closed prices for shares of each of the banks, calculating the daily return. This action was also done for the index.

Since beta reflects the risk inherent in a share compared to the market, in this case, the index, we build relation between them, considering as an independent variable (x) the daily return of the index and as a dependent variable (y) the daily return of the respective shares, as below:

$$R_{sj} = a_j + b_j R_i \tag{6}$$

where, $R_i$: the daily return of the index, $R_{sj}$: the daily return of shares of bank j, $b_j$: beta coefficient of shares of bank j, and $a_j$: intercept.

In this way we estimated the regressive beta, which has some limitations, so according to finance theory to bring that more close to reality, it must be adjusted with the standard procedure of Bloomberg. It is necessary due to the limitations of this study, for the index choice, for the period and the time

interval of return calculations. So we estimated the betas for each bank in a respective year and then calculated their average, which was adjusted giving the final row betas. The adjusted beta of a year will be used in CAPM to evaluate the cost of equity capital in that year.

This objective cannot be fulfilled without the market premium. Return of share of Iranian banks is realized from TSE. Market premium is the difference between Return of share and treasure bond interest rate (20%).

After calculating the last component of the EVA equation, now it is possible to measure the EVA in the chosen banks.

Table 8
*EVA of Iranian Banks*

| Bank Name | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egthesad Novin | -0.14 | -0.29 | -0.39 | -0.43 | -0.44 | -0.60 | -0.88 | -1.20 | -1.78 | -2.18 | -1.46 | -1.24 |
| Ansar | …. | …. | …. | …. | -0.29 | -0.26 | -0.36 | -0.46 | -0.74 | -0.96 | -1.30 | -2.62 |
| Parsian | -0.61 | -0.67 | -0.88 | -1.12 | -1.02 | -1.19 | -1.01 | -1.34 | -2.81 | -2.92 | -2.85 | -4.94 |
| Pasargad | -0.06 | -0.26 | -0.33 | -0.43 | 0.55 | -0.67 | -0.48 | -0.69 | -1.88 | -2.13 | -2.05 | -1.52 |
| Ayande | …. | …. | …. | 0.00 | 0.10 | -0.06 | -0.33 | -1.08 | …. | -3.45 | -2.3 | …. |
| Day | …. | …. | …. | …. | 0.01 | -0.01 | -0.11 | -0.38 | -0.27 | -0.91 | -0.97 | -1.26 |
| Saman | -0.10 | -0.14 | -0.18 | -0.21 | -0.13 | -0.39 | -0.49 | -0.71 | -0.97 | -1.32 | -0.85 | -0.16 |
| Sarmaye | 0.01 | -0.02 | -0.01 | -0.08 | -0.13 | -0.14 | -0.08 | -0.22 | -0.24 | -0.67 | -0.57 | -0.10 |
| Sina | -0.11 | -0.15 | -0.14 | -0.15 | -0.20 | -0.25 | -3.63 | -0.22 | -0.64 | -0.69 | -0.31 | -0.52 |
| Karafarin | -0.05 | -0.05 | -0.05 | -0.04 | -0.02 | -0.04 | -4.31 | -0.11 | -0.34 | -0.27 | 0.24 | -0.71 |
| Hekmate Iranian | …. | …. | …. | …. | -0.01 | -0.02 | -0.78 | -0.06 | -0.11 | -0.17 | -0.55 | -0.28 |
| Tejarat | -0.29 | -0.21 | -0.46 | -0.68 | -0.97 | -1.07 | -7.63 | -2.27 | -2.75 | -3.37 | -6.79 | -3.22 |
| Saderat | 0.01 | 0.01 | -0.01 | 0.32 | -0.50 | -0.52 | -2.88 | -2.10 | -3.89 | -4.72 | -6.08 | -5.15 |
| Mellat | -0.51 | -0.53 | -0.64 | -0.81 | -1.10 | -1.42 | -12.24 | -0.98 | -2.22 | -4.14 | -8.75 | -4.32 |

Source: Authors' survey

The study reveals that most of the banks have negative EVAs. The research shows that most Iranian Banks have a higher cost of capital compared to the returns. Which means that value is not being created for their investors, but rather that value is being destroyed.

At this stage, a significant concern is why are banks and financial institutions not earning an adequate return on capital. There could be two possible reasons: (1) banks could be overcapitalized, and (2) the yields are low

from the banking business. Data on the capital adequacy ratios of banks reveal that most of them have capital adequacy ratios around the minimum regulatory requirement. So it would be difficult to argue that the negative EVAs are due to overcapitalized banks. The second reason for negative EVA would find considerable support given the high non-performing assets of banks as well as the low employee productivity in banks.

Unless banks earn positive EVAs, investors would not be adequately rewarded, which would make it difficult for banks to access new capital for expansion. It could pose a problem, not just for banks, but for the economy as a whole, because inadequate capital could cause banks to restrict their lending activities, which could, in turn, lead to lower levels of economic activity. These results are the same as Thampy and Bahati (2000).

# 6 Conclusion

Economic Value Added (EVA) or Economic Profit is a measure based on the Residual Income technique that serves as an indicator of the profitability of projects undertaken. Its underlying premise consists of the idea that real profitability occurs when additional wealth is created for shareholders and that projects should create returns above their cost of capital.

This paper aims to create a framework about the way how can be Economic Value Added estimated in the Iranian System context. The purpose is analyzing the EVA philosophy with the restrictions met during its implementation.

First, some of the banks that operate in Iran are not listed in the capital market (including Tehran Stock Exchange or Over the Counter market) such as stated banks, so no activity allows evaluating the market prices for their shares, or the measures based on them. Because of this, we focused on private banks. Second, some of the listed banks haven't enough liquidity, and there are no fair market prices for them. So we ignore them for EVA analysis.

Results of this paper reveal that most banks have negative EVA. To improve EVA, banks need to understand the costs and profits of different activities and services offered by them. Only then they would be able to know which lines of business to reduce and which are the ones worth expanding. A considerable part of the banking business is regulated, but it still leaves a lot of room within each category. A sound costing system would be handy to the banks to measure the profits from different lines of activities. It would also help them to price their services appropriately, thereby improving the EVA. In Iran, the costing of banking services is not based on activities, but the central bank determines the price of services, although in 2016 the central

bank designed a pricing mechanism based on activities, its implementation is timely and, moreover, it is stipulated in the plan. That the central bank should be the same as in the past, while banks must be identified to identify the neglected activities.

One of the missing links in Iran's banking network is the lack of a proper mechanism for the credit rating of customers in banks. Although Iran's credit rating company uses the information received from banks to determine the actual reliability of banks' clients, the trend of increasing non-performing loan indicates this system is not efficient enough.

Iranian banks also have to focus on improving the efficiency of their primary activity of lending. The banks that have better EVAs are those who have a lower proportion of their loans as NPAs. Banks need to improve and strengthen their credit assessment techniques and monitoring mechanisms to bring down the NPAs. Investments in credit research and industry risk studies should help bank in earning more from the traditional business of giving loans and advances.

Finally, it is suggested that factors affecting economic value added to be identified. Identifying these factors will be useful in designing a suitable business model for banks and improving profitability and cost reduction.

# References

Abu-Alula, K., & Haddad, F. S. (2004). The Relationship between Economic Value Added, and Abnormal Returns: Empirical Study on Jordanian Industrial firms. *Dirasat, Administrative*, 31(1), 1–9.

Al Karim, R., & Alam, T. (2013). An Evaluation of Financial Performance of Private Commercial Banks in Bangladesh: Ratio Analysis. *Journal of Business Studies Quarterly*, 5(2), 65–77.

Al-Jafari, M. (1997). *Stock Market Valuation of Company Performance and Growth Potential: A Study of Value Creation and Investment* (Ph. D. Thesis). Manchester Business School, UK.

Baer, T., Mehta, A., & Samandari, H. (2011). *The Use of Economic Capital in Performance Management for Banks: A Perspective*. McKinsey & Company. Retrieved from https://www.mckinsey.com/~/media/mckinsey/dotcom/client_service/risk/working%20papers/24_the_use_of_economic_capital.ashx

Barbullushi, E. (2015). Implications and Application of Economic Value Added in the Banking Sector in Albania. *International Journal of Economics, Commerce, and Management*, 3(2). Retrieved from http://ijecm.co.uk/wp-content/uploads/2015/02/321.pdf

Bhattacharyya, A. K., & Phani, B. V. (2004). *Economic Value Added-A General Perspective*. Working Paper Series. 2004. Retrieved from Working Paper Series website: http://econwpa.repec.org/eps/fin/papers/0504/0504003.pdf

Biddle, G. C., Bowen, R. M., & Wallace, J. S. (1997). Does EVA® Beat Earnings? Evidence on Associations with Stock Returns and Firm Values. *Journal of Accounting and Economics*, 24(3), 301–336.

Biddle, G. C., Bowen, R. M., & Wallace, J. S. (1999). Evidence on EVA. *Journal of Applied Corporate Finance*, 12(2), 69–79. DOI:10.1111/j.1745-6622.1999.tb00008.x

Chen, S., & Dodd, J. L. (2001). Operating Income, Residual Income, and EVA™: Which Metric is More Value Relevant? *Journal of managerial issues*, 65–86.

Clinton, B. D., & Chen, S. (1998). Do New Performance Measures Measure up? *Strategic Finance*, 80(4), 38.

Damodaran, A. (1999). Estimating Equity Risk Premiums.

DeVilliers, J. U., & Auret, C. J. (1997). A Comparison of EPS and EVA as Explanatory Variables for Share Price. *Journal for Studies in Economics and Econometrics*, 22 (Aguest).

Dhanabhakyam, M., & Kavitha, M. (2012). Financial Performance of Selected Public Sector Banks in India. *International Journal of Multidisciplinary Research*, 2(1).

Fernandez, P. (2001). EVA, Economic Profit and Cash Value Added do not Measure Shareholder Value Creation. *Fecha de publicación*, 22.

Fiordelisi, F. (2007). Shareholder Value Efficiency in European Banking. *Journal of Banking & Finance*, 31(7), 2151–2171. DOI:10.1016/j.jbankfin.2006.10.021

Fogelberg, L., & Griffith, J. M. (2000). Control and Bank Performance. *Journal of Financial and Strategic Decisions*, 13(3), 63–69.

Fraker, G. T. (2006). *Using Economic Value Added (EVA) to Measure and Improve Bank Performance*. Retrieved from http://www.rmaaz.org/pictures/measuringbankperformance.pdf

Girotra, A., & Yadav, S. S. (2001). Economic Value Added (EVA): A New Flexible Tool for Measuring Corporate Performance. *Global Journal of Flexible Systems Management*, 2(1), 7–18.

Grant, J. L. (1996). Foundations of EVA™ for Investment Managers. *The Journal of Portfolio Management*, 23(1), 41–48. DOI:10.3905/jpm.1996.409573

Grant, J. L. (2003). *Foundations of Economic Value Added* (2nd ed.). Wiley finance. Hoboken, N.J., Chichester: J. Wiley. Retrieved from http://www.loc.gov/catdir/description/wiley037/2003269697.html

Guisse, M. L. (2012). *Financial Performance of the Malaysian Banking Industry: Domestic vs. Foreign Banks*. Institute of Graduate Studies and Research. Retrieved from http://i-rep.emu.edu.tr:8080/jspui/bitstream/11129/308/1/Guisse.pdf

Haddad, F. S. (2012). The Relationship between Economic Value Added and Stock Returns: Evidence from Jordanian Banks. *International Research Journal of Finance and Economics*, 89.

Haspeslagh, P., Noda, T., & Boulos, F. (2001). Managing for Value. It's not just about the Numbers. *Harvard Business Review*, 79(7), 64-73, 144.

IBICBI (2018). *Report on Performance of Iranian Banks in 2017*. Iran Banking Institute Central Bank of Iran. Retrieved from http://ibi.ac.ir/news/638-1396

IFSB (2018). *IFSB Islamic Financial Services Industry Stability Report 2018*. Islamic Financial Services Board. Retrieved from https://www.ifsb.org/download.php?id=4811&lang=English&pg=/index.php

Kimball, R. C. (1998). Economic Profit and Performance Measurement in Banking. *New England Economic Review*, 35–53.

Kleiman, R. T. (1999). Some New Evidence on EVA Companies. *Journal of Applied Corporate Finance*, 12(2), 80–91.

Kosalathevi, T. (2013). Impact of Economic Value Added on Financial Performance: Special Reference to Selected Private Banks in Sri Lanka. *Developing Country Studies*, 3(13). Retrieved from https://www.iiste.org/Journals/index.php/EJBM/article/download/11437/11788

Křečková, Š. (2018). Using Economic Value Added in Ex-Ante Profitability Calculation of Bank´s Medium-Sized Clients. *Prague Economic Papers*, 27(2), 232–247. DOI:10.18267/j.pep.653.

Kyriazis, D., & Anastassis, C. (2007). The Validity of the Economic Value Added Approach: An Empirical Application. *European Financial Management*, 13(1), 71–100. DOI:10.1111/j.1468-036X.2006.00286.x.

Lehn, K., & Makhija, A. K. (1997). EVA, Accounting Profits, and CEO Turnover: An Empirical Examination, 1985-1994. *Journal of Applied Corporate Finance*, 10(2), 90–97. DOI:10.1111/j.1745-6622.1997.tb00139.x.

Li, G., & Weidong, F. (2003). A Study on the Value-Creating Capability of the Banking Industry in China. *Finance & Trade Economics*, 11, 8.

Lima, F. G., Castro J., Sant Clair de, J., Tabajara P., & Gaio, L. E. (2014). Performance of the Different RAROC Models and their Relation with the Creation of Economic Value. A Study of the Largest Banks Operating in Brazil. *Contaduría y Administración*, 59(4), 87–104. DOI: 10.1016/S0186-1042(14)70156-1.

Lintner, J. (1965). Security Prices, Risk, and Maximal Gains from Diversification. *The Journal of Finance*, 20(4), 587–615.

Machuga, S. M., Pfeiffer, J. R., J., & Verma, K. (2002). Economic Value Added, Future Accounting Earnings, and Financial Analysts' Earnings per Share Forecasts. *Review of Quantitative Finance and Accounting*, 18(1), 59–73. DOI: 10.1023/A: 1013814328460.

Millar, L. (2005). *The Measurement and Determinants of UK Banks' Performance* (Cass Business School Past Dissertation), London. Retrieved from available from the Cyril Kleinwort Learning Resource Centre.

Nikhil, C. S. (2009). Key Discriminators of Bank Profitability. *Interdisciplinary Journal of Contemporary Research in Business*, 1(2), 97–110.

Nili, F. (2014). Iran: Islamic Banking and Finance. In S. Thiagaraja, A. Morgan, A. Tebbutt, & G. Chan (Eds.), *The Islamic Finance Handbook* (pp. 175–212). Solaris South Tower, Singapore: John Wiley & Sons Singapore Pte. Ltd.

O'Byrne, S. F. (1997). EVA and Shareholder Return. *Financial Practice and Education*, 7, 50–54.

Owusu-Antwi, G., Mensah, L., Crabbe, M., & Antwi, J. (2014). Determinants of Bank Performance in Ghana, the Economic Value Added (EVA) Approach. *International Journal of Economics and Finance*, 7(1). DOI:10.5539/ijef.v7n1p203

Pompong, S. B. (2015). The Influence of Economic Value Added On Liability Management in Commercial Banks of Indonesia. *Journal of Nursing and Health Science*, 4(3).

Popa, G., Mihailescu, L., & Caragea, C. (2009). EVA–Advanced method for performance evaluation in banks. *Economia Seria Management*, 12(1 Special), 168–173.

Prober, L. M. (2000). EVA: A Better Financial Reporting Tool. *Pennsylvania CPA Journal*, 71.

Radić, N. (2015). Shareholder Value Creation in Japanese Banking. *Journal of Banking & Finance*, 52, 199–207. doi:10.1016/j.jbankfin.2014.09.014

Saita, F. (2007). Risk-Adjusted Performance Measurement. In F. Saita (Ed.), Value at Risk and Bank Capital Management (pp. 195–216). Amsterdam, London: Academic Press.

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance*, 19(3), 425–442.

Shubita, M. F. (2010). The Relationship between EVA and Stock Returns. *International Research Journal of Finance and Economics*, 59(7), 35–41.

Stern, J. M. (1985). Acquisition, Pricing, and Incentive Compensation. *Corporate Accounting*, 3(2), 26–31.

Stern, J. M., Stewart, G. B., & Chew, D. H. (1995). The EVA Financial Management System. *Journal of Applied Corporate Finance*, 8(2), 32–46. DOI:10.1111/j.1745-6622.1995.tb00285.x

Stewart, G. B. (1994). EVA: Fact and Fantasy. *Journal of Applied Corporate Finance*, 7(2), 71–84. DOI:10.1111/j.1745-6622.1994.tb00406.x

Stoughton, N. M., & Zechner, J. (2007). Optimal Capital Allocation Using RAROC™ and EVA®. *Journal of Financial Intermediation*, 16(3), 312–342. DOI:10.1016/j.jfi.2006.12.004

Teitelbaum, R. (1997). *America's Greatest Wealth Creators. Fortune*. November 10. Retrieved from http://archive.fortune.com/magazines/fortune/fortune_archive/1997/11/10/233784/index.htm

Teker, D., Teker, S., & Sönmez, M. (2011). Economic Value Added Performances of Publicly Owned Banks: Evidence from Turkey. *International Research Journal of Finance and Economics*, 75.

Thampy, A., & Baheti, R. (2000). Economic Value Added in Banks and Development Financial Institutions. *SSRN Electronic Journal*. DOI:10.2139/ssrn.2162770

Torrez, J. G., Al-Jafari, M., & Juma'h, A. (2006). Corporate Valuation: A Literature Review. *SSRN Electronic Journal*. DOI:10.2139/ssrn.3165643

Tortella, B. D., & Brusco, S. (2003). The Economic Value Added (EVA): An Analysis of Market Reaction. *Advances in Accounting*, 20, 265–290.

Treynor, J. L. (1961). Market Value, Time, and Risk, Unpublished Manuscript.

Tully, S. (1998). *America's Greatest Wealth Creators*. Fortune. November 9. Retrieved                                                    from http://archive.fortune.com/magazines/fortune/fortune_archive/1998/11/09/2508 49/index.htm

Tully, S. (1999). *America's Wealth Creators*. Fortune. November 22. Retrieved from http://archive.fortune.com/magazines/fortune/fortune_archive/1999/11/22/2690 83/index.htm

Turvey, C. G., Lake, L., van Duren, E., & Sparling, D. (2000). The Relationship between Economic Value Added and the Stock Market Performance of Agribusiness Firms. Agribusiness: *An International Journal*, 16(4), 399–416.

Uyemura, D. G., Kantor, C. C., & Pettit, J. M. (1996). EVA® for Banks: Value Creation, Risk Management, and Profitability Measurement. *Journal of Applied Corporate Finance*, 9(2), 94–109.

Verma, B. P. (2000). Economic Value Added by Indian Banks—A Study. UTI Institute of Capital Markets,

Walbert, L. (1994). The Stern Stewart Performance 100: Using EVA to Build Market Value. *Journal of Applied Corporate Finance*, 6(4), 109–112. DOI:10.1111/j.1745-6622.1994.tb00256.x

Wallace, J. S. (1997). Adopting Residual Income-Based Compensation Plans: Do You Get What You Pay for? *Journal of Accounting and Economics*, 24(3), 275–300.

Xin'e, Z., Ting, W., & Yuan, Z. (2012). Economic Value Added for Performance Evaluation: A Financial Engineering. *Systems Engineering Procedia*, 5, 379–387. DOI:10.1016/j.sepro.2012.04.059

Zimmerman, J. (1997). EVA and Divisional Performance Measurement: Capturing Synergies and other Issues. *Journal of Applied Corporate Finance*, 10(2), 98–109.