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ANALYSIS OF ECONOMIC SUPERVISORY AND REGULATORY AUTHORITIES IN TÜRKİYE FROM THE PERSPECTIVE OF PUBLIC INTEREST THEORY: THE EXAMPLE OF BANKING REGULATION AND SUPERVISION AGENCY*

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Abstract

Public Interest Theory argues that public regulations should be implemented for the purpose of maximizing social welfare. The purpose of this study is to analyze the effects of the BRSA's activity results on the Turkish banking sector and some macroeconomic aggregates, vis-à-vis the Theory, by using the Bankometer Score (S-Score), which is a discriminant analysis method and Granger Causality Test. For this purpose, in the first stage, S-Score calculations for the banking sector were made for the sector total and for different segments of deposit banks (at year-ends for the 1989-2000 and 2001-2023 periods, and quarterly for the 2007-2023 period). In the pre-BRSA period (1989-2000), it was observed that the S-Score figure in all segments generally tended to deteriorate over the years. After BRSA became operational in 2000, S-Score results on a sectoral basis in the calculations made since 2001 have yielded much better results than before 2000. Then the quarterly results were made, together with Foreign Direct Investment (FDI), Real Sector Confidence Index (RSCI) and Capacity Utilization Rate (CUR), were used as a variable for the created model and Granger Causality Test was performed. According to the results of the Granger Causality analysis conducted on EViews, it was concluded that the S-Score, which measures the soundness of the banking sector, is the cause of FDI, which is a common opinion in the literature that it has positive effects on the country's economy. Since the BRSA's regulatory and supervisory activities contribute to the S-Score, the study concludes that the BRSA's efforts align with the Public Interest Theory, as they promote financial stability and attract investment, thereby serving the public interest.

Keywords: Public Interest Theory, Banking Regulation and Supervision Agency, Bankometer Score, Granger Causality

JEL Codes: A10, C32, G21

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INTRODUCTION

The concept of regulation is initially considered to be largely related to the discipline of law as it includes the meaning of regulation, supervision and direction, however it is also related to other disciplines such as economics and politics. Since regulation is an interdisciplinary concept, it is defined in different ways. From the point of view of legal science, it involves the establishment and control of rules related to a particular field or activity. In terms of economics, it is considered as a set of practices that reveal where, when and how the state will intervene to ensure the effective and efficient operation of markets in financial markets, infrastructure services, competition, transportation, etc., first in the USA and later in Continental Europe. It also concerns political science as it discusses both the control mechanism of the public sector and the role of the state in economic activities (Karakaş, 2008, p.102).

Regulations can be analyzed under three headings: economic regulations, social regulations and administrative regulations (Zülfüoğlu, 2013, p.20). Economic regulation theories are generally analyzed under two headings in the literature: Public Interest Theory and Private Interest Theory. These theories analyze the regulatory activities of the state in terms of who benefits from the regulations (Aktan & Yay, 2016b, p.317-320).

Since public regulations are considered as a form of state intervention in the markets and as an issue related to the role of the state in the economy, the theories explaining public regulations have been occured according to the perspectives of economic approaches on the state. While the Public Interest Theory concerns with public regulation in terms of market breakdowns and their compensation, the Private Interest Theory concerns with it in terms of interest parties and rent-pursuing activities (Çevik & Demir, 2005, p. 252).

This article aims to evaluate the results of the activities of the Banking Regulation and Supervision Agency (BRSA), which regulates the banking and non-banking financial sectors in Türkiye, in terms of regulation and supervision within the context of the Public Interest Theory, one of the economic regulation theories. For this purpose, the Bankometer Score (Solvency Score, S-Score), which is a discriminant analysis method, was used, and the Granger Causality Test was applied to the model created with the obtained S-Scores as one of the variables. The evaluation process is mainly limited to the total figures of the banking sector[4], which constitutes approximately 83% of the financial sector in Türkiye. Private finance institutions/interest free banks, development and investment banks that do not collect deposits, and other

[4] A Granger Causality Analysis will be conducted on the total figures for “deposit-taking” banks, which constitute approximately 85% of the total banking sector.

financial institutions outside the banking sector but under the jurisdiction of the BRSA (e.g., financial leasing companies, factoring companies, financing companies, etc.) are excluded from the scope of the article. In order to make an evaluation/comparison, data for the pre-BRSA period 1989-2000 were also used in the analysis.

THEORIES OF ECONOMIC REGULATION

Public Interest Theory

The Public Interest Theory examines public regulation in terms of the welfare provided to society and argues that regulation should be implemented with the aim of maximizing social welfare by eliminating market failures caused by various reasons such as public goods, economies of scale, external economies, imperfect competition and imperfect information. According to this theory, regulation emerges as a result of political efforts to eliminate market failures (Hantke Domas, 2003, p.166). It is necessary to create regulations in a way to increase the welfare of the society. Regulations;

- Should manage the supply of public goods,
- Should improve competition conditions,
- Should eliminate market failures by solving information problems

so that the social welfare predicted by the theory can be increased (Aktan & Yay: 2016b, p.84).

According to Oğuz, the public interest in economic terms is the efficient allocation of scarce resources for individual and social consumption (Oğuz, 2011, p.73). The public interest approach sees government regulation as the best way to ensure efficiency in the allocation of these scarce resources and envisages the active use of forms of regulation in order for the economy to reach the optimal level of efficiency.

The Public Interest Theory, introduced to the literature by A. C. Pigou and aiming at the most efficient allocation of scarce resources both individually and socially, is based on two fundamental assumptions:

- Economic markets tend to operate in a fragile and inefficient manner if not intervened,
- The regulations implemented by the state have almost no cost (Posner, 1974; Uslu & Tufaner, 2015).

Karl Polanyi, considered to be one of the founders of modern economics, argued that the idea of a market economy achieving self-equilibrium is utopia (Polanyi, 2001, p. 3, 2016, p.36-37):

> "Our thesis is that the idea of a self-balancing market is a utopia. Such an institution could not survive for long without destroying the human and natural essence of society; it would physically destroy man and turn his environment into a desert. Inevitably, society took some measures to protect itself, but these measures violated the laws of the market itself, upsetting working life and thus plunging society into danger in another form" (Polanyi, 2016, p. 36).

> "... But if the collapse of our civilization coincided with the collapse of the world economy, it was certainly not caused by it. The sources of the collapse must be sought in the social and technological upheaval that gave birth to the idea of the market operating according to its own rules in Western Europe a hundred-odd years ago. The end of this adventure closed a certain period in the history of industrial civilization and brought us to our own era." (Polanyi, 2016, p.37)

Accordingly, markets are not and cannot be functioning on their own. Therefore, regulations are absolutely necessary to bring the market into equilibrium, to eliminate imperfect and unfair competition and to ensure the conditions of perfect competition in the market. Therefore, structural regulations for the efficient functioning of markets are beneficial. Failure in the market, which is the place where the activities of producers and consumers, who are economic units, take place, is the failure of the market to fulfill the functions (production and consumption) necessary for the effective functioning of the market. Some of the failures of the market when left to its own devices constitute the rationale for the state to resort to economic regulation (Aktan & Yay, 2016a, p.127).

According to the Public Interest Theory, regulation is defined as the replacement of competition by explicit government orders as a policy instrument. The reason for this is to eliminate the elements of market equilibrium that prevent the Pareto optimum and to ensure that the market converges to the Pareto optimal state. According to the theory, without public regulation, "welfare losses" takes place in the market. Regulation ensures market stability and market equilibrium (Akça, 2007, p.61), and while in developed countries it is aimed at increasing competition and efficiency, in developing countries the aim may be stability and risk reduction (Eleni et al., 2011, p.39).

The impossibility of expecting effective results in the natural functioning of the market economy brings about the need for public intervention or regulation. For example, the production of public goods such as defense, justice and diplomacy, which are completely indivisible, non-marketable and subject to collective consumption, is very difficult or even impossible to be realized by the market economy. Therefore, state intervention in the economy is necessary for the provision of such services. On the other

hand, the production of public goods other than full public goods (semi-public goods, virtuous goods[5], etc.) does not have to be undertaken by the state. Such goods and services can also be provided by the private and third sector (private non-profit sector). It is said that both the benefits and costs of public intervention or regulation in these goods and services should be taken into account and public regulation should be resorted to when the benefits exceed the costs (Aktan & Karaaslan, 2009, p.88).

According to Shleifer, the Public Interest Theory is based on two basic assumptions:

- Unregulated/unhindered markets often fail due to monopoly and externality problems.
- Governments are benign and have the capacity to address these problems through regulation. This theory is used to describe what countries should do (Shleifer, 2005, p.440).

The main justification for economic regulation is to prevent the reduction of social welfare due to market failures. However, it should be kept in mind that the costs of government intervention in the market should not be ignored and that the potential costs of such regulation should be known before resorting to regulation. Therefore, both the benefits and costs of public regulation should be taken into account and public regulation should be resorted to only when the benefits exceed the costs. According to Erol (Erol, 2003, p.49-50), public regulations increase competition, innovation, efficiency, product diversity and service quality in the markets. For this reason, it has benefits such as facilitating adaptation to international markets, limiting the total earnings of firms, regulating the price structure and market entry and exit.

There are also criticisms of the Theory. The ground of these critiques is the perspective that the market can deal with the problems that arise without the need for state intervention, so the state should be limited as much as possible. Contrary to expectations, excessive state intervention in the market economy leads to severe problems, such as social, economic, and political, in the running of the market economy (Aktan &Yay, 2016b, p.84).

Private Benefit Theory

The second approach to economic regulation theories is the Private Benefit Theory developed by leading scholars of the Chicago School of Economics and the Virginia School of Political Economy. According to the theory, government regulations mostly serve the interests of special interest groups, and

[5] "Virtuous goods" is a concept introduced by Richard Abel Musgrave. It is defined as a third category of goods in addition to private and public goods. Goods that can be under-consumed when consumer preferences are not fully and accurately revealed, and for which public intervention is therefore necessary. Examples of such goods include compulsory vaccination, free milk distribution in schools, nursing homes, financing of the arts, and services for the protection of natural and cultural heritage (Yıldırım & Akyol, 2022, p.473).

regulations that are intended to contribute to social welfare do nothing but serve the interests of some privileged groups. According to economists who advocate the Private Benefit Theory, well-organized groups benefit from regulations at much higher rates than disorganized or poorly organized groups, and the expected benefits of regulations that are intended to serve the common good are not realized.

"The Theory of Economic Regulation" by George Stigler, one of the principal characteristics of the Chicago School of Economics, has been a climax in terms of regulation theories. In his study, Stigler shifted attention away from the Public Interest Theory and focused on the efforts of interest groups to share public rents by influencing regulatory policies. The prime actors in his studies are businessmen and politicians, for whom self-interest is more important than the public interest. Businessmen do not ponder to use their own resources to make selections that will make profit them; they back regulations that prevent competition and earn economic gains (Stigler, 1971, p.3).

REGULATION OF THE FINANCIAL SYSTEM AS A PUBLIC GOOD

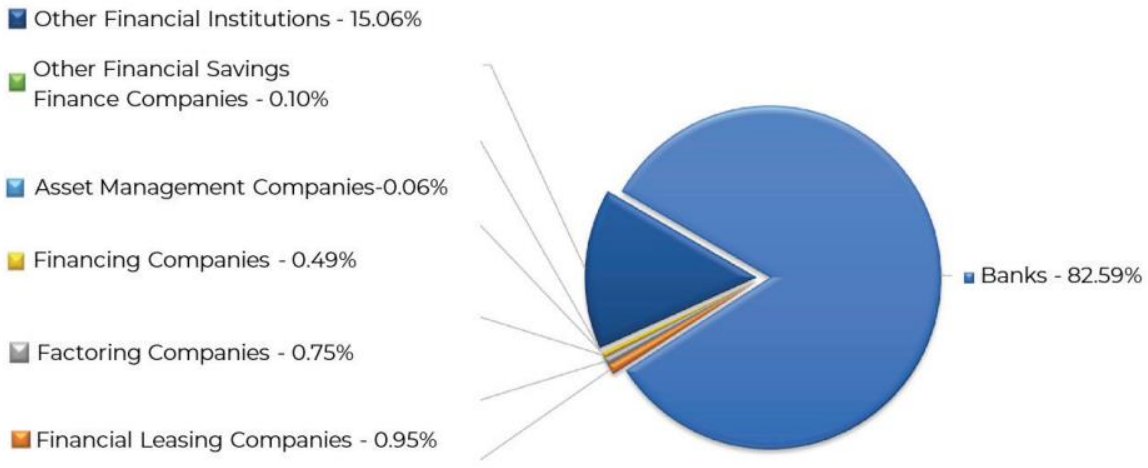
There is a consensus in the literature on how important the banking system in a country is for the economy of that country. It is emphasized that the proper functioning of the banking system has extremely positive effects on the economy as a whole, and therefore, it is very important to regulate and supervise the system well. Since the financial structure in Türkiye is bank-based, this is even more important for Türkiye[6].

The asset size of the financial sector has reached TL 28.5 trillion (approximately USD 968.7 billion) as of the end of 2023. When we analyze the financial sector, which is 1.09 times the gross domestic product, it can be seen from the Graph 1 that with 82.59% the Turkish banking industry has the largest share. Graph 1 shows the institutions and their share within the scope of the Agency's regulation and supervision in the financial sector in 2023. The BRSA is responsible for the supervision and regulation of 85% of the financial sector[7], except for other financial Institutions 15.06%, by asset volume and contributes to financial stability and development by increasing the reliability and efficiency of the financial system (BRSA, 2023, p.12-13).

[6] Financial systems can be classified into two main groups: bank-based and market-based financial systems. Bank-based financial systems are those in which financial intermediation is largely realized through banks. In market-based systems, on the other hand, market actors such as mutual and pension funds are more active. The asset size of the financial sector reached TL 28.5 trillion (USD 968.7 billion) as of end-2023. An analysis of the total assets of the financial sector, which reached approximately 1.09 times the GDP, shows that the Turkish banking sector has the largest share with 82.6% (BRSA, 2023, p.12).

[7] It can be seen that leasing companies have a share of 1%, factoring companies 0.8%, financing companies 0.5%, asset management companies 0.06%, savings finance companies 0.1% and other financial institutions 15.1% of the financial sector in terms of total assets in Turkey as of at the end of 2023.

Graph 1: Distribution of total assets in the financial sector (%)



Source: BRSA, 2023, p.12

Financial regulations, in the most general terms, are regulations that have emerged to find solutions to economic imbalances in financial systems. They mostly stem from the need to standardize financial structures internationally. On the other hand, regulation of financial markets is an important element of economic development, and economists agree that there is a link between an efficient financial market and economic development. Financial regulation can be divided into two important categories depending on the motivation behind it:

i. The first category of economic regulation aims to reduce market failures in resource allocation. However, despite the intention to ensure efficiency in financial markets, financial liberalization has made markets more vulnerable and unprotected against financial crises. Therefore, this type of regulation is being phased out in countries in the process of financial liberalization.

ii. The second category of prudential regulation aims to sustain the stability of the financial system and especially the small depositors. Contrary to economic regulation, prudential regulation has not been abolished within the scope of financial liberalization practices; on the contrary, it has become stronger and widespread in most countries as a precaution against financial crises (Brownbridge & Kirkpatrick, 1999, p.244-245)[8].

[8] Article 1 of the Banking Law No. 5411 in force in Turkey states that the purpose of this Law is i-Ensuring confidence and stability in financial markets, ii-Efficient functioning of the credit system, iii-To protect the rights and interests of savers. The purpose of the Law is to regulate the procedures and principles regarding the Banking Law. Article 1 of the Banking Law No. 4389, which was in effect during the period 1999-2005 before the Law No. 5411, also states the purpose of the Law as follows: i-Protecting the rights and interests of savers, ii-To ensure the effective functioning of the credit system by taking into account the requirements of confidence and stability in financial markets and economic development.

BANKOMETER METHOD

Literature Review

One of the many models developed to determine the solvency of banks is the Bankometer method. The method was developed by taking into account IMF recommendations to assess the solvency of banks (Bella & Radianto, 2020, p.328). The authors stated that the primary purpose of their study was to progress a model that can measure the fragility of financial institutions better than traditional methods such as CAMELS and used bank data operating in Pakistan for the period 1999-2002 to test the model they developed (Shar et al., 2010, p.81). After analysing different models (CAMEL, CLSA-stress test and VAIC etc.) to measure banking performance and fragility, they tried to develop a new model with small changes in limits and percentages, and when they compared their results with CAMEL and CLSA stress test results, they obtained similar findings and stated that Bankometer has the feature of reaching the closest results with the minimum number of parameters. The soundness of a bank is assessed using S-Score (Solvency) parameters. Since the model is organized for the banking sector, it performs better than other models such as Altman Z-Score and makes it possible to prevent future financial crises (Erben Yavuz, 2023, p.318).

The parameters and reference intervals in the Bankometer method are as follows.

S = (1.5*CA) +(1.2*EA) +(3.5*CAR) +(0.6*NPL) +(0.3*CI) +(0.4*LA)

CA: Tier 1 Capital / Total Assets

EA: Equity / Total Assets

CAR: Capital Adequacy Ratio

NPL: Non-performing Loans / Total Loans

CI: Expenses / Revenues

LA: Loans / Total Assets

The Law regulates the principles regarding the establishment, management, operation, transfer, merger, liquidation and supervision of banks. Both laws emphasize confidence and stability in financial markets and the protection of the rights and interests of savers.

It is stated that if the solvency score (S-Score) obtained by using the above function is higher than 70, the solvency of the bank is high, if it is below 50, the solvency is weak, and if it is between 50 and 70 (gray area), no comment can be made about the solvency.

Although there are studies using the Bankometer method in the literature, it is observed that it is a new method for Türkiye. In academic studies, almost all of which are in the form of articles, the bankometer is handled from two different perspectives as an indicator of solvency and an indicator of financial soundness, and in the inquiry made through the "National Thesis Center" website of the Presidency of the Council of Higher Education, only one doctoral dissertation using the bankometer method was encountered, while the number of theses using CAMELS analysis, which is more complex and difficult than this method, was found to be more numerous. In addition, while the existing studies are based on individual banks, our study is based on the consolidated figures of the sector and the Turkish banking sector is considered as a unit.

Domestic and foreign examples of articles written by using the Bankometer method are summarized below:

i. In order to compare the performance of interest free banks and commercial banks operating in Egypt, Fayed (2013) accepted Bankometer scores as an indicator of solvency. According to the scores obtained as a result of the study, he concluded that both interest free and commercial banks have weak solvency, while the scores of interest free banks are higher than the scores of commercial banks

ii. Nimalathasan at al. (2012) checked the financial soundness of commercial banks operating in Sri Lanka in the period 2006-2010 with this method. They concluded that public banks are stronger than private banks in terms of financial soundness and that Bankometer results help bank managers to avoid insolvency by providing an appropriate control mechanism.

iii. There are two studies done to figure out the financial soundness of banks operating in India. In the first study conducted in 2014, Kattel (2014), in his study to measure the financial soundness of joint venture banks and private sector banks, found that the S-Scores of all 6 joint venture banks and 22 private sector banks were above 70% in the period 2007-2012. In the second study, Nagami and Abirami (2017) used the Bankometer method and the adjusted economic value-added model in their study to investigate financial soundness and shareholder value in the banking sector in India. S-Scores calculated using the financial data of 20 banks listed on the Bombay Stock Exchange for the

period 2005-2015 revealed that all banks had a high level of financial soundness in the relevant period.

iv. Yameen and Ali (2016) analyzed 13 commercial banks in Jordan and found that all banks had good financial soundness for the period 2002-2011

v. Budiman at al. (2017) used the financial statement data of Islamic banks operating in Indonesia for the period 2011-2015 to determine the financial failure status of banks with Bankometer, and as a result, they stated that the Bankometer scores of the banks were high during the period under consideration, and therefore, financial failure was not in question for any of them.

In addition to the above examples, the number of articles analysing the Bankometer method in Türkiye has been increasing recently:

i. Çalış et al. (2022) examined the solvency and financial soundness of interest free banking in Türkiye. For this purpose, five interest free banks operating in Türkiye was analyzed based on the financial data for the period 2016-2020. In the study, the Bankometer model S-Score developed by Shar et al. was used to examine the solvency of banks, and the Z-Score model developed by Altman was used to forecast the probability of bankruptcy. According to the results of the Z-Score model used in the study, it was found that all interest free banks face the risk of bankruptcy, and according to the results of the Bankometer model, it was found that interest free banks were generally in the gray zone and had the potential to experience financial difficulties during the periods examined.

ii. Sakarya and Karakaş (2021) examined the financial performance of deposit banks operating in Türkiye in three groups: public, private and foreign capital banks. Using the 10-year financial data of the banks between 2010-2019, their financial conditions were analyzed using the CAMELS and Bankometer method. As a result of the analysis, it was found that the capital adequacy of the banks was quite good in the specified period, they were sensitive in managing risks, their solvency was sufficient despite the decrease in their liquidity, their non-performing loans were below acceptable levels despite the increase in non-performing loans, and the return on equity and return on assets have been decreasing in the sector in recent years. Bankometer method results states that the financial condition of banks in Türkiye is in the “Super Sound Bank” category.

iii. According to Akın Aksoy and Kandil Göker (2018), the Altman Z-Score model, which is one of the many models progressed to estimate financial risk, is a multivariate discriminant analysis that shows the probability of financial failure and bankruptcy of firms. The Bankometer model is another multivariate discriminant analysis. In their study, the authors calculate the financial risk levels of commercial banks listed on Borsa Istanbul for the period 2012-2016 using 2 models and test the

consistency of the results of 2 models used to check financial risk. The results obtained with the Bankometer model show that all commercial banks have high solvency and therefore low financial risk levels in the five-year period. The Altman Z-Score model results, on the other hand, reveal the opposite findings. It showed that all commercial banks had high financial risk levels in the period in question. Akın Aksoy and Kandil Göker explains in the research, it is expected that the Bankometer model, which has not yet been included in the studies, is more suitable for determining the financial risks of Turkish banks and will add diversity to the studies to be conducted in this context.

iv. Erben Yavuz (2023) stated that the purpose of his study was to see the financial position of the banks in the Turkish banking system between 2006 and 2022 with the Bankometer model, one of the financial soundness tests accepted in the literature. The model is used as a tool to assess the financial condition of banks. The findings of the analysis show that most of the banks meet the financial soundness criteria during the period analyzed. This analysis is of great importance in demonstrating the effectiveness of the methods used to assess the financial soundness of banks and the overall state of the banking sector in Türkiye.

v. Özbek at al. (2021) stated that the purpose of their study, in which they used Bankometer analysis as a method, was to analyze the impact of the Covid-19 Pandemic on the Turkish banking sector in the context of financial failure. In this method, Capital Adequacy Ratio, Tier 1 Capital to Total Assets Ratio, Equity to Total Assets Ratio, Non-Performing Loans to Total Loans Ratio, Expenses to Revenues Ratio and Loans to Total Assets Ratio were used from the financial data of 10 large and medium-sized banks, which constitute approximately 90% of the banking sector, for a period of 10 years. The study concludes that the Turkish banking sector was not affected by the Covid-19 pandemic due to the high capital adequacy and the measures taken by the BRSA.

The BRSA became operational in August 2000[9]. In order to see the effects of the BRSA's activities (regulation and supervision) on the Turkish banking sector in terms of the public interest dimension, S-Score calculations were made using the bankometer method over the 1989-2023 period on the basis of the

[9] BRSA started to calculate The Banking Sector Performance Index in 2004 in order to closely monitor the performance of the banking sector. The index is calculated monthly within the framework of the macro surveillance of the banking sector and covers all deposit banks except the SDIF bank(s). The index uses 10 indicators selected from the blocks of liquidity, equity adequacy, exchange rate risk, profitability and asset quality, which are determined as the basic measures of sector performance. The selected indicators are first converted into an index in the block they belong to, and then the averages of these indices are taken to create a composite index (BRSA, 2005: 24). The index calculation was continued for a while starting from 2004, but is not done today.

total sector (Sector) and sub-segments of deposit-taking banks (Total Deposit Banks, Public Deposit Banks, Private Deposit Banks, Foreign Deposit Banks) in the Turkish banking sector over the total year-end figures.

In the studies conducted for the total sector, the S-Score used in the calculation:

- Tier 1 capital,
- Equity,
- Total assets,
- Non-performing loans,
- Total credits,
- Interest revenues,
- Interest expenses,
- Capital adequacy ratio

since 2002, the Banking Regulation and Supervision Agency's "banking sector data" have been accessed through the BRSA's "banking sector data". The data required before 2002 were obtained by using the "statistical reports" under the "Bank and Sector Information" heading of the Banks Association of Türkiye and the "TBB Data System".

Bankometer Results

In order to compare the pre-BRSA and post-BRSA periods, we first present the results for the 1989-2000 period.

Table 1: S-Scores by segments of the Turkish Banking Sector for the period 1989-2000

	Total Banking Sector	Total Deposit Banks	Public Deposit Banks	Private Deposit Banks	Foreign Deposit Banks
1989	24,82	24,34	23,71	25,11	21,77
1990	26,74	25,66	24,03	27,33	21,75
1991	24,84	24,18	20,25	26,80	29,49
1992	21,85	21,58	18,87	23,06	26,86
1993	22,36	22,34	25,17	20,92	21,08
1994	20,16	20,99	16,40	23,14	31,49

1995	18,77	18,79	13,70	21,47	17,31
1996	18,18	17,53	12,97	19,65	17,30
1997	17,79	16,97	15,82	18,40	10,37
1998	17,08	16,03	11,51	22,10	14,27
1999	10,65	9,37	11,32	20,83	13,02
2000	13,32	11,79	8,58	20,93	11,10

Source: Author's calculation based on the Banks Association of Türkiye Data System

The above table (Table 1), which was created for the period 1989-2000 before the BRSA, contains S-Score information for the total banking sector, total deposit banks and public deposit, private deposit and foreign deposit banks.

- Since 1989, S-Score figures for all segments, except for the 1998-2000 period for private deposit banks, have been in a general deterioration trend over the years.
- The worst scores for the Sector and Total Deposit Banks were reached in 1999 (10.65 and 9.37), while the Public Deposit Banks hit a low point with 8.58 at the end of 2000, and the S-Score for the Sector and Public Deposit Banks were realized as 13.32 and 8.58, respectively.
- When the table is analyzed as a whole, it is seen that the table is completely dominated by the color red, and the solvency of the banks in the relevant segment is extremely weak in terms of the categories for which S-Scores are calculated.

The following table (Table 2) shows the S-Scores calculated for the period after the BRSA was established and became operational.

Table 2: S-Scores by segments of the Turkish Banking Sector for the period 2001-2023

	Total Banking Sector	**Total Deposit Banks**	**Public Deposit Banks**	**Private Deposits Banks**	**Foreign Deposit Banks**
2001	19,49	17,70	25,21	15,04	50,30
2002	67,76	81,29	115,76	69,41	115,39
2003	68,86	99,32	157,94	82,88	127,31
2004	64,97	92,30	145,93	78,49	94,72

2005	66,16	76,21	143,59	60,82	61,63
2006	65,05	70,29	109,75	61,93	57,10
2007	61,21	61,50	73,14	60,07	52,22
2008	59,67	58,65	60,05	57,97	59,08
2009	55,08	68,09	66,21	69,50	66,34
2010	55,01	62,60	59,99	64,22	61,26
2011	57,53	54,81	52,20	54,70	59,66
2012	54,02	60,90	61,32	60,39	62,10
2013	63,02	51,54	48,33	52,30	54,58
2014	58,47	55,35	56,32	54,02	58,19
2015	66,95	53,08	52,60	51,75	55,49
2016	72,74	53,41	50,67	51,37	59,60
2017	63,56	58,11	53,97	56,77	65,22
2018	66,94	59,89	54,37	59,77	67,30
2019	77,30	63,50	57,79	65,46	68,81
2020	83,59	64,69	60,02	67,93	67,27
2021	99,42	63,79	55,16	71,20	66,63
2022	108,87	67,69	55,67	81,25	69,40
2023	88,63	65,82	56,67	74,12	69,71

Source: Author's calculation based on the Banks Association of Türkiye Data System for the year 2001, and BRSA's Banking Sector Data for the other years

A similar calculation was made starting from 2001 based on year-end figures, and as can be seen in Table 2, S-Score results on a sectoral basis were much better than before 2000.

- Only in 2013, the solvency of public deposit banks was found to be weak (48.33%), while the solvency of the sector in terms of sub-segments was found to be adequate, especially in the first 6 years following the BRSA's inception.

- In this process, the positive effects of the Restructuring Program[10] for the banking sector implemented by the BRSA since 2001 were observed.
- Since 1999, problematic banks that were excluded from the banking sector until 2002 are no longer in the system, which also contributed positively to the Bankometer Score. Until 2018, the S-Score generally decreased in every category, and since this year, it has entered a steady upward trend in every category, except for Public Deposit Banks. In 2020, due to the Corona Virus pandemic, the BRSA's measures[11] aimed at alleviating the possible problems that the banking sector may experience in the pandemic are thought to have positive contributions on S-Score in this process.

RESEARCH

Data Set

In the model created during the analysis, S-Score, Manufacturing Industry Capacity Utilization Rate (CUR), Real Sector Confidence Index (RSCI) and Foreign Direct Investments (FDI) are considered as variables. S-Score data is generated by us using the formula in the Bankometer method. One of the many models developed to determine the solvency of banks is the Bankometer method and this method was developed to assess the solvency of banks by taking into account the IMF recommendations. The calculation is based on the total number of deposit-taking banks in the banking sector. CUR shows actual realized capacity utilization of workplaces operating in the manufacturing industry according to their existing physical capacities. CUR is closely monitored as it provides information about the course of industrial production. Generally, industrial production is expected to increase in periods when this rate rises, while industrial production is expected to decrease in periods when it falls. RSCI is an indicator that provides information about the general situation, periods of contraction and growth, in the economy. It aims to ensure that necessary measures are taken by anticipating possible problems. FDI are made by investors outside the borders of a country by establishing production facilities such as factories, opening branches, acquiring real estate or buying an existing company in whole or in part. Especially developing countries seek to attract foreign direct investments.

[10] The "Transition to a Strong Economy Program" was put into practice by the Government in order to rapidly eliminate the instability that emerged after the November 2000 and February 2001 crises and to create the infrastructure for the restructuring of the economy. One of the main elements of this program is the restructuring of the banking sector. https://www.bddk.org.tr/Duyuru/Detay/8

[11] In a period of high uncertainties and risks in global markets due to the Corona Pandemic, in order to support the real sector, bank customers and banks, some temporary arrangements were made in certain obligations to be fulfilled by banks. https://www.bddk.org.tr/Home/ShowAll_Mevzuat?metin=pandemi

In studies based on econometric analysis, daily, weekly, monthly, quarterly or annual time series data are mostly used. The necessary data for the S-Score calculations were obtained from the BRSA's Banking Sector Data, and since the Bankometer calculations and the formula used in the calculation are based on deposit-taking banks and provide meaningful results for this segment, they are based on the total figures of these banks and quarterly periods. A total of 68 periods from the end of the first quarter of 2007 to the end of the fourth quarter of 2023 are used. The reason for taking the results of the first quarter of 2007 as a starting point is that the Banking Law No. 5411, which is still in force, was published in the Official Gazette, the Law entered into force on 01.11.2005, and the BRSA, with the powers derived from this Law, enacted very intensive regulations in 2006. The BRSA was able to accelerate its regulatory activities in 2006, after a long period of time since its establishment in 2000, following the procedures regarding the 23 banks whose banking licenses were revoked in accordance with the legislation due to weaknesses in their financial structures arising from the period of its operations, and therefore, it is considered that an analysis based on the figures generated in the sector as of 2007 would be more meaningful and healthier.

Method

The research techniques used in this study, Bankometer Score (S-Score) and Granger Causality Test, were considered to be an appropriate combination to achieve the research objectives. The S-Score, calculated to be used as a variable/data in the Granger Causality Test, is considered to be particularly suitable for this study and adds originality to the analysis since it is calculated according to the banking sector, which constitutes 83% of the financial sector in Türkiye. In the context of the scope of the research, it has enabled an analysis focused on the a safe and sound banking the sector. While the S-Score provides a clear measure of solvency, the Granger Causality Test helps determine whether the activities of the BRSA have a causal effect on this measure. Together, these both techniques provide a comprehensive approach to assess the effectiveness of the BRSA.

Assuming that the S-Score results are largely the result of the BRSA's regulation and supervision activities in the banking sector, a Granger Causality Analysis was conducted by using Eviews program, taking into account the other variables considered to be important for the economy, namely FDI, CUR and RSCI, and the existence and direction of the relationship between the S-Score and the other three variables were examined. The S-Score data used in the analysis were calculated by us, while the other data (FDI, CUR and RSCI) were obtained from the CBRT Electronic Data Distribution System. In practice, the generally used method for determining the causality relationship between time series is the causality analysis developed by Granger and is called “Granger Causality” (Granger, 1969). The causality test is used to analyze whether there is a cause-and-effect relationship between two variables, and if so, the direction of

the relationship. Granger causality analysis determines the relationship between variables and the direction of this relationship. One of the most important prerequisites for Granger causality analysis is that the variables are stationary at the level. For this reason, before applying Granger causality analysis, the stationarity of the variables is determined by unit root tests.

In Granger causality, the direction of the relationship between two variables such as X and Y is investigated. If the current value of Y can be better predicted by past values of variable X rather than the current value of variable Y, Granger causality can be mentioned from variable X to variable Y. Granger Causality Method has the advantages of being a powerful tool for time series analysis, having a simple and understandable application, and being suitable for multivariate analysis. It also has disadvantages such as not revealing a true causal relationship but only revealing predictive relationships, requiring stationary data because otherwise the results will not be reliable, and being inadequate in capturing non-linear relationships.

Unit Root Tests

In time series analyzes, it is of great importance that the series are stationary, because if a series is not stationary, different results will emerge in different data sets. Economic time series should be stationary in order to obtain econometrically significant relationships between variables. This results in the inability to generalize the series to other periods and to use it in future forecasts. It is important that the stationarity condition is fulfilled in regression equations using time series data. In this study, Augmented Dickey-Fuller (ADF) and Philips Perron (PP) unit root tests are used to test whether the time series are stationary. These tests were applied for the variables (CUR, FDI, RSCI, SSCORE) and as can be seen in **Table 3 and 4** below all variables were found to be stationary at the level.

Table 3: Augmented Dickey-Fuller (ADF) unit root tests at level

ADF test statistics		**CUR**		**FDI**		**RSCI**		**SSCORE**	
		t-Stat.	**Prob.**	**t-Stat.**	**Prob.**	**t-Stat.**	**Prob.**	**t-Stat.**	**Prob.**
		-3.73	0.0055	-7.24	0.0000	-4.28	0.0010	-3.21	0.0237
Test critical values	1%	-3.53		-3.53		-3.53		-3.53	
	5%	-2.90*		-2.90*		-2.90*		-2.90*	
	10%	-2.59		-2.59		-2.59		-2.59	

Note: *Significant at the 5%

Table 4: Philips Perron (PP) unit root tests at level

ADF test statistics		CUR		FDI		RSCI		SSCORE	
		t-Stat.	**Prob.**	**t-Stat.**	**Prob.**	**t-Stat.**	**Prob.**	**t-Stat.**	**Prob.**
		-3.72	0.0058	-7.20	0.0000	-4.28	0.0010	-3.28	0.0197
Test critical values	1%	-3.53		-3.53		-3.53		-3.53	
	5%	-2.90*		-2.90*		-2.90*		-2.90*	
	10%	-2.59		-2.59		-2.59		-2.59	

Note: *Significant at the 5%

The reverse roots of the AR characteristic polynomial were studied to figure out whether the model exhibits a static structure or not. Results are shown in Figure 1. As can be seen from the Figure 1 and Table 5 below, the variables used in the model are stationary since all points are inside the circle (Modulus values are less than 1). No root lies outside the unit circle.

Figure 1: Inverse roots of AR characteristic polynomial

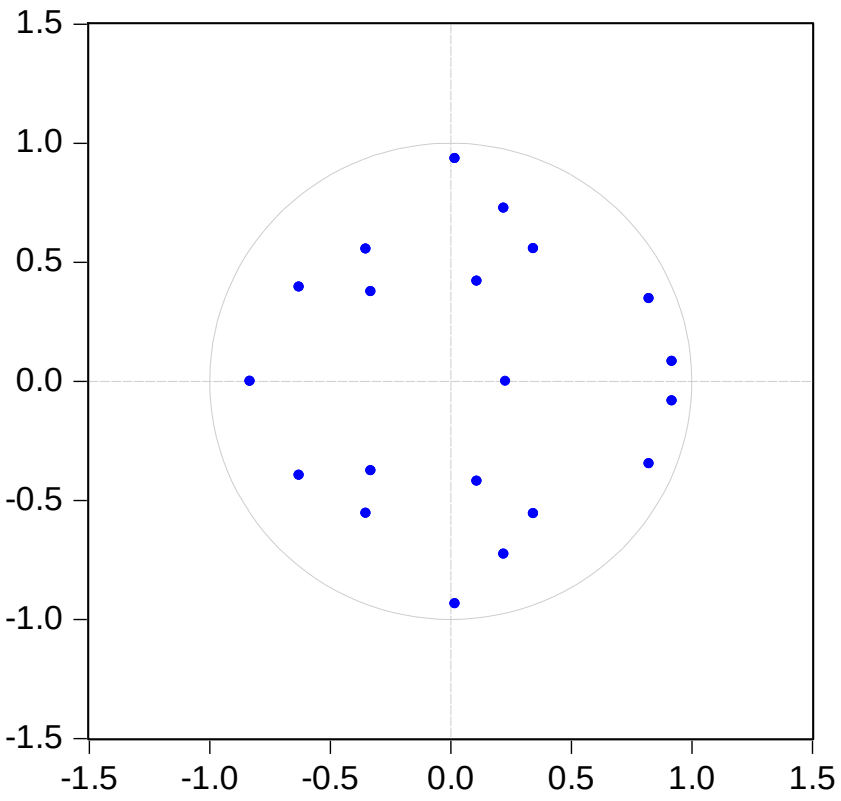


Table 5: Roots of the characteristic polynomial

Root	Modulus	Root	Modulus
0.017753 + 0.934824i	0.934993	-0.628247 + 0.394573i	0.741878
0.017753 - 0.934824i	0.934993	-0.351133 + 0.555471i	0.657147
0.919218 + 0.083254i	0.922981	-0.351133 -0.555471i	0.657147
0.919218 - 0.083254i	0.922981	0.344528 0.555870i	0.653981
0.823979 + 0.346350i	0.893811	0.344528 -0.555870i	0.653981
0.823979 - 0.346350i	0.893811	-0.329988 + 0.375974i	0.500249
-0.831650	0.831650	-0.329988 -0.375974i	0.500249
0.220774 - 0.725846i	0.758678	0.108744 +0.420218i	0.434061
0.220774 + 0.725846i	0.758678	0.108744 - 0.420218i	0.434061
-0.628247 - 0.394573i	0.741878	0.228135	0.22813

Autocorrelation-LM Test

Before Granger Causality Test the LM test was conducted to research for autocorrelation problem in the model. Autocorrelation indicates that there is a relationship between the error terms. In the case of autocorrelation, the least squares estimators of the parameters are unbiased and consistent, and it is concluded that they are not effective. The probability of an insignificant coefficient being significant increases. As a result, t and F tests lose their reliability and cause statistically incorrect results (Yavuz, 2009:126). The test results are shown in Table 6. No autocorrelation problem was detected at the 5% significance level in the model with lag length as 5.

Table 6: Autocorrelation-LM test

Lags	LM-Stat	Prob
1	13.26297	0.6534
2	30.18694	0.0171
3	19.19836	0.2585
4	21.95029	0.1448
5	9.152099	0.9070
6	10.38935	0.8455
Probs from chi-square with 16 df.		

Granger Causality Results

Among the Pairwise Granger Causality results (Table 7), the Prob (probability) value of the hypothesis "SSCORE is not the Granger Cause of FDI" is 3.32% and the hypothesis is rejected. There is a causality relationship from SSCORE to FDI. The other hypothesis "FDI is not the Granger Cause of SSCORE" is accepted since the probability value is 87.73% which is above the confidence interval of 5%. The test result shows the existence of a unidirectional causality from SSCORE to FDI. The test results indicate that there is no other Granger causality relationship between the variables, except for RSCI to CUR. There is a statistically significant link between RSCI and the CUR. It can be concluded that the positive trend in RSCI affects CUR due to the confidence in the banking sector.

Table 7: Pairwise Granger causality tests

Null Hypothesis	F-Statistics	Prob.
FDI does not Granger Cause SSCORE	0.35417	0.8773
SSCORE does not Granger Cause FDI	***2.64577***	***0.0332****
RSCI does not Granger Cause SSCORE	1.72062	0.1463
SSCORE does not Granger Cause RSCI	0.46165	0.8029
CUR does not Granger Cause SSCORE	1.07201	0.3866
SSCORE does not Granger Cause CUR	0.17850	0.9695
RSCI does not Granger Cause FDI	1.83299	0.1226
FDI does not Granger Cause RSCI	0.62869	0.6786
CUR does not Granger Cause FDI	1.49963	0.2060
FDI does not Granger Cause CUR	0.50531	0.7709
CUR does not Granger Cause RSCI	6.70768	7.E-05
RSCI does not Granger Cause CUR	***6.02510***	***0.0002****

*= donates rejection of null hypothesis at the 0.05 significance level

In the literature, there are studies indicating that FDI is especially important for developing countries. For example, Çinko (2009, p.123-125) evaluates the main macroeconomic effects of FDI in terms of balance of payments, national production, growth and employment. While stating that the contribution of FDI to the macroeconomy in developing countries is positive, Çinko emphasizes that there are also studies that reach negative results in microeconomic terms. In his study, Mensah (2018, p.62) concluded that FDI for African countries does not have a significant impact on the growth rates of countries in the short run, but has significant positive effects on economic growth in the long run. In his thesis on South East Asian Countries,

Khatir (2023, p.163) concludes that FDI has a positive impact on economic growth in the region and outlines the considerations for governments and policy makers to attract FDI,

- The existence of a set of regulatory rules that are both predictable and non-discriminatory,
- A stable macroeconomic environment,

Abundant and easily accessible resources, necessary infrastructure and human capital

Alagöz at al. (2008, p.79-80) state that there is no complete consensus among the studies examining the effects of FDI on economic growth, but the dominant view is that there is a close and parallel relationship between them. On the other hand, Alagöz et al. emphasizes that the results of the studies on the effects of FDI on growth indicate that developing countries should prepare an appropriate-supportive investment environment and reach a minimum level of development in order for the enhancing effects of FDI on growth to emerge.

Kurtaran (2007, p.367) also considers FDI as a necessary and important factor for the realization of economic growth and development objectives worldwide. In the case of foreign direct investment, the investing firm enters into a long-term relationship with the investing country and, in addition to capital, often brings other opportunities such as new technology, new management techniques, job creation and new channels of access to world markets to the host countries that receive them.

Baliamoune-Lutz (2004, p.54), in his study on Morocco, states that the empirical results provide evidence of the positive effects of FDI on economic growth and that these results also support the bidirectional causality between FDI and exports and the positive effect from exports to economic growth, thus FDI has direct and indirect effects on growth. He states that it is reasonable to assume that economic growth is a necessary, though not sufficient, condition for poverty reduction.

On the other hand, Türkiye has also enacted laws to encourage foreign capital and foreign direct investments. The subject of the Law No. 6224 on the Encouragement of Foreign Capital, which entered into force in Türkiye in 1954, is defined in Article 1 of the Law as follows;

"This law provides that the investee undertaking:

a) Being beneficial for the economic development of the country,
b) Working in a field of activity open to Turkish private enterprises,
c) Does not constitute an exclusive or special privilege,

It shall be applied to foreign capital to be imported into Türkiye and to foreign loans to be made from abroad, subject to the decision of the Foreign Capital Promotion Committee and the approval of the Executive Board of Deputies...”

as “Foreign Direct Investment”. Law No. 6224 was repealed by the Foreign Direct Investment Law No. 4875, which entered into force in 2003. Article 1 of Law No. 4875 titled “Purpose” states “encouraging foreign direct investments”. As can be seen, in our legislation, foreign capital/foreign direct investment is encouraged with the idea that it will be beneficial for the country.

CONCLUSION

This article analyzes the results of the regulatory and supervisory activities of the Banking Regulation and Supervision Agency, an independent administrative authority, in the context of the Public Interest Theory, one of the economic regulation theories. The analysis made by using the Bankometer Score (S-Score), a discriminant analysis method, covers different elements/items for the period 1989-2023. In the studies conducted for the total sector, the S-Score used in the calculation

- Tier 1 capital,
- Equity,
- Total assets,
- Non-performing loans,
- Total credits,
- Interest revenues,
- Interest expenses,
- Capital adequacy ratio

Data for the period 1989-2023 were obtained from the BRSA's “banking sector data” starting from 2002, while the data required before 2002 were obtained by using the “statistical reports” under the “Bank and Sector Information” heading of the Banks Association of Türkiye and the “TBB Data System”.

In the calculation of the S-Score for the period 1989-2023 for the Turkish banking sector on the basis of the total sector (Sector) and sub-segments of deposit-taking banks (Total Deposit Banks, Public Deposit Banks, Private Deposit Banks, Foreign Deposit Banks), it was observed that for the period 1989-2000 before the BRSA, the S-Score for the sector as a whole and for the deposit-taking segments generally showed a steady deterioration trend over the years. The worst scores for the Sector and Total Deposit Banks were

reached in 1999 with 10.65 and 9.37, while the Public Deposit Banks hit the bottom with 8.58 and the S-Score for the Sector and Public Deposit Banks were realized as 13.32 and 11.79 by the end of 2000. When the table is considered as a whole, it is seen that the solvency of banks in the categories for which S-Scores are calculated, which are completely dominated by the color red, is extremely weak.

Based on year-end figures, similar calculations have been made since 2001, after the BRSA became operational in 2000, and S-Score results on a sectoral basis have been much better than before 2000. Only in 2013, the solvency of public deposit banks was found to be weak (48.33), whereas the solvency of the sector in terms of sub-segments was found to be adequate, especially in the first 6-year period following the BRSA's inauguration. Until 2018, the score tended to decline in each category without reaching the dangerous limit and from this year onwards, it has been on a steady upward trend in each category, except for Public Deposit Banks. In 2020, due to the Corona Virus pandemic, the measures taken by the BRSA for the banking sector to mitigate the possible problems that the sector may experience in the pandemic are thought to have made positive contributions to the S-Score in this process.

In conclusion, as can be seen from the S-Scores calculated for the periods before 2000, when the BRSA became operational, S-Scores were quite problematic and banks had serious problems in terms of their ability to pay their debts and meet their commitments. In addition to the banks that were liquidated from the system, the scores indicating problems for the banks that have continued their existence until today have improved in the 2000s. From 1999 until 2002, the fact that the problematic banks that were excluded from the banking sector were no longer in the system contributed positively to the Bankometer Score. Moreover, the Restructuring Program implemented by the BRSA in the early 2000s is considered to be one of the important factors contributing to this improvement, especially in the post-crisis period of 2001-2002. It is concluded that the BRSA's supervisory activities in the following years and the intensive regulatory activities in 2006, especially after the enactment of Law No. 5411 in November 2005, were very important for the Turkish banking sector to regain its health and for the financial sector to continue its activities in confidence, and therefore, the BRSA's activities are in line with the Public Interest Theory in terms of their results.

The test results in the context of Granger Causality analysis show the existence of a statistical relationship from S-Score to FDI, and based on these findings, it is concluded that the soundness of the banking sector in the country has an impact on FDI inflows to the country. The existence of the Granger Causality relationship between S-Score and FDI and the BRSA's determinant contribution to S-Score

(through to regulations and supervisions) suggest that the BRSA's activities are in line with the Public Interest Theory, one of the theories of regulation.

The difference of the research lies in its combination of methodologies, Bankometer and Granger Causality Test, and specific application to the Turkish financial sector, particularly focusing on the banking sector and the BRSA. There is no research on the Bankometer Score used to measure solvency in studies evaluating regulatory effectiveness and consolidated banking sector data, but there are numerous studies, both international and local, in the literature on individual performance of banks. This research adds a quantitative dimension to the evaluation of the performance of the BRSA, despite the subjectivity and difficulty in measuring the concept of public interest quantitatively. This offers a different view on how the practices of a regulatory authority in Türkiye align with theoretical expectations, namely the public interest theory.

AUTHOR STATEMENT

Researchers have jointly contributed to the article. Researchers have not declared any conflict of interest.

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