

The Determinants of Loan Approval in The Turkish Banking Sector: A Study of Turkish Commercial Banks

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ABSTRACT: The purpose of this paper was to examine and evaluate the effectiveness of the central tendency of the lending behavior of commercial banks and the variables that affects the lending behavior of commercial banks in Turkey. Five variables influencing bank lending activity has been selected and analyzed. The panel FMOLS and DOLS and the Demiterscu and Hurlin causality are used for fifteen commercial banks in Turkey from 1996-2017. The analysis suggested that credit risk has a negative impact on loans; this means that an increase in credit risk will decline the lending behavior of banks. Likewise, both economic growth and monetary policy rate have negative consequences on lending. Thus, an increase in both GDP and interest rate decreases the bank lending, this suggests that the transmission mechanism of the central bank of Turkey is effective in increase the lending rate of banks. The negative relationship between monetary policy rate and bank lending can be attributed to the proper monetary transmission effect. Contrarily, capital adequacy and non-performing loans are positively connected to lending. Thus, an increase in both will increase the lending behavior of the banks by 1.33% and 0.65% respectively. In summary, all the selected explanatory variables are determinants of lending behavior of banks in Turkey.

Keywords: loans and advances, credit risk, monetary policy rate, non-performing loans, GDP, FMOLS, DOLS, DH causality, Turkey

1. Introduction

In all civilizations and communities, dating back before the origination of prosperity, there have perpetually been those possessing capital exceeding their pressing necessities, surplus economic entities, or whose current holdings would not finance their economic undertakings, deficit economic entities. Acknowledgment by the surplus economic entities that their excess could be utilized fruitfully to bridge the shortfalls confronted by deficit economic entities catalyzed the advent of a financial framework. This configuration was initially instituted through direct lending between providers (surplus entities) and borrowers (deficit entities) rather than borrowers exploring individually instead of engaging directly with providers. Associated financing (Hassan et al., 2016). Indirect financing materialized through banks garnering deposits from various individuals, administrations, and enterprises to provide loans to deficit entities; reimbursement of the loan is imparted to the lender who can also refund withdrawals to the surplus entity. Loans, Banks provide a range of services, including short-term, medium-term, and long-term loans, to their customers. Essentially, banks extend loans and advances to individuals, emerging enterprises, and governments, with the intention of encouraging investment and growth. This action not only supports the expansion of businesses but also plays a role in the overall economic advancement of a nation. Therefore, through their lending activities, banks contribute to economic growth by supplying capital for tangible investments (Güls & Kara, 2019)"

According to Maria et al. (2020), "lending constitutes the undeniable essence of the banking sector. Managing this aspect demands considerable skill and adaptability from bank management. While a bank is obligated to pay interest on deposits garnered from diverse origins, effectively identifying viable opportunities for utilizing deposit funds to generate reasonable returns, all while maintaining liquidity and stability, demands a strategic approach. Banks hold paramount significance in allocating capital, facilitating production, and managing financial resources."

Accordingly, particular functions render banks an indispensable force for economic expansion and progress. In executing their duties, it should be recognized that banks have the capability, scope, and aptitude to mobilize and channel financial capital toward investment expenditures. Therefore, notwithstanding the wellsprings of income generation or a state's fiscal policies, commercial banks will be implicated in furnishing loans and advances to their diverse patrons, while adhering to the three tenets governing their operations: profitability, liquidity, and solvency. That being so, the decision of commercial banks to provide loans is influenced by various elements, such as the amount of deposits, interest percentages, cash reserve stipulations, and liquidity proportions, among others (Vinh, 2018).

Moreover, the banking industry constitutes a pivotal element of the financial framework in developing areas, assisting to spur capital accrual and economic proceedings. This can be accomplished through efficacious financial securitization. Banks garner capital from surplus investment entities to diminish financial expenses. Banks frequently

transform liquid holdings such as deposits into illiquid assets including loans (No et al., 2017). This world changing mechanism of bank operation is best affected by a range of variables, namely macroeconomic, banking industry-level dynamics (Journal & Cucinelli, 2015). As Ç, (2020) asserts, "credit represents the predominant source of income for individual banks. This clarifies the substantial efforts invested by banks in forecasting, overseeing, and managing creditworthiness. This inherently has a significant influence on banks' lending operations, given the considerable resources involved". Sarpong-kumankoma & Osei (2020) Despite examining variables that affect interest percentages, lending volumes, and collateral thresholds in bank loan determinations, it dictates: banks must be prudent with their lending pricing choices, as banks could not furnish loan rates that are excessively low since interest proceeds would be inadequate to defray deposit expenses and general overheads.

Moreover, charging excessively lofty loan rates can also engender adverse selection and moral hazard for borrowers. Investigation is crucial since banks in Turkey must also discern the determinants of lending operations to administer their substantial loan and advance holdings. To uphold their cardinal objectives of liquidity, profitability, and solvency, lending must be regulated effectively and banks should behave to attract and retain prospective patrons. This research aimed to furnish perspicacity into optimal practice and conduct in lending.

As far as the researcher is aware, there has been no empirical examination of the factors influencing lending behavior in Turkish commercial banks. This study aims to assess the relevance of commonly acknowledged determinants of commercial bank lending and their impact on lending practices in Turkey.

2. Literature review

2.1 Overview

This chapter explores the relationship banking theory that can be applied to long-term lending decisions by banks and the empiric analysis of long-term lending literature. The variables in study have been checked and a conceptual structure has been developed for the linking of the research variables.

2.2 Theoretical Basis

There are several ideas that have already been presented in the field of credit evaluation and management by various authors. The thesis identifies four theories: the theory of the portfolio of credit risk management, the theory of loan pricing and the theory of the delegated monitoring of borrowers.

2.2.1 Theory of Delegated Monitoring of Borrowers

The surveillance of borrowers by financial institutions pertains to the gathering of data throughout the loan assessment phase and the subsequent delivery of credit. The process include the verification of the borrower's adherence to the lending conditions set forth by the bank, the assessment of the borrower's creditworthiness, and the implementation of post-deal supervision measures to ensure compliance with all agreements. When banks manage customer transaction accounts, they seem to possess exclusive information regarding cash flows and expenses. The aforementioned exclusive information proves advantageous for small and medium-sized enterprises (Okay, 2020). The banking sector's financial productivity has been emphasized as a necessary condition for economic progress.

This elucidates the reason behind the significant emphasis placed on ongoing research in this domain. The change in the banking sector is characterized by intense rivalry. Local banking has entered a new era of competition due to technological progress and financial reform. Major banks have expanded their operations to be competitive with this rising trend (Fulford, 2015). Subsequently, the banking sector has witnessed technological progress that presents a diverse range of prospects for the development of novel non-conventional banking offerings and the augmentation of their distribution channels, including the Internet and mobile financial services. This phenomenon has resulted in a reduction in the allocation of resources towards branch facilities.

2.2.2 Portfolio Theory to Credit Risk Management

The Current Portfolio Theory (MPT) has been used effectively by commercial banks to market credit management risk from the 1980s onwards. In controlling their market risk exposure and the interest rate paid, most commercial banks have adopted Value at Risk (VAR) models. Unfortunately, considering the listing of credit risk by banks as their key obstacle, the practicality of current credit risk portfolio theory has trailed (Sefer et al., 2014).

Commercial banks understand the effect that credit concentration can have on their financial performance, which can be detrimental if not well handled. It has prompted the majority of commercial

banks to apply quantitative methods to credit risk measurement, but accurate data has been the key obstacle to this.

Major steps have also been taken by the banking industry to establish methods that can be used in assessing credit risk. In an attempt to effectively pass risk that they do not want to bear while at the same time safeguarding consumer relationships, banks have also resorted to credit derivatives. Thus, the progress that has been made in credit risk management over the past few years in a portfolio sense has accelerated these two emerging problems.

Banks initially employed the asset-by-asset approach as the prevailing method for managing credit risk. The methodology employed in this study encompassed the periodic assessment of the loan book's quality and other credit exposures, the utilization of credit risk ratings, and a comprehensive examination of the findings to quantify the possible losses associated with the loan portfolio. Based on a comprehensive credit investigation and the bank's pre-existing credit risk rating system, the investment strategy is founded. The utilization of credit risk assessment methods and regular credit reviews enables management to promptly detect any changes in the portfolio. The management may make adjustments to its portfolio strategy or improve loan monitoring within a reasonable timeframe, based on the outcomes of the organization's challenges in loan identification, credit risk rating system, and loan analysis.

One significant limitation of the asset-by-asset technique is its inability to provide a comprehensive assessment of the credit risk portfolio. In this context, the term "risk" pertains to the likelihood that the actual losses incurred would exceed the expected losses. An inherent limitation of the asset-by-asset strategy is its incapacity to precisely identify and measure concentration risk. Systemic risk refers to the elevated level of risk that emerges as a result of heightened exposure to a singular lender, affiliated lenders, or a particular sector. Commercial banks enhance this technique by incorporating a quantitative evaluation of their credit portfolio through the utilization of diverse credit models.

2.3 Previous Study

Loan is the provision of money (loan) from one party to another. The responsible party does not automatically repay the first party by creating a loan, and rather orchestrates either to reimburse or defer those assets at a later date. Banks operate as commercial banks, aggregating capital from savers in the form of deposits, and then offering loans to customers. Both banks and borrowers benefit from these roles.

"An essential element of any commercial bank's operation is extending credit to businesses. Banks accumulate funds from surplus capital holders and lend it to those in need for diverse purposes. This intermediary function of banks thus holds a crucial position in economic operations. In their analysis focused on the U.S. employing a corporate development model, Athavale et al. (undated) categorized multiple theories concerning bank functions. The initial theory ascribes to banks a distinct role in addressing information asymmetry, allowing the financial system to tackle it through borrower screening, contractual agreements, and monitoring. The second monetary theory attributes bank a distinctive function in money generation and the transmission of fiscal policies; banks have demonstrated both capacity and willingness to offer loans"

"Banks' readiness to lend is contingent upon the attractiveness of projects and the credibility of borrowers, while their ability to provide loans is contingent upon the sufficiency of bank resources and the prevailing monetary policy. Financial establishments amass deposits from customers and utilize these resources to offer loans to different clients or invest in assets with the potential to yield returns surpassing depositor investments (McCarthy et al., 2010). It implies customer deposits are the primary loan source for banks, so increasing deposits directly boosts lending. The cardinal profit-generating function of commercial banks is furnishing loans to patrons.

When distributing resources to the lending portfolio, the central objective of banking is to generate profits while meeting the aggregate credit needs (Reed and Gill, 1989)"

"Lending forms the industry's nucleus. Loans constitute the primary asset, making up 50-75 percent of the overall amount in the majority of banks, generating the major portion of operational earnings, and showcasing elevated risk exposure for banks (Cioran, 2014). Bacha et al. (2014) addressed the utility of commercial banks after evaluating various performance assessment approaches and risks in Romania. The bank is the center of credit for every country's economy. In turn, credit was found to be the mechanism catalyzing the financial flows determining a country's growth and economic progress. Consequently, any efficiencies in financial institutions' operations have distinct ramifications for a country's economy

holistically. Loans constitute the primary asset of financial institutions. McCarthy et al. (2010) discerned that the primary asset for a significant portion of the ten largest U.S. banks during 2007 and 2008 was loans, closely followed by investments. The core focus of their study predominantly dwelt on evaluating the magnitude and distribution of investments and loans among these top ten banks. Additionally, they presented evidence demonstrating how bank bailouts and the financial crisis could exert transformative effects on the 2009 crisis's eventual ramifications”

“Baran and Smiljanic (2008) utilized survey methodologies to investigate the effects of tight monetary policy and bank financing on the activities of small and medium-sized enterprises (SMEs) and large corporations in Croatia. This research found that currency devaluation substantially influenced the monetary strategies of commercial banks towards both SMEs and large corporations. As indicated by the study, the impact on small and medium-sized enterprises was more conspicuous compared to larger corporations. The inference drawn from the preceding analysis is that monetary policy, especially when contracted, has a greater effect on banks with lower levels of liquidity. Reducing the availability of loans indirectly affects the return on bonds and impacts larger, medium and smaller businesses. In assessing the impacts of liquidity limitations on U.S. banks, Webb (2000) proposed that in a financial environment where companies are primarily funded through bank loans, banks themselves largely depend on demand deposits. This interconnection might result in a situation where the demand for liquidity from depositors leads to a scenario where a bank, encountering a cash deficit, becomes unable to extend loans to other financial entities.”

Within this paper, Webb (2000) indicated that the challenge of bank liquidity was somewhat mitigated by deposit shortages. The analysis did not investigate deposit insurance as a solution. Similarly, Cadet (2009) explored the correlation between monetary policy and vulnerabilities in the banking sector of developing economies, employing a model that seeks to maximize benefits.

“Cadet (2009) identified that government bonds, serving as an alternative revenue avenue in developing nations, exacerbated bank insolvency under the influence of tight monetary policies. Heightened interest rates directly intensified the prevalence of asymmetrical information. To counteract this informational hurdle, a proficient bank should accordingly curtail its lending portfolio. Building upon this foundation, Cadet (2009) advised central bank authorities to exercise caution in their endeavors to strengthen contractionary policies (leading to bank failures). Financial systems compelled to enhance market-based pricing mechanisms might weaken the banking sector if interest rate hikes are not judiciously calibrated (Cadet, 2009). When monetary policy takes on a restrictive stance, banks must curtail or even halt fresh lending activities due to diminishing reserves, which correspondingly affects deposits. Primarily, the origin of loans is rooted in depositor funds. As deposits decline, their fungibility with alternative financing options like bond issuance, equity sales, and certificates of deposit is hampered by credit market inefficiencies. Conversely, there exist contrasting viewpoints that assert the impact of contractionary policy might not significantly alter reserves and consequently, lending. An investigation conducted in the United States by Oliner and Rudebusch (1996), employing the analytical approach of Kashyap, Stein, and Wilcox (KSW) (1993), demonstrated that monetary contractions did not substantially curtail the availability of bank loans relative to non-bank lending supply. Ultimately, they concluded that a tenuous connection existed between policies aimed at reducing bank reserves and their consequential influence on bank lending”

Banks use other sources such as shares, equity and CDs to solve liquidity issues. Matz (2010) clarified that holding highly marketable securities is a hedge that can be used when liquidity issues arise before other reserves of liquidity have been reached. The whole argument posed in the paragraphs above is from the point of view of the lender (banker). If one sees the problem on the part of the borrowers, businesses should brace themselves when the monetary policy of the borrowers is stringent.

Cumming and Nel (2005) utilizing a pattern analysis examined lending activity preliminary findings on the prospective impact of Basel III in Europe. This research evinces that introducing the 1988 Basel Accord augmented the capital adequacy ratio by raising supplementary capital to offset the advent of the international agreement, which would constrain bank lending and contribute to economic recession. They assessed bank loan supply fluctuations by segmenting banks by asset size and U.S. capital coverage ratio employing a bank model. Isiksal et al. (2019) argued that the dimensions of a bank's assets and its capital reserves played a role in determining its ability to secure funding and sustain credit expansion during periods of contractionary policy. An examination carried out in Austria, focused on the influence of fiscal

policy modifications on bank lending through modeling, revealed that the most modest average bank size demonstrated the most pronounced lending reaction in response to changes in interest rates.

“Further investigation conducted by (Basurto & Ghosh, 2001) in the United States concerning shifts in bank supply revealed that newly established banks are notably responsive to fiscal policy. In contrast, substantial time deposits at small banks display minimal sensitivity to policy changes. This reinforced their assertion that smaller banks struggled to seek alternative avenues for loan financing during periods of contractionary policy. The evaluation of bank well-being involves an assessment of financial performance and the prevalence of non-performing loans (NPLs). As a result, banks facing capital adequacy challenges and elevated NPL rates experience a reduction in their lending activities. Fukunaga et al. (2019) delved into the consequences of weakened financial conditions of banks in Japan and demonstrated that there existed a reciprocal relationship between regulatory capital adequacy and the ratios of non-performing loans, both of which exerted an influence on lending activities.”

“The objective of the research was to examine the elements that influence the lending conduct of Nigerian commercial banks and how these factors subsequently impact their lending practices. The adopted framework involved the evaluation of Nigerian Commercial Banks' Loan Advance (LOA) in conjunction with various other determinants or variables, including deposit volume (Vd), investment portfolio (Ip), interest rate (Ir), cash reserve requirement ratio (Rr), and liquidity ratio (Lr) within the timeframe from 1980 to 2005. The model presumed a structural link between the dependent variable and the established relationships among the independent variables. Through regression analysis, the model exhibited significance, and its estimations aligned with expectations, revealing that commercial bank deposits wielded the most substantial influence on their lending behaviors.”

“The study conducted by Semuel & Nurina (2015) examines the factors that influence the lending activity of commercial banks in Nigeria. It is a cointegration study that covers the period from 1975 to 2010. This study employs secondary data and employs a range of econometric methodologies to examine the enduring association between Commercial Banks and their lending activities during the duration of the research. Furthermore, this study examines the extent of loan advances made by commercial banks in Nigeria and analyzes the many factors that influence the lending behavior of Nigerian commercial banks. In addition, the utilized framework computed the Loan and Advance (LOA) of Nigerian Commercial Banks, taking into account various determining factors such as Deposit Volume (Vd), annual exchange rate of the Naira to the Dollar (Fx) over a period of thirty-seven (37) years, Investment Portfolio (Ip), Interest rate (lending rate) (Ir), Gross Domestic Product at current market price (Gdp), and Cash Reserve Requirement Rate (CRR) over the same time frame. Hence, the findings of the model demonstrate a statistically significant association between loan and advance and gross domestic product at market price, annual total exchange rate from naira to dollar, and cash reserve requirement ratio. However, it is important to note that the investment portfolio and interest rate (lending rate) exhibit a negative correlation. The results of the study also revealed a significant and enduring correlation between Loan and Advance and all dependent variables included in the model. This suggests that commercial banks exert a considerable influence on their lending practices”

“In their empirical study, Nguyen et al. (2017) investigated the various factors that impact bank lending to firms in the face of diverse financial environments and increasing global problems. This study examines the relationship between bank credit growth towards the private sector and various factors that influence bank credit behavior. The dependent variable is the growth of foreign liabilities, domestic deposit growth, money market rate, M2 as a fraction of GDP, actual economic growth, inflation, and exchange rate. This analysis focuses mostly on the supply element and utilizes the ARDL econometric method. It analyzes annual data from 1971 to 2008 for Pakistan. The findings of the study reveal that foreign liabilities, domestic deposits, economic growth, and exchange rate exert a major impact on domestic lending in Pakistan, particularly over an extended period of time. Additionally, economic development is found to have a substantial influence on domestic lending in the country. The impact of inflation rate and money market rate on private credit is negligible.

Furthermore, in the short term, the influence of domestic deposits on private credit is negligible. This could be attributed to the fact that banks don't immediately extend loans from the currently deposited funds by their customers. The findings also suggest that the financial stability and profitability of banks significantly and fundamentally contribute to the lending mechanism.”

“A positive economic environment measured by GDP, acting as a catalyst for banks, holds a consistent and significant influence in facilitating increased private credit allocation to businesses. The outcomes also suggest that the enduring connection remains robust, and any brief imbalances would be transitory, rectifying themselves over time with a rapid annual rate of 53.5 percent. Notably, this study does not establish a statistical distinction between bank credit patterns in the pre-financial reform era (1971-1989) and the financial reform period (1990-2008) in Pakistan.”

2.3.1 Gaps in Earlier Study

In consistent with the theory and empirical analysis alluded to above, lending activity is essential to the banking industry, Undoubtedly, lending stands at the core of banking operations, and this study reaffirmed its susceptibility to a myriad of influences, encompassing both bank-specific and macroeconomic factors. While delving into the determinants of lending behavior among Turkish commercial banks, the research primarily focused on select bank-specific and macroeconomic variables.

This comprehensive analysis primarily concentrated on the banking sector in developing countries, whereas research in developed countries has been more extensively explored. However, the existing literature on this specific research topic remains relatively scarce.

To the best of the researchers' awareness, there has been a lack of empirical investigations concerning the determinants of commercial bank lending behavior in Turkey. Previous studies in this domain have predominantly focused on performance aspects, with a notable dearth of exploration into the underlying determinants.

“Given the expansion of the banking sector through new bank establishments and the absence of a vibrant secondary stock market within the nation, it becomes essential to clarify the key factors steering bank lending behavior through an empirical investigation of established banks. Consequently, this research addresses this void by placing heightened focus on the concrete determinants as well as macroeconomic elements that shape the lending practices of Turkish commercial banks.”

2.4 Conceptual Framework

This framework demonstrates the link between the two researches variables involved in this research. It is categorized in the theory of money supply. Seven & Yetkiner (2016) indicates that the level of the budget deficit is essentially determined by the requirements for the reserve ratio, additional capital (volume of deposits) and interest rates. These determinants, taken together can decide the potential of supportable funds.

3. Statement of Research problem

Financial institutions appear to be the most critical funding, allocation, and circulation entities for financial capital. Consequently, these functions render them an indispensable entity for economic advancement and expansion. In fulfilling this function, it's important to recognize that banks possess the ability, scope, and potential to gather financial assets and direct them towards direct investments (Hassan et al., 2016).

The contemporary banking industry is so susceptible that an increasing proportion of its income (earnings) is derived from purveying credit (loans) to its patrons (Jermias & Yigit, 2019). This mechanism of credit genesis renders banks susceptible to heightened credit risk, which can engender deficits. Hence, in the absence of cognizance regarding the determinants of lending comportment, satisfactory bank returns or remuneration would be unthinkable.

Commercial bank credit provision to enterprises and non-banking financial establishments has frequently fulfilled a salient and crucial function in the economy. Such loans furnish individuals and corporations occasion to augment and enhance their ventures, which successively can increase output and employment.

Augmented output and employment can engender enhancement in prosperity for a nation or locality. Though numerous additional variables may catalyze accretion in welfare, commercial bank lending constitutes one of the most salient catalyzers of expansion. One archetypal impactful commercial bank credit extension is mortgage finance, which assists individuals in purchasing residential property by furnishing loans, in exchange for which they must remit interest on the imparted mortgage. Nevertheless, there will perpetually subsist a possibility of default from the debtors.

The economic crisis that blitzed the world in 2007 exemplifies how mismanaged lending can have catastrophic repercussions. The financial debacle engendered by mortgage loans in the United States reverberated across banks globally, with devastating effects on international economies. The fallout of the crisis has engendered vigilance among banks, rendering them extremely circumspect about dispensing credit. For instance, in the United States, lenders ostensibly possess adequate capital to furnish loans yet appear reluctant to do so. The incapacity or unwillingness of commercial banks to tender credit would thus adversely impact production and employment in a given nation or region, hampering development and progress. This realization of the value of commercial bank lending to locales and countries catalyzes the aims of this study.

Accordingly, irrespective of the provenances of income creation or a state's fiscal policies, commercial banks will be entangled in purveying loans and advances to their diverse patrons, while adhering to the three tenets regulating their activities: profitability, liquidity, and solvency.

However, the decision of commercial banks to provide loans is influenced by a variety of factors, encompassing deposit amounts, levels of both domestic and foreign investments, interest rates, mandatory cash reserves, and liquidity ratios, to mention just a few (Apak & Atay, 2014).

In addition, the banking sector is a vital financial intermediary in developing nations capable of promoting wealth creation and economic processes. This can be done by effective financial intermediaries. Banks raise funds through surplus investment classes to reduce financial costs. Banks often turn liquid assets including deposits into risky investments such as loans (Kara, 2016). This transformational phase of bank operation is best affected by a number of variables, such as macroeconomic, bank level and specific industry attributes (Gunes & Yildirim, 2016).

The fundamental role of financial institutions is centered around providing loans to customers. In allocating resources for the lending portfolio, the primary aim of bank management is to generate revenue while simultaneously meeting the credit requirements of their customers (Maria et al., 2020). At the core of the banking sector lies the extension of credit. Loans form the core offering, typically constituting 50-75 percent of total volumes in most banks, driving the majority of operational earnings and presenting heightened risk exposure for banks (Mkhaiber & Werner, 2021).

Commercial banks' provision of credit has played a central role in stimulating industrialization across economies, facilitating the mobilization of capital that drives economic progress. These well-operating banks also propel technological advancement by identifying and supporting entrepreneurs with higher prospects of successfully pioneering innovative products and manufacturing methods. However, the effectiveness of public policies aimed at regulating banking activities is influenced by the prudent and effective functioning of commercial banks. This mandates a tightly controlled interest rate framework, directed lending, obligatory reserve criteria, and supervision of liquidity management practices; often, the bank's available cash directly impacts its ability to offer loans.

Since, in many instances, checks have to be paid in cash, they can store a sufficient amount of cash to satisfy customer demand (Vinh, 2018).

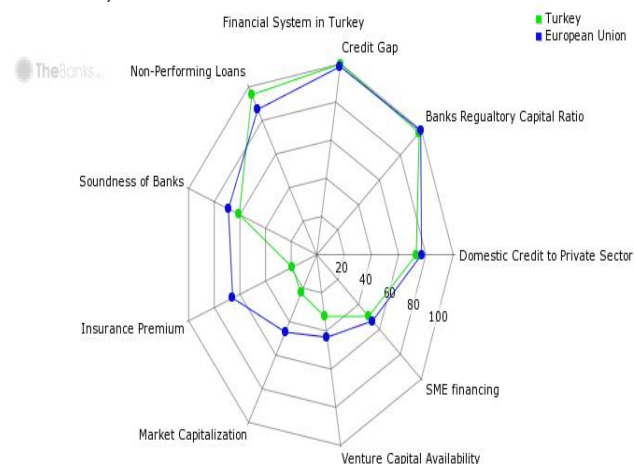


Figure 1: Financial Development in Turkey: Source Wef

4. Methodology

4.1 Research Approach

“To accomplish the overarching objective of the analysis and explore research inquiries while building theories, quantitative methodologies have been employed. As asserted by Loose (1993), the quantitative (deductive) analysis entails the establishment of a theoretical and conceptual framework before empirical investigation. Traditionally, deductive or quantitative analysis initiates with a literature survey to pinpoint a specific issue or gap in information, resulting in the formulation of primary research queries where current understanding might be inadequate (recognizing variations amidst existing hypotheses or facts, addressing contradictions, or identifying new scenarios for prior research applications) (Sutrisna, 2009). The objective of utilizing the quantitative approach in this study is to expand on earlier findings within the Turkish context. Creswell (2009) identified two primary survey methods commonly employed in quantitative approaches: surveys and experimental techniques”

“In this investigation, the research approach chosen was the quantitative technique of utilizing surveys. As per Fowler (1984, p. 12, Yesegat, 2009), the survey method's advantages are rooted in its widespread use, particularly in employing statistical sampling, consistent data interpretation, and the capacity to amass information that might not be conveniently accessible elsewhere or in the necessary format for analysis. The author's intention in utilizing qualitative research is to generalize the findings of the study to a larger population through an impartial approach.”

“The data collected, primarily through samples taken from a subset of the overall population, enables researchers to draw generalizations and draw conclusions. The findings are subjected to analysis to determine the probability of replicating the survey results in the broader population. Conclusions are derived based on the data obtained and the steps involved in statistical research (Maria et al., 2020). The primary objective is to quantitatively assess the causal relationship between variables within a value-neutral context (Ibicioglu & Kapusuzoglu, 2012). Through this analysis, a causality relationship was established to examine the connection between loan and advance and the primary business-specific and macroeconomic factors influencing lending activity among commercial banks in Turkey. This approach successfully substantiates the underlying idea within the Turkish context”

4.2 Data Collection

Only secondary data were used in the analysis. Conducting effective data collection tools can allow researchers to incorporate strengths and to adjust some of the inadequacies of any data source in order to reduce the possibility of an insignificant inference. Consistent and accurate analysis shows that research performed using effective data collection methods improves the legitimacy and value of research results (Yurdakul, 2014). Structured text review was therefore used for this research to gather the knowledge necessary to correct the objectives of the report. The data for this study were acquired from the audited financial records, including balance sheets and income statements, of all the commercial banks that participated in the research. Additionally, relevant macroeconomic data spanning the years 1990 to 2019 were sourced from diverse journals and publications of the Turkish central bank.

4.3 The Study Sample

According to Apak et al. (2016) Sampling is a technique employed to select units (such as individuals or organizations) from a specific population of interest. By studying this selected sample, researchers can draw reasonable generalizations and apply their findings back to the larger population from which the sample was drawn”.

The survey entails a sample 15 banks from Turkey.

This thesis utilizes a non-probability sampling approach known as the purposive method. In this method, firms are deliberately selected based on specific criteria relevant to the topic, such as financial strength, profitability, and size.

Table 1: Variance Measurement

	Variable	Measure	Notation	expectation
Dependent variable	Loans	Total loans issued by the banks	LLAD	
explanatory variables	Economic growth	GDP	LGDP	+/-
	Monetary policy rate	3 months treasury bills rate	LMPR	
	Capital adequacy ratio		LCAR	-
				+/-
	Credit risk	Reserve for loan losses to total loans.	LCRE	-/+
	Non-performing loans	NPL total by the total amount of outstanding loans in the bank's portfolio.	LNPL	-/+

4.4 Model Specification:

4.4.1 Stationarity Test

The reason of stationarity is to certify that the achieved findings are not false. As stated by Dickey & Fuller (1979) that the when a model as a unit root it assert that the variables are nonstationary. Therefore, analyses are made to check the presence or absence of stationarity. The assessment of the FMOLS necessitates that the indicators be either serene of stationary and nonstationary variables at levels, however none of the variables should not be integrated at 2 order (Pesaran et al., 2001). Thus, employed breitung (2000) to test the order of integration. The main characteristics of these techniques are that they are primarily run at levels: 1st difference, then 2nd difference and either at constant with no trend, or at constant with trend.

4.4.2 Long-run estimation

After establishing the stationarity of all variables, the cointegration technique proposed by Johansen (1988) and Phillips and Ouliaris (1990) is employed to prevent the occurrence of spurious analysis. The long-term associations among all variables are determined by a "single vector cointegration procedure" in a sequential manner. This thesis employs the "Fully Modified Ordinary Least Squares" (OLS) method proposed by Phillips and Hansen (1990). The approach possesses the characteristic of achieving asymptotic efficiency by taking into account the presence of serial correlation and mitigating the endogeneity concerns among the explanatory factors. The Dynamic Ordinary Least Squares (OLS) method, as proposed by Stock and Watson (1993), is utilized to enhance the robustness of the study. Expression of the model:

$$LLAD = \beta_0 + \beta_1 GDP + \beta_2 MPR + \beta_3 CAR + \beta_4 LCRE + \beta_5 LNPL + \varepsilon_{it}$$

Where, LLAD is log of loan, GDP is economic growth, MPR is monetary policy rate, CAR is capital adequacy ratio, LCRE is log of credit risk, LNPL log of non-performing loan and ε is the error term.

4.4.3 Presentation and analysis of data

"The suggested model was evaluated using statistical analysis using the following techniques: first, descriptive statistics of the variables (both dependent and independent) were calculated throughout the period of the study. This is consistent with the methodology employed by Malhotra (2007), which emphasizes that the utilization of descriptive statistical techniques allows the researcher to envision the present circumstances and incorporate pertinent particulars. Subsequently, correlation analysis was conducted to examine the relationship between the dependent and independent variables. Ultimately, a comprehensive perspective on fixed effect regression, encompassing all of its underlying assumptions, was employed. The researchers collected data from multiple sources and conducted an analysis using the E-views software application.

5. Result and Discussion

Descriptive Statistic

"The following section presents the descriptive statistics for both the independent and dependent variables. The variables that are being measured are the logarithmic values of loan and advance. In the present study, the independent variables encompass the capital adequacy ratio, monetary policy rate, credit risk, gross domestic product, and non-performing loans. Descriptive statistics for the dependent and independent variables are presented in the following table."

Table 2: Descriptive Statistic

	LLAD	LGDP	LCRE	LCAR	LMPR	LNPL
Mean	2.828504	7.587699	-1.458800	6.555139	34.50840	0.552650
Median	2.832299	7.219304	-1.423361	6.358163	3.883000	0.587687
Maximum	5.077323	10.54095	-0.377656	9.193126	5382.000	2.293313
Minimum	-2.314992	5.346449	-2.852102	4.812745	-0.107000	-2.156755
Std. Dev.	0.747316	1.192511	0.503297	0.921418	392.4792	0.744671
Skewness	-1.453865	0.745262	-0.243937	0.990414	12.65469	-0.812993
Kurtosis	11.19399	2.904956	3.200381	3.775758	162.3344	4.556441
Jarque-Bera	1004.801	29.64965	3.697396	60.15114	345955.7	67.34005
Probability	0.000000	0.000000	0.157442	0.000000	0.000000	0.000000
Sum	902.2927	2420.476	-465.3572	2091.089	11008.18	176.2952
Sum Sq. Dev.	177.5970	452.2225	80.55175	269.9858	48984692	176.3423

The distribution of loans and advances exhibited significant deviation from the mean value (2.828504).

Having a standard deviation of 0.747, the loan and advance data exhibited notable dispersion, with highest and lowest values at 5.0773 and -2.3149, respectively. This range encompassed Turkey's major commercial banks, including privately held ones like AKBank and Ziraat Bank. Among the distinctive independent variables of banks, GDP displayed significant variability from its mean (7.5876) with a standard deviation of 1.1925. Its range extended from 10.540 to 5.346.

Turkey's privately held commercial banks, including AKBank and Ziraat Bank, represented both the maximum and minimum values within the spectrum of Turkey's commercial bank landscape. Within Turkey's commercial bank landscape, a few banks surpassed the 100 percent mark. The average loan amount reached 74.9 percent, signifying that a substantial proportion of the asset base was financed through customer loans. This was underscored by the range of values, spanning from 87.2 percent to 52 percent.

"The deposit volume displayed a significant dispersion, with a standard deviation of 7.49 percent, highlighting considerable variance from the average across many Turkish banks. The credit risk mean value stood at -1,458, surpassing Turkey's central bank requirements before January 2012. Non-performing loans exhibited negligible dispersion from the average for Turkish commercial banks, as evidenced by the 0.503 standard deviation. The range for non-performing loans extended from 2.293 to -2.156. The remaining independent variables encompassed macroeconomic factors with the potential to influence banks' lending activity over time."

The average empirical GDP growth rate was recorded at 9.2%, reflecting the country's mean economic expansion rate for the preceding 13-year period. The highest level of increase was observed in the year 2005, however the lowest point was recorded in 2003.

"Over the past thirteen years, the nation's aggregate inflation rate has consistently exceeded the average of its real GDP. The highest level of inflation was observed in 2009, reaching 36.4%, while the lowest level of inflation was documented in 2002. The interest rate of the loan interest rate is associated with several macroeconomic variables. The average lending interest rate over the examined period was 11.4%, with the highest and lowest values observed in the years 2009 and 2010, respectively. The reserve requirement margin exhibited minimal variability from its mean value during the examined periods, with a standard deviation of 0.8 percent"

Table 3: Multicollinearity

Correlation					
Probability	LNPL	LCAR	LCRE	LGDP	LMPR
LNPL	1.000000 -----				
LCAR	-0.303368 0.0000	1.000000 -----			
LCRE	-0.466148 0.0000	0.211523 0.0001	1.000000 -----		
LGDP	-0.153653 0.0060	0.749311 0.0000	0.079731 0.1554	1.000000 -----	
LMPR	0.007364 0.8958	-0.016614 0.7675	-0.010490 0.8519	-0.025015 0.6562	1.000000 -----

"This assumption pertains to the relationship nature between the independent variables. When an explanatory factor forms the same linear combination as other independent variables, we infer that the model grapples with full collinearity, rendering it susceptible to OLS calculation (Brooks, 2008). Multicollinearity emerges when there exists a notable yet not absolute correlation between two or more independent variables (Cameron and Trivedi, 2009; Wooldridge, 2006). Nonetheless, as per Churchill and Iacobucci (2005), the occurrence of multicollinearity brings about specific implications, it could diminish the insight into how explanatory variables impact each other. Consequently, certain explanatory variables might seem unrelated to the explanatory variable even though they truly are linked. This assumption allows some level of correlation between independent variables, although they can't be entirely correlated. If we don't permit any correlation between independent variables, multiple regressions might not be as efficacious for econometric analysis."

"Nonetheless, the precise extent of correlation that triggers multicollinearity remains ambiguous. While Hair et al. (2006) propose that a correlation coefficient below 0.9 doesn't lead to severe multicollinearity issues, Malhotra (2007) asserts that a coefficient above 0.75 indicates multicollinearity concern. Kennedy (2008) goes further, stating that any linear relationship surpassing 0.7 might engender pronounced multicollinearity, impairing accurate estimation and reducing precision. This inconsistency underscores the lack of a definitive consensus on the correlation level that gives rise to multicollinearity. Gujarati (2004) suggests that traditional statistical methods to assess multicollinearity include analyzing correlations among independent variables (CC), (CI), and (VIF). Thus, a correlation matrix was computed for seven independent variables in this analysis, as illustrated in the table. The resultant correlation matrix reveals the highest correlation of 0.7 between gross domestic product (GDP) and capital adequacy ratio (CAR). Since this association doesn't exceed the thresholds of 0.7, 0.75, and 0.9 proposed by Kennedy (2008), Malhotra (2007), and Hair et al. (2006), respectively, this analysis concludes that multicollinearity is not a concern."

5.2 Unit Root Result

The unit root results in Table 3 and 4 of Breitung and ADF Fisher showed the variables have unit roots at I(0) and are nonstationary. However, at first difference, they are stationary and hence the assumption of a unit root is abandoned. (LLAD, LGDP, LCRE, LCAR, LMPR and LNPL are all significant at 1%).

Table 4: Unit Root Test of Breitung

Variables	Level	Trend	First	
	intercept &		Difference	
	T-statistics	P Values	T-statistics	P Values
LLAD	-1.06081	0.1444	-3.5619	0.0002***
LGDP	0.17162	0.5681	-4.00115	0.0000***
LCRE	1.7728	0.9619	-1.82051	0.0343**
LCAR	-0.7368	0.2306	-2.0003	0.0227**
LMPR	-0.9532	0.1702	-1.8754	0.0304**
LNPL	0.3219	0.6263	-2.5264	0.0058***

Table 5: KAO Cointegration

ADF	t-Statistic	Prob.
	-1.826037	0.0339
Residual variance	0.084625	
HAC variance	0.075159	

The kao cointegration test highlighted that the variables in the series are cointegrated in the long term hence; the p value is less than 5% significance level, therefore, the null inertia of no cointegration is discarded.

Table 6: Parwise Dumitrescu Hurlin panel causality tests lags2

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
LGDP does not homogeneously cause LLAD	7.75998	7.63289	2.E-14
LLAD does not homogeneously cause LGDP	2.94377	0.86303	0.3881
LCRE does not homogeneously cause LGDP	3.27428	1.38919	0.1648
LGDP does not homogeneously cause LCRE	2.86943	0.80733	0.4195
LCAR does not homogeneously cause LGDP	4.74483	3.50267	0.0005
LGDP does not homogeneously cause LCAR	7.43018	7.36206	2.E-13
LMPR does not homogeneously cause LGDP	4.61627	3.31790	0.0009
LGDP does not homogeneously cause LMPR	5.76462	4.96831	7.E-07
LNPL does not homogeneously cause LGDP	2.70706	0.53029	0.5959
LGDP does not homogeneously cause LNPL	4.16500	2.57963	0.0099

Table 5 showed the Dumitrescu and Hurlin Causality. The analysis suggested that LGDP causes loans and advances and not the opposite, this means that there is a unidirectional causation moving from economic growth to loan and advances. Similarly, a one-way causal relationship moving from capital adequacy to loans and advances is found. Furthermore, a one-way causal relationship was found running from non-performing loans to loans and advances. However, a feedback causal association between credit risk and loan and advances was found. Likewise, bidirectional causation between monetary policy rate and loan and advances was found.

Table 7: Panel Dynamic Least Squares (DOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCRE	-0.378663	0.200935	-1.884508	0.0678
LCAR	1.333962	0.224271	5.947980	0.0000
LGDP	-0.743470	0.189278	-3.927915	0.0004
LMPR	-0.251248	0.086417	-2.907377	0.0063
LNPL	0.648066	0.112432	5.764067	0.0000
R-squared	0.978428	Mean dependent var		2.889653
Adjusted R-squared	0.855778	S.D. dependent var		0.639601
S.E. of regression	0.242899	Sum squared resid		2.064989
Long-run variance	0.009808			

The analysis suggested that credit risk has a negative impact on loans, this means that an increase in credit risk will hinder the banks in granting loans to customers, that is 1% increase in credit risk will reduce loans issued to customers by 0.38%. Likewise, both economic growth and monetary policy rate have negative consequences on lending. Thus, an increase in both GDP and interest rate decreases the bank lending by 0.74% and 0.25% respectively. The negative relationship between monetary policy rate and bank lending can be attributed to an improper monetary transmission effect. Contrarily, capital adequacy and non-performing loans are positively connected to lending. Thus, an increase in both will increase the lending behavior of the banks by 1.33% and 0.65% respectively.

Table 8: Panel Modified Least Squares (FMOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCRE	-0.290789	0.029471	-9.866910	0.0000
LCAR	0.348416	0.020578	16.93144	0.0000
LGDP	-0.049757	0.017977	-2.767751	0.0060
LMPR	-6.14E-05	3.45E-05	-1.778005	0.0764
LNPL	0.829592	0.023728	34.96292	0.0000
R-squared	0.415132	Mean dependent var		2.844116
Adjusted R-squared	0.407120	S.D. dependent var		0.711137
S.E. of regression	0.547566	Sum squared resid		87.54998
Long-run variance	0.057342			

The analysis suggested that credit risk has a negative impact on loans, this means that an increase in credit risk will hinder the banks in granting loans to customers, that is 1% increase in credit risk will reduce loans issued to customers by 0.29%. This result supports and accept the null hypothesis (H1) of the study which indicates that credit risk did not have a positive relationship with lending. Likewise, both economic growth and monetary policy rate have negative consequences on lending. Thus, an increase in both GDP and interest rate decreases the bank lending by 0.05% and 0.14% respectively. The negative relationship between monetary policy rate and bank lending can be attributed to an improper monetary transmission effect. The findings debunk the null hypotheses (H4 and 5) that both economic growth and monetary policy rate increases lending rate. Therefore, the alternative hypotheses are accepted. Contrarily, capital adequacy and non-performing loans are positively connected to lending. Thus, an increase in both will increase the lending behavior of the banks by 1.34% and 0.83% respectively. We accept the null hypothesis (H2) suggesting a positive association between capital adequacy and lending.

5.3 Discussion

“The coefficient indicators related to real GDP growth rate reveal a favorable impact on banks concerning loans and advances. This positive influence is attributed to the notion that robust economic conditions, evaluated through GDP, act as a driving force for banks, leading to a significant increase in portfolio investment to companies.”

"Robust economic conditions foster heightened demand for goods and services, leading to increased investments in diverse industries, thereby boosting both per capita income and savings. Consequently, these factors influence banks to extend more private credit (Fukunaga et al., 2019). Surprisingly, the findings indicate that the actual gross domestic product has a positive coefficient but lacks significance, contrary to initial expectations. This suggests that bank borrowers' perceptions are not solely dependent on the present stage of business operations, corroborating the observations of Gunes & Yildirim (2016)." The vector coefficient value (-0.049757) implies that a percentage increase/decrease in the real GDP growth rate corresponds to a slight change (0.03 per cent) in the lending and advance role of commercial banks in Turkey. A positive and meaningful relationship is observed between GDP and bank loan and advance.

6. Conclusion

"In most banks' portfolios, loans and advances represent the predominant revenue asset, as documented in the literature section. This study aimed to explore and assess the central tendency of commercial bank lending behavior and its impact within the context of Turkey. Seven variables that influence bank lending activity were chosen and subjected to analysis. Panel data collected from commercial banks in Turkey during the period 1990-2019 were utilized for the survey, and descriptive statistics were applied to interpret the data. A structured correlation and regression analysis was conducted specifically for loans and advances. Before engaging in ordinary least squares regression, the models were thoroughly assessed against the assumptions of (CLR). The models met the requirements of the classical linear regression model. The decision to employ the Fixed Effect Model (FEM) was based on its suitability. Six determinants affecting banks' loans and advances were identified and evaluated. Nearly all of the eligible independent variables exhibited statistical significance, with the sole exception of the gross domestic product (GDP)."

"The conclusions drawn from the models yield the following outcomes. Bank loans and advances are significantly and positively influenced by deposit volume, bank size, cash reserve requirement, and inflation rate. Conversely, liquidity ratios and interest rates have a notable and negative impact on loans and advances. The findings of this study are significant as they do not contradict four assumptions on the relationship between bank loans and advances and deposit quantity. The study examined the dimensions of bank scale, liquidity proportion, and lending rate. However, the validity of two assumptions on the relationship between bank loans and advances with reserve fund requirements and inflation rate was challenged. Furthermore, the impact of the GDP growth rate on bank lending and advancement inside Turkey was shown to be statistically insignificant. This study highlights the connection between the lending behavior of banks and the intricate interplay of macroeconomic factors and bank-specific attributes."

"Larger financial institutions exhibit a greater propensity for lending, possibly because to their considerable capital reserves, which serve as a safeguard for lending operations. Commercial banks have a prominent place in the banking system, with a substantial portion of total assets and deposit liabilities. Despite encountering significant limitations arising from governmental rules, institutional constraints, and various macroeconomic circumstances, the aggregate loans and advances provided by these entities, which constitute a vital element of the overall loans extended to the private sector, persistently exhibit growth. Nevertheless, it is imperative for both governmental and commercial banks to acknowledge that the operational environment has a substantial influence on their achievements and behaviors. An advantageous and inclusive environment improves productivity and encourages conscientious lending conduct. On the other hand, an uncertain and difficult atmosphere can result in decreased bank effectiveness. As a result, it is imperative for commercial banks to aggressively embrace viable policies and execute efficient credit management techniques in all situations."

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