Master's Thesis

Ways of Trust Restoration in the Banking System

Case Study of Tajikistan

by

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Certificate Page

I, Ismatjon Hoshimov (Student ID 51220633) hereby declare that the contents of this Master's Thesis are original and true, and have not been submitted at any other university or educational institution for the award of degree or diploma.

All the information derived from other published or unpublished sources has been cited and acknowledged appropriately.

Ismatjon Hoshimov
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Table of content

List of tables

List of graphs

List of abbreviations

ADF	-	Augmented Dickey-Fuller
AIC	-	Akaike Information Criterion
ARDL	-	Autoregressive Distributed Lag Model
AST	-	Agency on Statistics under President of the Republic of Tajikistan
BT	-	Banking Trust
CCI	-	Consumer Confidence Index
CFI	-	Credit Financial Institutions
CPI	-	Consumer Price Index
CSI	-	Consumer Sentiment Index
DepRate	-	Average Interest Rate on Deposit
DIF	-	Tajik Deposit Insurance Fund
ECM	-	Error Correction Model
EXR	-	Exchange Rate
FDI	-	Foreign Direct Investment
GDP	-	Gross Domestic Product
GFC	-	Global Financial Crisis
IMF	-	International Monetary Fund
KYC	-	Know Your Customer
NBT	-	The National Bank of Tajikistan
NPL	-	Non-performing loans
OLS	-	Ordinary Least Square
ROA	-	Return on Assets
ROE	-	Return on Equity
TJK	-	Tajikistan
TJS	-	Tajikistan Somoni
TSSR	-	The Tajik Soviet Socialist Republic
Unempl	-	Registered Unemployment
USA	-	United States of America
USD	-	United States Dollars
USSR	-	Union of Soviet Socialist Republics
VAR	-	Vector Autoregressive
WB	-	World Bank
Wgs	-	Average Statistical Wages

Abstract

The banking system of Tajikistan has faced a financial crisis that caused instability and disrupted banking confidence among the population. This study tackles the possible ways of public trust restoration in the banking sector. The research measures the economic means of public trust in banks and establishes various determinants of banking confidence. Additionally, this study explores key factors influencing customers' trust in banking. Hence, this research investigates the level of banking confidence and analysis the determinants of banking trust in the case of Tajikistan. The study adopts economic measurement of integrated banking index trust and, by creating time-series data, estimates the banking system and macroeconomic determinants and factors of banking trust. Based on a literature review, the research framework focused on three methodological approaches by collecting primary and secondary data. First, the research conducted secondary data analysis by constructing a trust index. Second, a regression (ARDL) model is employed to estimate the relationship between the calculated index and other economic indexes. Third, the study gathered primary data through the survey to assess the main factors that affected public trust in banking and evaluated the current state of banking confidence. The results of the analysis revealed that the calculated trust index is reliable. The ARDL regression estimations indicated that average wages, return on equity, and the interest rate on deposits are determinants of banking trust with a positive relationship to banking confidence. However, unemployment and non-performing loans being determinants of banking trust have a negative effect on public confidence.

Keywords: Banking confidence, public trust, ARDL, determinants of banking trust

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1 Chapter I. Introduction

1.1 Study background

Historically, the world of finance has been built upon the notion of trust. Trust plays a significant part in cooperation in society. Trust, confidence, and creditworthiness are fundamental financial service components (Earle, 2009). However, the financial industry faces various crises that damage the accumulated trust and reputation from time to time. The banking system is one of those that experienced considerable losses in overcoming numerous financial catastrophes. For instance, the Global Financial Crisis (GFC) of 2008 caused by Lehman Brothers greatly impacted most of the financial institutions of the world; at the same time, it diminished public trust and confidence (Earle, 2009; Debab & Yateem, 2012; Gillespie & Hurley 2013).

Global crises cause financial institutions to face unexpected market fluctuations and customer behaviors. This economic uncertainty creates an ambiance of distrust between the population and the financial industry. Thus, lost money inevitably makes a loss of confidence, consequently building a foundation of mistrust. Therefore, banking trust has become one of the central discussion subjects in the world of the economy (Lebedyev, 2011; Debab & Yateem, 2012).

Scholars of various countries demonstrated that financial collapse is contagious and affects major financial institutions (Bülbül, 2013; Debab & Yateem, 2012). The case of Tajikistan has experienced the scenario of contagiousness in the last crisis. Therefore, the world financial crisis laid the foundation of mistrust in most financial institutions, including the banking system of Tajikistan.

1.2 Study motivation

The 2008 Global Financial Crisis caused by Lehman Brothers affected most of the world's financial institutions. Developed and developing countries experienced many losses (Debab & Yateem, 2012; Lebedyev, 2011). Moreover, in 2014 the political instability of economic giants such as the USA and the Russian Federation over Crimea's destiny gave birth to the next crisis (Sarwat, 2017). The costs of the Crimea crisis were long-term sanctions from the USA against the Russian Federation. Eventually, Russia's resistance affected former Soviet countries that depended on Russia's economy.

The Republic of Tajikistan is one of those economically dependent countries with many migrant workers in the Russian Federation (Sarwat, 2017). Therefore, Russian economic instability caused Tajikistan to experience a crisis. Migrant workers became unemployed or earned less than they used to because of the rapid devaluation of the Russian currency (Zubarevich, 2016). Shortly after, the volume of remittances in Tajikistan dropped, increasing expenditures from savings accounts. However, the banking institutions of Tajikistan could not anticipate the magnitude of withdrawals and faced liquidity problems leading to insolvency. The population of Tajikistan had several negative banking experiences during and after the collapse of Soviet Union (Ashurov & Lalbekov, 2002). Therefore, the circumstances of insolvency forced people rush to withdraw funds. Consequently, country’s four major banks experienced bank runs, and all of them periodically were announced bankrupt.

The financial failure again raised mistrust by eroding the public trust and confidence in the banking sector. Therefore, this research explores possible ways of gaining and rebuilding public trust. Thus, the study addresses raised questions of banking trust

restoration. It is expected that recommendations and proposed methodologies lead the banking system towards overcoming the issues of public mistrust and financial crises.

1.3 Research focus

This research mainly focuses on the restoration of public trust in the banking system of Tajikistan. Public trust became the central concern because of several financial and economic crises. The restoration of public trust plays a vital role in the future development of the banking system and deserves special attention. In the first step, the research study intends to investigate and review the related literature about the fundamentals of trust and confidence in the banking system. Second, the research plans to define the main determinants of banking trust and ways of trust measurement. Third, the research challenges measuring public trust by running a regression model to describe the relationship between economic indicators and the banking trust index. Finally, using a survey, the research tries to distinguish factors related to banking confidence and discuss the outcome of the conducted analysis to conclude with possible recommendations and approaches to regain public trust in the banking system. The overall focus of the research is to explore the effective methods of rebuilding public confidence in the banking sector of Tajikistan.

The related trust concept within the empirical study refers but is not limited to confidence, trustworthiness, belief, and faith.

1.4 Research questions

Nowadays, the majority of the population does not have confidence in the banking sector of Tajikistan as the financial crises damaged public trust (OECD, 2019). Accordingly,

the banking system is experiencing public mistrust. Thus, the central question of the research is "How to restore trust in the banking system?". Additionally, this study raises the question of the impact of adequate factors related to public confidence and various attempts to adopt verified international practices for trust restoration. The research aims to estimate the current level of public confidence in the banking system, find compatible and effective indicators related to banking trust to overcome public mistrust issues, and recommend possible ways of restoring public trust in banking.

1.5 Research objectives and significance

This research intends to explore the issues of public mistrust and restoration of trust in the banking system by using the Republic of Tajikistan as a research case. The study proposes various approaches to reestablishing and maintaining customer confidence and loyalty. Thus, the research objectives are as follows:

To investigate the conceptually related studies and distinguish the fundamentals of trust in the banking system

To study the determinants of banking trust and the methodologies of trust measurement

To explore the existing trust indexes and the construction of a composite trust index

To determine the main factors of banking trust and assess its relationship with other banking systems and macroeconomic indicators.

This research is the first study of the trust issue and trust index in the banking system of Tajikistan. Thus, the research intends to suggest ways to re-establish public trust in the financial sector. The significance of the study is to suggest possible approaches to influence the future of the banking system and public trust. The analysis assumes that the suggestions

and proposed methodologies may increase public loyalty to the banking system and financial institutions in general.

1.6 Research method

This research performs a quantitative analysis. It presumes a survey to collect primary data and uses secondary data from various sources such as the NBT, the Agency on Statistics under President of the Republic of Tajikistan, the World Bank, etc. The collected data is analyzed to estimate the level of public trust (trust index). Moreover, it constructs a composite trust index based on collected data, integrating banking indicators and macroeconomic indexes to measure a quantitative trust level. Thus, this study follows the recommendation of Nikolaev et al. (2006) and Vorobiev and Maibarada (2014) to measure trust based on social opinion and the reflection of confidence on the economic indicators; in other words, the combination of a public survey, financial reports, and related macroeconomic indexes and ratios. The data analysis will answer the research objectives and conclude the research.

2 Chapter II. Literature Review

2.1 Introduction

The literature review discusses objectives 1 and 2 of the research study. The objectives are to distinguish the concept of trust and cover the practices of rebuilding trust and various methods of trust measurement. Thus, this chapter consists of theoretical background and determinants of trust in banking, regulation attempts of central banks in regaining trust, methodologies of trust index measurement, and other discussions related to banking trust. The current chapter challenges various aspects and views of scholars to demonstrate the critical role of the central bank, the influence of financial institutions, and other establishments in restoring public confidence in banking.

This chapter also reviews related research to summarize various aspects of banking trust. Special attention is focused on circumstances and observations of cases that have similarities in financial, cultural, and some elements of historical values of Tajikistan; to find and propose the best possible resolutions to the current issue of banking mistrust.

2.2 Theoretical background

Generally, trust is a widely studied concept of relationship quality in science. This research considers the following common perception of trust; nevertheless, other interpretations are not excluded or undermined within the study. The common notion of trust is a psychological phenomenon that carries an interdisciplinary concept on belief, confidence, and faith (Ennew & Sekhon, 2007; Misztal, 1992; Nikolaev et al., 2006). However, the interdisciplinary concept makes trust challenging to have one firm definition

to grasp various related aspects; thus, the scholars have difficulty agreeing upon one idea acceptable for all disciplines to which trust relates (Debab & Yateem, 2012).

2.2.1 The concept of trust

The study of trust differs from field to field depending on the judgment and perception of the researcher. The concept of trust is a subject of various disciplines and is discussed in psychology, sociology, economics, and other fields (Debab & Yateem, 2012; Ennew & Sekhon, 2007; Mayer et al., 1995).

Generally, trust is a very demanding type of social essence centered on the freedom and unpredictability of the other entity (Siegrist & Gutscher, 2012). As Lewicki and Wiethoff (2000) describe, trust's definition may be based on belief systems from life experience, rules or norms established by society, or experience within a specific relationship. Earl (2012) defines trust as the expectation of a beneficial outcome based upon social relations, group involvement, and shared values. Nikolaev et al. (2006) define trust as a quantitative and dynamic characteristic of the relationship of various economic entities based on the profitability of the financial results of interaction and confidence in conscientiousness (loyalty, sincerity, etc.) of each other.

Siegrist and Gutscher (2012) argue that confidence is a closely related concept to trust, which depends on and stands after trust. On the contrary, Earle (2009) claims that the idea of trust is different from confidence. He supports this claim by defining trust as a social and relational notion involving two entities having a similar expectation of something beneficial by making one party vulnerable to another. Confidence is a belief built upon experience or evidence (Earle, 2009). Similarly, Luhmann (2000) refers to trust and confidence as

distinctive means to understand danger and risk. According to Luhmann, trust presupposes a risky situation and requires a previous engagement.

On the other hand, confidence occurs in the circumstances characterized by contingency and danger. There is a possibility that a relation of confidence may turn into a trust relationship; conversely, a trust may be reverted to confidence depending on the consequences of some actions and or occasions (Luhmann, 2000). Luhmann (2000) assumes both concepts may lapse into disappointment. Thus, empirical studies show that trust is a versatile concept (Devlin et al., 2015; Ennew & Sekhon, 2007; Siegrist & Gutscher, 2012). In conclusion, the distinction between trust and confidence may depend on every individual's perception and attribution.

2.2.2 Trust and financial development

Financial development is a traditional and general concept of a mutual corporation based on high levels of trust (Kwame, 2019). The atmosphere of trust is one of the key elements for financial development which triggers economic growth. Many scholars study the positive influence of financial development on economic growth, exposing financial stability, including the banking sector's performance (Ito & Kawai, 2018).

Financial development carries multilayer factors. It captures banking sector development and different types of the financial market, such as insurance, bond, and equity markets. Ito and Kawai (2018) study the effect of economic development on macroeconomic performance and propose employing quantitative and qualitative measures. They offer a composite index with eight variables for quantitative measures to grasp the size and depth of various financial markets, including banking. The proposed composite index considers four subindexes for quality measures to measure the degrees of market

diversity and the institution's environment. For instance, the variables of the quantitative index include domestic credit to the private sector by banks, stock market capitalization, etc., all defined as the percentage of GDP. Ito and Kawai (2018) found a significantly positive correlation between the implied qualitative and quantitative measures of financial development are significantly positively correlated. Thus, their regression analyses showed that financial products positively influence output growth and negatively influence inflation and output volatility for both developed and developing countries.

2.2.3 Trust and confidence in the financial system

The main criterion of the cooperation between financial institutions and their customers is based upon trust. It is accepted that trust in the financial system is considered crucial (Devlin et al., 2015). Thus, financial trust is vital in endorsing customer confidence and engagement in the economy, including the banking sector (Ennew & Sekhon, 2007). Shalimova (2014) views trust in the banking system as a set of expectations, behavior predictability of the parties involved, no fraudulent activities, and cooperation based on honesty, courtesy, and mutual benefit. However, being the closest concept to the trust, financial confidence is motivated by danger; by expressing confidence to an entity, one party exposes itself to the danger (Siegrist & Gutscher, 2012).

Therefore, trust in the financial system arguably plays a more critical role because a person willing to give over some money to any financial institution must have a basic level of trust in the system. It is worth mentioning that financial trust is associated with vulnerability and risk in the financial institution. However, the parties involved are interdependent and have positive expectations regarding existing risks and exposure. Similarly, Ennew and Sekhon (2007) identify trust as an “individual’s willingness to accept

vulnerability on the grounds of positive expectations about the intentions or behavior of another party in a situation characterized by interdependence and risk" (p.63). The risk and vulnerability of trust are entailed in the freedom of another party (Ennew & Sekhon, 2007). Thus, the concept of trust in the context of this research considers the mutual collaboration of the public and the banking system and the productive support of the NBT to create the ambiance of financial trust by implementing policies and procedures that protect the rights of consumers and guarantee their funds being safe and sound. Consequently, the described collaboration will create an atmosphere to restore trust and confidence in the banking system.

2.2.4 Conceptually related studies

The crisis of the last two decades awakened the global issues of trust in the financial system. The study of public trust, confidence, and reliability remains a vital concern of the future banking industry. Lately, the matter of trust and confidence between financial institutions and the public has gained global popularity. Historically, confidence and trust were raised, especially after domestic and international economic crises or political instabilities. Therefore, the research study attempts to analyze the core understanding of banking trust as a fundamental to overcoming the consequences of problems.

The literature review suggests various approaches researchers propose to overcome trust issues in the financial sector. As mentioned earlier in this chapter, trust results from multiple historical events in society, which builds subconscious belief toward the entity.

Esterik-Plasmeijer and Raaij (2017) propose a bank trust-loyalty model by testing the data collected from the Netherlands and focusing on bank trust and loyalty determinants. Their model investigated six determinants of bank trust and loyalty. According to Esterik-

Plasmeijer and Raaij (2017), the delivery of financial services that involve customer trust and loyalty mainly consists of the following critical drivers: competence, stability, integrity, and transparency. Their findings indicate that the named determinants/drivers positively correlate with the trust in banks in general. The authors conclude that focusing and strengthening customer policies on the determining factor prioritizes banks' effective restoration of trust and loyalty.

Shalimova (2014) discusses various theories that define trust factors, inferring banking trust as one of the critical components of cooperation development, which triggers banking development and the country's economic growth. Confidence in the banking institution significantly influences the construction of resource foundations as people intentionally make deposits and savings in the bank. Shalimova reports that individual deposits and savings positively correlate with public trust. For instance, she analyzed that during 2008-09, public confidence in the financial sector dropped down, which caused the outflow of deposits and savings (Shalimova, 2014). Shalimova concludes her research findings by indicating the following factors that increase banking trust. They develop an individual client approach, form a favorable bank image, and elaborate on new banking products and services, feedback approach, and personnel upgrades (Shalimova, 2014).

Ennew et al. (2011) describe trust as emphasizing to another party why an organization or individual is worthy of being trusted (reputation, tradition, etc.). People choose financial institutions relying on their own subjective opinion. The fundamentals of which basis on trust because it is accepted that majority of the population do not possess the financial skills to do a cost analysis of the credit or quality of other services offered by banks (Shalimova, 2014). However, Devlin et al. (2015) find trust in the financial sector to play an even more critical role than in a typical case of business-customer relationships.

Lately, the researchers have been concentrating on various aspects of trust. For instance, Nienaber et al. (2014) mention interpersonal and impersonal trust; Sekhon et al. (2014) touch upon cognitive and practical forms of trust (Nienaber et al., 2014; Sekhon et al., 2014). Moreover, Ennew and Sekhon (2007) report trust as an attribute of a customer, which has personal traits corresponding to trustworthiness, benevolence, and integrity. Ethics are also strongly connected to the financial world as they form the foundation for trust (Angeloni, 2014). The researchers Lewicki and Wiethoff (2000), in their handbook, distinguish two types of trust "calculus-based trust" (CBT) and "identification-based trust" (IBT).

2.3 Empirical literature review

This section highlights the empirical findings of other studies that relate to public trust in the banking system and trust level measurements. Additionally, this section considers investigating the patterns of the culturally and economically similar events in history for further recommendation and implication in the banking sector of Tajikistan.

2.3.1 Determinants of banking trust

Trust and creditworthiness are the critical drivers for a successful business relationship. Therefore, many researchers investigate the determinants of banking trust, and especially most of them attempt to study the measurement of trust (Bülbül, 2013; Debab & Yateem, 2012; Ennew & Sekhon, 2007; Lebedyev, 2011; Nikolaev et al., 2006).

The central aspect of trust study is associated with various internal and external factors of the determinants of trust. The outer element of trust has a positive or negative effect that does not depend on the bank (Shalimova, 2014). For instance, inflation level,

political and social stability, adequate banking supervision, and a government guarantee of deposits and savings. The internal aspect of trust depends on the bank and has a positive or negative influence; for example, bank credit rating, increase in assets, net income, equity value, etc. (Shalimova, 2014). Lebedyev (2011) studies determinants of trust in banks of Ukraine. He gathers data from the FINREP survey and implies two ordered probit models to evaluate the characteristics of an individual. Lebedyev's research findings show that deposit insurance, financial awareness, and literacy are the critical elements of confidence in banks and positively affect public trust. However, the research also indicates that people with low income have a low level of trust in banks (Lebedyev, 2011). Similarly, Bulbul (2013) researched the determining factor of trust in the banking system of the Federal Republic of Germany by gathering cross-sectional data. Bulbul (2013) explores the key determinants of banking trust: cooperation, communication with main managers, hesitant environment, and credibility. The research analysis shows that understanding trust determinants in the banking system is the first step toward the modern financial sector.

Kwame (2019) studies the determinants of customer trust in banks of Ghana. He collects randomized data from questionnaires and implies OLS regression to find the relationship between trust, expertise, stability, reliability, openness, client orientation, and shared values. Kwane's research findings conclude that competence, client orientation, and transparency correlate significantly with banking trust. His study confirms Lebedyev's (2011) findings that competence and client orientation positively affect public trust. Izhlobin (2014) researched the progress of determinants of banking trust by conducting a cross-country analysis during the economic crisis of 2008-2009. Izhlobin considers the implication of macroeconomic factors; for instance, he assumes that the GDP dynamic influences trust levels. Moreover, he includes bank accounts, credit/debit cards, and income

sources for economic characteristics. Thus, the findings conclude that age and education variables are statistically significant and people with banking accounts have more confidence in banks. Contrary to Lebedyev (2011) study, Izhlobin finds that socio-demographic characteristics are statistically insignificant to banking trust.

Debab and Yateem (2012) assessed factors that impact trust to retail banking in Bahrain. They study various aspects of customer trust and customer satisfaction in the retail banking industry. Using a questionnaire and survey method to collect data, employ a 5-points Likert-type scale toward global and national financial circumstances, bank standing, political aspects, customer devotion, and satisfaction. Debab and Yateem found that significant intervention and supervision of authorities during crises positively correlate with public trust. Additionally, their research indicates that public trust and satisfaction increase loyal customers. Thus, from six researched factors, four factors, namely political factor, bank reputation, bank performance, and general financial condition, were most important toward banking trust (Debab & Yateem, 2012).

The literature review suggests that banking performance is strongly associated with public trust (Debab & Yateem, 2012). Additionally, various studies show the conjunction of banking performance with the variability of macroeconomic conditions (Staikouras & Wood, 2011). Thus, the banking sector and trust are sensitive to macroeconomic factors and indicators.

2.4 Measuring trust (Trust Index)

This research considers the practical study of trust, which pertains to the actual economic measurement by constructing a trust index as suggested by Nikolaev et al. (2006), and Vorobiev and Maibarada (2014). Thus, this research intends to cointegrate several

economic values to identify the authentic level of trust following scholars' suggestions (Nikolaev et al., 2006; Vorobiev & Maibarada, 2014).

The measurement of trust is a globally recognized and widespread concept. Most researchers conduct surveys and interviews to define the trust level and index (Ennew & Sekhon, 2007). Studies typically obtain primary data by conducting a study and analyzing the respondents' answers to determine the level of trust in the institution, including the bank or banking system in general (Ennew et al., 2008). Arguably, the importance of trust should not rely on the simple measures of yes/no statements (Ennew & Sekhon, 2007). Only compound quantitative measurements based on factual numbers may provide accurate and fair trust levels (Nikolaev et al., 2006).

Vorobiev and Maibarada (2014) review various theoretical and methodological approaches to quantitative trust measurements at the macroeconomic level. The formation and accumulation of trust and its influence on macroeconomic policy is one of the research areas of Vorobiev and Maibarada. They separately review institutional trust and assume it is determined based on reliability, reputation, and risk assessment. Therefore, the factors that determine trust are risk assessment and risk appetite, knowledge and information, profit and loss, business network, the frequency of transactions, and reputation (Vorobiev & Maibarada, 2014).

2.4.1 Trust index construction

There are over 45 countries worldwide that conduct consumer sentiment surveys to monitor trust and confidence in the economy and or institutions. Almost all developed and several developing countries have implemented confidence measurements to forecast the potential changes in consumer spending (Curtin, 2007). It is arguable to consider all these

samples as trust indices because of their construction method. For instance, the Consumer Sentiment Index (CSI) or Consumer Confidence Index (CCI) of the USA focuses on a separated segment of the economy; in this case, the future decrease and increase in consumer expenditure. Similarly, the Consumer Confident Index of the Central Bank of Turkey measures how optimistic or pessimistic consumers are towards the economy in the future, thus, forecasting future consumer spending (İşman, 2015).

The USA's Consumer Sentiment Index (CSI), founded by George Katona in the 1940s, indicates economic growth by forecasting consumers' behavior. The index is based on a survey of random US households by the University of Michigan's Survey Research Center. The survey measures consumer confidence in the current economic conditions. The study results are reported monthly and have predictive power (Howrey, 2001). The survey polls five thousand US households focusing on finance, general conditions of the economy (employment and inflation), and their saving or spending preferences. However, the Survey Research Center is not the only organization in the USA to conduct surveys and measure trust and confidence.

Similarly, the Confidence Board is an independent US research center that surveys households to determine consumer confidence by questioning present and expected economic performance (Curtin, 2007). The index is calculated from the surveys and usually has a benchmark value of 100. The consumer sentiment index is not more than a predictor of the expenditure desire of consumers (Nikolaev et al., 2006).

Nikolaev et al. (2006) advocate the construction of the index based on the recent performance and or activities of the institution and the economy of the country. In other words, they claim that integrating the financial institution indicators and the economic indexes could show an accurate level of trust. Thus, the index will grasp the entire meaning

of trust as an economic category and indicate the consolidated status of trust in the institution (Nikolaev et al., 2006). Furthermore, Nikolaev et al. suggest analyzing factual data preferring the quantitative approach; however, they mention that the quantitative changes and dynamics do not always confirm an accurate trust level.

The methodology of index construction proposed by Nikolaev et al. (2006) possesses various economic indicators that are, to a certain extent, related to trust or demonstrate the level of cooperation between entities. The index construction recommendation's conditions include the reports' official statistical consistency and transparency. Besides, the indicators and determinants should be selected based on compatibility with other similar indexes. Thus, in their research, Nikolaev et al. (2006) surveyed experts and investigated the following indicators (determinants) of the trust index; moreover, they assigned weights to these indicators by their relevance to public trust and confidence. Additionally, it is worth mentioning that the growth of the following indicators is not always accepted as an increase in trust.

Table 2.1 Indicators/determinants and their weights

Indicators/determinants	Weight
Consumer price index (CPI) or Inflation	0.11
Public expenditure (cash) / GDP	0.12
o Deposits / GDP	0.08
o Savings / GDP	0.05
Deposits of legal entities and banks / GDP	0.10
o Deposits of legal entities / GDP	0.07
o Deposits of banks (financial institutions) / GDP	0.03
Volume of foreign investment / GDP	0.14
Capital investment / GDP	0.15
Capital outflow of private sector (gross) / GDP	0.14
Volume of extended credits (loans) / Assets	0.14
o Credits to individuals / Assets	0.05
o Credits to enterprises / Assets	0.03
o Credits to banks / Assets	0.02
o Long term credits / Assets	0.04

Financial institutions' investments to securities / Assets	0.11
o Investment to government securities / Assets	0.02
o Investment to securities of non-residents / Assets	0.04
o Investment to securities of residents / Assets	0.04
Total	1.00

Source: Author's view constructed from Nikolaev et al. (2006)

The country's economy is usually in development progress; therefore, with a parallel rise in fundamental macroeconomic indicators such as the GDP, indicators and determinants rise. Thus, an index increase is calculated as the GDP ratio (Nikolaev et al., 2006).

Nikolaev et al. (2006) recommend considering the GDP growth rate in each country for index construction because various emerging and advanced countries have different development rates, which may affect the calculation method. Additionally, the selection of determinants and indicators that characterize public trust should be evaluated thoroughly (Nikolaev et al., 2006). Nikolaev et al.'s findings of index measurement show that the level of trust has an increasing tendency; hence, the indicator went up from a base point of 100 to 216.4 from 2000 to 2005.

Vorobiev and Maibarada (2014) identify trust measurement using the survey and complex methods. The survey method represents international and domestic surveys conducted by public or private research centers. The data collected employing surveys are not always stable and reliable, making it difficult to use to measure comprehensive trust level. However, surveys reflect the conventional nature of trust (Vorobiev & Maibarada, 2014). The complex method utilizes various indicators and or indexes for further composite calculation. A composite index is constructed from a wide range of economic and statistical data to illustrate the level of trust.

Nevertheless, the drawback of the complex method may be the selection and distinction of weights of specific indicators. Therefore, in the case of availability, using both ways allows for discovering the formation and accumulation of trust levels (Vorobiev & Maibarada, 2014). However, some indicators were modified and substituted by their availability and relevance to the Republic of Belarus. For instance, the dollarization indicator of deposits was added, and hence the correction of weights was applied.

Further development of the index assumes the inclusion of indicators and or their weights; moreover, the implementation of an index regularly may have a reliable economic effect on trust (Vorobiev & Maibarada, 2014).

2.5 Practices and regulation attempts of central banks to regain trust

The financial crisis is not a new phenomenon and has occurred several times. The USA authority adopted Sarbanes-Oxley Act (2002) after several major financial scandals that resulted in public mistrust (Angeloni, 2014). After the Global Financial Crisis of 2009, the policy response of G20 countries and the Basel Committee on Banking Supervision enhanced the "Second Pillar," which requires strengthening internal risk control processes and corporate governance standards (Angeloni, 2014). The new principles aim not only at changing regulation but also supervisory methods. They suggest using the supervisor's judgment and dialogues by examining the bank's senior management and board members (Angeloni, 2014).

2.5.1 Capital adequacy and deposit insurance

The incentive of central banks toward sound banking demonstrated an effective influence on the banking environment and public confidence. While encouraging public

trust, it is vital to promote a complementary depositor protection system. The protection system includes supervisory standards on minimum capital and deposit insurance, which are critical regulatory mechanisms for central banks (Kreps & Wacht, 2016). The imposition of the minimum capital requirement for banks supposes soundness in the banking system, while the deposit insurance obligation assures partial or complete funds protection. The central bank arrangement of the named system provides adequate thickness to protect depositors from loss by preventing banks from failure (Kreps & Wacht, 2016).

The deposit insurance system plays a vital role in restoring public trust in the banking system (Micajkova, 2013). During the financial crises and after, the central bank authorities increase the potential financial obligation of the insurance institutions. The implication of various changes in the deposit insurance regulation by strengthening the coverage base and the speed of payouts promotes the prevention of moral hazard problems (Micajkova, 2013). For instance, after the GFC of 2008, the USA's coverage level of insured deposits was raised from 100.000 US dollars to 250.000 US dollars; the EU member states gradually shifted the maximum aggregate coverage from 20.000 EUR to 50.000 EUR later to 100.000 EUR (Micajkova, 2013).

The primary goal of adopting higher insurance coverage levels is to prevent instability in the financial market and depositors' panic and minimize the risks of bank failures. This approach brings confidence to the financial market and assures depositors that they will receive their money back in case of bank failure. Consequently, it encourages customers to worry less about unpredicted economic conditions (Anginer & Demirguc-Kunt, 2018).

2.6 Summary and Emerging Issues

The literature of the study was mainly related to the concept of trust and trust measurement. Trust is the central aspect of cooperation that involves future belief and confidence. Nikolaev et al. (2006) offer the construction and development of a trust index to measure public trust. Debab and Yateem (2012) propose risks, KYC- procedure, and liquidity requirements as the key factors influencing trust. Lebedyev (2011) stresses that trust is essential for all economic activities and the existence of civil society (Lebedyev, 2011).

In most cases, the problem of public trust is arguable and differs from culture to culture and time to time. Financial crises lead to population distrust by destroying cooperation, trustworthiness, belief, and future expectations. Thus, the research finds it necessary to measure public trust and survey to define the population confidence and make a relevant proposal to policymakers. A survey defines several factors of trust among respondents, whereas statistical reports shall disclose the internal nature of the banking situation.

2.7 Summary of the chapter

In this chapter, we have reviewed the conceptual and fundamental basis of banking trust. The reviewed literature outlines the importance of banking trust's banking and macroeconomic determinants for future measurement and estimation of their relationship. Therefore, the following chapters will focus on the trust index measurement and subsequent estimations. Additionally, the research aims to follow the literature suggestion by collecting primary data to assess the current level of public confidence. The abovementioned steps

will help us measure the trust index, estimate its relationship with other indicators, and finally gain knowledge about the population's present mindset toward the banking system.

3 Chapter III. The banking system of the Republic of Tajikistan

3.1 Introduction

This chapter explores the history and the development stages of the banking system of Tajikistan. It also discusses various events that influenced the banking system and public trust in hierarchal order. The current condition and related issues in the financial sector are also discussed in this chapter. Thus, this chapter supplements the research by adding an overview perception of the economic progress of Tajikistan.

3.2 Background of the banking system of Tajikistan

The banking system of Tajikistan originates after the formation of the Tajikistan Autonomous Republic of the Soviet Union. The first banking representative, later called the State Union of Soviet Socialist Republics Bank (State Soviet Bank), was established in 1925 as a subordinate to the State Soviet Bank of Uzbekistan SSR in Tashkent (Ashurov & Lalbekov, 2002). In 1929, the Republic of Tajikistan was officially recognized as one of the republics of the Soviet Union (The Tajik Soviet Socialist Republic – Tajik SSR) (Congress, 2007). The subordinate of the State Soviet Bank of Tajikistan department was transferred to the main office of the State Bank of the USSR in October 1934 (Khonjonov, 2010). During the first year, the State Soviet Bank rapidly expanded throughout the country and possessed 24 branches to deliver banking services in various regions of the Tajik SSR. The expansion of the banking structure slowed down during World War II, reaching a branch growth of 42 in 1942 (Ashurov & Lalbekov, 2002). However, the progress of the quantitative expansion continued after the war, and until the late 80s, it reached 59 banking facilities. During this period, three Soviet bank representatives functioned in Tajikistan: The Republic

Department of State Soviet Bank, the Republic Department of Industry and Construction Soviet Bank, and Savings Soviet Bank. The Department of Social and Accommodation Development of the Soviet Bank was created after the banking reconstruction of 1987, which involved a significant reform in the banking sector. Thus, during the Soviet era, the Republic of Tajikistan established the banking system foundation and expanded it to a specific development level.

After the fall of the USSR, Tajikistan, as an independent state (September 9, 1991), started to develop the banking system from the remnants of the Soviet structure and command economy (Congress, 2007). All existing banks from former Soviet times were changed to domestic banks in January 1992 (Ashurov & Lalbekov, 2002). Until the end of the ’90s, the banking system had a quantitative development, and the number of newly established banks reached 17 (Ashurov & Lalbekov, 2002). However, after strengthening the regulatory requirements of the central bank or the National Bank of Tajikistan (NBT), most of the newly established banks failed to follow. Additionally, several unstable banks joined in complying with the requirements, and some liquidated.

3.3 Development of the national banking system

Despite having a young banking system, independent Tajikistan’s banking system has faced various transition periods. Even though Tajikistan announced independence from the collapsing Soviet Union, it used the Soviet ruble as the main currency until the end of 1993 (Davlatov, 2005; Khonjonov, 2010). Tajikistan’s economy deteriorated and weakened due to the Civil War, which lasted from 1992 to 1997. Moreover, the Civil War and political instability caused hyperinflation in 1993, rapidly reaching the highest level of 2600% (World Bank, 2021). The entire population witnessed the official banknotes, government

bonds, and savings converting to worthless pieces of paper (Ashurov, 2021). Thus, the public trust in the banking system built for over a half-century by the robust command system collapsed after the Soviet era.

Nevertheless, in 1994 the domestic currency of the dissolved Soviet Union was replaced by the Russian Federation ruble because Tajikistan did not have an economic resource for the emission of its money. However, in the mid-'90s, Tajikistan managed to issue its first national currency – "Tajik rubles," which illustrated the creation of the domestic banking system and significant accomplishment during the years of civil war. In May 1995, the exchange rate for cash currency was officially announced with the ratio of 1 Tajik ruble to 100 Russian rubles. However, the exchange rate of non-cash funds as government bonds and all funds in the banking accounts had a ratio of 1 Tajik ruble to 1200 Russian rubles (Ashurov, 2021). During the Soviet time, most of the population accumulated their funds in savings accounts, and the exchange rate of non-cash funds devastated the majority. It is worth mentioning that the equivalent of 1 Soviet ruble in January 1992 was 1.8021 USD, denoting that for noncash funds of 2162 USD, banks (government) paid 1 Tajik ruble (CBR, 2013).

Tajikistan was the last country of former Soviets to introduce its currency. Thus, the abovementioned development stages greatly impacted the population's trust in the banking system. Generally, the people of Tajikistan survived two domestic crises in the first five years of independence, having lost all their wealth and savings together with banking trust and reputation.

At the end of the '90s and the beginning of the new millennium, Tajik rubles were finally substituted by the national currency, "Somoni." Moreover, this period initiated the

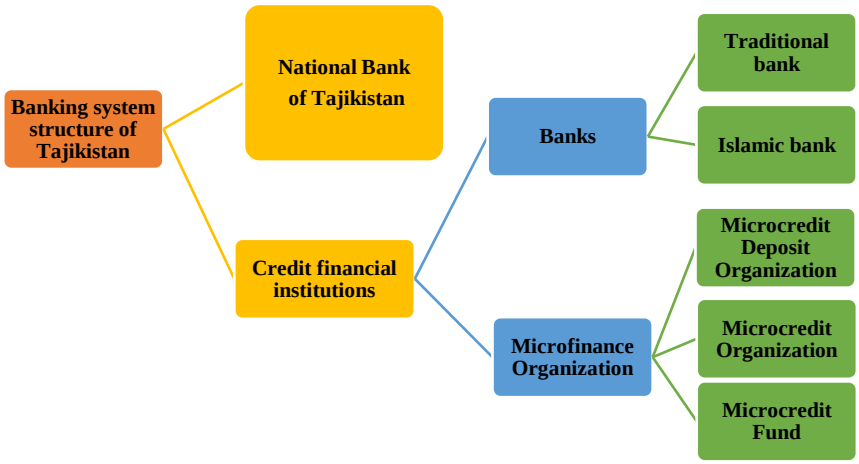
issuance of most banking laws, policies, procedures, and normative acts to establish and strengthen the national banking system.

3.4 The current state of the Banking system

The banking system of Tajikistan consists of two levels: The National Bank of Tajikistan and the Credit Financial Institutions (CFI). The NBT is Tajikistan's central issuing, reserve, authorized regulatory, and supervisory bank. The credit financial institutions contain state-owned and private banks and microfinance organizations.

The National Bank of the Republic of Tajikistan (NBRT) was founded in 1991; was renamed the National Bank of Tajikistan (NBT) in 1996. According to the "Law of the Republic of Tajikistan on the National bank of Tajikistan" (Law 3.08.2018, No1548), the NBT is the central bank of Tajikistan. It has regulatory and supervisory authority over credit financial institutions of the country. Currently, there is one state-owned bank in Tajikistan. It is worth mentioning that the Government of Tajikistan fully guarantees the deposits of the state bank.

Graph 3.1 The structure of the banking system of Tajikistan



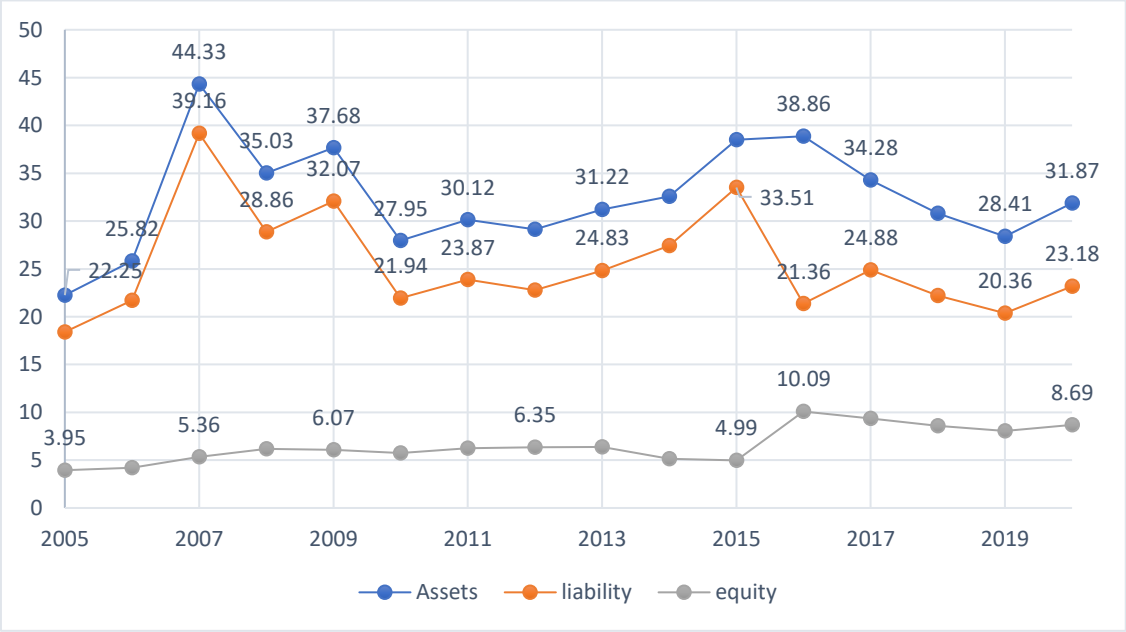
Source: Author's view constructed from the NBT report

The banking system of Tajikistan and the country's economy are in the development stage. The government is relevantly young so is the banking system. On December 31, 2020, 69 credit financial institutions are functioning in Tajikistan (NBT, 2020). According to the Banking Statistics Bulletin of the NBT (2020), the total assets of the banking system of Tajikistan comprise 2.33 billion US dollars or 31.87% of the country's GDP by the end of 2020. Compared to the total assets in 2005 – 22.25%, 2010 – 27.66%, and 2015 – 32.47% of GDP or 1.55 billion US dollars (NBT, 2010; NBT, 2020).

The total liabilities of the financial institutions at the end of 2020 are 23.18% of the GDP or 1.69 billion US dollars, compared to total liabilities in 2005 – 18.40%, 2010 – 21.94%, and 2015 – 33.51% of the GDP (NBT, 2010; NBT, 2020).

At the time of this analysis (12/2020), the total equity of the banking system is 8.69% of the GDP or 0.63 billion US dollars. Compared to the total equity of 2005 – 3.95%, 2010 – 5.71%, and 2015 – 4.99% of the country's GDP, respectively (NBT, 2010; NBT, 2020).

Graph 3.2 Banking system assets, liabilities, and equity of Tajikistan (2005-2020) (in percent of GDP)



Source: Author's view constructed from the NBT report
https://www.nbt.tj/tj/statistics/statistical_bulletin.php

Graph 3.1 shows the trend of assets, liabilities, and equity of the banking system of Tajikistan for the period 2005 to 2020. The dynamic has two drastic falls that indicate the GFC of 2007-2009 and 2014 Russian crises. However, the capital account has been gradually growing and stable. It increased after 2015 when the National Bank of Tajikistan strengthened the capital requirement for financial institutions.

3.5 Banking system challenges

The banking system of Tajikistan is exposed to external shocks because of poor asset quality, weak solvency, and low profitability (Bayle T, 2021). The IMF (2021) reports the sector's vulnerability to credit risk since most of the extended credits are non-performing and relate to collateral's lack of risk mitigation. Additionally, the market is associated with unhedged creditors with foreign currency credits subjected to exchange rate risks (Bayle T, 2021). The named factors increase the banking challenges to identifying, monitoring, and managing risks. Thus, the sector's bank governance and risk management issues remain vital.

Strengthening the Tajik Deposit Insurance Fund (DIF) deposit guarantee mechanism remains one of the banking sector's challenging aspects and financial stability. The DIF's insured amount and the payout process are crucial, especially after the bank failures in the system. Consequently, public confidence in banking will resume by ensuring depositor protection. Therefore, the NBT should become the driving force of an ambitious strengthening of the regulatory and supervisory framework to fulfill the intermediary functions (Bayle T, 2021).

4 Chapter IV. Methodology and Data Description

4.1 Introduction

This chapter covers the research methodology and consists of the research strategy, data collection description, and framework for data analysis. Objective one of the research (concepts and theoretical views) was reviewed in the Literature review. Objectives two and three, which are valuable aspects of this study, a methodology of banking trust measurement and the estimation of determinants of banking confidence, will be discussed in this chapter. The research methodology consists of three investigations: index construction, estimation of determinants, and the assessment of banking confidence factors.

Therefore, the chapter focuses on calculating the banking trust index and estimating various economic indicators related to the banking trust index to fulfill objective 3 of the research. Finally, we survey random people to measure the current level of trust and evaluate factors that influence public confidence in the banking system.

4.2 Analytical framework

The literature review in the previous chapter suggests that the measurement of banking trust is a compound economic structure. However, we can estimate it from banking system factors and related macroeconomic indicators (Nikolaev et al., 2006; Vorobiev & Maibarada, 2014) and the public polls (Debab & Yateem, 2012; Ennew & Sekhon, 2007; Lebedyev, 2011). We collected the monthly data spanning from January 2011 to December 2020 from the NBT, the Agency on Statistics Under the President of the Republic of Tajikistan, and the World Development Indicators of the World Bank. The period mentioned above is chosen based on the data availability. Moreover, the long-term effect of

the GFC 2007-2009 and the Russian crisis of 2014-2016 occurred during this specified period.

4.3 Calculation methodology of Trust Index

In the first step, this research conducts an economic approach to measure public trust from secondary data following the previous studies of Vorobiev and Maibarada (2014) and Nikolaev et al. (2006); both studies relate to the issues of trust measurement by integrating the banking system factors and macroeconomic indicators.

Moreover, we modified the model by adjusting the calculation method to the Tajikistan financial market environment, considering the recommendation of Nikolaev et al. (2006). Therefore, we substituted the secondary market indicators with bank-related indicators.

Thus, the following model is used to calculate the banking trust index:

$$BT = \sum_{i=1}^{n} Ki * Wi * \left(\frac{Xi \,/\, Yi}{X0 \,/\, Y0}\right)$$

where:

BT = banking trust,

K = the coefficient that shows the influence of the variable (positive or negative),

W = the assigned weight of the variable,

X = banking/economic indicator (ratio to GDP or bank assets),

Y = adjustment base variable calculated for a specific year and further assigned as the base year,

i – the ordered number of variables.

The abovementioned model estimates Banking Trust index (BT) by assigning BT as a dependent variable; K – is the coefficient which takes positive or negative (-1 or 1) to distinguish the influence of the variable; for instance, there are some indicators that have a negative effect, thus the positive and negative indicators show the increase or decrease of the dependent variable respectively; W – is the weight of the indicators assigned by financial experts in Nikolaev et al. (2006) and Vorobiev and Maibarada (2014) studies; X – represents the banking/economic indicators; the typical state of the economy is in constant development phase, therefore, the increase of the model indicators take into account the dynamics of GDP or bank assets as a ratio; Y – is an adjusted base variable calculated for the specific year (2011 is for this research) to demonstrate the following years as a comparison to the base year; i – is ordered number of variables used to calculate the index, there are 12 variables used to calculate trust index. The finalized adopted version of the economic indicators of the model is as follows:

Table 4.1 Indicators/determinants and their weights (adapted in this research)

Indicators/Determinants	Variable acronyms	Weights
Consumer price index	CPI	0.10
Bank savings		0.20
Individual's deposit / Total Banking Assets	IndDep	0.11
Legal entity's deposits / Total Banking Assets	LegDep	0.09
Deposit dollarization	DepDol	0.02
Loans		0.18
Loans to Individual's / Total Banking Assets	LI	0.07
Loans to Legal entity's / Total Banking Assets	LLE	0.05
Long term loans / Total Banking Assets	LTL	0.06
FDI inflow to financial intermediaries / GDP	FDI	0.12
Return on Assets	ROA	0.10
Capital Adequacy Ratio	CapAdq	0.08
Exchange Rate	ExR	0.10
Credit Risk	CredRsk	0.07
Banking cardholders / ratio to population	BC	0.03
Total		1.00

Source: Author's construction

The descriptive statistics of the trust index calculation variables are presented in Table 4.2 below.

Table 4.2 Descriptive statistics of the trust index variables (2011M01–2020M12)

	CAR	CPI	CR	DEPDOL	EXR	FDI	INDDEP	LEGDEP	LI	LLE	LTL
Mean	0.2071	142.7979	0.1438	0.6123	7.0867	0.0025	0.2544	0.2031	0.1063	0.3115	0.0079
Median	0.2195	138.4228	0.1455	0.6412	7.4163	0.0018	0.2580	0.2040	0.1021	0.3249	0.0086
Maximum	0.2730	201.7761	0.2816	0.7251	11.3000	0.0082	0.3009	0.2949	0.2063	0.4611	0.0120
Minimum	0.0900	101.9000	0.0516	0.4396	4.4028	0.0000	0.2085	0.1258	0.0754	0.2018	0.0032
Std.Dev	0.0426	27.2512	0.0724	0.0833	2.1718	0.0023	0.0260	0.0406	0.0266	0.0744	0.0024
Skewness	-0.9626	0.4646	0.1079	-0.6349	0.1472	0.7964	-0.3035	0.0171	2.0086	0.1021	-0.7719
Kurtosis	3.4213	2.1419	1.6075	1.9782	1.4334	2.6228	1.8442	2.1958	8.0917	1.8768	2.4297
Jarque-Bera	19.4200	8.0000	9.9300	13.2800	12.7000	13.0800	8.5200	3.2400	210.3100	6.5200	13.5400
Probability	0.0001	0.0183	0.0070	0.0013	0.0017	0.0014	0.0141	0.1980	0.0000	0.3850	0.0011
Sum	24.860	17136	17.250	73.470	850.400	0.310	30.520	24.370	12.760	37.380	0.950
Sum Sq. Dev	0.216	88373	0.624	0.826	561.270	0.001	0.080	0.197	0.084	0.659	0.001
Observations	120	120	120	120	120	120	120	120	120	120	120

Source: Author's calculation

Table 4.2 contains descriptive statistics of all the related variables for the trust index calculation of the banking system of Tajikistan. The collected statistics incorporate 120 monthly observations. The standard deviation of the Consumer Price Index and Exchange Rate is more significant than other indicators due to the exchange rate volatility (TJS/USD) and purchasing power of the national currency, respectively.

According to Nikolaev et al. (2006) and Vorobiev and Maibarada (2014), each variable executes the index calculation with a cumulative method. All the variables are compared concerning their base value (January 2011). After the first-period analysis, the base value is set to 100 points; then, the rest of the periods are calculated and compared according to their economic meanings and weights.

4.4 Trust Index Variables Discussion

Following the recommendation of previous studies (Nikolaev et al., 2006; Vorobiev & Maibarada, 2014), we selected the following variables to measure the banking trust level

in Tajikistan; thus, the sample chosen for the study covers a period of ten years from 2011 to 2020. The following excerpts discuss the importance of the variables and their relevance to the composite index:

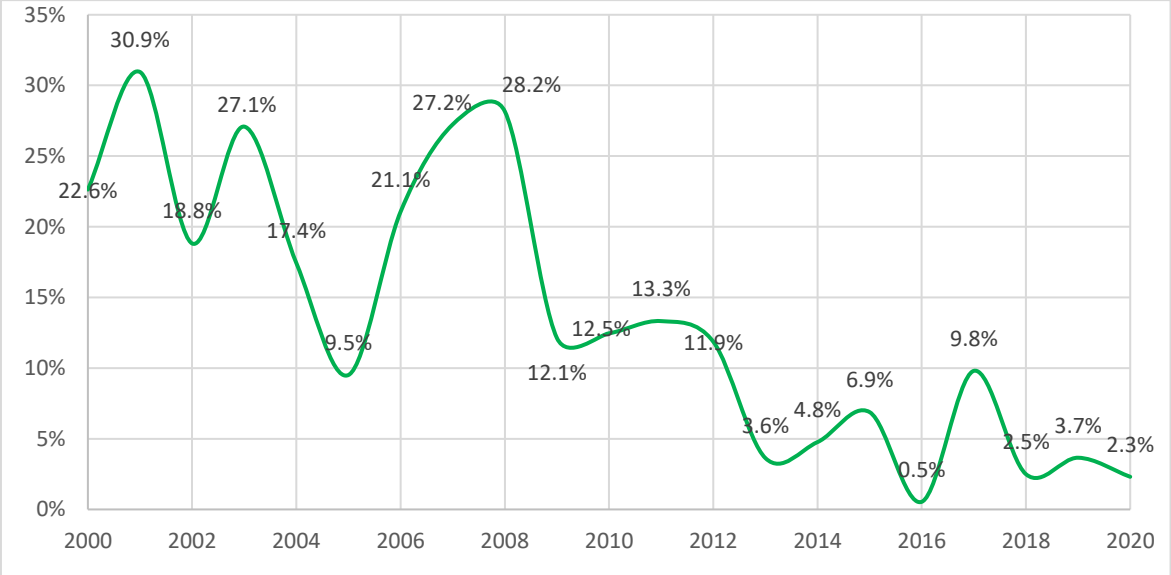
4.4.1 Consumer Price Index

The Consumer Price Index (CPI) is one of the macroeconomic variables of the trust index that measures the average price change for a market basket of consumer goods and services in Tajikistan. Following the recommendation of previous studies in the literature review section, the research assumes that the prices of goods and services are associated with public trust. The named variable for this research has a dynamic character. The base is set to the beginning of 2011. Thus, the CPI variable is an incrementing indicator that increases compared to the base period of the end of 2010 to 2020. It is worth mentioning that Tajikistan's CPI went up 2.1 times in the last decade, thus doubling the average prices of goods and services. As CPI is an instrument of inflation measurement with a basket of over 300 goods and services, the previous studies valued the weight of the CPI in the trust index at 10%; therefore, this research retains the influence of the variable with the same weight value.

Graph 4.1 shows the tendency of the inflation rate in Tajikistan, which fluctuates in response to internal and external economic factors. It indicates that Tajikistan is reluctant to experience the financial crises and aftershocks primarily because of the economic dependency (see Graph 4.1). Tajikistan was experiencing high inflation fluctuations after the Civil War (1992-1997) following several internal economic and banking reforms. The global crisis of the US investment bank Lemon Brothers collapse in 2008-2009 had shaken the inflation rate again; additionally, the Russian crisis of 2014 negatively influenced the

inflation and overall banking sector. The economy of Tajikistan is relatively small and is vulnerable to external factors.

Graph 4.1 The inflation rate of the Republic of Tajikistan (2000-2020)

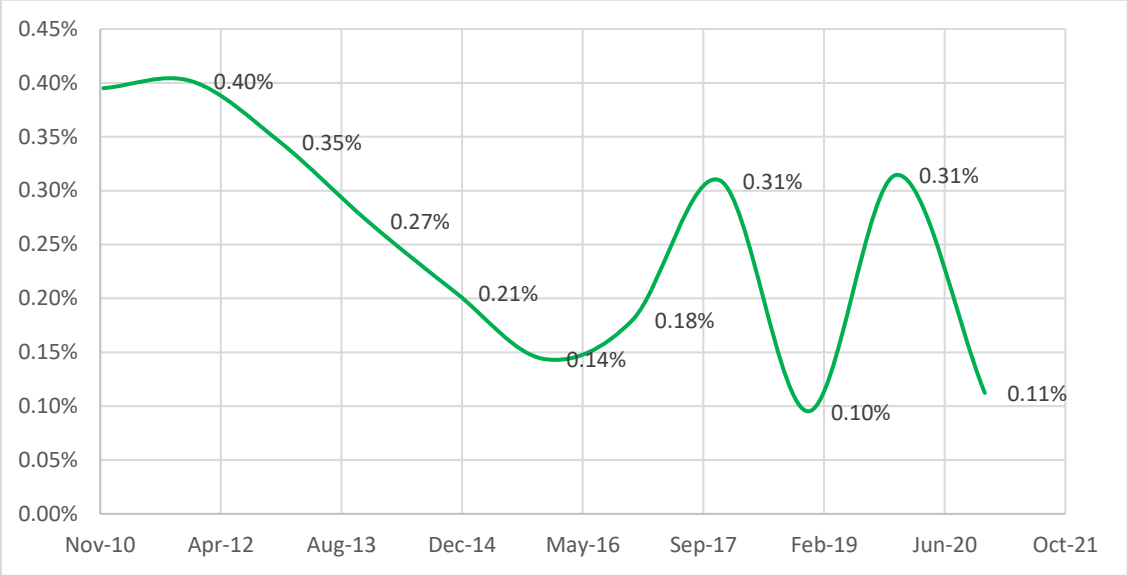


Source: Author's construction, data source: World Bank
https://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG?locations=TJ

4.4.2 FDI inflow to financial intermediaries'

This study modifies the concentration of general Foreign Direct Investment into specific field investments of financial intermediaries. The Foreign Direct Investment inflow to financial intermediaries (FDI) variable of the trust index is characterized as a ratio of FDI to GDP with a weight-value of 12%, as it is employed in the previous literature (Nikolaev et al., 2006; Vorobiev & Maibarada, 2014). The FDI is one of the economic indicators representing external trust in Tajikistan's financial sector. Graph 4.2 demonstrates that the financial system of Tajikistan attracts foreign funds, which is a sign of access to external capital despite having a dangerous trend and low ratio to GDP. Both the low level of foreign capital and attractiveness of the banking system of Tajikistan indicates limited access to foreign markets.

Graph 4.2 The FDI inflow into financial intermediaries' ratio to GDP (2010-2020)



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/tavozuni-pardokhti-jt/sarmoyaguzori-oi-mustakimi-khorii/index.php

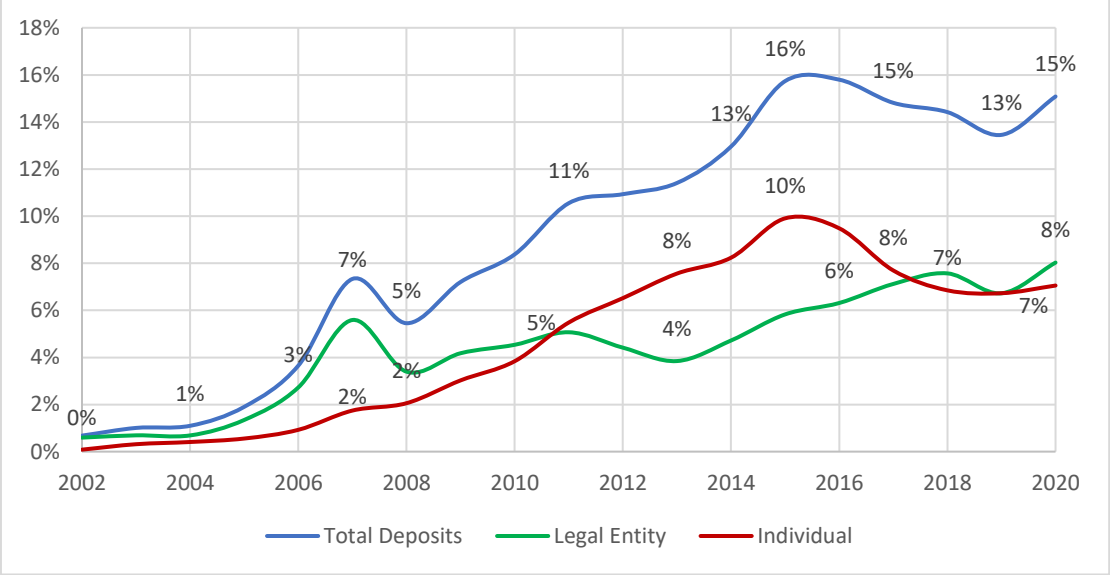
4.4.3 Bank Savings

The bank savings is a bank-specific variable of the research which represents deposits, savings, and time deposits of the banking system of the Republic of Tajikistan. As the literature review suggests, the bank savings variable is strongly associated with public trust in the banking system. Thus, following the previous studies, the bank savings variable is divided into two sub-groups, Individuals' deposits and Legal Entities' deposits ratio to total banking system assets. According to the literature, the total weight of the variable is 20%, and the division of the importance into subgroups: Individuals' deposits – 11% and Legal Entities' deposits – 9%. The individuals' deposit weight is more considerable because of the share of deposit portfolio ratio, the number of people involved, and savings sizes.

There is an overall increasing tendency in deposit portfolio to GDP ratio of Tajikistan according to Graph 4.3; however, some events of the last decades forced to destabilize the

growth of the savings. Therefore, the savings in the banking system declines in response to domestic and global factors. For instance, the savings trend has a rapid fall in 2007 and the recession after 2014 with subsequent depression. The Global Financial Crises (GFC) of 2007-2009 and the Russian crisis of 2014-2015 significantly impacted the economy of Tajikistan, especially the banking sector, by challenging the liquidity problems in four systemic banks that faced bankruptcy with thousands of customers losing trust.

Graph 4.3 Deposit portfolio of the banking system to GDP ratio



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/real_sector.php

4.4.4 Deposit dollarization

The Deposit Dollarization variable of the trust index calculator is a bank-specific variable that measures the overall tendency of savings in foreign currency ratio to the total deposit portfolio. Considering the economic environment of Tajikistan, dollarization negatively impacted the national currency. Thus, the low trust in national currency indicates the increase of dollarization. The reviewed literature utilizes this variable to demonstrate the presence and influence of the foreign currency as the mean of savings. Moreover, the

dollarization variable indicates the preference for less volatile and more stable savings. The decrease (increase) of the variable is interpreted as the fall (rise) of trust. Following Vorobiev and Maibarada's (2014) research, this research retains the variable's weight value at negative 2% (with a negative impact in case of growth).

Graph 4.4 illustrates that until the GFC of 2007-2009, people tended to keep their savings in foreign currency because of Tajikistan’s 90s hyperinflations due to the political and economic reforms. Thus, the highest dollarization of the savings peaked at 84% in 2007. In the aftermath of the crisis, the decline in the share of foreign currency savings dropped to 56% in October 2010. It is worth mentioning that the overall savings decrease by 14% until the end of 2008. From 2011 to 2015, the total deposit portfolio of the banking system rapidly increases to 202%; however, the level of currency share elevates along with total savings to 73%. According to the growth of the deposit portfolio, this research assigns a moderate level of public trust during this period. Starting in 2016, the NBT performed banking system reforms in response to the past bank failures and further strengthened the banking system for future withstanding. Thus, promoting low rates in foreign currency savings and moderate rates for local currency savings influence a part of the population to change preferences from foreign currency to local currency savings. Some of the strict measures of the NBT negatively impact public trust. However, since reforms, the share of foreign currency declined to 44% in 2020, with only a 20% rise in total deposits in the last five years.

Graph 4.4 The dollarization tendency

Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/real_sector.php

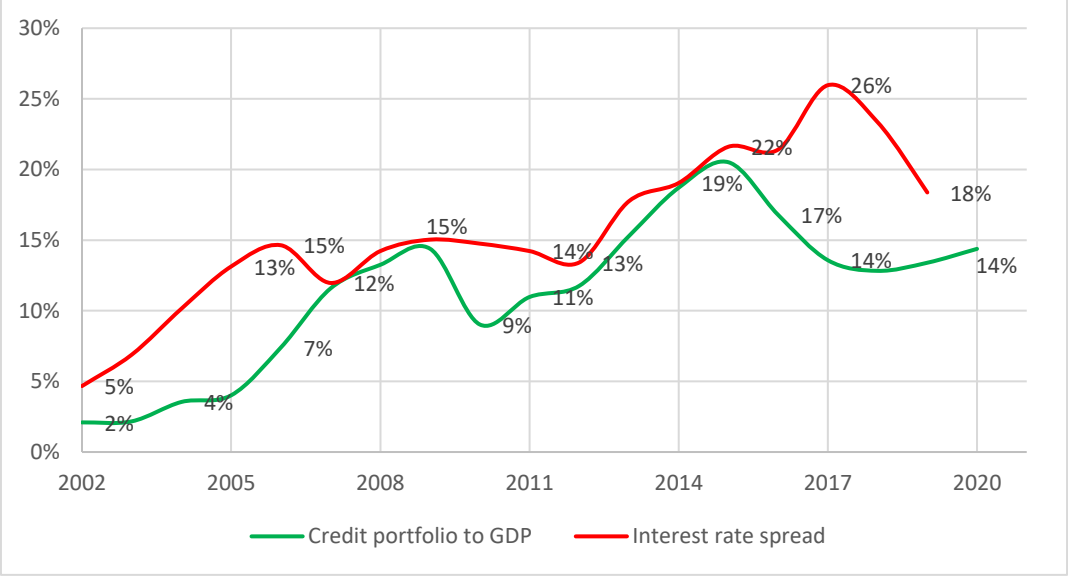
4.4.5 Loans (credits)

The Loans variable of the research is a banking system factor of the banking trust index; it comprises loans to individuals, loans to legal entities, and long-term credits ratio to total banking system assets. The loan portfolio of the banking system demonstrates cooperation between banks and clients (customers). The previous studies' researchers (Nikolaev et al., 2006; Vorobiev & Maibarada, 2014) emphasize that banking system loans are one of the leading development indicators, including the banking trust component. This research retains the total weights value of the variable, which is 18%; moreover, the sub-weight values are reserved at 7% (individuals), 5% (legal entities), and 6% for long-term loans as in Vorobiev and Maibarada (2014) and Nikolaev et al. (2006) studies.

Graph 4.5 grasps the loan tendency in the banking system of Tajikistan from 2002 to 2020. The trend illustrates the two significant declines that drastically changed the financial atmosphere. The declines in the credit market are associated with the GFC (2007-2009),

domestic financial failure, customers facing insolvency, and being unable to make due loan payments, eventually brought to credit stoppage by most credit financial institutions. Furthermore, the low level of credit turnaround started to affect the financial stability of the banking system. In consequence, most credit financial institutions encountered unprecedented outcomes of failure. However, the credit portfolio indicates that the credit market demand, one of the main factors of cooperation between the banks and the public, has an overall growth tendency.

Graph 4.5 Credit portfolio of the banking system to GDP ratio and interest rate spread



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/real_sector.php

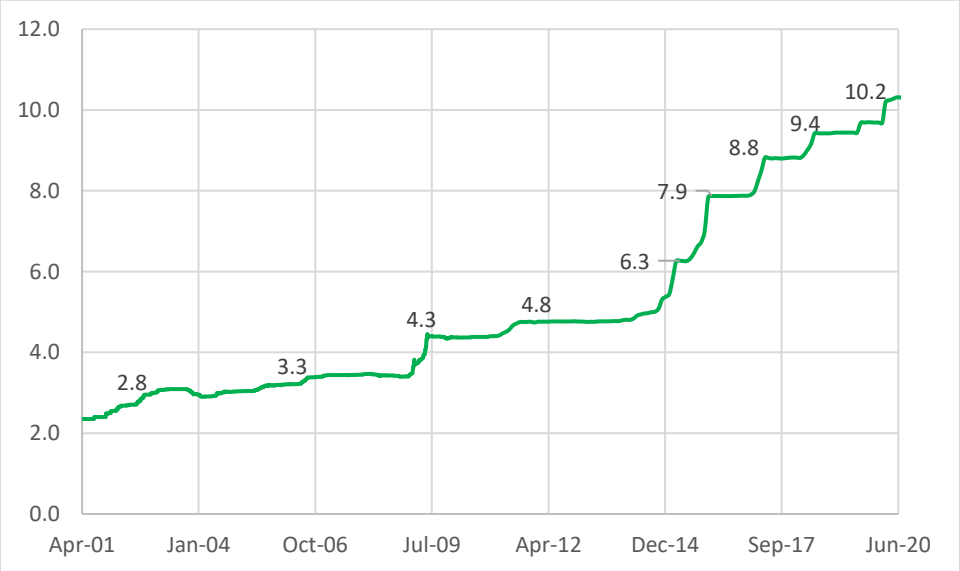
4.4.6 Exchange Rate

One of the distinct variables of the trust index is the Exchange Rate (ExR), which illustrates the tendency of the official US dollar to Tajikistan's domestic currency Somoni (USD/TJS). The exchange rate variable is a substitution adopted by this research instead of the Number of Small Enterprise variable. The exchange rate retains its weight as it is evaluated for some small enterprises in reviewed literature (Nikolaev et al., 2006; Vorobiev

& Maibarada, 2014) at 12 percent. The exchange rate in Tajikistan draws special attention from the population. The vivid examples of exchange rate importance can be withdrawn from the dollarization volume of deposits that averaged over 60% last decade. Moreover, the corrections (devaluation and revaluation) that the NBT makes and the general fluctuation of the national currency rate attract population attention. It is directly connected with the prices of imported goods and services because Tajikistan is mainly an importing country.

Graph 4.6 illustrates the exchange rate tendency from 2002 to 2020 (USD/TJS). The general direction leans to possess an increasing trend; however, it is worth mentioning that the central bank (NBT) maintains a managed floating exchange rate. Moreover, the internal market operates with an unofficial exchange (black-market) rate with a slight gap between the two. The central bank intervenes to close the gap between official and unofficial rates by periodical devaluations. Graph 4.6 indicates that the national currency's general devaluation for the last decade is 157%. Therefore, the volatility of the national currency of Tajikistan at this point remains vigilant.

Graph 4.6 The exchange rate (USD/TJS)



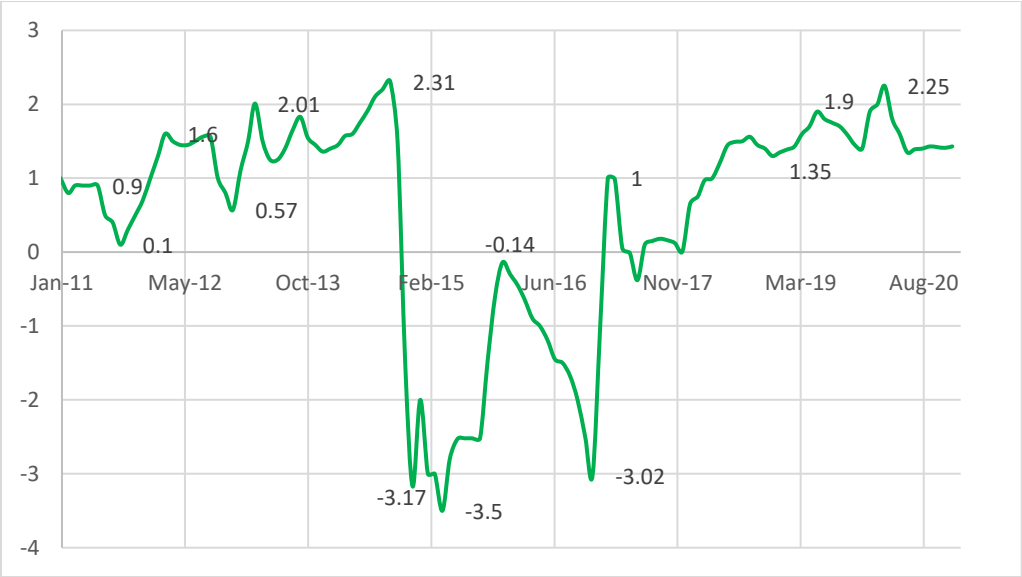
Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/kurs/kurs.php

4.4.7 Return on Assets

The Return of Assets (ROA) variable of the trust index represents the profit-generating rate or the banking system's profitability as the ratio of net income over total average banking system assets. The ROA variable is assigned the weight value of 10% as the literature suggests it strongly relates to the concept of trust, including economic and financial trust (Nikolaev et al., 2006; Staikouras & Wood, 2011).

Graph 4.7 illustrates the trend of efficiency of the assets (ROA) of the banking sector during the last decade. The two significant falls in the graph are associated with the Russian crises of 2014-2016, which traumatized the banking system of Tajikistan, causing bank runs and solvency issues. Moreover, several systemic financial institutions having negative income statements cautioned the public to withhold further cooperation since the banking system's reputation was already torn. Thus, the impact of the financial crises greatly affected the banking system and population trust.

Graph 4.7 Return on Assets of the banking system of Tajikistan (ROA 2011-2020)



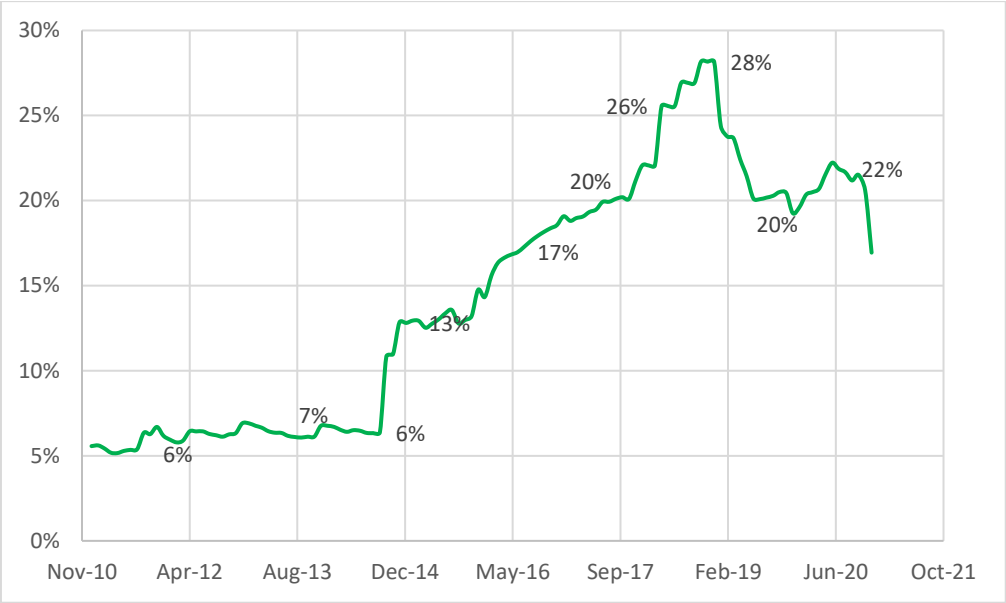
Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/banking_system/nadzor.php

4.4.8 Credit Risk

The credit risk variable of the trust index represents the level of provisions of the credit financial institutions. This variable demonstrates the risk measurement of the banking system and its response to potential losses that the banking system may experience due to credit risk. The credit risk variable in the trust index calculation has attained the weight value of 7%, following the recommendation of the literature (Nikolaev et al., 2006; Saiful & Ayu, 2019; Soyemi et al., 2014; Vorobiev & Maibarada, 2014). The provisions indicate the credit system's vulnerability to specific borrowers' financial conditions. The overall level of the requirements determines the credit market's common vulnerability and economic state (Vorobiev & Maibarada, 2014).

Graph 4.8 demonstrates the level of provisions in the banking sector which has an increasing dynamic. The credit market's negative tendency continues as the crises' consequences and effects remain in the industry. The initial point of the intensification originated in mid-2014, and subsequently, credit provisions reached 6% to 28% within four years. It is worth mentioning that the current condition of credit institutions remains at a level of over 20%, which can be characterized as a high-risk market.

Graph 4.8 Credit Risk (provisions) of the banking system of Tajikistan (2011-2020)



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/real_sector.php

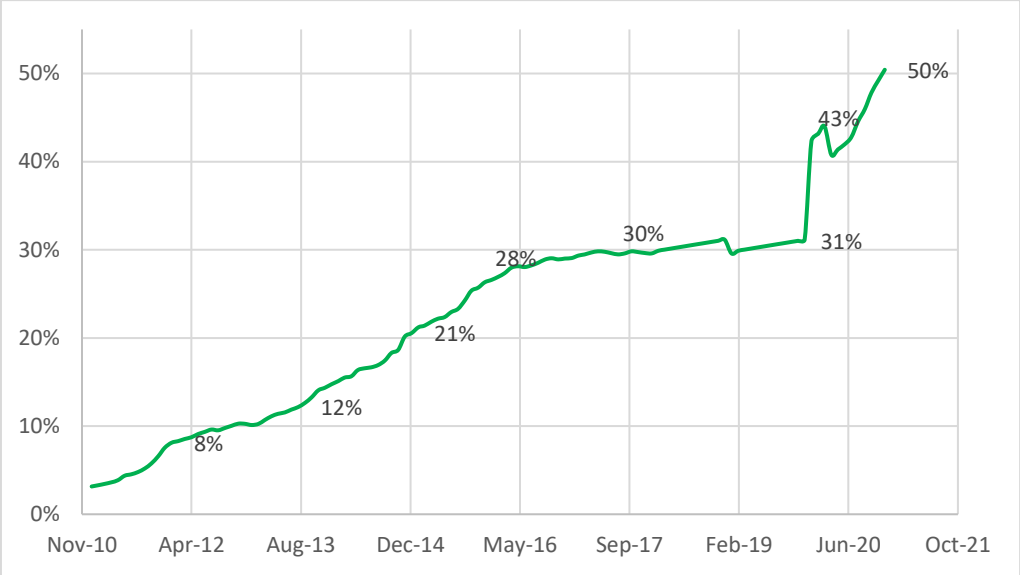
4.4.9 Banking cardholders

The last indicator of the trust index is the Banking cardholder's variable or debit and credit payment banking cards, which carries a minor influence in the index calculation. This variable attains the weight value of 3% and involves the ratio of total banking cardholders to the population (15 years old and older). This research assumes that the more people collaborate with financial institutions, the more they have opportunities for financial literacy and inclusion. Thus, the cardholders of the banking institutions have direct access to the financial facilities, including online banking opportunities and other services offered to the holders of the banking debit and credit cards. By encompassing this variable, the segment of internet banking gets attached since many people use cards for online shopping and other internet payment services.

The tendency of the bank cardholders has an upward trend, as Graph 4.9 illustrates. The trend has significantly increased in the last few years because the NBT promotes non-

cash transactions. Financial institutions in compliance with the regulator are offering various programs to promote the digitalization of the banking system.

Graph 4.9 Banking cardholders of the financial sector (2011-2020)



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/real_sector.php

4.5 Estimation model methodologies

The calculation of the trust index over the analyzed period makes available time-series data for this research. Thus, this research conducts an econometric analysis employing the Autoregressive Distributed Lag (ARDL) model proposed by Pesaran et al. (2001) following the empirical studies of Karim et al. (2016) and Yakubu and Abokor (2020). To fulfill the objectives of this research, we will estimate the short and long-run effects of the selected independent factors on the banking trust index. Previous studies use various models and datasets to identify the determinants of banking trust. This research complements the existing literature by examining the elasticity of macroeconomic and financial sector indicators of Tajikistan on the banking trust index.

4.5.1 Model rationale

The ARDL is an Ordinary Least Square (OLS) based model widely used in the econometric analysis (Gujarati & Porter, 2009). The ARDL has an advantage over the other cointegration techniques, for instance, fully modified Ordinary Least Squares, Johansen, etc. (Yakubu & Abokor, 2020). The model employs stationary level I (0) variables, the first difference I (1), or mixed. Moreover, the ARDL model takes different lagged values of dependent and explanatory variables to estimate balanced relationships (Karim et al., 2016; Pesaran et al., 2001; Yakubu & Abokor, 2020). As the theory of economics states, the dependence of one variable on another variable is rarely instantaneous, and the dependent variable responds to the explanatory variable with a lapse of time (lag) (Gujarati & Porter, 2009). Thus, after obtaining time-series data from the calculated index, we adopt the ARDL approach considering the case study of Tajikistan, which has a relevantly small and vulnerable economy, and most economic indicators integrated over several periods.

4.6 Model specification

The empirical model following the work by Pesaran et al. (2001), the ARDL (*p, q*) to observe the association between banking trust and the explanatory variables is as follows:

$$\Delta\gamma_t = \beta_0 + \sum_{i=1}^{p} \delta_j \Delta\gamma_{t-i} + \sum_{j=0}^{q} \omega_j \Delta x_{t-j} + \mu_1 \gamma_{t-1} + \mu_2 x_{t-1} + \varepsilon_t \qquad \textbf{(1)}$$

where γ_t is the independent variable; coefficient β_0 is the constant term; coefficients δ_j, ω_j for all j– correspondents to the short-run and μ_i, j= 1, 2 corresponds long-run relationship; x_t - is the independent variable; p, q – are the respective lags of variables, and ε_t - is the error term. There are two phases to conducting the ARDL model. The initial phase is to estimate equation 1 to execute an F-bound test for a long-run relationship

between the variables. The second phase includes the Error Correction Model (ECM) from the ARDL model.

4.7 Error Correction Model (ECM)

To further determine the long-run equilibrium relationship, the linear combination of the non-stationary variables is stationary in a simple OLS framework. The ECM is defined to capture the convergence of the model towards equilibrium. The residuals obtained from the convergence became new data series ECM_{t-1}. To acquire the short-run dynamic range, the lagged variables $x_t and\ \gamma_t$ with the ECM_{t-1} plugged into equation 1, and estimation is performed. The estimation equation is specified as follows:

$$\Delta\gamma_t = \beta_0 + \sum_{i=1}^{p} \delta_j \Delta\gamma_{t-i} + \sum_{j=0}^{q} \omega_j \Delta x_{t-j} + \lambda ECM_{t-1} + \varepsilon_t \qquad \textbf{(5)}$$

The primary purpose of the estimation equation is to attain a model which converges to equilibrium. If the ECM coefficient λ is statistically significant and negative, the conclusion of model convergence to equilibrium is drawn. The significant ECM coefficient verifies the existence of a long-run relationship and cointegration between the independent and explanatory variables. Additionally, the ECM coefficient determines the speed of adjustment from short to long-term equilibrium.

4.8 Econometric modelling

The ARDL model following the technique specified by Pesaran et al. (2001) for the bounds test is applied to the research data. The dependent (BT) and Wages (Wgs) variables are expressed as the natural logarithms, and other variables are represented in raw form since these data are in ratio form. The logarithm is taken to reduce the possible heteroscedasticity and simplify regression outcomes. Thus, the ARDL model with

corresponding ECM to analyze the long-run and short-run relationship of the dependent variable and explanatory variables is expressed as follows:

$$\ln\mathrm{BT_t} = \alpha_0 + \sum_{i-t}^{p1} \alpha_{1\mathrm{i}}\, \Delta\ln\mathrm{BT}_{t-1} + \sum_{i-t}^{q1} \alpha_{2\mathrm{i}}\, \Delta\mathrm{ROE}_{t-1} + \sum_{i-t}^{q2} \alpha_{3\mathrm{i}}\, \Delta\mathrm{NPL}_{t-1} + \sum_{i-t}^{q3} \alpha_{4\mathrm{i}}\, \Delta\ln\mathrm{WGs}_{t-1} + \sum_{i-t}^{q4} \alpha_{5\mathrm{i}}\, \Delta\mathrm{DepRate}_{t-1} + \delta_1 BT_{t-1} + \delta_2 \mathrm{xROE}_{t-1} + \delta_3 NPL_t + \delta_4 lnWgS_{t-1} + \delta_5 DepRate_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \quad \textbf{(6)}$$

where p lags are used for dependent variables and q lags are used for explanatory variables, the remaining coefficients explain short-term and long-term relationships. The δ_j, $j=0,1,2,3$ corresponding long-run relationship, while first difference of coefficients α_i (i=1,2,3,4) represent a short-run relationship, λ is the coefficient of ECM; and ECM_{t-1} represents error-correction term lagged by one period, ε is the error term.

4.9 Regression Data Variables Discussion

The Banking Trust Index (BT) is a personal calculation of the author, which serves as a dependent variable. There is a wide range of economic and banking sector indicators to estimate the determinants of banking trust. This research implements the ARDL model by Pesaran et al. (2001) and, at the same time, considers the dependent (BT) variable prospects with the time-series data of 120 monthly observations (01/2011-12/2020). Therefore, before choosing independent variables for the regression model, we considered the monthly data availability of indicators and their compatibility with ARDL requirements. Additionally, it is worth noting that we have already employed some variables (11 variables) proposed by Nikolaev et al. (2006) and Vorobiev and Maibarada (2014) to calculate the trust index; consequently, we consider endogeneity issues of explanatory variables.

Initially, this research intended to employ banking indicators, such as ROA, ROE, NPL, Exchange Rate, Interests on Deposit, and economic indicators, namely GDP, Inflation,

Money Supply, Government debt, Wages, Unemployment, and Remittances. However, after the dependent variable calculation, exploring the ARDL compatibility, and gathering available data, the selection of regressors was considered as follows:

Table 4.3 The selection consideration of nominated variables

	Indicators	Eliminated	Selected	Rationale
1	GDP	√		This indicator is used to calculate the banking trust index and is eliminated because of possible endogeneity issues
2	Inflation	√		This indicator is used to calculate the banking trust index and is eliminated because of possible endogeneity issues
3	Money supply	√		This indicator is stationary with 2nd difference - I (2) and is not compatible with the ARDL model
4	Government debt	√		The data on this indicator is unavailable
5	Wages		√	Wages generally represent the price of labor; thus, the compensation of employees as a share of the national product shows the general economic condition and is a vital variable to estimate the banking trust. Additionally, this indicator does not have endogeneity issues, the monthly data is available, and the unit root test on data shows that it is stationary at I(1)
6	Unemployment		√	Unemployment is a key economic indicator that shows the share of the unproductive labor force. The high level of unemployment denotes less economic production; thus, this indicator characterizes lost output. Moreover, this indicator does not represent endogeneity issues, the monthly data is available, and the unit root test on data shows that it is stationary at I(1); therefore, it is considered for further regression analysis with the banking trust index.
7	Remittances	√		The monthly data on this indicator is not available
8	ROA	√		This indicator is used to calculate the banking trust index and is eliminated because of possible endogeneity issues
9	ROE		√	ROE is a central measure of the country's financial sector profitability. It shows capital strength and financial stability; thus, ROE embodies a critical financial indicator related to the banking trust index. This indicator does not represent endogeneity issues, the monthly data is available, and the unit root test on data shows that it is stationary at I(1); therefore, we consider ROE for regression analysis.
10	NPL		√	NPL presents the financial burden and possible losses of the banking system. A high level of NPL means bad risk management and financial instability that leads to reduced profitability. This indicator does not represent endogeneity issues, the monthly data is available, and the unit root test on data shows that it is stationary at I(1); thus, we consider NPL for regression analysis.
11	Deposit Interest rate		√	The Interest Rate of this research is an indicator of profit-making on deposits and savings. It characterizes the rate of return on individuals' and legal entities' funds by representing the customer and bank cooperation. Additionally, this indicator does not represent endogeneity issues, the monthly data is available, and the unit root test on data shows that it is stationary at I(1); therefore, we consider interest rates for regression analysis.
12	Exchange rate	√		This indicator is used to calculate the banking trust index and is eliminated because of possible endogeneity issues

Source: Author's construction

Finally, Nonperforming Loans (NPL), Wages (WGs), Return on Equity (ROE), Registered Unemployment (Unempl), and Average Interest Rate on Deposit (DepRate) were selected as the explanatory variables for further analysis to establish their relationship with banking trust (BT).

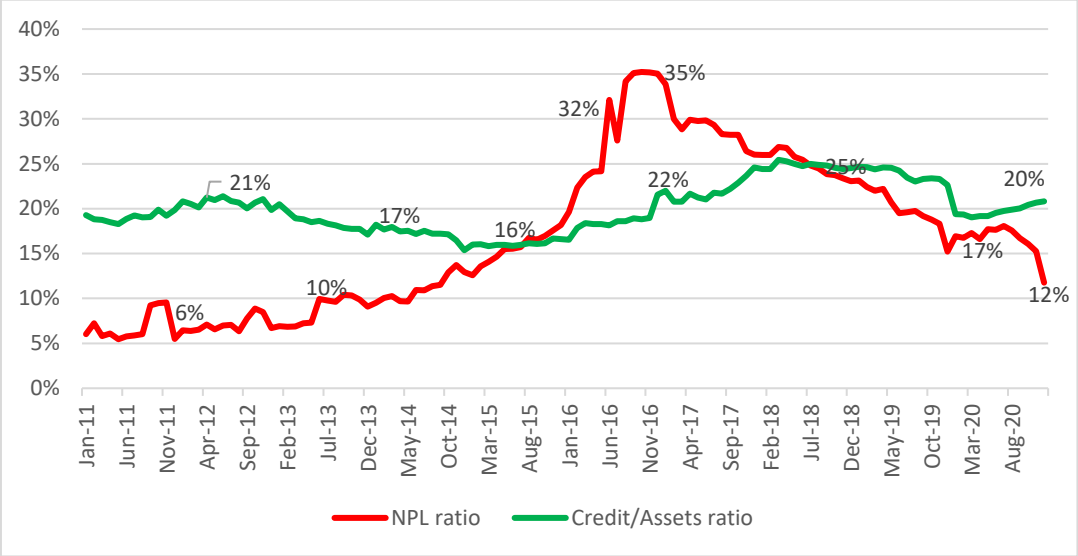
4.9.1 Nonperforming Loans

Nonperforming Loans (NPL) are the total overdue loans (including credits and overdrafts) of the banking system of Tajikistan. Under normative acts of NBT, unpaid or substandard loans are considered all loans that are not paid on time for over 30 days (NBT, 2020). The NPL ratio in this research is a percentage rate of all substandard loans over the total credit portfolio of the banking system.

Nonperforming loans usually increase during economic instability and uncertainty. The NPL is a sensitive indicator of the financial institutions, which shows the quality of outstanding loans, level of credit risk, and possible losses. Graph 4.10 illustrates the NPL ratio and total credit portfolio over total assets of the Tajikistan credit system. The drastic rise in overdue loans is significant after the crisis of 2014 (Russian crisis), proving that the NPL ratio is a financial-stability-sensitive indicator.

The NPL indicator is expected to estimate the linkage between customers who failed to make an on-time payment and the banking trust index. As the literature suggests, the NPL is a vital banking system indicator that has a strong connection with overall financial stability (Chernykh et al., 2021). Therefore, we use NPL as an explanatory variable of the regression model to find the relationship between overall public confidence and nonperforming loans.

Graph 4.10 Nonperforming loans ratio and credit to assets ratio of the banking system (2011M01–2020M12)



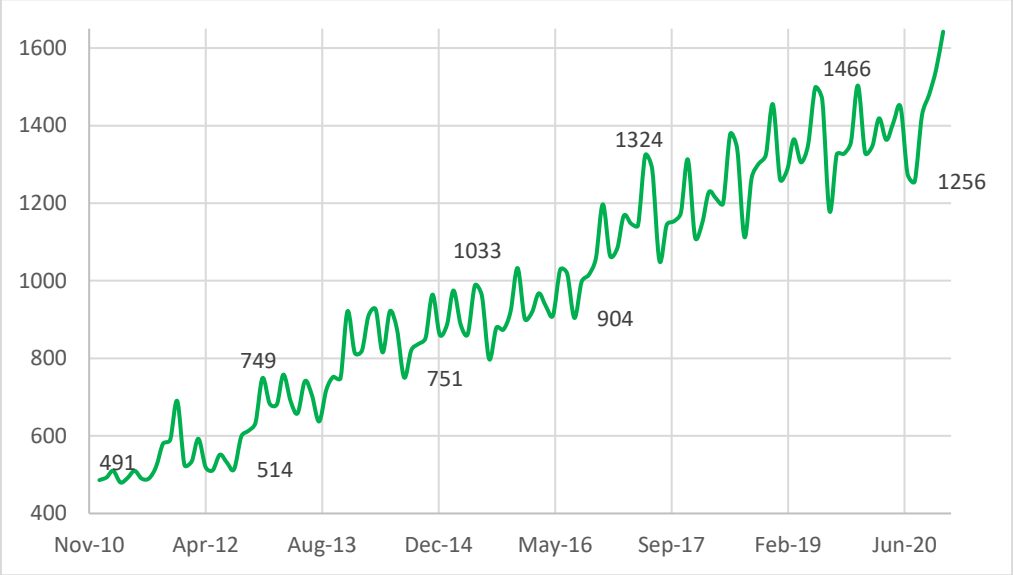
Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/real_sector.php

4.9.2 Wages

The Wages (WGs) variable grasps the average formal population labor or service compensation from economic activities. This macroeconomic variable indicates the level of official income derived from the labor force; therefore, it demonstrates one of the primary income sources of residents. The data analysis shows that the average wages have increased 2.5 times during the last decade. Graph 4.11 reflects the dynamic of official wages having an upward trend over the previous ten years *(research period)*. Generally, we expect wages to stimulate the financial market by surging the cash flow and increasing the cooperation between the public and banks. Additionally, according to the reviewed literature (Lebedyev, 2011), low wages increase the chances of distrusting financial institutions. Therefore, this research employs the wages variable in the regression model to find the association between the primary source of public income and their level of trust in the banking system.

Graph 4.11 Average official wages in the Republic of Tajikistan (2011M01–2020M12)

(in somoni)



Source: Author's construction, data source: TJStat
https://www.stat.tj/en/tables-real-sector

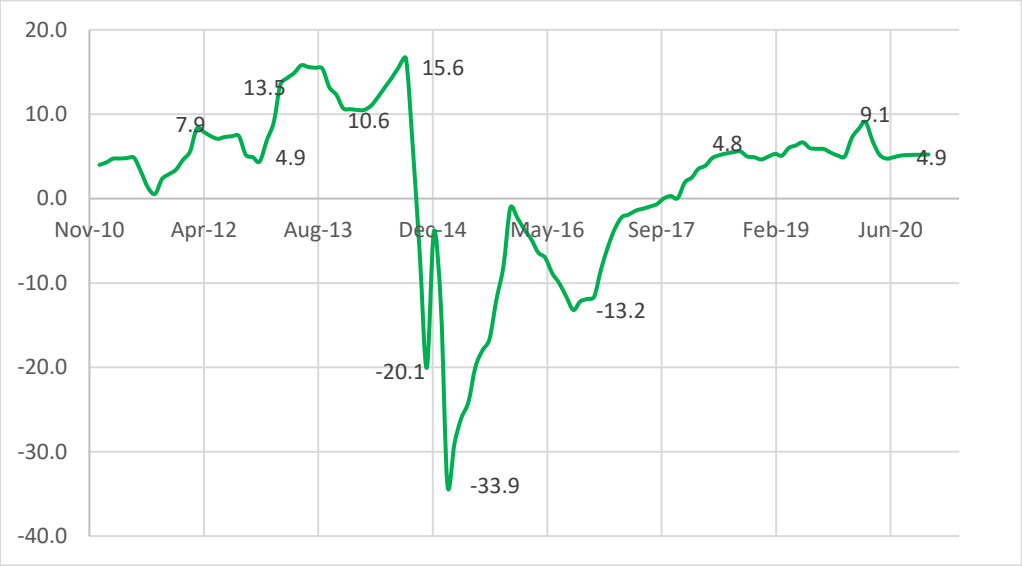
4.9.3 Return on Equity

The Return on Equity (ROE) indicator is the banking system-specific variable that reveals the overall earnings ratio to banking system equity. The profitability ratio of equity is the financial sector component that attracts current or possible future shareholders and investors. Therefore, the ROE determines how efficiently the financial institutions utilize the resources to generate profit. This study employs ROE to discover its relationship to the public trust index. It is worth mentioning that during the last decade, the equity profitability of the financial system has been unstable. Graph 4.12 expresses the tendency of the ROE performance of the banking system in the research period.

We assume that the Return on Equity will indicate the banking sector's soundness as it relates to the banking system's profitability. Moreover, the literature reviewed suggests that ROE is connected to other essential banking values such as ROA and risk management

(credit risk, liquidity risk, and operational risk) (Saiful & Ayu, 2019). Therefore, having estimated the relationship of ROE to the trust index, we also grasp the relation of other vital indicators.

Graph 4.12 Return on Equity of the banking system of Tajikistan (2011M01–2020M12)



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/banking_system/nadzor.php

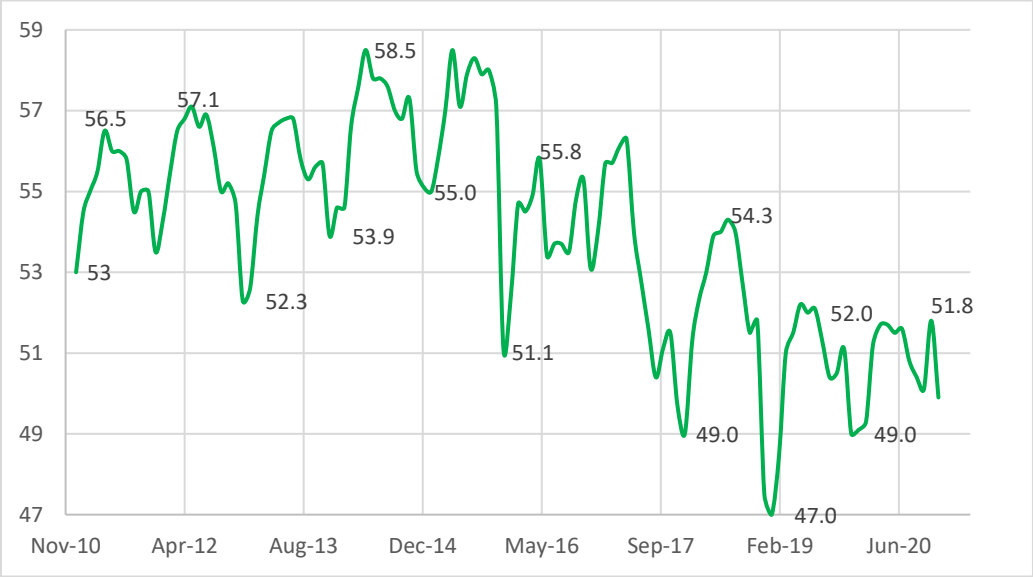
4.9.4 Registered Unemployment

The Registered Unemployment (Unempl) is an explanatory variable that includes the number of officially registered residents with unemployed status. According to economic theory, unemployment is one of the leading indicators of macroeconomics. This research investigates the relationship between unemployment and the public trust index. Graph 4.13 shows the tendency of registered unemployment in the research period. The dynamic in the unemployment trend is strongly driven by economic-financial stability, as in the case study of Tajikistan. Therefore, this research expects unemployment to have an association, particularly a negative effect on banking confidence. The literature also suggests that

banking confidence is negatively affected by unemployment during and after the crisis (Roth et al., 2014).

Graph 4.13 Officially registered unemployed people in Tajikistan (2011M01–2020M12)

(in thousands)



Source: Author's construction, data source: TJStat
https://www.stat.tj/en/tables-real-sector

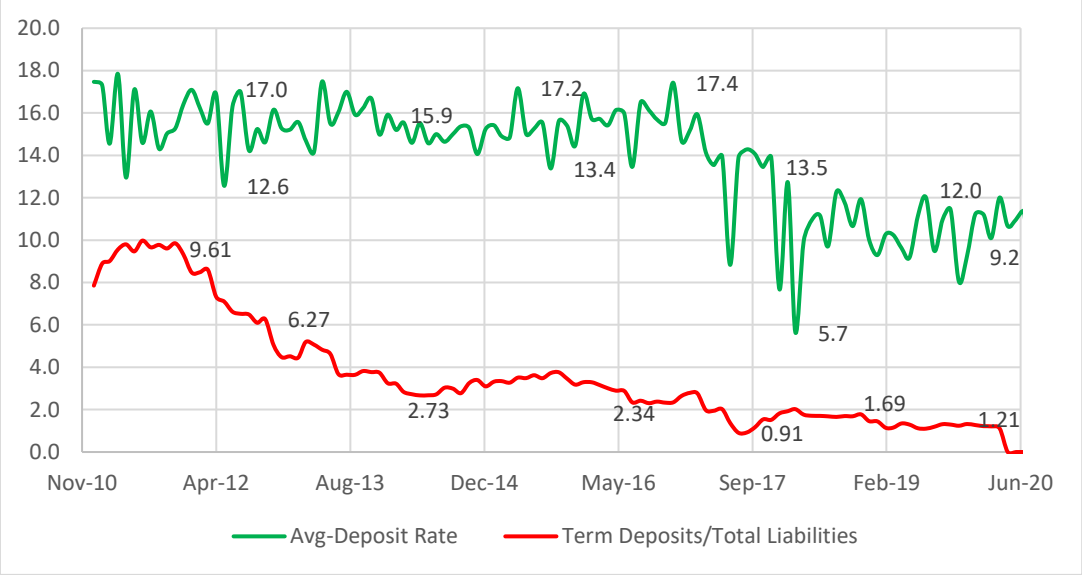
4.9.5 Interest Rate on Deposit

The interest rate on deposits (DepRate) is the average interest rate paid by financial institutions on time deposits and savings accounts. The interest rate and term deposits tendency in the research period is downward, as illustrated in Graph 4.14. As described in Chapter 3, the banking system of Tajikistan is in the developing stage; therefore, as the credit market competition grows, the interest rate on credits lowers down; thus, reducing the deposit rates. The crisis of the last two decades forced financial institutions to promote low-interest rates to cover the losses. Additionally, the banking sector has widened the path to foreign capital in the previous decade. The growth of funds from international financial institutions affected the deposit policies in the banking sector. This research considers the

deposit rate as a direct indicator representing public attention because most residents follow up on the competition and promotions between financial institutions with higher interest rates to get interest incomes. Thus, the determination of society to keep their funds (public confidence) in financial institutions is expected to depend on the level of interest rates (Viphindrartin et al., 2021).

Graph 4.14 describes the dynamics of term deposits to total liabilities ratio and average interest rate on deposits in the banking system of Tajikistan.

Graph 4.14 The interest rate on deposits and term deposits to total liabilities ratio (2011M01–2020M12)



Source: Author's construction, data source: NBT
https://www.nbt.tj/tj/statistics/monetary_sector.php

Table 4.4 provides a detailed explanation of all the variables included in the regression model of this study.

4.10 Survey

Additionally, we collected primary data to assess the factors affecting public confidence in banking. Therefore, we used the survey method to collect data and perform

additional analyses of public trust factors in the banking system. Within the survey questionnaire, we adopted inquiries related to the factors that affect consumer trust (Debab & Yateem, 2012). The economic state and factors determining public trust include global and domestic financial conditions, banking reputation, political aspects, customer loyalty, satisfaction, and confidence.

The survey approach of this study attempts to determine the factors and possible antecedents of trust in the banking system. The previous literature suggests answering the research questions by developing the study hypothesis. Therefore, following the literature, we propose the following hypotheses:

H1: Global financial conditions influence banking confidence in Tajikistan

H2: Domestic economic conditions impact public trust in the banking system

H3: Bank reputation and performance affect public confidence

H4: Customer loyalty affects the banking trust

H5: Customer satisfaction influences individuals' trust in the banking system

H6: The banking system of Tajikistan is developing public confidence.

Following Debab and Yateem (2012), we designed a questionnaire to profile the customers, explore factors that affect public trust, and identify other financial concerns that may influence banking confidence. The survey questionnaire is in the Google Forms platform and contains a total of 37 questions as follows:

- The first section: 7 personal information and 4 general-financial
- The second section: 5 global-financial, 4 domestic-financial, 4 bank reputation, 4 customer loyalty, 4 customer satisfaction, and 5 banking confidence questions.

We employ a 5-points Likert-type scale rating from 1 (Strongly disagree) to 5 (Strongly agree) for collecting survey data. We will accept our null hypotheses assuming that the factors mentioned above have a significant effect on public confidence:

- if the Mean (Average) value is between 4 and 5;
- if the mean value is between 1 and 2, the proposed factors have little affection for peoples' trust;
- if the mean value of 3 is considered to have an average (moderate) effect on public confidence in the banking system. Moreover, the mean value of less than 3.0 is deemed to have a negative trend, and the mean value of greater than 3.0 is considered positive.

4.11 Validity and Reliability

The collected data is subject to the literature's validity and reliability tests. The validity element is suggested to find out the authenticity of the scores to which they are intended. At the same time, reliability is referred to as testing the consistency of the outcome in future reproduction cases. Therefore, Cronbach's alpha test is used to examine the internal surface of the variables. One desirable approach is calculating the Cronbach's alpha on a set of 10 to 15 items to incorporate the variability of the associated variables (Hulin et al., 2001). Therefore, the second section of our questionnaire with Likert scale answers is split into two:

- Financial situation and banking reputation
- Customer satisfaction and consumer confidence

and each divided subsection encompasses 13 questions. The Cronbach's alpha coefficients vary from 0 to 1, and the most advocated level of adequacy is 0.70. This

coefficient gives us information about the correlation of items in the section set. The reviewed literature suggests that the more significant (above 0.70) coefficient alpha offers consistent measurement (Debab & Yateem, 2012; Hulin et al., 2001).

4.12 Survey data analysis

We use the Statistical Package for Social Science (SPSS) to analyze the questionnaire results. Using this statistical tool, we further calculate descriptive analysis, including mean, frequencies, and standard deviation, to explain the characteristics of our sample respondents and variables.

5 Chapter V. Empirical Results and Discussion of Findings

5.1 Introduction

The following chapter aims to measure the level of public trust in the banking system and estimate the long-run and short-run relationship between public trust and the financial system and macroeconomic indicators of Tajikistan. The time-series data obtained from the calculation of the banking trust index for the research period enables us to conduct the regression analysis to investigate the association of banking system trust with other indicators. Finally, we will describe the survey results and analysis to conclude this chapter.

5.2 Banking Trust Index calculation

The measurement of the trust index following the methodology described in the previous chapter is presented in Table 5.1.1. The calculation is derived from 120 monthly observations (01/2011 – 12/2020), covering the research period. The following table (Table 5.1) and graph (Graph 5.1) contain the annual calculation and the graphical representation of the index.

Table 5.1 Banking Trust Index (annual representation)

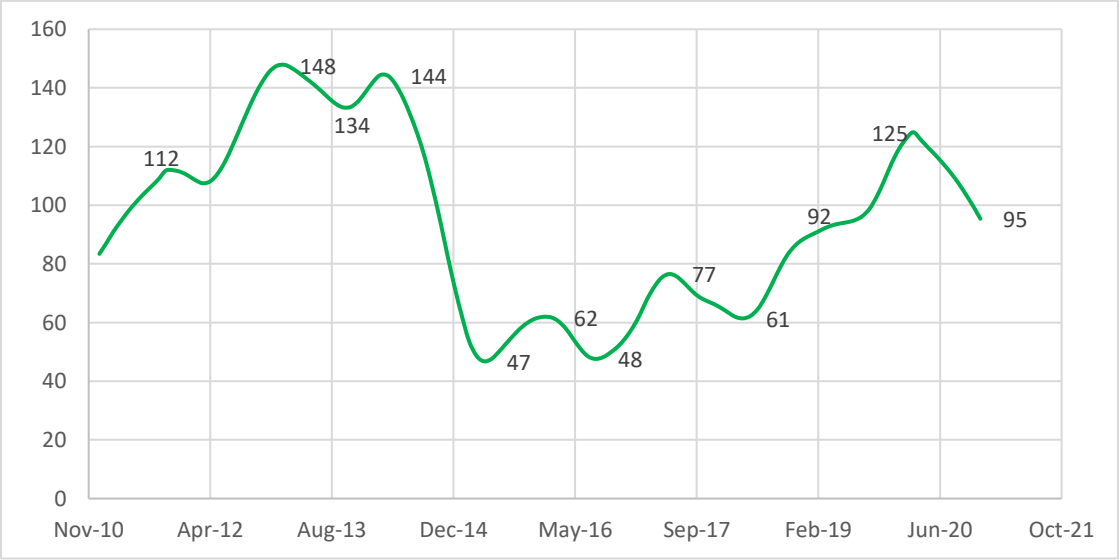
Variables	K (-;+)	weights	31/1 2011	31/12 2011	31/12 2012	31/12 2013	31/12 2014	31/12 2015	31/12 2016	31/12 2017	31/12 2018	31/12 2019	31/12 2020
LegDep	1	9%	100	90	73	57	64	66	68	83	93	86	104
IndDep	1	11%	100	115	128	132	131	133	120	105	100	102	108
DepDol	-1	2%	100	94	99	102	108	128	100	86	77	69	67
LI	1	7%	100	49	55	70	65	54	42	41	46	56	63
LLE	1	5%	100	114	119	135	165	146	104	77	75	75	87
LTL	1	6%	100	104	158	270	275	261	232	260	289	286	285
EXR	-1	10%	100	100	95	91	94	118	124	129	131	122	130
CAR	1	8%	100	97	97	79	53	40	49	61	56	49	38
FDI	1	12%	100	246	333	147	27	35	154	22	40	97	3
BC	1	3%	100	223	285	382	500	620	639	607	607	546	808
ROA	1	10%	100	65	50	114	-248	-10	-210	1	80	77	72

CR	-1	7%	100	103	109	102	180	197	231	245	310	191	154
CPI	-1	10%	100	107	114	119	128	135	144	155	163	181	198
INDEX		100%	100	135	168	153	24	73	40	47	63	91	88

Source: Author's calculation.

Graph 5.1 is derived from Table 5.1 to illustrate the dynamics of the banking trust index. The dynamic of the index indicates various seasonal fluctuations; however, the level of trust should not depend on seasonal economic disequilibrium. The behavior of consumers and the economic environment of Tajikistan has their specific phenomenon, which may rely on crops, labor migration, holidays, and other temporary reasons. The index calculation considers trust as an economical category rather than an emotional or psychological type. Thus, using Eviews statistical tool, STL Decomposition seasonal adjustment is applied to discard the specifics of the economic seasons. Graph 5.1 demonstrates a seasonally adjusted chart of the banking trust index, containing some falls in the trend.

Graph 5.1 Dynamics of the banking trust index 2011-2020 (with seasonal adjustment)



Source: Author's construction. EViews statistical tool

5.3 The regression model descriptive statistics

Table 5.2 Descriptive statistics of regression variables (2011M01–2020M12)

	BT(index)	NPL(%)	Wgs(TJS)	ROE(%)	RegUnempl (thousands)	DepRate%
Mean	95.348	16.908	977.263	1.891	54.025	13.753
Median	91.35	16.572	947.46	4.9	54.5	14.655
Maximum	179.366	35.222	1642.27	16.6	58.5	17.84
Minimum	14.7	5.462	480	-33.9	47	5.65
Std.Dev	42.261	8.552	310.843	9.739	2.655	2.751
Skewness	0.241	0.422	0.045	-1.296	-0.418	-0.805
Kurtosis	2.087	2.078	1.893	4.834	2.382	2.702
Jarque-Bera	5.3231	7.8191	6.1723	50.3897	5.3979	13.4187
Probability	0.0698	0.02	0.0457	0	0.0673	0.0012
Sum	11441.77	2028.93	117271.5	226.96	6483	1650.38
Sum Sq. Dev	212534.4	8702.29	11498185	11287.08	838.53	900.83
Observations	120	120	120	120	120	120

Source: Author's calculation.

The descriptive statistics of the study show that the sample is balanced and contains 120 monthly (01/2011 to 12/2020) observations. The standard deviation of the Banking Trust Index (BT) and Wages (Wgs) variables is relatively higher than other variables expected. Therefore, the regression model takes these two variables in the natural logarithm types. The Jarque-Bera statistics and p-value of BT and Unemployment do not seem to be normally distributed at the independent level; however, the further joint distribution of all variables is normally distributed. The next sections demonstrate the diagnostics section being 0.05 > p-value statistics, rejecting the null hypothesis of normality.

5.4 Unit Root Tests results

Following the methodology chapter, we conduct the Unit Root tests to ensure that our variables are not integrated of order 2 (I(2)) because the order of regressors should be

purely I(0), purely I(1), or mutually cointegrated for the ARDL estimations (Pesaran et al., 2001). The following tables (Tables 5.3 and 5.4) contain the Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) unit root test results of the variables. It is worth mentioning that lag length of the Unit root tests in the EViews statistical tool is on default settings and is automatically set based on AIC and SIC selections (See Appendix for lag length of Unit Root test results for all variables).

Table 5.3 ADF Test Results

Variable	Intercept				Trend and Intercept				Decision
	Level		First Difference		Level		First Difference		
	T-stat	p-value	T-stat	p-value	T-stat	p-value	T-stat	p-value	
LnBT	-3.23	0.0208	-10.63	0.0000	-3.27	0.0751	-10.59	0.0000	I(0), I(1)
NPL	-1.39	0.5817	-4.57	0.0003	0.29	0.9984	-12.84	0.0000	I(1)
ROE	-2.41	0.1422	-5.31	0.0000	-2.38	0.3867	-5.29	0.0001	I(1)
LnWgs	-1.73	0.4107	-3.21	0.0220	-1.68	0.7537	-3.53	0.0407	I(1)
LnUmempl	-0.46	0.8932	-3.56	0.0080	-2.08	0.5485	-3.63	0.0319	I(1)
DepRate	-0.99	0.7542	-13.8	0.0000	-2.74	0.2220	-13.77	0.0000	I(1)

The critical value for ADF statistics with an intercept: - 2.887425 (5%)
The crucial value for ADF statistics with an intercept and trend: -3.450436 (5%)

Source: Author's calculation- EViews statistical tool

Table 5.4 PP Test Results

Variable	Intercept				Trend and Intercept				Decision
	Level		First Difference		Level		First Difference		
	T-stat	p-value	T-stat	p-value	T-stat	p-value	T-stat	p-value	
LnBT	-3.32	0.0159	-12.59	0.0000	-3.39	0.0580	-12.53	0.0000	I(0), I(1)
NPL	-1.34	0.6084	-12.54	0.0000	-0.19	0.9926	-12.72	0.0000	I(1)
ROE	-2.37	0.1529	-9.53	0.0000	-2.35	0.4031	-9.50	0.0000	I(1)
LnWgs	-1.12	0.7045	-32.96	0.0001	-6.30	0.0000	-36.71	0.0001	I(0), I(1)
LnUmempl	-2.53	0.1110	-10.81	0.0000	-4.22	0.0057	-10.81	0.0000	I(0), I(1)
DepRate	-4.22	0.0009	-40.35	0.0001	-8.57	0.0000	-42.62	0.0001	I(0), I(1)

The critical value for PP statistics with an intercept: - 2.885863 (5%)
The crucial value for PP statistics with an intercept and trend: -3.448021 (5%)

Source: Author's calculation- EViews statistical tool

Tables 5.3 and 5.4 depict the regression variables' ADF and PP unit root test results. The null hypothesis assumes that the series has a unit root with intercept, no trend, or with the trend and intercept. In both cases of the ADF test method, the null hypothesis is accepted that the variables have unit root at their level except LnBT (p-value < 0.05; 0.0208) at intercept and no trend and ROE (p-value < 0.05; 0.0178) with trend and intercept. Thus, we proceed to the next test with the first differencing with ADF testing. Table 5.3 indicates that we can reject the null hypothesis at I(1) for all the variables having no unit root after taking the first difference (p-value < 0.05, see Table 5.3) in both cases at the intercept and no trend, and trend and intercept. However, the PP unit root test results show that the LnBT and DepRate variables are stationary at intercept and no trend, and the LnWgs, LnUnempl, and DepRate variables are stationary at a level with trend and intercept (p-value < 0.05, see Table 5.4). Table 5.4 also indicates that we reject the null hypothesis at the first difference for all employed variables: non-unit root and stationary at a significance level of 1% with the PP unit root test. Having conducted the ADF and PP unit root tests, we conclude that all our variables are not integrated of order 2 I(2). Therefore, the test results assure that we can proceed to the ARDL cointegration tests.

5.5 Lag Selection Outcome

The lag length for research variables is selected utilizing the Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn Criterion (HQ) criterion of vector autoregressive (VAR). Table 5.5 represents the results of the optimal lag length proposed by various criterion information. We have collected monthly data, and the reviewed literature offers 6, 12, and 24 periods. At the same time, it is recommended to restrict with smaller lag length to avoid losing the degrees of freedom. The main objective

is to select optimal lag for the VAR, and the literature suggests setting the lowest value among the AIC, SIC, and HQ information criteria. The smallest value lag length from VAR order selection calculated by EViews statistical tool is the AIC, as depicted in Table 5.5. Thus, among the AIC, SIC, and HQ, the Akaike Information Criterion (AIC) has the lowest value (0.075), which meets the requirement.

Table 5.5 VAR lag order selection criterion (included observations 114)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-26.7673...	NA	0.104047	0.574866	0.718876	0.633312
1	-5.72694...	39.49692	0.073209	0.223280	0.391292	0.291467
2	-2.24467...	6.475804	0.070094	0.179731	0.371745	0.257659
3	2.377510...	8.514558	0.065785	0.116184	0.332200*	0.203853
4	2.418441...	0.074679	0.066909	0.133010	0.373027	0.230419
5	4.496706...	3.755462	0.065665	0.114093	0.378112	0.221243
6	7.715931...	5.760720*	0.063169*	0.075159*	0.363180	0.192051*

Note 1: LR- Likelihood ratio; FPE- Final prediction error; AIC- Akaike information criterion; SBC- Schwarz Information criterion; HQ- Hannan-Quinn criterion.

Note 2: *Indicates Optimal lag length.

Source: Author's calculation- EViews statistical tool

5.6 Bounds testing for cointegration

After defining that none of the research variables are of order I(2) or above and establishing the optimal lag length, we conduct a bounds test to determine the presence of long-run cointegration. The ARDL bounds test of cointegration outcome to demonstrate the relationship between the dependent variable and explanatory variables is illustrated in table 5.6. The ARDL bounds test results, as shown in table 5.6, exceed the upper critical bound value of 4.68 at a 1% significance level with an estimated F-statistics value of 10.6659, provided by Pesaran et al. (2001). Thus, this evidence is sufficient to reject the null

hypothesis of no long-run relationship at a 1% significance level, supporting the existence of cointegration among the research variables.

Table 5.6 ARDL Bound Test of Cointegration

Variables	F-Statistics	Decision
F(LnBT, NPL, ROE, LnWgs, LnUnempl, DepRate)	10.6659	Cointegration exists
Critical Value Bounds (Significance)	Lower Bound I(0)	Upper Bound I(1)
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68
Included observations	114	

Source: Author's calculation – EViews statistical tool

5.7 Estimation of Short-Run and Long-Run relationship

5.7.1 Short-Run Relationship

Table 5.7 presents the parsimonious estimation of the short-run relationship. The results demonstrate that the ROE and DepRate determinants are statistically significant (p-value: 0.0041 and 0.0052, respectively), whereas the NPL and LnWgs indicators are statistically insignificant in the short run. It is worth mentioning that according to table 5.7, the ROE, DepRate, and LnWgs have negative relationships with the banking trust index; we assume that it is the effect of the fluctuating economy of Tajikistan.

The central part of the short-run estimation is the coefficient of the lagged error-correction term (ECM_{t-1}) which is negative and statistically significant (p-value < 0.001). The significance of the lagged ECM indicates a long-term causality from explanatory variables of the regression model towards the banking trust index. The coefficient of the

error-correction model is around -0.92, which suggests that the speed of adjustment from short-run to long-run equilibrium is about 92%.

Table 5.7 The short-run estimation model (ECM)

ARDL (6,4,1,1,4,0) selected based on AIC Dependent variable LnBT

Variable	Coefficient	Std.Error	t-statistic	Prob.
C	6.982	0.851	8.206	0.0000
$\Delta LnBT_{t}$	0.282	0.079	3.540	0.0006
ΔROE_{t}	-0.018	0.006	-2.944	0.0041
ΔNPL_{t-5}	-0.001	0.014	-0.079	0.9375
$\Delta LnWgs_{t-3}$	-0.001	0.217	-0.005	0.9960
$\Delta DepRate_{t}$	-0.039	0.013	-2.860	0.0052
ECM_{t}	-0.923	0.112	-8.214	0.0000
R-squared	0.6054			
Adjusted R^2	0.5403			
Durbin-Watson stat	1.8364			
F-statistic	9.3006			
Probability (F-statistic)	0.0000			
Included observations	114			

Source: Author's calculation – EViews statistical tool

5.7.2 Long-run Relationship

The empirical results of the long-term determinants of the banking trust index are represented in Table 5.8. In the long term, our model's research variables are statistically significant. The estimation results demonstrate that ROE, LnWgs, and DepRate have a significant positive association (0.000, 0.038, and 0.027, respectively) with a probability of less than 1% and 5% significance. In contrast, NPL and LnUnempl have a significant negative impact (0.000 and 0.047 respectively) with a probability of less than 1% and 5% significance level the banking trust in the long run.

Table 5.8 Long-run coefficients of ARDL estimation

Unrestricted Constant and No Trend

ARDL (6,4,1,1,4,0) selected based on AIC Dependent variable = LnBT

Variable	Coefficient	Std.Error	t-statistic	Prob.
NPL	-0.0317	0.0045	-6.9672	0.0000

ROE	0.0290	0.0030	9.4501	0.0000
LnWgs	0.3485	0.1657	2.1033	0.0382
DepRate	0.0437	0.0195	2.2412	0.0274
LnUnempl	-1.4086	0.7001	-2.0120	0.0471
Included observations		*114*		

Source: Author's calculation – EViews statistical tool

From the estimation (Table 5.8), we can infer that the coefficient of return on equity (ROE) is 0.03, and it is statistically significant, which means that a 1% increase in the banking system's return on equity (ROE) will lead to 3% growth of trust index in the long run. The coefficient of official wages (lnWgs) is 0.35 with a statistically significant probability, which implies that a 1% rise in the relative wages of the population (LnWgs) will lead to a 35% subsequent increase in the banking trust or banking cooperation in this respect in the long term. Accordingly, the positive coefficient of interest rate on deposits (DepRate) is 0.04, indicating that a 1% increase in the relative interest rate on deposits will follow a 4% surge in public trust in the long run. However, the overdue loans of the banking system (NPL) revealed a negative coefficient of -0.03 with a statistically significant probability at a 0.01% significance level, which implies that a 1% increase in nonperforming loans (NPL) will further decrease the banking trust index by 3% in the long run. Similarly, the coefficient of the registered unemployed people (LnUnempl) exposed a coefficient of -1.41 with a statistically significant probability, which means that a 1% increase in unemployment (LnUnempl) leads to 14 points decrease in the banking trust index in the long run. The estimation for the long-term relationship shows that all the model's banking system and macroeconomic variables are statistically significant.

5.8 Diagnostic tests results

We conduct several diagnostic tests to demonstrate the model fit and the validity of the findings. The test values displayed in Table 5.9 indicate that the ARDL model is a practically proper fit for the short-run and a complete fit for long-run estimates for testing a public trust index and its relationship with other indicators in Tajikistan. The serial correlation test of the Breusch-Godfrey LM test demonstrates F-statistics at 1.5931 with a probability value of 0.2090, which implies that residuals are serially uncorrelated. The heteroskedasticity of the Breusch-Pagan-Godfrey test results illustrate that data series are homoscedastic (with F-statistics of 1.6459 with a probability value of 0.0554), which cannot deny the null hypothesis of homoscedasticity of variables. The research model passes the Ramsey Reset Test with a 0.5403 F-statistics value and a probability value of 0.4642, denoting no functional misspecification in the model. Additionally, the Jarque-Beta test value (0.4901) indicates that the residuals of our model are also normally distributed with a probability value of 0.7827.

Thus, the diagnostic test results show that the research model is free from serial correlation, heteroscedasticity, and functional form misspecification (at a 5% ($p<0.05$) significance level), as presented in Table 5.9.

Table 5.9 Diagnostic Tests Results

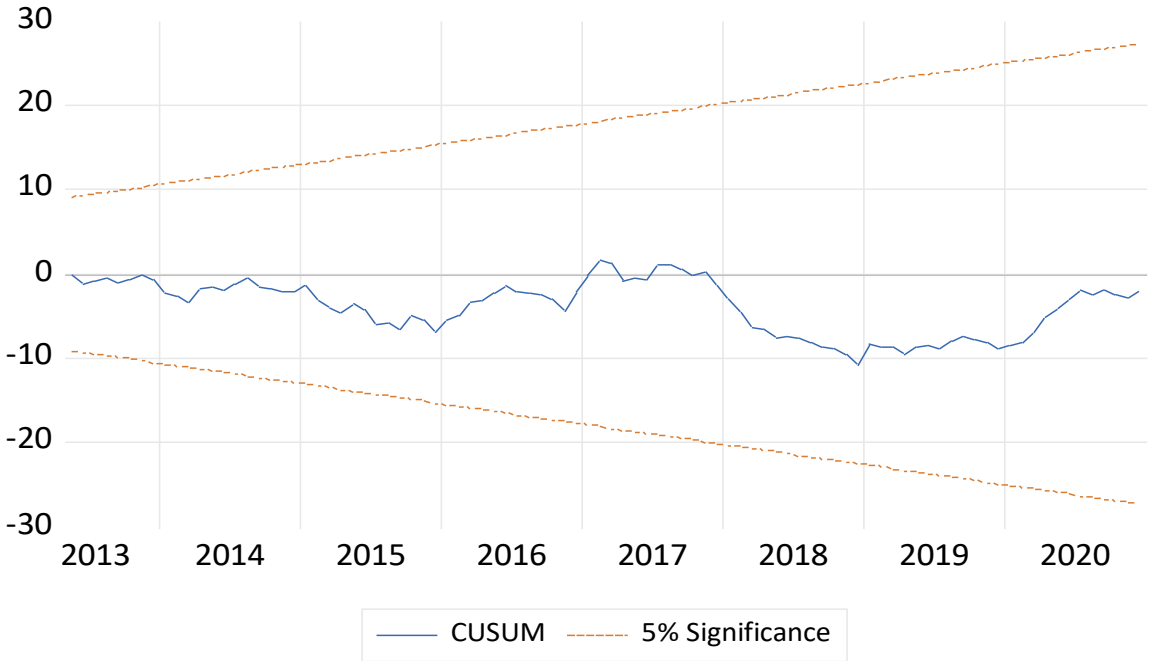
Specification	F-statistics	P-value
Breusch-Godfrey (serial correlation LM test)	1.5931	0.2090
Breusch-Pagan (heteroscedasticity)	1.6459	0.0554
Jarque-Bera (normality)	0.4901	0.7827
Ramsey Reset Test	0.5403	0.4642
Included observations	*114*	

Source: Author's calculation – EViews statistical tool

5.9 Stability test results

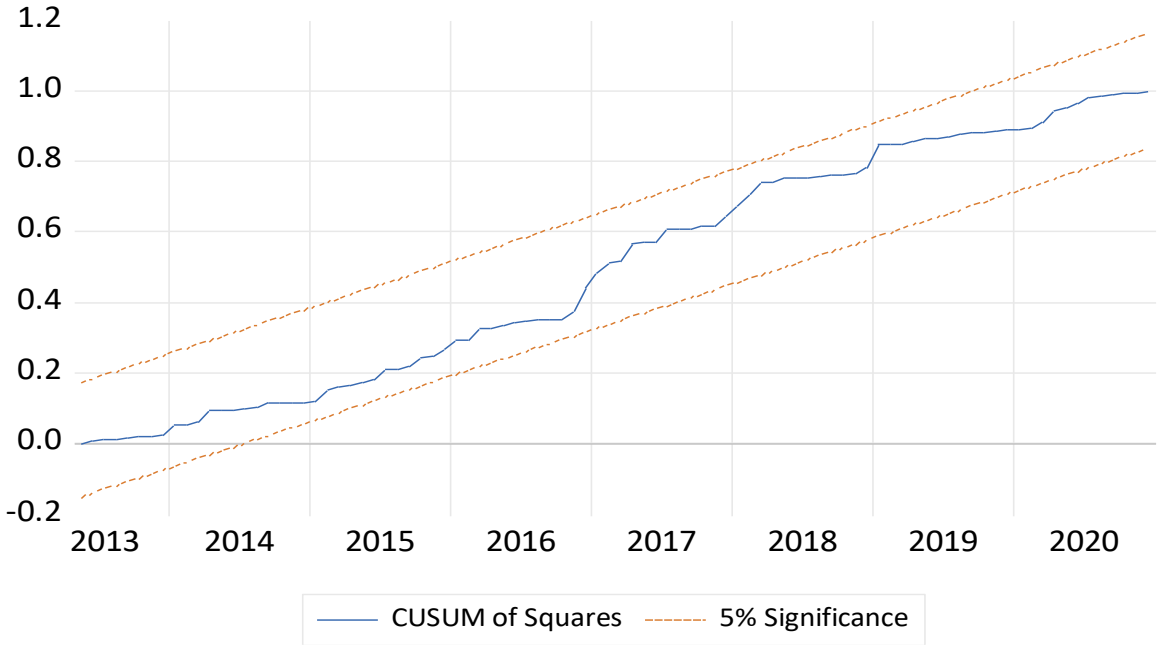
Finally, we perform stability tests of the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of recursive residual squares (CUSUMSQ) proposed by Brown et al. (1975) to assess the stability of the model. Plots (Graph 5.2 and 5.3) illustrate the results of the CUSUM and CUSUMSQ tests, respectively. From these graphs, we can infer that the curves of CUSUM and CUSUMSQ do not exceed the critical limits at the 5% significance level, which means that the model is stable.

Graph 5.2 CUSUM Test



Source: Author's calculation – EViews statistical tool

Graph 5.3 CUSUM of Squares Test



Source: Author's calculation – EViews statistical tool

6 Chapter VI. Survey questionnaire

6.1 Introduction

This chapter presents the outcome of data collection from the respondents and data analysis of the survey questionnaire. We start with descriptive statistics of our survey variables through statistical and descriptive measures; then, we will test our survey hypotheses to find the main factors of banking confidence and the overall trust level in the banking system of Tajikistan. In the questionnaire, we specified that within our questionnaire, the term "Bank" refers to all financial organizations that have the right to accept deposits and savings of citizens.

6.1 Validity and Reliability results

Following the literature, we conducted the Cronbach's alpha test to determine the internal consistency of the collected data. The second part of the survey with the Likert-type scale responses is divided into two groups to measure Cronbach's alpha coefficient. The first group represents the overall financial situation, and the second group embodies customer satisfaction toward the financial institutions.

Table 6.1 Cronbach's alpha test results

Factors	Number of questions	Alpha coefficient
Financial situation and banking reputation	13	0.734
Customer satisfaction and consumer confidence	13	0.864

Source: Author's calculation – SPSS statistical tool

As presented in table (Table 6.1), the Cronbach's alpha test coefficient scales are above 0.70, which exceeds the suggested alpha value. As a result, we infer this outcome as

an acceptable level of consistency. Moreover, the test results indicate that the employed survey questions are reliable.

6.2 Survey results

We used a random sampling approach to conduct the survey. Thus, the questionnaire link was distributed from 13 February to 2 May 2022 (78 days) via online social networking services (SNS) platforms such as Facebook, Messenger, Instagram, WhatsApp, Viber, Gmail, etc. Moreover, we have requested some acquaintances share the questionnaire in various networking groups. Thus, we have collected 283 responses to our survey questionnaire through the SNS distribution. The descriptive statistical analysis is as follows:

Table 6.2 Respondents' Personal information

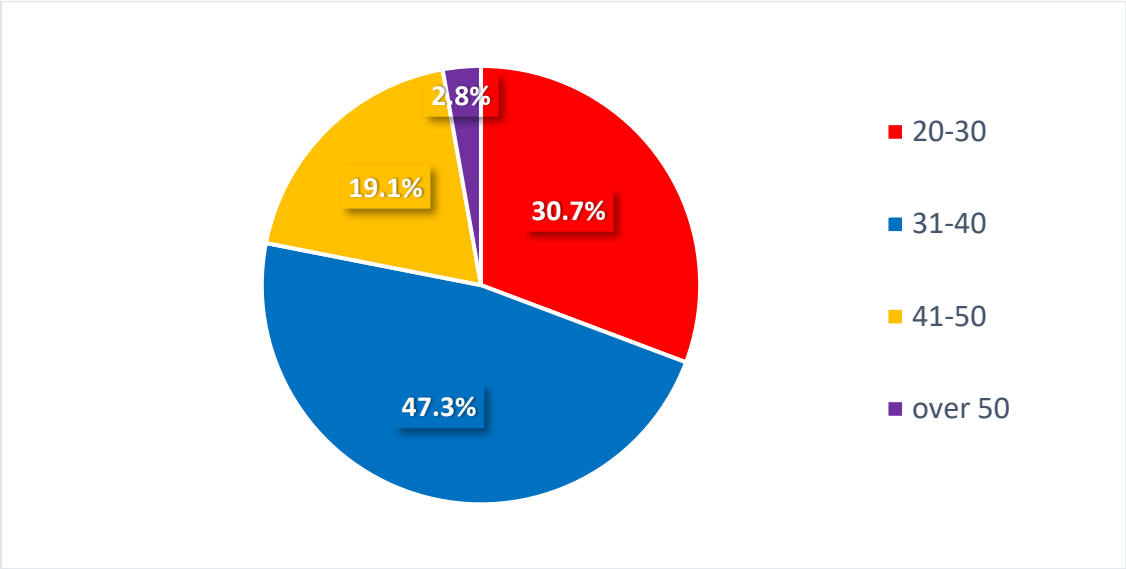
Age	Frequency	Percent		Gender	Frequency	Percent
20-30	87	30.7%		Male	174	61.5%
31-40	134	47.3%				
41-50	54	19.1%		Female	109	38.5%
greater than 50	8	2.8%				
Total	283	100%		Total	283	100%

Education	Frequency	Percent		Work	Frequency	Percent
High school	7	2.5%		Private sector	159	56.2%
Bachalor	58	20.5%		Public sector	84	29.7%
Higher Education	189	66.8%		Individual Enterprenuar	23	8.1%
Masters/PhD	20	7.1%		Unemployed	12	4.2%
other special	9	3.2%		Student	5	1.8%
Total	283	100%		Total	283	100%

Experience	Frequency	Percent		Income	Frequency	Percent
1 to 5 years	89	31.6%		650 or less	11	3.9%
6 to 10 years	74	26.2%		651-1500	81	28.6%
11 or higher	113	40.1%		1501-5000	132	46.6%
no experience	6	2.1%		greater than 5001	59	20.8%
Total	283	100%		Total	283	100%

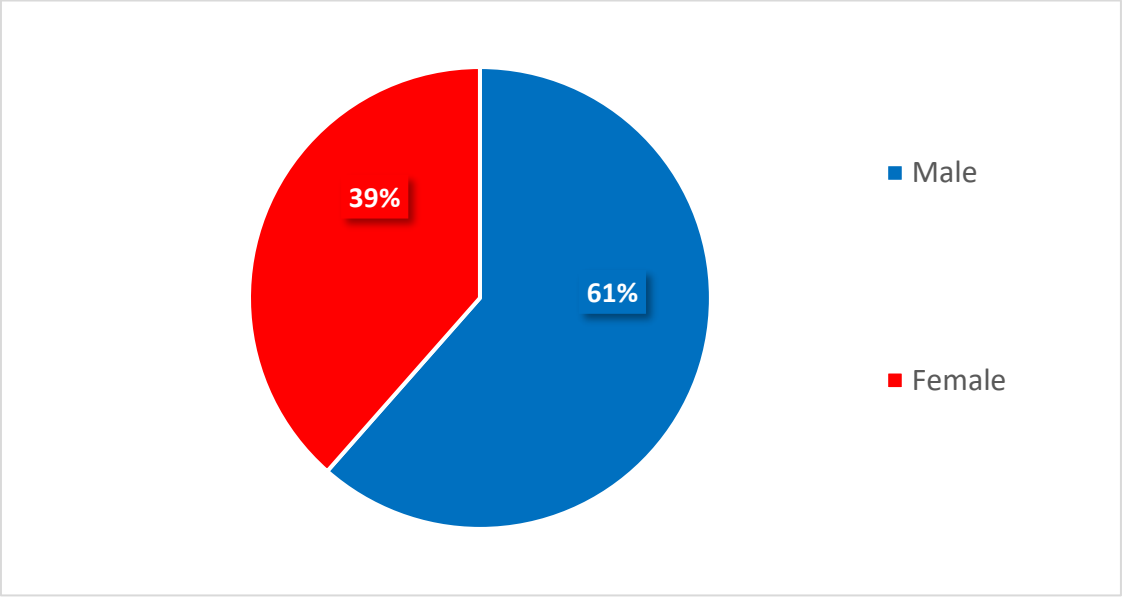
Source: Author's construction

Graph 6.1 Respondents' age frequencies



Source: Author's construction

Graph 6.2 Respondents' gender frequencies

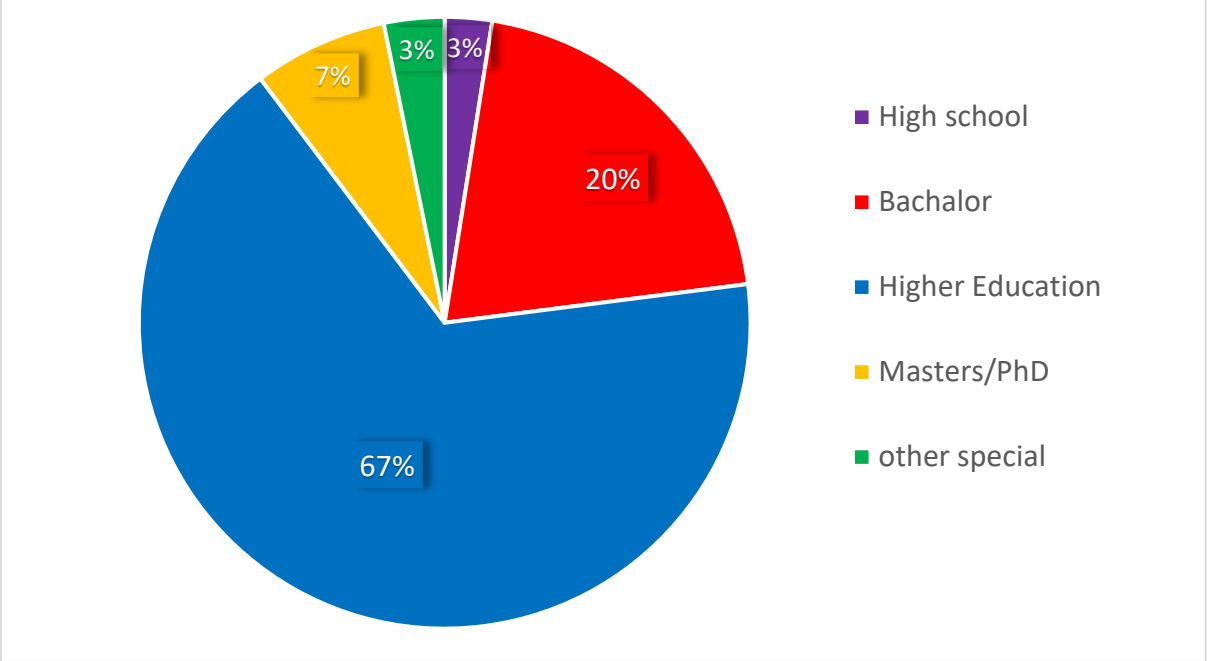


Source: Author's construction

As we are studying the case of Tajikistan's banking system, all our respondents are Tajikistan residents. They represent various economic sectors, experiences, and educational backgrounds. From the above charts (Graph 6.1), the Age variable for our sample can be

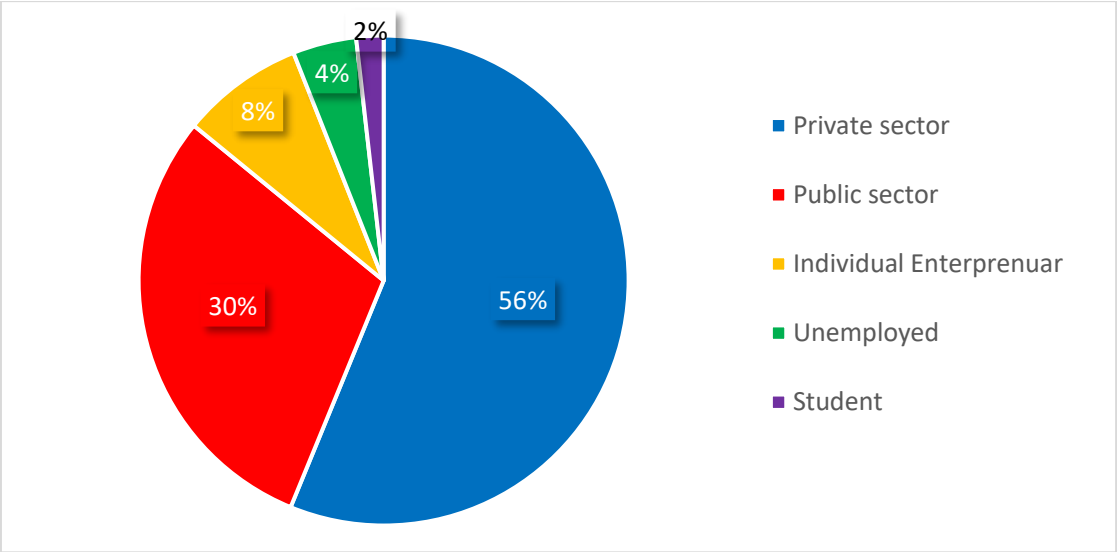
grouped as follows: 47.3% - which is the most significant frequency of the survey respondents are between 31 to 40 years old; 30.7% are between the age of 20 to 30 years old; 19.1% are between 41 to 50 years old, and 2.8% are above 51 years old. According to the following pie chart (Graph 6.2), the Gender variable of our respondents is grouped as 61.5% male and 38.5% female. Hence, we can conclude that our sample has more male than female respondents. We assume this unbalanced proportion is due to the cultural commitment of male representatives in most layers of social life. Almost 78% of the respondents' ages fall into the 20 to 40 category, which illustrates Tajikistan's current demographic age distribution.

Graph 6.3 Respondents' education frequencies



Source: Author's construction

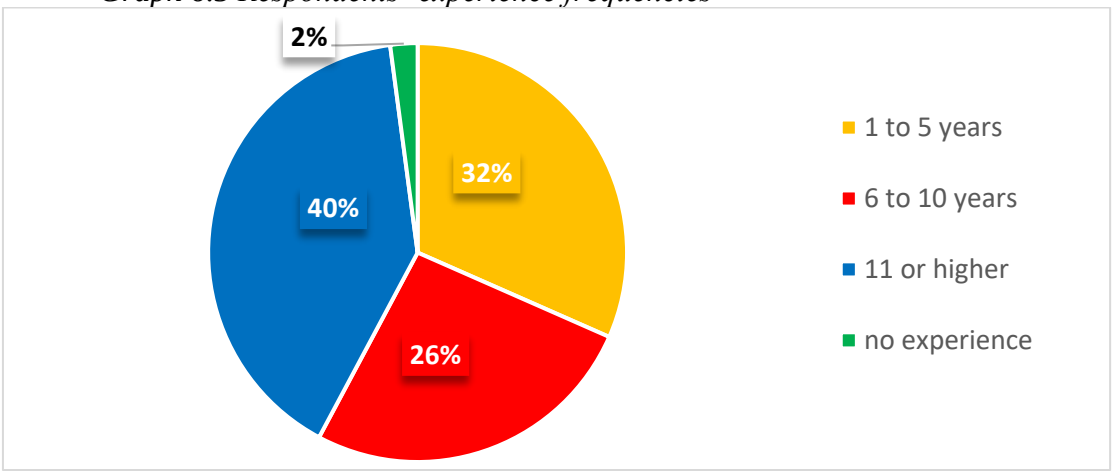
Graph 6.4 Respondents' work frequencies



Source: Author's construction

The survey analysis shows that the respondents' employment status (Graph 6.4) is reasonable as expected. Most respondents (56.2%) are employed in the private sector, the second-largest section (29.7%) is the public sector, 8.1% representers self-employed individuals (individual entrepreneurs), 4.2% are unemployed, and 1.8% are students. The result also reveals that more than half of our respondents are employed in the private sector. We assume this phenomenon is because of the private sector's higher salaries and various career opportunities.

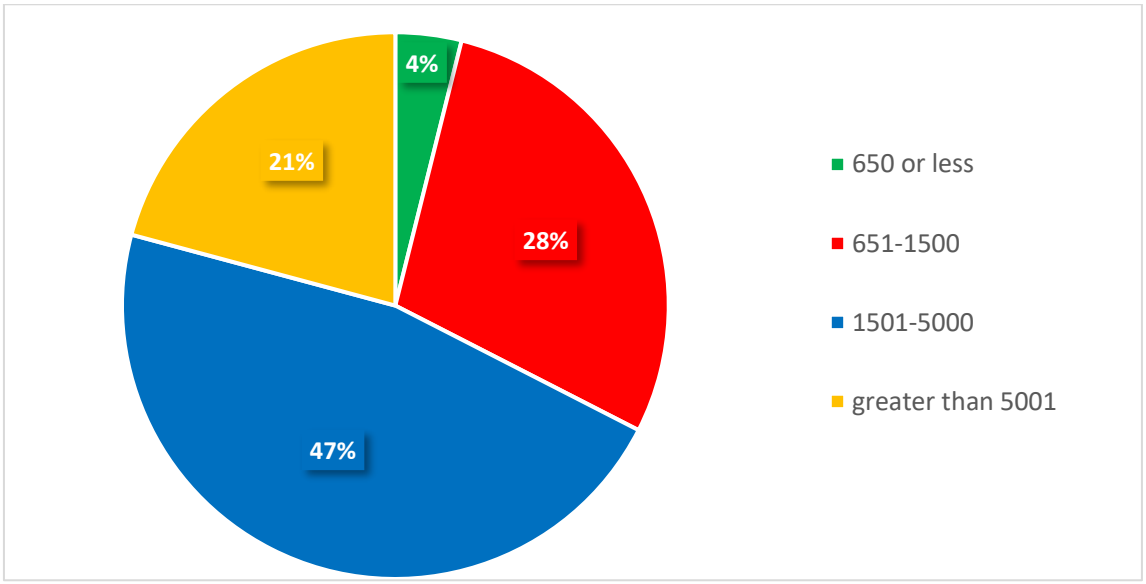
Graph 6.5 Respondents' experience frequencies



Source: Author's construction

Based on the chart above (Graph 6.5), the respondents' experiences are as follows: 40.1% have 11 years or more of working experience, 31.6% have 1 to 5 years of working experience, 26.2% have from 6 to 10 years, and 2.1% have no working experience. This shows that a significant percentage of our respondents have long years of working experience, which means long life experience and potential financial awareness. Therefore, we may assume that a more significant number of our sample has dealt with financial institutions and highly likely responded to our questionnaire rationally. A smaller amount of our representative has less than a year or no experience, which can be justified as students and homemakers.

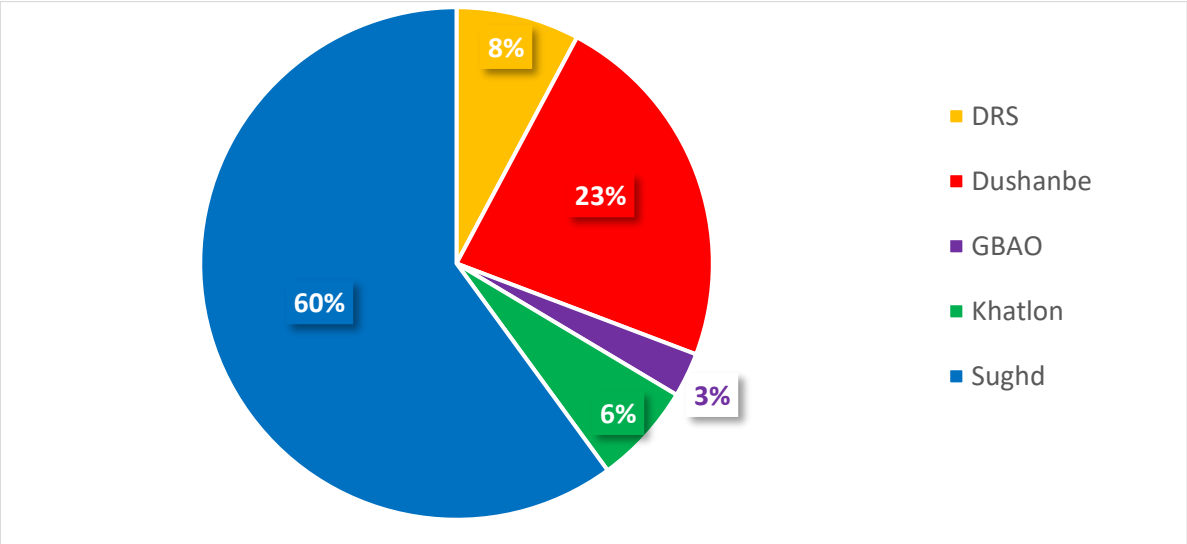
Graph 6.6 Respondents' income frequencies



Source: Author's construction

The respondents' monthly income (Graph 6.6) can be categorized as follows: 46.6% with an income range between 1501 to 5000 Somoni (TJS), 28.6% with an income of 651 to 1500 TJS, 20.8% have over 5000 TJS, and 3.9% with an income of less than 650 TJS. This concludes that most of our respondents' income ranges between 1500 to 5000 TJS.

Graph 6.7 Respondents' location frequencies



Source: Author's construction

Finally, the last chart (Graph 6.7) deals with respondents' current location and can be classified as follows: 60.1% Sughd Region, 23% Dushanbe City (The capital), 7.8% District of Republican Subordination, 6.4% Khatlon Region, and 2.8% GBAO. The unbalanced distribution of our respondents can be explained by the fact that the north part of Tajikistan (Sughd Region) and the capital city of Dushanbe are more relevantly responsive to questionnaires and polls.

6.2.1 General questions of the survey

To compare the mean values of the general answers section, we assign weights to answers for further statistical testing. The weights for general survey answers were designated as No = 0, Not sure = 1, and Yes = 2. Hence, the mean value of less than 1.0 is considered as not persuasive (or not satisfactory). In contrast, the mean value of greater than 1.0 is implied as persuasive (or acceptable) (Debab & Yateem, 2012). Additionally, their statistical values measure other responses to the general section. The following table (Table 6.3) shows the descriptive statistics of the survey's general question section.

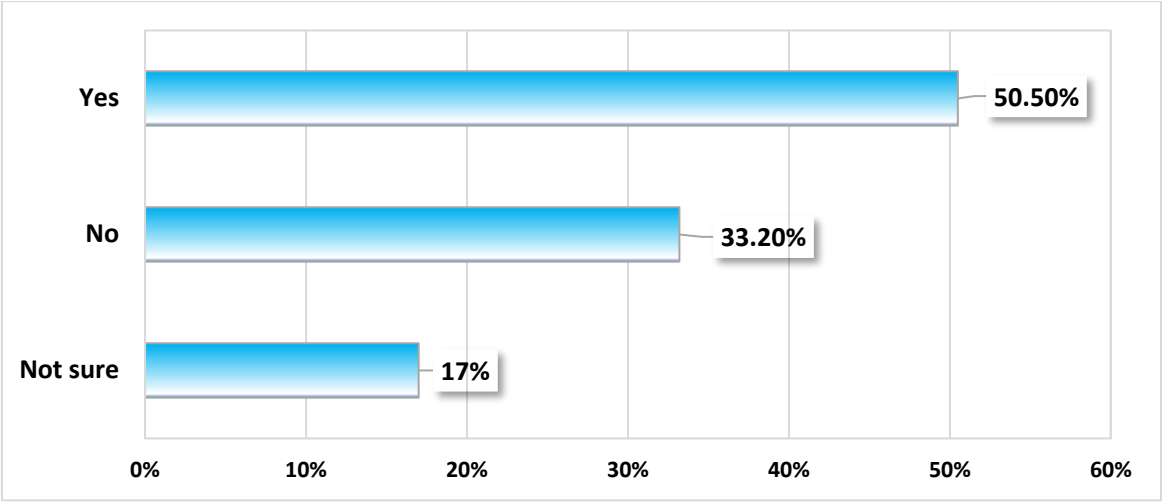
Table 6.3 General questions section

	Questions	Percentage	Mean Value	Standard Deviation
1	Has your level of trust toward the banks changed after the crisis?	Yes - 50.5% No - 32.5% Not sure - 17%	1.18	0.895
2	How do you rate the current performance of the banks?	Excellent - 31.4% Very good - 48.4% Good - 15.9% Poor - 4.2%	2.07	0.800
3	Which type of banks do you think is safer?	Islamic banks - 18% Traditional banks - 82%	1.82	0.385
4	Do you think it is better to find new ways of investment other than regular bank deposits?	Yes - 65.7% No - 12.7% Not sure - 21.6%	1.53	0.711

Source: Author's construction

As the chart (Graph 6.8) reveals, the respondents were asked about the change in their trust in banking after the recent financial crisis. The survey shows that 50% respond*ed* "Yes," 32.5% responded "No," and 17% were unsure. The mean value of all responses is 1.18, implying that the overall trust level was affected after the crisis. Moreover, we calculated the standard deviation of the crisis effect on banking confidence to find the difference in views among respondents. The SD of greater than 1.0 shows a significant difference of opinion amongst the population sample. The Standard Deviation of crisis (first question) is 0.895, which denotes that most respondents have similar impressions about financial problems.

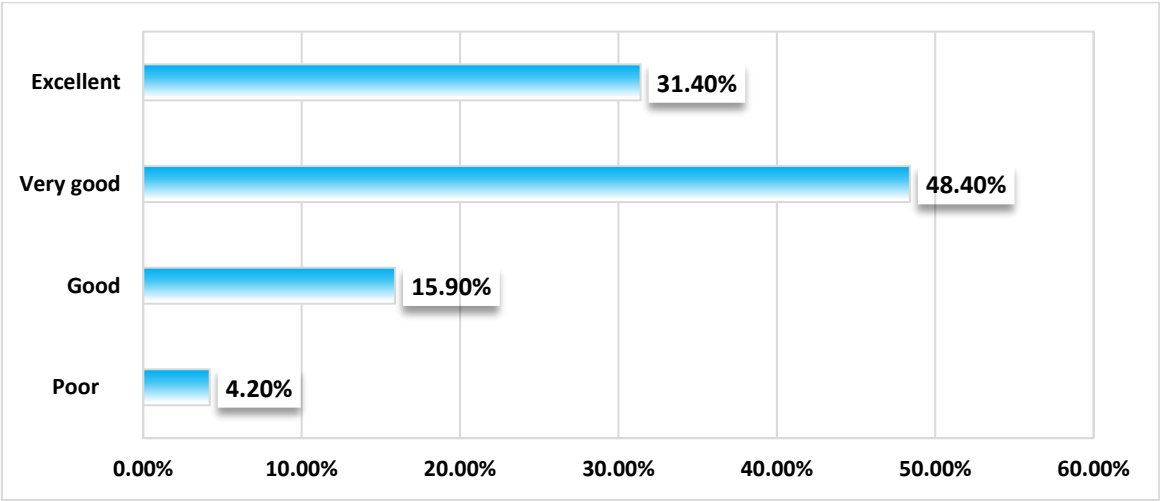
Graph 6.8 Has your level of trust toward the banks changed after the crisis?



Source: Author's construction

The next question refers to the current performance of the banks in Tajikistan. The survey results revealed that 48.4% of the respondents graded "Very Good," 31.4% rated "Excellent," 15.9% marked "Good," and only 4.2% c*alled it* "Poor." The mean value of the question is (denoted from 0 to 3) 2.07, which implies a persuasive conclusion. Additionally, the standard deviation is 0.800 (less than critical point 1), indicating consistency among the respondents' views. This can be explained *by the fact* that most banking institutions are recovering from the crisis and working on regaining customer confidence.

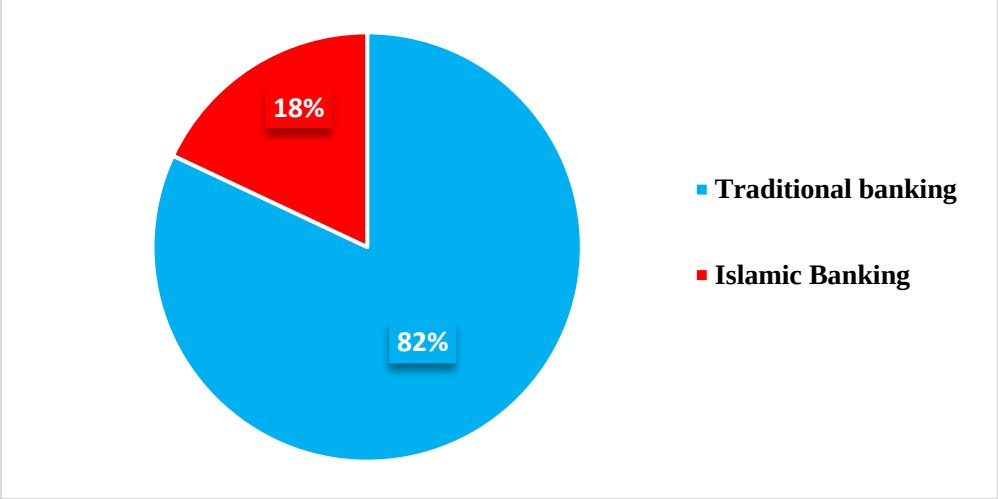
Graph 6.9 How do you rate the current performance of the banks?



Source: Author's construction

The respondents *are* asked about *a* safer type of banking *with* the traditional and Islamic options (Graph 6.10). The survey result shows that 82% of the sample respondents think that conventional banking is safer, although 18% answer that Islamic banking is less risky. The mean value of the question is 1.82, which is satisfactory with a very consistent standard deviation (0.385). This can be explained that the majority are dealing with traditional banking; additionally, Islamic banking is relevantly new in the market, introduced in September of 2019 (NBT, 2019).

Graph 6.10 Which type of banking do you think is safer?



Source: Author's construction

Finally, the respondents *a*re questioned about their future intentions and whether it is better to find new ways of investment other than regular bank savings and deposits. The result of the survey shows that 65.7% answered "Yes," 12.7% replied "No," and 21.6% responded, "Not sure." The mean value of the question is 1.53, which implies the strong persuasiveness of the respondents. Moreover, the standard deviation value (0.711) supports the consistency of the views. Last decade, the interest rates on deposits and savings have lowered by about 47% (see Graph 4.1.4); additionally, special attention *is* given to the

issues of financial inclusion and financial literacy. Therefore, the respondents *are willing to find other investment ways better* than bank deposits and savings.

6.2.2 The perception of the banking confidence factors

Following our survey results, this section of the research reveals the respondents' views about the factors that affect banking confidence. We adapted several aspects from the previous studies and developed some elements to measure respondents' perception of banking confidence. The respondents rated the following questions using 5 points Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). This section employs the mean and standard deviation (SD) values to describe factors from the questionnaire responses that affect banking confidence in Tajikistan. The below-constructed tables demonstrate the perception of the elements corresponding to the survey:

Table 6.4 Global financial condition

The influence of global financial condition	Mean	Standard Deviation
The latest Global Financial Crisis has affected most banks	3.59	1.155
I changed my mind about my bank after the recent crisis	3.12	1.230
I attempted to withdraw my deposit from my bank during the Financial Crisis	2.80	1.521
I always follow the global financial indicators and relate them to my local banking system	3.59	1.215
I think that any bad or good financial news taking place around the globe will affect my country's financial system.	4.21	1.033

Source: Author's construction

The above table (Table 6.4) shows the assessment results of the global financial condition's effect on public trust. All our item questions, except one (third question), have a mean value of over three (3.0) and a standard deviation of above one (1.0); this result indicates that there is a relationship between the global financial condition and banking confidence. It is worth mentioning that this section has an overall mean value of 3.44,

which we consider a moderate effect of global economic conditions on public trust with a positive trend.

Table 6.5 Domestic Financial Conditions

The impact of domestic Financial Conditions	Mean	Standard Deviation
I believe that my country's government will take the necessary actions in case of any financial difficulties in the banking system	3.69	1.183
The latest Global Financial Crisis affected the banking system of Tajikistan	3.69	1.102
I am fully satisfied with the measures taken by the National Bank of Tajikistan to minimize the effect of the Global Financial Crisis on the banking system.	3.47	1.204
Whatever happens to other banks in my country will not affect my bank	3.07	1.331

Source: Author's construction

Table 6.5 indicates that all the mean values of the domestic financial condition section are more significant than three (3.0) with a standard deviation value of above one (1.0). Hence, the impact of the domestic factors on population trust towards the banking system has an average effect with a positive trend. According to the survey results, the government and central bank's adequate encouragement are the most influential factors. However, the standard deviation of over one indicates a significant difference among the respondents' views.

Table 6.6 Bank Reputation and Performance

The influence of bank reputation and performance	Mean	Standard Deviation
The best bank in my country is determined based on the bank's reputation among my family members and friends.	3.49	1.281
My best bank is determined by the number of customer base in the market	3.84	1.162
I am always dealing with the oldest and most well-established bank	4.00	1.116
The bank's financial results are the most important indicator for me when I want to deal with a bank	4.12	1.007

Source: Author's construction

The following section describes the factors related to bank reputation and performance. The above table (Table 6.6) shows that the mean value of the section is relatively high, with two items over 4.0, which indicates the strong relationship of this

section with public confidence. However, the standard deviation of greater than one (1.0) states the difference in perception of trust factors. The survey indicates that well-established banks and financial results have a significant impact and positive relationship with public trust in the banking system.

Table 6.7 Customer loyalty

The customer loyalty factor	Mean	Standard Deviation
The impact of the latest Global Financial Crisis affects my trust in banks.	3.57	1.123
I believe that my primary bank rewards me for the multiple products I deal with	3.19	1.337
I have changed my main bank because of the financial crisis	2.42	1.377
Changing my main bank affects my cash and saving management	3.01	1.285

Source: Author's construction

Table 6.7 describes the factors that relate to the loyalty of customers. The survey results show that the mean values of most questions are over 3.0, but the SD of all questions is over 1.0. This result reveals that banking institutions do not sufficiently promote loyalty programs to their customers. Based on our literature review, we infer that loyalty programs are one of the key factors that enhance cooperation and boost confidence between banks and customers.

The following table (Table 6.8) presents customer satisfaction factors. The mean values of all questions in this section are over 3.0, indicating a strong connection between satisfaction and confidence. We conclude that in Tajikistan, the banking system has a moderate level of satisfaction regarding banking products, customer service, and convenience of transactions and costs.

Table 6.8 Customer satisfaction

The customer satisfaction factor	Mean	Standard Deviation
My bank provides me with no-risk products	3.56	1.205
My bank provides me with great convenience to conduct my banking transactions anywhere	3.72	1.121
My bank provides me with professional customer service	3.85	1.115

My bank provides the best banking tariffs	3.67	1.165

Source: Author's construction

Table 6.9 Banking confidence

The banking confidence factor	**Mean**	**Standard Deviation**
Tajikistan's banking system is much more developed than in previous years and has restored public confidence.	3.80	1.136
How much do you trust banks?	3.61	1.074
Do you think bank managers have the knowledge and experience to manage banks?	3.75	1.134
In general, do you trust that banks in Tajikistan can repay deposits?	3.39	1.198
If you had extra money, would you save it in a bank?	3.46	1.324

Source: Author's construction

The last table (Table 6.9) is related to the banking confidence factors. According to our results, the mean values of proposed factors are greater than three (3.0), which demonstrates a significant relationship between banking confidence and banking system trust. Moreover, according to the reviewed literature, trust and confidence are correlated notions that lead to potential growth of cooperation.

6.3 Hypothesis testing

This section employs the One-Sample T-Test to examine the mean differences between the sample and the population mean (two-tails value of t-Table). The statistical hypothesis decisions are based on the difference between the sample means and population means for all variables. Therefore, we assess the computed value with the table value; if the computed value is greater than the table value, we reject the null hypothesis, which supposes no effect from the factor, and accept the alternative hypothesis that states an impact from the testing factor. The table below (Table 5.16) shows the outcome of the One-Sample T-Test.

Table 6.10 Hypothesis testing results

H	**Factor**	**Mean**	**T-Test**	**T Table**	**Significance**	**Support/Reject**

H1	Global financial condition	3.46	8.592	1.96	0.000	Supported
H2	Domestic Financial Conditions	3.48	9.799	1.96	0.000	Supported
H3	Bank Reputation and Performance	3.86	18.714	1.96	0.000	Supported
H4	Customer loyalty	3.05	2.445	1.96	0.015	Supported
H5	Customer satisfaction	3.70	12.797	1.96	0.000	Supported
H6	Development of public confidence	3.60	5.837	1.96	0.000	Supported

Source: Author's construction

The following conditions should be met to reject the null hypothesis and accept the alternative hypothesis. The mean value of the testing sample should be greater than three (>3); the calculated T-test value should be greater than the T-table value, and the alpha value should be statistically significant (<0.05).

H1: Global financial conditions influence banking confidence in Tajikistan

We have tested our hypothesis according to Table 6.10. We set the null hypothesis stating there is no influence of global financial condition in the banking system of Tajikistan expressed by [H0: $\mu=0$], against the alternative hypothesis that the global financial condition affects the banking system stated by [H0: $\mu\neq0$]. Therefore, following Table 6.10, the mean value of the first hypothesis (H1) is 3.46 (greater than 3.0), and the T-test value is 8.592 (greater than the T-table value). Additionally, the last condition shows that the p-value is statistically significant ($0.000 < 0.05$); accordingly, we reject the null hypothesis and accept the alternative hypothesis.

H2: Domestic financial conditions impact public trust in the banking system

H3: Bank reputation and performance affect public confidence

H4: Customer loyalty affects the banking trust

H5: Customer satisfaction influences individuals' trust in the banking system

H6: The banking system of Tajikistan is developing public confidence.

Following our analysis displayed in Table 5.16, all others (H2 to H6) also meet the required conditions by having a mean value of greater than 3.0; calculated T-test value of greater than T-table (two-tails with 95% confidence level) with the statistically significant p-value. The null hypothesis states that there is no effect on the public trust from the following proposed factors. In contrast, the alternative hypothesis indicates an impact on public trust because of those factors. As the above table (Table 5.16) implies, all three conditions are met to accept the alternative hypothesis and reject the null hypothesis. Subsequently, all null hypotheses are rejected, and the alternative hypotheses are accepted. Therefore, the survey study supports an impact on the domestic financial condition, bank reputation and performance, customer loyalty, customer satisfaction, and the development of public confidence in the banking system. Hence, our analysis concludes that all six factors emphasize the impact of trust on the banking sector.

7 Chapter VII. Discussion and Conclusion

7.1 Introduction

This chapter covers the discussion of the findings and the overall conclusion of the research. The discussion presents the assessment of the banking trust index calculation and the determinants of banking confidence with the ARDL regression findings; furthermore, this chapter discusses the survey analysis and concludes the research.

7.2 Banking Trust Index discussion

In this section, we touch upon the banking trust index of Tajikistan calculated within the framework of this study and look at indexes of other countries. We will discuss the calculated index in detail and compare it with similar studies.

This research follows the study of Nikolaev et al. (2006) to calculate the trust index as a valuable index to evaluate and forecast economic activities. Therefore, within the framework of this research, we calculate the integrated banking trust index of Tajikistan from 2011 to 2020 (Graph 5.2). The index is necessary for financial and macroeconomic analysis (Nikolaev et al., 2006). As a result, the graph trend coincides with the economic events in Tajikistan. The drastic fall in 2014-2016 is assumed to be the effect of the Russian crisis, and other minor fluctuations are various internal policy impacts. The significant result of the crisis was the four systemic banks of Tajikistan going bankrupt during this period. The NBT's subsequent responses were the regulation changes on foreign exchange transactions, specifically the closure of exchange units (individual enterprises), the increase of minimum capital requirement for credit financial institutions, and a so-called transition from quantity to quality banking. Additionally, all remittances sent in Russian rubles were

paid in Somoni – national currency. Subsequently, the named measures helped to hold the fall of banking reputation and, at the same time, assisted in gaining stability in the financial system.

Comparably, Egorova and Koroleva (2019) calculated the trust index as an economic component, with similar falls in the trend between mid-2014 and 2016. During these fluctuations, economic and political issues occurred in the Russian Federation, particularly the Russian and Ukrainian conflict (Egorova & Koroleva, 2019). We suppose the impact of this crisis initiated the banking crisis in Tajikistan. The trust index study of Vorobiev and Maibarada (2014) indicates that confidence issues in post-Soviet countries are volatile due to limited financial transparency. Therefore, the secondary data index calculation method is suggested to measure public confidence (Vorobiev & Maibarada, 2014). According to Sarah Feldman's (2018) report, the trust in banks is still recovering after the Global Financial crisis of 2007-2009 in most developed countries. The percentage of people mistrusting banks rose quickly and was coming down very slowly (Feldman, 2018). Thus, the findings of this research concerning the trust index support the proposed method of Nikolaev et al. (2006) and Vorobiev and Maibarada (2014). Moreover, we have similar outcomes to Nikolaev et al. (2006), Egorova and Koroleva (2019), and Vorobiev and Maibarada (2014).

7.3 Discussion of the findings of determinants of banking trust

This research section presents arguments for the results according to the research objectives. The detailed summary of the findings of the research is as follows:

Table 7.1 Overview of the determinants of the Banking Trust

		Obtained outcome	
Variables	**Acronym**	**Short-run**	**Long run**

Nonperforming loans	NPL	(-) insignificant	(-) significant
Return on Equity	ROE	(-) significant	(+) significant
Natural logarithm of Wages	LnWgs	(-) insignificant	(+) significant
Deposit Interest Rates	DepRate	(-) significant	(+) significant
Natural logarithm of Unemployment	LnUnempl	(-) insignificant	(-) significant

Source: Author's construction

The study determines the relationship between trust in banks and other indicators. We used three banking system variables and two macroeconomic variables to investigate the short and long-term relationship with the banking confidence index calculated in this study. The research analysis showed that some short-term factors have an opposite effect on the dependent variable (BT), such as ROE, lnWgs, and DepRate. However, in the long-term, all explanatory variables (NPL, ROE, LnWgs, DepRate, and LnUmempl) showed significance at 0.01% and 0.05% confidence levels, respectively. Therefore, the long-term relationships of the explanatory variables can be discussed as follows:

First, we have employed NPL, the banking sector indicator, to determine its relationship with the banking confidence index. The negative coefficient of NPL is statistically significant, which denotes that NPL negatively affects the banking trust in Tajikistan. The higher the number of overdue loans, the lower the confidence in banks because, following the theory, the late payments or defaults by debtors are a sign of an unstable economy. Our results support the findings of Karim et al. (2016), Chernykh et al. (2021), and Viphindrartin et al. (2021) that a high level of nonperforming loans drives down public confidence (Chernykh et al., 2021; Karim et al., 2016).

The second banking sector variable of the regression model is Return on Equity (ROE), which describes the banking system's performance. The banks' net income is divided by average equity capital, which equals the return on equity. The ROE has a

significant positive relationship with banking confidence and performance in the long run. This result is consistent with the findings of Saeed et al. (2013) and Saiful and Ayu (2019).

The last banking system component of the regression (ARDL) model is the interest rate on deposits (DepRate). We have employed the interest rate to examine how people are affected by the rise and fall of the interest rate on deposits. The higher deposit rates offered by financial institutions encourage citizens to keep their savings in the banks. In other words, people are more likely to trust banks with higher interest rates, although higher interest rates, in the long run, are not profitable for financial institutions. Additionally, the trend of average interest rates in Tajikistan has been downward in the last five years. Accordingly, our analysis shows that deposit rates have a significantly positive effect on public trust in the long term. This finding is coherent and supports the results of Karim et al. (2016) Shalimova (2014), and Viphindrartin et al. (2021).

To estimate the macroeconomic relationship of the trust index, we have employed the Wages (LnWgs) variable in our regression model. This variable comprises the statistical average wages of the population from all sectors of the economy. The analysis shows that wages have a significant positive impact on banking trust in the long run. The higher salaries stimulate collaboration between the customers and banks. Hence, if people have extra money from their wages, they will keep these funds in the banks as saving deposits or business capital. Lebedyev's (2011) findings show that people with low wages tend to trust banks less; however, his study did not find a significant effect of high income on banking trust. Our study is consistent with the first part of Lebedyev's (2011) finding that low income does not promote collaboration. However, we also found that people with higher wages have more confidence in the banking system of Tajikistan. This result supports the

findings of Fischer and Hahn (2008); however, it contradicts the findings of Lebedyev (2011).

The last macroeconomic indicator of the ARDL regression model is unemployment (LnUnempl). The unemployment variable represents the number of officially registered unemployed citizens in Tajikistan. We have employed this variable to examine the influence of the labor market on the banking system. The analysis shows that unemployment has a statistically significant negative effect on public confidence. This result contradicts the findings of Lebedyev (2011) and Fischer and Hahn (2008); their studies did not find a significant connection between unemployment and banking trust. However, this result is consistent with the findings of Roth et al. (2014). We assume the significance of the relationship between unemployed people and banking trust derives from four systemic banks facing bankruptcy and laying off many employees.

7.4 Discussion of the factors of the banking confidence

This section discusses the results of the survey questionnaire. We have surveyed Tajikistan residents to find the relationship between the proposed elements and population confidence. The analysis shows that all developed factors are associated with people's trust in banks.

The survey questionnaire represents several essential factors that affect banking confidence. The analysis shows that global and domestic financial conditions influence people’s perception of banking confidence. The bank's reputation and performance are strongly correlated with banking confidence. Bank’s financial results and standing are important aspects that create an atmosphere of trust and long-term relationships (Debab & Yateem, 2012). Another proposed factor is an adequate encouragement of the government

and central bank that maintains the level of trust by on-time response and interference to various effects of crises.

It is worth mentioning that we have developed a banking trust restoration hypothesis for this research. The survey results show that our proposed factors significantly affect people's perception of banking confidence. Thus, all suggested aspects are significant for banking confidence, and our survey study is consistent with Debab and Yateem (2012) and Fischer and Hahn (2008).

7.5 Recommendation on outcome implications

Following the research findings, we propose various points of view that, according to this research, may benefit the banking system of Tajikistan on trust restoration efforts.

- The research recommends that the government of Tajikistan coordinate and reconcile the accountable parties responsible for wage management since the well-timed wage surge positively affects public confidence in the long run and stimulates economic growth.
- The study's results revealed that unemployment negatively relates to public confidence; therefore, the Government should create new job opportunities, especially for previously employed people, and provide labor incentives for future healthy economic growth.
- The study suggests the National Bank of Tajikistan strengthen the regulatory basis and the supervisory mechanisms, including in the NPL management in the banking system. Consequently, executing the uninterrupted supervision of the financial institutions minimizes the level of credit risks and the NPL, respectively, which negatively affects the public trust in the banking sector.

- The National Bank of Tajikistan and the Deposit Insurance Fund should consider the strategic implementation of higher deposit insurance coverage and supervise the competitive promotion of interest rates on deposits among financial institutions.
- The research advises financial institutions to implement up-to-date risk management processes to improve their performance and profitability. Likewise, the amplification of professional banking services, customer loyalty programs, and customer satisfaction is recommended.

The research also recommends that the global and domestic financial condition and other factors should be considered while elaborating new policies and regulations to restore public trust in the banking system. They play a vital role in framing customer confidence in the financial system. The final implication of the outcome and recommendation of the research shall contribute to restoring trust in the banking system.

The data on some (Government debt, including public and foreign debts and remittances) indicators were unavailable for this research to employ in regression analysis. Therefore, we recommend that future studies consider the availability of data to explore the relationship between banking confidence and other vital economic indicators.

7.6 Research Conclusion

This study is the first empirical attempt at public confidence measurement in the banking system, estimating the relationship between banking system-level and macroeconomic indicators with the banking trust index and evaluating factors of banking confidence. We research the banking trust with other economic factors and indicators to estimate their short and long-term relationship to propose possible tools to restore banking confidence in Tajikistan. The research's key findings support the vital role of economic

indicators of financial stability (such as non-performing loans, Wages, Interest rates, Unemployment, and Return on Equity) and their main factors in framing the population's perceptions about banking system confidence. Collectively, these findings highlight the central character of financial stability in shaping public trust.

The calculated banking trust index within the research framework demonstrates the economic events of the country. The overall financial condition of Tajikistan coincides with the proposed banking confidence index, which indicates several events occurred during the research period. The analysis shows that the banking system variables (such as NPL, DepRate, and ROE) and macroeconomic variables (such as Wages and Unemployment) have a statistically significant relationship with banking confidence.

The ARDL regression model shows that NPL and Unemployment negatively relate to banking trust in the short and long run. Many bad loans damage banking stability promoting lower banking trust. The increase in unemployment adversely affects the public confidence in the banking system.

The research variables ROE, wages, and interest in deposits have a significant positive relationship with public trust. The level of ROE indicates the banking system's performance and profitability, attracts people’s consideration and increases their trust level. The wages variable represents that an increase in the population’s income surges further cooperation between public and banking institutions as savings or business capital. The higher interest rates generate higher customer trust; thus, people tend to keep their savings in the banks rather than holding out of the bank. Seasonal promotions of higher interest rates are an excellent example of securing population funds.

7.7 Limitations and potential problems

The research is the first attempt to study banking confidence in Tajikistan. Therefore, the scope of the study is narrowed down to grasp the essential points which may not fully cover all the aspects of public trust. The index calculation was adapted from previous studies conducted in European countries, and the substitution of some variables was done following the creators' suggestions to meet the financial market criteria of Tajikistan. The part of the research basis on a survey; therefore, the survey is more representative and may not be a depth analysis of the financial confidence factors. The survey respondents may not fully understand the concept of the questionnaire, the existing financial literacy issues and financial inclusion among the respondents from various regions, cultural hesitation within the survey sample to tell the truth, and survey population bias regarding failed banks. Additionally, due to the pandemic situation (Covid19) restrictions, our survey was conducted via online platforms; therefore, it may exclude the views of those who do not have an internet connection or were not reachable.

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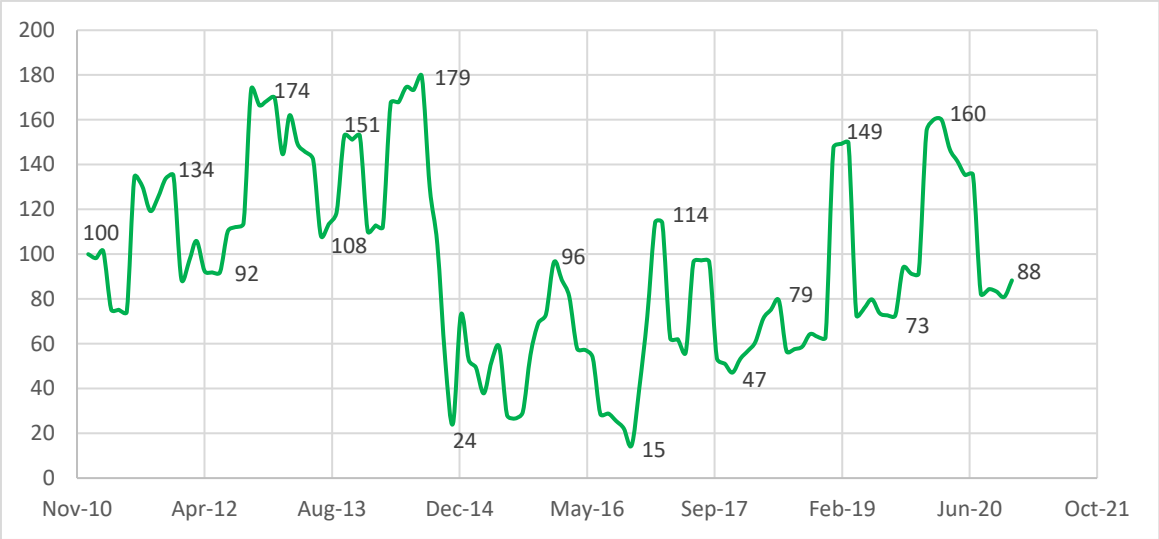
Appendix

Graph 1.0

Dynamics of the banking trust index 2011-2020 (without seasonal adjustment)



Source: Author's construction.

Graph 1.0 is a graphical chart derived from Table 5.1 to illustrate the dynamics of the banking trust index with all of the seasonal fluctuations of the economy.

Unit Root Test and Lag Length test results

The ARDL framework does not require preliminary testing of variables; however, we perform a unit root test to determine the order of integration for each variable and, at the same time, determine whether the ARDL model should be used to explore the cointegration between variables. Thus, a standard method of an Augmented Dickey-Fuller test (ADF) and Philip-Perron (PP) test for a unit root is applied to test for stationarity of the collected times series data (Dickey & Fuller, 1979). The I(2) variables are not eligible because the bound test assumes that the variables are stationary at I(0), I(1), or a mix of I(0) and I(1).

Therefore, we employ the unit root test as a procedure of the ARDL model to ensure none of the variables are I(2) or beyond. The following Eviews statistical tool outputs represent the Unit Root results to demonstrate the stationarity level of the variables and lag length selection based on default settings, which is defined by the statistical tool:

Tables of Unit root tests and lag length selection

Augmented Dickey-Fuller Unit Root Test on D(ROE)

Null Hypothesis: D(ROE) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.308496	0.0000
Test critical values:	1% level	-3.487550	
	5% level	-2.886509	
	10% level	-2.580163	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ROE,2)
Method: Least Squares
Date: 07/15/22 Time: 14:42
Sample (adjusted): 2011M05 2020M12
Included observations: 116 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROE(-1))	-0.818756	0.154235	-5.308496	0.0000
D(ROE(-1),2)	0.019448	0.118843	0.163641	0.8703
D(ROE(-2),2)	-0.237348	0.091783	-2.585955	0.0110
C	0.002922	0.321550	0.009086	0.9928

R-squared	0.496968	Mean dependent var	8.62E-05
Adjusted R-squared	0.483494	S.D. dependent var	4.818784
S.E. of regression	3.463181	Akaike info criterion	5.356126
Sum squared resid	1343.286	Schwarz criterion	5.451078
Log likelihood	-306.6553	Hannan-Quinn criter.	5.394671
F-statistic	36.88327	Durbin-Watson stat	2.026585
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Unit Root Test on D(NPL)

Null Hypothesis: D(NPL) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.576814	0.0003
Test critical values:	1% level	-3.487550	
	5% level	-2.886509	
	10% level	-2.580163	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NPL,2)
Method: Least Squares
Date: 07/15/22 Time: 14:40
Sample (adjusted): 2011M05 2020M12
Included observations: 116 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NPL(-1))	-0.780672	0.170571	-4.576814	0.0000
D(NPL(-1),2)	-0.375092	0.145201	-2.583256	0.0111
D(NPL(-2),2)	-0.130166	0.096034	-1.355413	0.1780
C	0.030899	0.134551	0.229642	0.8188

R-squared	0.599096	Mean dependent var	-0.032663
Adjusted R-squared	0.588358	S.D. dependent var	2.246199
S.E. of regression	1.441146	Akaike info criterion	3.602629
Sum squared resid	232.6132	Schwarz criterion	3.697581
Log likelihood	-204.9525	Hannan-Quinn criter.	3.641174
F-statistic	55.78961	Durbin-Watson stat	1.973812
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Unit Root Test on LNBT

Null Hypothesis: LNBT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.228101	0.0208
Test critical values:	1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNBT)
Method: Least Squares
Date: 07/15/22 Time: 14:46
Sample (adjusted): 2011M02 2020M12
Included observations: 119 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNBT(-1)	-0.163163	0.050545	-3.228101	0.0016
C	0.723423	0.225962	3.201522	0.0018

R-squared	0.081781	Mean dependent var	-0.001045
Adjusted R-squared	0.073933	S.D. dependent var	0.298228
S.E. of regression	0.286992	Akaike info criterion	0.357938
Sum squared resid	9.636624	Schwarz criterion	0.404646
Log likelihood	-19.29731	Hannan-Quinn criter.	0.376905
F-statistic	10.42064	Durbin-Watson stat	1.829091
Prob(F-statistic)	0.001617		

Augmented Dickey-Fuller Unit Root Test on D(DEPRATE)

Null Hypothesis: D(DEPRATE) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.80370	0.0000
Test critical values:	1% level	-3.487046	
	5% level	-2.886290	
	10% level	-2.580046	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DEPRATE,2)
Method: Least Squares
Date: 07/15/22 Time: 14:44
Sample (adjusted): 2011M04 2020M12
Included observations: 117 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEPRATE(-1))	-2.156192	0.156204	-13.80370	0.0000
D(DEPRATE(-1),2)	0.343936	0.087228	3.942960	0.0001
C	-0.134690	0.140572	-0.958158	0.3400

R-squared	0.828960	Mean dependent var	0.017692
Adjusted R-squared	0.825959	S.D. dependent var	3.634609
S.E. of regression	1.516294	Akaike info criterion	3.695723
Sum squared resid	262.1030	Schwarz criterion	3.766548
Log likelihood	-213.1998	Hannan-Quinn criter.	3.724477
F-statistic	276.2547	Durbin-Watson stat	2.024799
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Unit Root Test on D(LNWGS)

Null Hypothesis: D(LNWGS) has a unit root
Exogenous: Constant
Lag Length: 11 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.211432	0.0220
Test critical values:	1% level	-3.492523	
	5% level	-2.888669	
	10% level	-2.581313	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNWGS,2)
Method: Least Squares
Date: 07/15/22 Time: 14:47
Sample (adjusted): 2012M02 2020M12
Included observations: 107 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNWGS(-1))	-1.974394	0.614802	-3.211432	0.0018
D(LNWGS(-1),2)	0.785509	0.563721	1.393435	0.1668
D(LNWGS(-2),2)	0.531538	0.512397	1.037356	0.3022
D(LNWGS(-3),2)	0.513766	0.462216	1.111529	0.2692
D(LNWGS(-4),2)	0.400497	0.415726	0.963368	0.3378
D(LNWGS(-5),2)	0.345725	0.373582	0.925434	0.3571
D(LNWGS(-6),2)	0.253075	0.330900	0.764809	0.4463
D(LNWGS(-7),2)	0.189229	0.287349	0.658535	0.5118
D(LNWGS(-8),2)	-0.051071	0.241745	-0.211262	0.8331
D(LNWGS(-9),2)	-0.193748	0.191722	-1.010570	0.3148
D(LNWGS(-10),2)	-0.460465	0.133216	-3.456525	0.0008
D(LNWGS(-11),2)	-0.565803	0.074499	-7.594817	0.0000
C	0.018545	0.006868	2.700187	0.0082

R-squared	0.934743	Mean dependent var	0.003123
Adjusted R-squared	0.926413	S.D. dependent var	0.150893
S.E. of regression	0.040933	Akaike info criterion	-3.440316
Sum squared resid	0.157496	Schwarz criterion	-3.115580
Log likelihood	197.0569	Hannan-Quinn criter.	-3.308672
F-statistic	112.2053	Durbin-Watson stat	2.169584
Prob(F-statistic)	0.000000		

Lag Selection

The lag selection is one of the essential steps since it affects the model's outcome. There are various methods to obtain optimal lag for model variables, and the most practicals are the Schwarz Information Criterion (SIC), the Akaike Information Criterion (AIC), and the Hannan-Quinn Criterion (HQ). Following the reviewed literature, the optimal lag selection depends on the collected data (annual, quarterly, and monthly); however, the choice of lag length selection basis on the empirical sample. Thus, there is no introductory guide for maximum or minimum lag length (Gujarati & Porter, 2009). The recommendation and specifics to consider are as follows: for annual data, 1 or 2 lags, quarterly data 1 to 8 lags, and monthly data 6 to 12 or 24 lags can be used (Wooldridge, 2012).

Diagnostic Tests and Stability Tests

The ARDL model is expected to estimate the best linear unbiased estimator (BLUE). Therefore the literature suggests conducting diagnostic tests. We perform several diagnostic tests to ensure that the model is free from serial correlation, heteroscedasticity, and functional form misspecification. The residuals diagnostics include:

- the Histogram - Normality test to check the Jarque-Bera probability value for residual distribution;
- Breusch-Godfrey test for serial correlation;
- Breusch-Pagan test for heteroscedasticity;
- Reset Specification test for functional misspecification.

As the ARDL is a sensitive model regarding economic factors and as we are using times serious data, the stability of coefficients is subject to test. Accordingly, we assess the

stren gth of the coefficients for long-run and short-run terms employing CUSUM and CUSUMSQ tests of recursive residuals by Brown et al. (1975).