Non-Performing Loans (NPLs) Determination of Commercial Banks: An Empirical Evidence from Afghanistan

By

ZAHIDOGLI, Ahmad Jawed

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

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Committee in charge:

Professor Kim, Hyeon-Wook, Supervisor

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Approval as of December, 2023

Abstract

Significant role of banking institutions on economic development of the countries have been drawn the interest of policy makers, academicians, administrative holders and finance professionals to look at this sector more critically and provide deep analysis to avoid any further failures. Therefore, this study tries to examine the factors which affects Non-Performing Loans (NPLs) in the banking sector of Afghanistan by using panel data for the period of 9 years (from 2010 to 2018). Considering the nature of data, fixed and random effect model was utilized and after performance of Hausman test, fixed effect was elected as best model of estimation for this study. For this study, percentage of non-Performing loan over the total loan was used as dependent variable and GDP, annual percentage of economic growth, Inflation, annual changes in inflation rate, CAR, capital adequacy ratio of commercial banks which is measured by dividing shareholders equity to total asset, LR, liquidity ratio measured by dividing total loan to total deposit and size of the bank (Log total asset) were chosen as explanatory variable. The result of the study shows that NPLs level of commercial banks in Afghanistan was sensitive to both macroeconomic and bank specific determinants. In particular, inflation as macroeconomic and capital adequacy ratio as bank specific variables had significantly negative effects on NPLs level of banking industry in the country. The policy implication of the result recommends that policy makers and supervisory as well as management bord of commercial banks are required to monitor, evaluate and predict the inflation level in Afghanistan while approving credits to the customers. Further, the result implies that the regulators at central bank of Afghanistan needs to implement Basel accords fully with within a specific time farmwork in order to avoid adverse effect of credit risk on the industry.

Dedication

This thesis is dedicated to the Government of Republic of Korea and KDI School of Public Policy and Management, who provided this academic opportunity for me, to many others, from developing countries to gain academic, professional and practical knowledge in different policy related field.

Acknowledgement

In the name Allah (God), first and foremost, I am indebted to the KDI School of Public Policy and Management for providing me with an exceptional academic environment and invaluable resources to study and complete my master degree in Public Policy . The rigorous curriculum and diverse learning opportunities have profoundly shaped my understanding of public policy and management. I am grateful to the faculty members and staff who have shared their knowledge and expertise, inspiring me throughout my journey.

I extend my heartfelt appreciation to my supervisors, professor Kim, Hyeon Wook and Professor Lee, Jinsoo for their guidance, support, and continuous encouragement. Their profound insights, constructive feedback, and dedication have been instrumental in shaping the direction of this research. I am immensely grateful for their patience, understanding, and unwavering belief in my abilities.

I forward my immense appreciation to my family, without their love, support, and encouragement have been the foundation of my academic pursuit. Their sacrifices and constant motivation have been my driving force, enabling me to overcome challenges and reach this milestone. I am forever grateful for their belief in my dreams and their firm support throughout this journey. Heartfelt appreciation goes to my father, Abdul Wahid, my mother, Halima, my beloved wife, Mursal, my uncle, who has been supporting me in aspect of my life like an elder brother, Khal Mohammad.

Lastly, I cannot end this acknowledgment without thanking all my friends and colleagues who have provided invaluable assistance, encouragement, and friendship throughout the course of journey at KDIs and this research. Their insights, discussions, and camaraderie have enriched my experience and fostered a stimulating academic environment.

Contents

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List of Abbreviation

1. CAR (Capital Adequacy Ratio) ……...…….
2. NPL (Non-Performing Loan) ……
3. DAB (Da Afghanistan Bank) ……..
4. LR (Liquidity Ratio) …….
5. GDP (Gross Domestic Product) …….
6. (BMA) Bank Millie Afghan …….
7. (PTB) Pashtany Tejaraty Bank …….
8. (ADB) Agriculture and Development Bank ……..
9. (EPB) Export Promotion Bank ……
10. (MCB) Mortgage and Construction Bank ……
11. (IDBA)The Industrial Development Bank of Afghanistan ……
12. (MSP) Money Service Providers ……
13. (FXD)Foreign exchange dealers …….

Chapter 1

Introduction

1.1.Background

After the great financial crisis during the first decade of 21st century, which was started at the United States of America and left many giant financial companies bankrupt and proved the theory of too big to fall, the soundness of banking sector has been the key concern of the head of states, central bankers, regulators and policymakers (Raashid, Rasool, & Raja, 2015). This is because the sector plays an increasingly imperative role in the economic prosperity of countries through channeling funds between individuals, firms, institutions, and governments. Many studies have confirmed the positive and significant nexus between commercial bank activities and the countries' economic growth (Rushchyshyn et al., 2021; Rajaraman and Visistha, 2002; Sorge, 2004). Therefore, a weak and unstablef banking sector erodes the overall economy of the country (Morris & Turner, 1996).

It is commonly known that the principal and primary objectives of any corporation and business are generating profit and maximizing shareholders' equity. They faces differet types of risks while engaging in business. Banking business is not apart from that. Given the complexity of the banking business environment, commercial bank confronts different types of risks while providing business services to their customers in the market. Specifically, credit risk is one of the risks, which is directlty related to the core activities of the commercial banks, lending activities, exposed by the commercial banks and it indangers the soundness of commercial banks through diminishing profitability of commercial banks if remains unaddressed, which eventually affects the economy of the country (Naili & Lahrichi, 2022). According to Basel (2000), "Credit risk refers to the possibility that a borrower or counterparty of a bank may not fulfill its obligations in accordance

with the agreed terms." (P. 1). This means when NPLs raises, the sector faces greater level of credit risk and this rises a red flag not only for the banking industry but for the aggregate economy of the country. In other word, NPL is the main causes of credit risk in the lending institutions. Therefore, it requires considerable attention from the management to oversee daily activities of the commercial banks to manage any issues related to the (NPLs).

Technically, various indicators are used to quantify the credit risk, among others, NPLs is one of the most common indicators which is related to the main activities of commercial banks. According to the IMF (2005) a loan is categorized as non-performing when payment of principle of loan together with its interest are exceeds a delay of 90 days. (p. 8). Thus, the amount of non-performing loans in lending financial institution is a critical indicator of the soundness and safeness of that institution and it has significantly contributed to the banking crisis in the past through impairing the financial statement of the banks, deteriorating asset quality, depressing the profitability and credit growth (IMF, 2019), and ultimately leading to bank instability in the economies. This nexus between banking sector crisis and level of the impaired loan was documented comprehensively by (Samad, 2012; Atoi ,2018).

1.2.Statement of Problem

It is an undeniable fact that banks contribute significantly towards the economic development of the countries and at the same time, the instability in this sector is directly linked to the instability of economy of the countries (Greenidge et al., 2010). According to the MacDonald and Kpch (2006), one of the main factors which deteriorates the balance sheet of commercials bank is the impaired loan, impacting the asset quality, squeezes the profitability and weakens the capital structure of lending institutions. In other words, Typically, interest payments from loans to customers are how banks make money. However, this kind of income exposes banks to risk, since

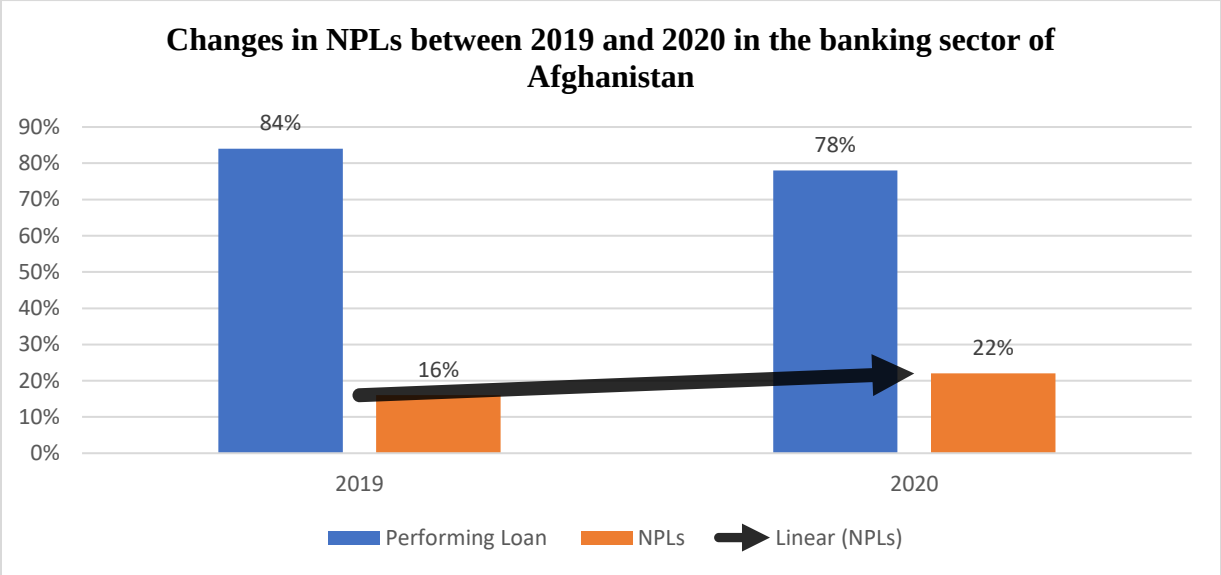
some borrowers can default on their loans. Therefore, considering the importance of the NPLs, it has been one of the core subjects as well as research interest area in the banking sector that has drowned the attention researchers, policy makers, professionals and academicians at national and international level.

Non-Performing Loans (NPLs) effects the productivity of commercial banks significantly through deteriorating asset side of commercial banks (Çollaku and Aliu, 2021). Considerable amount of Impaired asset size means a mismatch between liability and asset which in returns it creates liquidity risk, subsequently threatens the soundness of the banks. Therefore, it requires special consideration to manage the amount of NPL within the limit. Not only that, the distribution and trend of NPLs varies between private and public owned banks as (Cornett et al., 2010) found that private banks incline to have less exposer to credit risk than public banks owned banks. This shows the importance of the governance in banking business and impact of shareholder's decision on critical issues related to the daily banking business among the private and public commercial banks.

In case of Afghanistan, banking sector in Afghanistan is relatively new, young and small. Despite being so, the sector faced one of it is catastrophic crisis in 2010, after collapse of Kabul Bank, the country's largest and systemically important commercial bank. The collapse of the country's largest bank mainly attributed to the related party loan, the credits that is approved to the companies and individuals related to the shareholders of bank, which eventually written off as NPL from the balance sheet of the bank. The Afghan Government had to step in as a Lender of Last Resort to preserve client savings and stop serious crises in the nation's developing financial system. For this, they used $825 million of the reserves held by the central bank (Mcleod, 2016).

Therefore, NPLs has been one of the main issues which threatens the sector in Afghanistan. By the end of December 2020, the amount of NPL in banking sector of Afghanistan amounted AFN 8.65 billion which accounts 21 .89 percent of gross loan in the sector while the figure in December 2017 was 12.18 percent of total gross loans (DAB, 2020). This shows a considerable increase in amount of the NPL in the banking sector and figure could have perpetuated further due to the COVID-19 pandemic and recent political development in the country as the overall investment environment and the economy of the country deteriorated.

Feigure1: Level of NPLs in the banking sector of Afghanistan



Source: Central Bank of Afghanistan

Taking in account the uniqueness of the banking sector in Afghanistan and the reviewed literature, current work attempts to explore the determination of the NPLs in the banking industry of Afghanistan. It is worth mentioning that as of the knowledge of the author, no study has been published to study the main determination factor of impaired loan in the country.

1.3.Research Objective

Investigating the factor accounting for the NPLs in Afghanistan's banking industry is the main goal of this study.

1.4.Research Question

Considering the problem statement and research objective, this tries to provide answer in the following question:

1. What are the macroeconomic and bank-specific factor causes of NPL in the banking sector Afghanistan?

1.5.Significant of the study

This work will contribute to the body of literature related to the commercial banking issues such as of Non-Performing Loan (NPL) in developing countries such as of Afghanistan. Furthermore, this study will be a useful for not only commercial bank professionals but also this will help central bank policy makers in Afghanistan to draft comprehensive regulations to address the issue of risk management. In addition, this research will be a base for the future researches in the field of credit risks management in Afghanistan because, as of the author's limited information, no particular study has been published in the context of Afghanistan to address the issue of NPL.

1.6.Organization of the Study

This thesis will be organized as following. It begins with introduction, followed by the second chapter where the relevant literature on the topic will be reviewed, which provides readers a deeper understanding of the issue from different angel. The third chapter will highlight the research methodology and the Findings and Analysis of the data will be discussed in the fourth chapter. The last chapter, chapter five, will be dedicated to the conclusion remarks.

Chapter 2

Literature Review

2.1.Introduction

This chapter reviews the previous relevant works produced by the scholars in the field of banking and finance. This chatter divides several sections; (1) overview of the banking sector in Afghanistan; (2) theoretical framework for the study; (3) Macroeconomic factor (4) Bank Specific Factor; (5) Conceptual Framework.

2.2.Banking Sector in Afghanistan

In Afghanistan, banking industry has a long ups and down history due to the domestic conflict. According to the Naseri and Sharofiddin (2020), the first commercial bank of the country, Bank Millie Afghan (BMA), was established in 1933, followed by the second commercial bank of the country, Pashtany Tejaraty Bank, both of which were owned by the government. The establishment of these two banks lead to the establishment of central bank of Afghanistan in 1939, which known as Da Afghanistan Bank. Furthermore, several other specialized commercial banks such as Agriculture and Development Bank (ADB), Export Promotion Bank (EPB), Mortgage and Construction Bank (MCB), The Industrial Development Bank of Afghanistan (IDBA) established in different subsequent years to provide financial services for the citizens, companies and business in the country.

Almost after four decades of domestic conflict and endemic security challenges, the new interim government was formed in 2001. Likewise other economic, political and social intuitions, financial sector had almost collapsed. That time the whole financial system of Afghanistan consists of six dysfunctional licensed commercial banks such as of Export Promotion Bank (EPB), Mortgage and

Construction Bank (MCB), The Industrial Development Bank of Afghanistan (IDBA) and so on, together with around 300 licensed and around 6000 unlicensed money service providers (MSP) and foreign exchange dealers (FXD) (World Bank, 2003). Due to the outdated banking system, payment system was crippled and as the only operational payment system in Afghanistan, the informal financial network has become essential to the country's economy. However, this system was also open to dangers including the financing of terrorism, drug trafficking, and money laundering (Bennett, 2005). Fortunately, Afghanistan had all resources in hand to reform the fragile financial sector with assistance of international development and financial organizations like IMF and World Bank. Subsequently, in 2003 through a presidential decree, the new legal framework for banking sector was enacted. This, the new area for banking industry have had opened a platform for the development of a sound and resilient private banking sector and this was a step forward toward the financial stability and economic growth in Afghanistan (Taqipor, 2017).

As result of these development, today relatively young financial sector of Afghanistan comprises of banking and non-banking financial institutions, Money Service Providers (MSP) as well as Foreign Exchange Dealers (FXD) and Electronic Money Institutions (EMI) (DAB, 2019). Specifically speaking, financial sector of country consists of 12 licensed banks, out of which 3 banks are owned by government, 8 banks owned privately and 2 branches of foreign banks. Not only that, in respect to MSPs and FXDs, currently 1561 MSPs and 1639 FXDs are actively involved in the sector (DAB, 2020). In addition, there are 7 microfinance institutions have been actively providing financial services to the customers in Afghanistan. Furthermore, there are four telecommunication companies namely Roshan, Etisalat, Afghan Warless and MTNA have been providing mobile money services under the brands of MSDA or (M-Paisa), M-Hawala, My-Money and Mobile Money Ltd respectively. It is crucial to mention that According to the DAB (2019),

total asset of banking sector reached to almost AFN 3 billion, which contributes 21 percent GDP of the country and in terms of loan portfolio, the sector contributed an amount of AFN 40 billion to the different economic sector in the country, while total deposits to the sector has reached to the AFN 239 billion.

2.3.Theoretical Framework

Scholars in the field of Finance have been developed several theories to explain the financial risk management in banking industry. In this regard, two most relevant theories in finance world which possibly explains the accumulation NPL in the banking sector, which will be highlighted as follow.

2.3.1. Moral Hazard Theory

Theory of moral hazard has been widely discussed in financial industry in general and insurance industry in particular. The theory states that insured individuals involve in risker activities than uninsured individuals (Muhanzu, 2011). This is mainly caused by the asymmetry information, in which one of the involved parties in the contract has more information than other parties within the banking industry. It has gained significant attention after the Great Financial Crisis of 2007 and 2008 as Bernanke (2013) stated "As we try to make the financial system safer, we must inevitably confront the problem of moral hazard" (p. 6). This is because, within the lending institution, the permission of bailout by the government creates the moral hazard problem, which induce the financial institutions to involve in riskier lending activities.

It is difficult to detect the moral hazard problem directly in the banking sector but it can be observable through looking to the lending behavior of the banks. Considering this, rent seeking behavior of the managers in the banking sector is one of the main reasons that banks involve in

risky behavior through lending more unsecured lending activities (Jensen and Meckling, 1976), which ultimately ends up increasing the amount of NPL. Furthermore, Zhang et. (2015) examined the impact of NPL on the bank's behavior in China. The result of their studies indicates that loan approval decision in the banking sector of chine exhibits the existence of the moral hazard issue. Similar study by (Novellyni and Ulpah, 2017) in case of lending behavior in banking sector in Indonesia confirms the hypothesis of Zhang et. (2015).

2.3.2. Theory of Asymmetric information

The theory of Asymmetric information for the first time presented by the Akerlofs (1970). It is a situation in which the information between the parties of the contract unequally disclosed (Ekumah and Essel, 2003). This means one party possess more information than others about that particular transaction. Therefore, most of the lending in the banking sector involves asymmetric information issue which effects the repayment process of loan. According to the Ariccia (1998) under the asymmetric information, it is challenging for lending institutions to determine the credit worthiness of potential borrows while granting credit services to their customers. Therefore, adverse selection is one of the main challenges arises due the existence of the asymmetric information, leading the intuition to the uncertainty of recognition between good potential borrowers and bad customers, which leads the customer of the lending institutions defaults in their loan and subsequently impacts the asset quality of the balance sheet through raising the amount of NPL.

2.4.Factor effecting the non-Performing loan

Various studies have been conducted in the past at different level such as individual country and regional level to determine the factors effecting the NPLs. Based on these literatures, there are two main factors which explains the NPL in the banking sector, external factor such as of

Macroeconomic environment dynamics, and internal factors which is bank specific factor. The former directly or indirectly impacts the repayment ability of the customer of lending institutions while the latter focuses on the bank related factors like profitability, bank size, management efficiency and liquidity.

2.4.1. Macroeconomic Factors

In respect to the macroeconomic factor determination of NPLs, Klein (2013) conducted a study covering between 1998 and 2011 in (CESEE) region, the study confirmed that, NPL level in the region mainly attributed to the macroeconomic condition compare to the microeconomic factors. The result of the study concludes that the amount of NPLs tend of rise when inflation, unemployment and exchange rate increase in the region. Another study by Makri and Tsagkanos (2014) in Eurozone also confirms the that NPL is strongly defined by macroeconomic variables. Furthermore, Messai and Jouini (2013) inspected the NPLs determination in banking sector three countries in Europe namely; Italy, Greece and Spain. They have also reached to similar conclusion as of Makri and Tsagkanos (2014). Therefore, it can be stated that overall improvement macroeconomic condition through low unemployment, low inflation and high economic growth, effects the repayment capacity of borrowers; subsequently effects the NPL level of banking industry in the Eurozone countries.

Research by Saba, Kouser and Azeem (2012) reviled that NPLs is inversely related to the GDP and Interest in the US banking sector. In case of GCC countries, a study by Espinoza and Prasad (2010) showed that macroeconomic determination of the NPL for the period of 14 years, between 1995 and 2008 by employing dynamic panel model. Their result confirms that economic growth and financial market indicators significantly impacts the NLP. In addition, in case of Baltics States, a study by Kjosevski and Petkovski (2021) reached to the same conclusion, and their study

contributed to the literature by confirming a significant association between public debt and NPLs among the banking sector in the Baltics States. Research by Djiogap and Ngomsi (2012) was conducted covering the (CEMAC) region to investigates causes of long-term bank loans in the region by using a fixed effect model. The study includes data from 35 banks in African countries from 2001 to 2010. Their study concluded that in the long-run, macroeconomic factor had insignificant impact on NPL level among commercial banks in the region.

Regarding macroeconomic determination of NPL in individual economies, İslamoğlu (2015) studied the connection between macroeconomic phenomenon and credit risk in Turkey. The work confirmed that increase in public debt results in increase in NPL and the study further shed light a significant association between lower interest rate and loan-growth. A study of Nepalese banking reviled that macroeconomic factors effects the level of NPLs both positively and adversely (Prakash, 2013). However, Koju, Ram Koju and Wang (2018) found an opposite association between GDP and NPL in Neplanes banking sector.

Research of Hyun and Zhang (2012) on causes of the NPL among the US banking sector for two spread period, pre-financial crisis (2002-2006) and during the crisis (2007-2010) reviled that in pre-financial crisis period, their study confirms that unemployment and economic growth inversely affect NPLs and smiler result has been concluded during the crisis period as well. This implies that due to the economic deterioration, unemployment rate increased, which effected repayment capacity of the borrowers negatively in the US. Subsequently, the lending institutions ended up with mountains of NPLs.

Ahmad and Bashir (2013) studied the macroeconomic phenomenon that explains credit risk in the banking sector of Pakistan by applying the OLS method. Their study confirms that except CPI, other macroeconomic variables had significant negative association NPLs.

2.4.2. Bank Specific factor

In addition to the macroeconomic factor, Khan et al., (2020) investigated microeconomic determination of credit risk in the banking sector of the Pakistan. In this study, they have used profitability, capital adequacy, income diversification and operating efficiency as explanatory variables. By using random and fixed effects, their study concluded that bank specific factor had both negative and positive impact on NPLs of commercial banks. For example, profitability and operation efficiency associated negatively with NPLs while CAR and income diversification had direct impact on NPls.

Another research by Khan and Ahmad (2017) finds that Return on Asset, EPS and CAR have a substantial impact on NPLs in Pakistan's banking industry. Furthermore, a study by Wondimagegnehu (2022) found that number of factors have a substantial influence on non-performing loans (NPLs). These include inadequate credit assessment, ineffective loan monitoring, a lack of a credit culture, and excessively lenient credit terms. Besides, this study took into account interest rates as bank-specific factors which had insignificant impact on the amount of NPLs among the Ethiopian commercial banks.

Additionally, work by Daniel and Wandera (2013) on how sharing credit data effects the commercial bank's nonperforming loans in Keynia reviled that asymmetry information, interest and lending rates, loan management, the legal system, and credit criteria have a favorable impact on NPLs.

Assaf et al. (2013) inspected the association of non-performing loans with the size of bank, capitalization, and efficiency level from a microeconomic approach. The research found a link between capitalization and bank effectiveness. Nevertheless, no significant relationship has been found between dependent and explanatory variables. In fact, internal or bank-specific variables

are the product of business activities. These elements are linked to diversifiable risk (Louzis et al., 2012), which would reduces by effective management. Unlike an external component, this risk may be managed because it is a market risk (Ghosh, 2015; Rachman et al., 2018). A company can achieve great profitability if it manages its internal variables well, but when these components are poorly handled, the balance of the financial will be affected adversely (Ofori-Abebrese et al., 2016).

In regards to Vietnam's banking sector, Hue (2015) conducted a study to determine the NPLs by using data between 2009-2012. The study looks at how NPLs has been relate to industry-level variables over the previous year. The findings demonstrate that these variables contributed to the development of NPLs in recent years. Sheefeni (2015) assessed the industry-level factors that affect NPLs in Namibian's banks over the years 2001 to 2014. The findings show that the NPL defined by ROA, ROE, and log of total assets. Ghosh (2015) looked at industry specific predictors of credit risk for banking sector and saving institution in the District of Columbia and all 50 US states. According to the study, bank profitability decreases NPLs.

1.1. Conceptual Framework

Source: *Author's drawing based on the literature review*

Chapter 3

Research Methodology

3.1.Research Design

Design of a research is one of the most important parts of every research paper, specifying the method and procedure for analyzing collected data. Choosing a correct and suitable methodology for the research depends on the main question, objective and nature of the data of the research. The core aim of this research is to examine the causes of the NPLs in the banking sector of Afghanistan. Considering this, a quantitative approach will be employed to answer the main question of the research because explanatory study focuses on empirically examined researches. As such, for the purpose of understanding the determination of NPLs in the banking sector, an explanatory study design will be employed.

3.2.Data Source

For this study, secondary data sources are used because, using secondary data is cost effective and easily accessible. For bank related data, the data is obtained from audited financial statements of the banks in Afghanistan for 9 years, from 2010 to 2018. Likewise, for macroeconomic variables, the author obtained data from world bank data bank for that specified period. In respect of the nature of data, this study will utilize a panel-data because according to the Gurjarati (2004) panel data is preferred in measuring effects over time-series or cross-section in data.

3.3.Sampling Design

Sampling is the selection techniques of specific number sample to determine the parameters of the whole population. According to the official page of central bank of Afghanistan, currently 12 banks are operating in the country, out of which 3 of them state owned, 7 private banks and 2 branches

of foreign banks. Thus, for the purpose of this study, a sample of 8 banks have been selected which are "Afghanistan International Bank (AIB), Afghan United Bank (AUB), Azizi Bank (AZB), Maiwand Bank (AMB), Bank Mille Afghan (BMA), First Microfinance Bank (FMFB), Ghazanfar Bank (GB), and Pashtani Bank (PB)".

3.4.Operationalization of the Variables

3.4.1. Dependent Variable

- Non-Performing Loans (NPLs)

The study identified the Non- Performing Loan (NPLs) as dependent variable of study. NPLs ration can be calculated as follows:

NPLs (Ratio)= Non-Performing Loan/ Gross Loan

3.4.2. Independent Variables

- Economic Growth

Based on the previous studies, it is confirmed that economic growth had inverse impact on NPLs (Fofack 2005; Messai and Jouini 2013). This implies that during the economic expansion period the individual, business and companies gradually grow their production, which increases their profit. This effects the payment aptitude of the bank's customers. Annual growth rate as proxy for the economic growth variable will be utilized.

- Inflation

Inflation is another variable which effects the daily life of individuals. High inflation effects the saving attitude of the people and firms in an economy, leading to lack of lending and investment (Farhan et al., 2012). This could affect the overall economy of the country, which leads to raise in NPLs. However, according to Klein's (2013) argument, when there is a higher level of inflation,

borrowers' loan payment capacity can increase because the real value of their outstanding debt decreases. This means that inflation effects the borrower's payment capacity negatively, where an increase in inflation can result in a decrease in the real value of borrowers' debt and an increase in their ability to make loan payments. On the other hand, some other studies such as Škarica (2014), and Vogiazas and Nikolaidou (2011) and concluded a negative relationship between inflation and NPLs. For this study annual inflation rate will be utilized.

- Bank Size

One of the bank-specific elements that will be considered in this study's explanatory variables is bank size. As industry specific on NPLs determination is considered, the findings of previous research are inconsistent. It is verified in the instance of Indonesia that the NPLs were negatively impacted by bank size (Yulianti and Aliamin, 2018). Likewise, other researchers such as Saurina and Salas and (2002) and Fernández de Lis et al. (2000) and concluded an inverse association between credit risk and NPLs. However, Other studies such as Misra and Dhal (2010), Louzis, Vouldis, and Metaxas (2010) found direct association between size of bank and NPLs. For the sake of this study, log total asset will be used as a stand-in for bank size.

- Capital Adequacy Ratio

Capital is the foundation of each commercial banks which is used as a buffer against any sudden losses. It is mandatory for commercial banks to maintain minimum CAR ration to fulfil the requirement of international Basel accord and domestic banking regulation in respective countries. Several studies in different region found inverse relationship between CAR and credit risk (NPLs) see Hu and Chiu (2004) and Makri et al. (2014). This indicates when a bank is well capitalized, they intended to become risk averse financial institution and entertain only less risky customers.

Other studies such as Amuakwa and Boakye (2015) and Ngomsi (2012) cocluded a negative relationship between NPLs and CAR ratio. In this study, CAR is measured by dividing shareholder's equity to the total asset of the bank (Chintha, 2018) and used as one of the bank specific factor.

- Liquidity Ratio

It is mandatory for commercial banks to maintain a specific level of liquid assets to run the banking activities and avoid bank failure. Some of the studies (Jameel 2014; Anjom and Karim 2016) found an inverse relationship between NPLs and Liquidity ration. This means the lending institutions with sufficient fund involves in less risky activities or those institutions will invest in less risky assets. However, Olson and Zoubi (2008) found a negative connotation between liquidity and NPLs in the banking sector. In this study the liquidity ratio is measured as follow:

Liquidity Ration = Total loan / Total deposits

3.5.Hypothesis of the study

In the light of the above literature review, the following hypothesizes have been developed to determine the factors which effects the NPLs in the banking sector of Afghanistan.

Table.1. Hypothesis of the study

Independent Variables	Null Hypothesis (H0)	Alternative Hypothesis (H1)
Bank Size (LogTA)	"There is no relationship between bank size and non-Performing loan".	"There is a direct relationship between Non-performing loan and Bank Size".
Capital Adequacy Ratio CAR	"There is no relationship between Non-Performing loan and CAR ratio".	There is an indirect relationship between Non-Performing loan and CAR ratio.
Liquidity Ratio (LR)	"There is no relationship between Non-Performing loan and liquidity ratio (LR)".	"There is an inverse relationship between Non-Performing loan and LR".
Economic Growth	"There is no relationship between Non-Performing loan and GDP growth".	"There is a an inverse relationship between Non-Performing loan and GDP".
Inflation	"There is no relationship between Non-Performing loan and Inflation".	"There is a direct relationship between Non-Performing loan and inflation".

3.6.Model Specification

To analyze the panel data, the previous literature has utilized verities of the models. Among others, fixed and random effect model is one of the common one. Random effect model estimates through allowing time-variation to individual banks with fixed coefficient while fixed effect model is used to control the unobserved heterogeneity, allowing different-constants for separate banks while the coefficients are fixed over time (Gujarati and Dawan, 2015). Therefore, in this study, the factors which influences the NPLs in the banking sector has been investigated, which consist of both cross section and time series data. Due to the high correlation possibility between residual value and individual banks and time variant, employing the ordinary least Square (OLS) method may produce a biased result. Thus, to minimize this issue, Fixed or random effect model will be utilized.

$$Y_{it} = \alpha_0 + \beta X_{it} + \varepsilon_{it}$$

The equation above illustrates a regression model, in which the outcome variable (Yit) for a given bank (i) at a certain time (t) is represented by the equation. The explanatory variables (X) for the same bank (i) in the specified year (t) are represented by the coefficient (β), and the constant term is indicated by (α). The unaccounted-for or residual variance in the model is captured by the error term, which is denoted by (ε). Considering the above equation, the following model has been developed:

$$NPL_{ti} = \alpha_0 - \beta_1 (CAR)_{it} - \beta_2 (LR)_{it} + \beta_4 LogTA_{it} - \beta_4 (GDP)_{it} + \beta_5 (INF)_{it} + \varepsilon_{it}$$

Non-Performing Loan (NPL) represents the Dependent Variable

CAR, LR, Log TA, GDP, INF represents the explanatory variables.

$\beta_0 \sim \beta_5$ = Coefficient of Explanatory Variables

ε_i = Regression Residual

Chapter 4

Analysis, Finding and Discussion

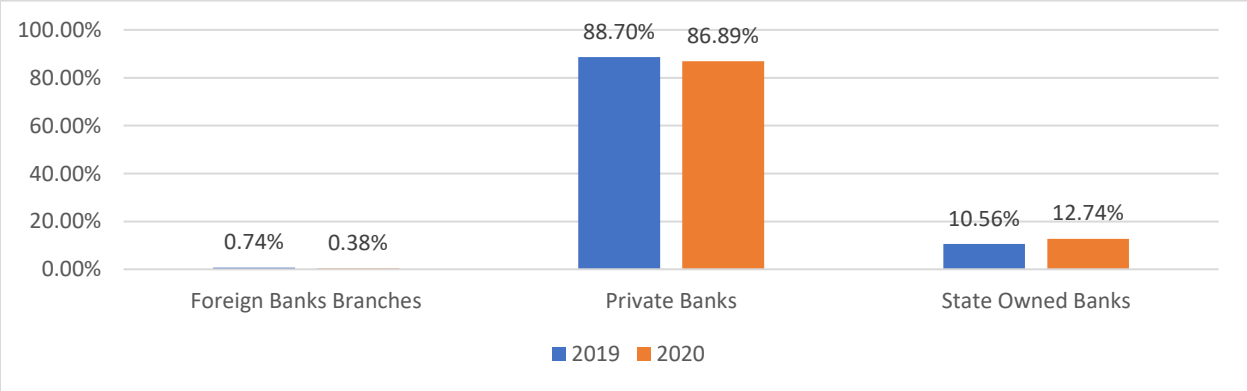
4.1.Introduction

This chapter delivers an analyzes on the data that have been observed. It starts with an examination of non-performing loans in Afghanistan's banking industry and then on to a descriptive analysis of the data. Regression analysis is presented after a correlation analysis to identify the multicollinearity problem with the data. The chapter concludes with a discussion that contrasts the results with those of other researchers.

4.2.Analysis of Non-Performing Loan in banking sector of Afghanistan

Although the banking industry in Afghanistan is relatively young and small, still its contribution to the economy of the country in terms credit distribution is undeniable. In aggregate form, the banking industry disbursed 40 billion AFN equivalent to credit 500 million USD to different economic sectors and consumers. Most of the loan were provided by private banks as it can be seen in the following figure.

Figure2: Loan Distribution by Banking Institutions in Afghanistan



Source: Central Bank of Afghanistan

It is critically important to understand the sectoral distribution of loan in the economy, which signals how well the loans were diversified. In Afghanistan, commercial banks mostly disbursed credit to trade sector, followed by service and manufacturing sector. Agriculture stands at the lowest ranks. In terms of geographical distribution of loan, more than 70% of the loan given to business and firms in Kabul, capital city of Afghanistan; followed by Balkh province and Herat province (DAB, 2020). Loan concentration in few economic sector and geographical location exposes commercial banks to sever credit risks in case of any external or macro shocks, which in return effects the whole sector.

Figure 3: Sectoral Distribution of Credit by Commercial Banks in 2020

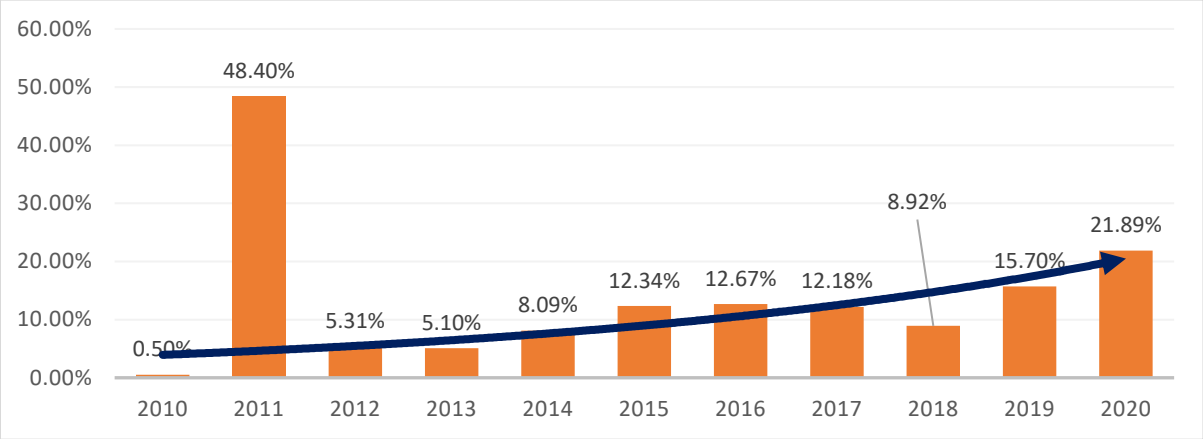
Commercial Real Estate and Construction	7.62%
Infrastructure Projects	8.06%
Manufacturing and Industry	9.93%
Trade	41.23%
Service	27.15%
Livestock and farms	6%

Source: Central Bank of Afghanistan

Given a brief loan profile of banking sector in Afghanistan, NPL is one of the main issues which threatens the sector. The trend in the Figure 3 shows a steady and gradual increase in the percentage of NPLs to the total loan for the past ten years with a dramatic rise in 2011. The dramatic increased in 2011 associated with the failure of Kabul Bank, the largest commercial bank in the country. However, there are other several factor which have contributed to the trend. On the one hand, country risk such as of security instability and political tremble due to the international troop withdrawal, on the other hand, emergence of Covid-19 pandemic in 2019, have contributed greatly to deterioration of overall investment environment and the economy of the country. This in return, undermined the ability of business and firms to payback their loan and ultimately triggered the

NPLs to raise. Furthermore, luck of risk management and inadequately diversified loan basket could be another reason for the increasing trend of the NPLs as it is mentioned early that most of the loan was concentrated in few sectors and geographical location.

Figure 4: Trend of NPLs in the banking sector of Afghanistan



Source: Author's calculation-based Data from the Central Bank of Afghanistan

4.3.Descriptive analysis

The primary objective of descriptive analysis is to look at the distribution of the data. In other words, summary of statistics shows how the data of the research has been distributed. In particular, it presents statistical character of the data such as minimum and maximum value, the mean, and standard deviation of each variable of the study. Therefore, the following figure, Table 4, shows the summary of statistics of variables, both dependent and independent, used for this for the period of 2010-2018. Total number observation for this study was 72. Result shows the mean value for NPL, CAR, LR, TA, GDP and INF were 8.4, 28.13, 28.56, 1.26, 4.80 and 4.65 respectively. The standard deviation for NPLs was 15.17 with minimum value of 0 and maximum value of 94.55, with average mean of 8.4 percent. Here, the highest value indicates the failure of Kabul Bank and 0 NPLs means after the crisis, the regulatory body have ordered the bank to stop providing loan

for the specific period of time. Furthermore, on average the economy of Afghanistan grew 4.6 percent.

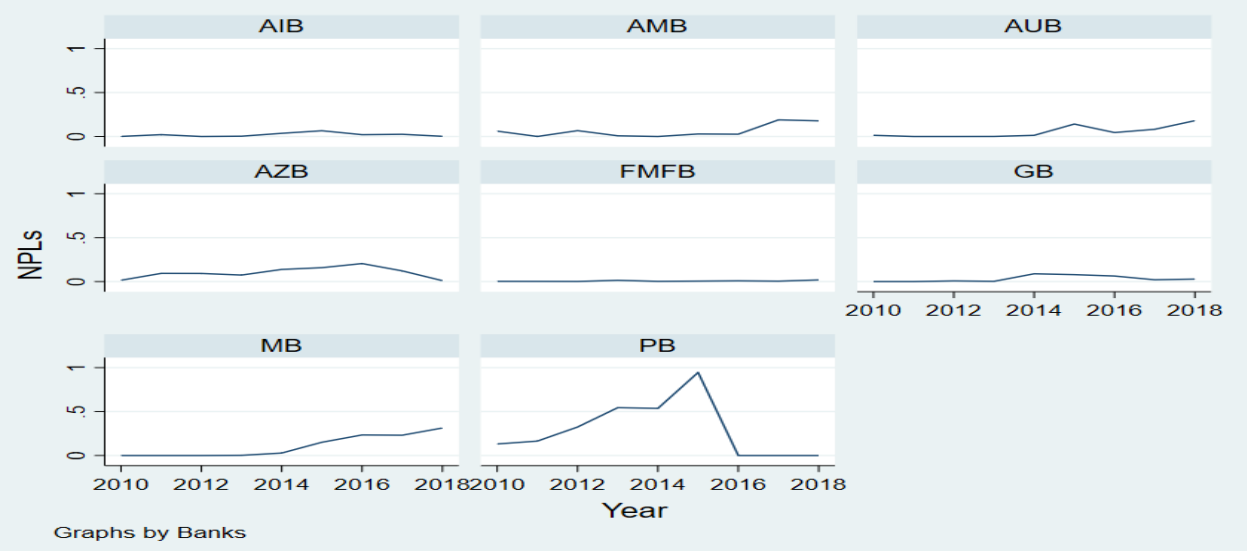
Table 2: Summary of Statistics

Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
NPLs	72	0.084394	0.15171	0	0.945452
CAR	72	0.281319	0.211369	-0.125	0.917
LR	72	0.285562	0.186594	0	0.614497
LogTA	72	1.263917	0.281955	0.642959	1.855658
GDP	72	0.048071	0.049234	0.00426	0.1436
INF	72	0.046511	0.035536	-0.0066	0.118

Source: Extracted from version 17 Stata based on the observed data

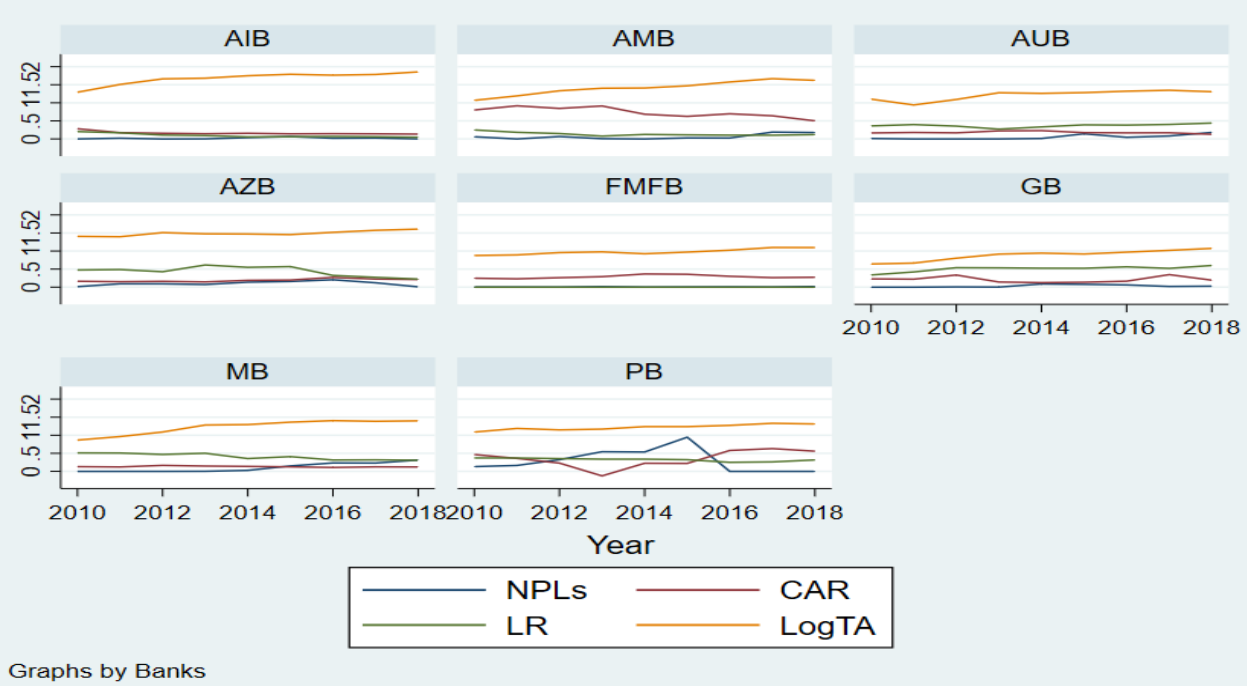
Figure number 5 shows the trend of NPL with respect to each sampled commercial bank of this study. In most of the bank, NPLs intended to rise. Comparatively speaking, NPLs in public commercial banks namely; PB (Pushtani Bank) and BMA (Bank Milli Afghan) raised gradually over the period of study while NPLs among private bank managed well. Technically, PB was ordered by central bank of Afghanistan, to hold corporate loan for a several years because of the regulatory issues.

Figure 5. Trend of NPLs with respect to each Bank



Source: Extracted from STATA 17 based on the observed data

Figure 6. Trend of Bank Specific Factor with respect to the banks



Source: Extracted from STATA 17 based on the observed data

4.4.Correlation Analysis

Correlation matrix provides information on how closely two independent variables are related to each other. R is Coefficient which shows the how strongly variables are associated with each other. It can take the value between -1 and +1, or $-1 \leq R \leq +1$ (Senthilnathan, 2019). Kennedy (2003) stated that two variables are highly corelated when the value of correlation coefficient, R, exceeds 0.80 and 0.90. The correlation analysis assists in determining whether multi-collinearity problem existed in the data before a regression model was run. Therefore, the following table demonstrates the correlation-matrix between the independent variables. As it can be seen there is no multicollinearity issue has been detected in this study because the value of coefficients was less than 0.8. In addition, the correlation result shows a negative relationship between GDP growth and inflation rate in Afghanistan, which is in contrary of relevant economic theories.

Table 3: Correlation Matrix

Variables	NPLs	CAR	LR	LogTA	GDP	INF
NPLs	1					
CAR	-0.1871	1				
LR	0.1594	-0.3435	1			
LogTA	0.1015	0.033	-0.2615	1		
GDP	-0.1404	0.0361	0.062	-0.2558	1	
INF	-0.1848	0.024	0.0462	-0.1763	-0.0372	1

Source: Extracted from version 17 Stata based on the observed data

4.5.Regression Analysis

Given the panel nature of the data in this study, either fixed-effect or random-effect model will be utilized because these methods have the both properties of time series and cross section. To determine which test is appropriate in particular, Hausman Test will be further executed.

4.5.1. Fixed and Random Effect Model

The following table presents the result of fixed and random - effect model at (1, 5 and 10 percent) level of significancy. Based on the result, R square for both fixed -effect and random -effect model was 0.4266 and 0.4174 respectively. This means that around 43 % and 42 % of the NPLs explained by explanatory variables of the study under both models respectively. In both model, capital adequacy ratio of commercial banks was found to have significantly negative relationship with NPLs at 1 percent level of significancy. Likewise, similar relationship is true between inflation and NPLs at 5 percent level of significancy.

Table 4: Result of Fixed and Random Effect Model

VARIABLES	(1) Fixed Effect	(2) Random Effect
CAR	-0.7333***	-0.5359***
	(0.1239)	(0.1147)
LR	-0.0922	-0.0469
	(0.1937)	(0.1607)
LogTA	-0.0698	-0.0094
	(0.1245)	(0.1048)
GDP	-0.4203	-0.3718
	(0.3050)	(0.3039)
INF	-0.7814**	-0.7335*
	(0.3862)	(0.3946)
Constant	0.4617**	0.3124*
	(0.2085)	(0.1793)
Observations	72	72
R-squared	0.4266	0.4174
Number of Banks	8	8

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Furthermore, economic growth and NPLs had negative and insignificantly related to each other. For the rest of the bank specific factors such as liquidity ratio and bank size, the result shows a negative and insignificant association between them and dependent variable, NPLs.

4.6. Hausman Test

It is a test which is executed to find the most appropriate model that is suitable for Pannal data. The null hypothesis for this test posits that the random-effects model represents the optimal fit for the Pannal data, whereas the alternative hypothesis advocates for the fixed-effects model. The value of P is to accept or reject the hypothesis. Therefore, when P value is more than 0.05, the Null

hypotheses is accept meaning random-effect model is suitable model, otherwise, Null hypotheses is excluded and fixed effect model is the suitable one (Moyo and Tursoy, 2020).

Table 5: Result of Hausman Test

Variables	Fixed	Random	Difference	SE
CAR	0.733259	0.535894	-0.197365	0.0468224
LR	0.09215	0.046944	-0.045206	0.1080278
LogTA	0.069764	0.009371	-0.060394	0.0672263
GDP	0.420289	0.371769	-0.048519	0.0262634
INF	0.781367	0.73348	-0.047887	.

$Chi^2 = 19.31$, $Prob > Chi^2 = 0.0017$

Thus, the result in figure 7 above shows that P-value is less 0.05, which confirms that fixed effect model is suitable model for this research.

4.7.Discussion

The primary objective of the study was to examine the factors that determine NPLs level among the commercial banks in Afghanistan. By taking this in consideration, the following liner regression model was developed in chapter three.

$$NPL_{ti} = \alpha_0 - \beta_1 (CAR)_{it} - \beta_2 (LR)_{it} + \beta_4 LogTA_{it} - \beta_4 (GDP)_{it} + \beta_5 (INF)_{it} + \varepsilon_{it}$$

By considering the result of Fixed effect model, the following coefficient has been estimated for our predicted model.

$$NPL_{it} = 0.4617 - 0.7333(CAR)_{it} - 0.0922 (LR)_{it} - 0.0698 LogTA_{it} - 0.4203 (GDP)_{it} - 0.7814 (INF)_{it} + \varepsilon_{it}$$

4.7.1. Discussion on Bank Specific Factors

According to the result of regression, capital adequacy of commercial banks and NPLs level negatively related with a coefficient of (-0.7333) and this relationship is substantial at 1 percent level of significancy, indicating that one percent variation in the value capital adequacy ratio of banks in Afghanistan could result a negative change on NPLs level by 0.7333 percent. This result supports the work of Ranja (1994), Makri et al. (2014) and Swamy (2012). In comparing with Islamic banking industry, it confirms the study by Hernawati et al. (2021) who examined the non-performing financing determinants among Islamic banks in the Asia-Pacific region. Thus, it can be argued that well capitalized commercial banks in Afghanistan tend have more risk tolerance appetite compare to the banks with weak capital foundation. Not only that, the inverse relationship between CAR and NPL among the banking sector in Afghanistan also indicating a strong regulatory measure by Central bank of Afghanistan in regards to maintaining a specific capital threshold, which is in compliance with international Basel accords.

Moreover, log total asset as proxy measurement for size of the banks is considered to be one of the banks specific determinations of NPLs in this study. As it can be seen from the result, size of the Afghan commercial banks and NPLs are negatively related with a constant of - 0.0698, which shows that 1 unite change in total asset of commercial banks can result in 0.0698 unite change in NPLs level of commercial banks in opposite direction. Obtained outcome is in line with the result of many researchers such as Barus and Erick (2016), Dewi and Ramantha (2015) and Suwarna (2014), who's research confirms an inverse relationship between size of bank and NPL. This presents that large commercial banks are able to do better pre-approval loan screening which enables them to better cope with their loan defaulters. Furthermore, large banks have more resources to hire highly qualified risk management experts that foster the risk management system

of the banks and ultimately lessening the NPLs burden. In addition, the adverse association between size of banks and NPLs also indicates the strong impact of loan-diversification ability of large banks which allows them to diversify the credit risk and subsequently lower the NPLs level. On the other hand, some studies such as of Dao et al. (2020) and Laksono & Setyawan (2019), who found a direct association between banks size and their NPLs level.

Liquidity is imperative for the operation any commercial banks whether it is small or giant. This is because, it shows the solvency or insolvency of banks in case of emergencies. Thus, liquidity ratio (LR) is quantified by the dividing total loan to total deposit, which indicates how many percentages of public fund is being lent by banks. Thus, the result of regression in the above table shows an opposite relationship between liquidity ration and level of NPLs among the commercial banks in Afghanistan with a constant of (-0.0922), indicating that any percentage change in loan to deposit will result in a negative 9.2 percent change in NPL level among the commercial banks in Afghanistan, given other factors are remined unchanged. This result is in line with findings of Tsegaye &b Nigatu (2016) and Safiullah & Shamsuddin (2018), who founds that high level of liquidity means lower credit risk or low level of NPLs. Such inverse relationship portrays the ability of commercial bank's management in Afghanistan to involve in business activities, specifically in lending activities, that is safer and more productive as level of liquidity increases. Not only that, it is also indicates regulatory pressure and restriction on highly liquid commercial banks to not involve in more risky activities that will undermine solvency of the institution, given the macroeconomic and country risk in Afghanistan.

4.7.2. Discussion on macroeconomic factors

Macroeconomic environment plays an imperative part in determining loan default in developing countries. The result of the regression exhibits a opposite association between economic growth

and NPLs in Afghanistan with a coefficient of (-0.42). This result was not statistically significant. One of the main reasons why these inverse relationships are not significant is that macroeconomic environment in Afghanistan, particularly GDP growth, during the study period was mainly supported by foreign aid and was not generated domestically. However, the outcome is in-line with the common economic believes that economic prosperity boosts the business activities and ultimately enables individuals to payback their loans as it is evident from life cycle hypothesis. This means that in Afghanistan as economy grows, the earnings of business, firms and individuals raises and ultimately, they would be able to pay their loans. Further, the result is also supporting the study conducted by Fofack (2005) and Bonilla (2012) who found that NPLs tend to raise as macroeconomic condition of the country deteriorates.

Beside GDP as proxy for economic growth, inflation is another macroeconomic variable which represents the explanatory variable for this study. At 5 percent level of significancy, annual inflation in Afghanistan has a adverse association with level NPLs among the commercial banks in the country with coefficient of (-0.78), which is statistically significant and it is in contradictory of what it was expected in hypothesis development section. The negative association between inflation and NPLs can be as result of recovery phase of business cycle in the country, during which the aggregate economy prospers and this leads to raise income of firms, individuals and companies, enabling them to pay their loan to the financial institution. Simultaneously, this phase of the business cycle is associate with high inflation. Comparatively speaking, the result is in line with the studies of Ahmad & Bashir (2013), Zribi & Boujelbene (2011), Vogiazas & Nikolaidou (2011) and Skarica (2014). On the other hand, the result of the regression shows an insignificant impact of GDP on NPLs in the banking sector. This possibly can explain that in case of Afghanistan economic growth mainly driven by the international doner's support which heavily focused on

service sector such as health care, education and military while the main economic sector in the country such as agriculture and industry minimally was the target of international aids. On the other hand, inflation in Afghanistan mainly determined by global factor rather than domestic variables because the country is heavily export dependent. Therefore, this could be the main reason why the GDP growth had insignificant impact on NPLs while inflation associated significantly with NPLs in the sector.

Chapter 5

Conclusion and Recommendations

The study tried to explore the causes of NPLs in the banking industry of Afghanistan by using both microeconomic and macroeconomic data for the period of 9 years (2010 to 2018). In order to determine the factor influencing the NPLs, fixed and random effect model was utilized and after performance of Hausman test, fixed effect was elected as best model of estimation for this study. Several researches have been conducted on the banking and financial sector in Afghanistan, however, as of the limited knowledge of the author this is first inclusive research explores the topic in the context of Afghanistan. Therefore, contribution of the study will be significant in many aspects including but not limited to the assessing credit risk management strategies within the context of banks in Afghanistan, regulation development process by the central bank of Afghanistan and base for the future researches in the field.

According to the regression result bank related factors such as CAR, LR and Bank Size (Log TA) had adverse influence on NPLs with a constant of (-0.7333), (-0.0922) and (-0.0698) correspondingly, indicating that one percentage change in CAR, LR and Bank Size (Log TA) could result a negative variation on NPLs level by 0.7333, 0.0922, and 0.0698 respectively. Similarly, the macroeconomic indicators like economic growth and inflation also effects the NPLs negatively with a constant value of – 0.4203 and -0.7814 respectively, demonstrating any one percentage changes in macroeconomic factors will change the NPLs level of commercial banks in Afghanistan by 0.4203 and 0.7814 in opposite direction. Furthermore, the estimated result revealed that 42.2 percent of the variation in outcome variables is enlightened by the independent variables. Moreover, the result of the study supports the pervious empirical studies and theoretical farmwork that NPLs among the commercial banks in Afghanistan determined by both bank specific and

macroeconomic factor. In particular, non-performing loan significantly influenced by capital adequacy ratio commercial banks and inflation level in the country. Additionally, it is important to mention that comparison of credit risk between public and private bank was difficult due to the tow main reasons. First, two of public commercial banks were restricted by the Central Bank of Afghanistan (CBA) to provide loan for several years due to the significant of the past loans that needs to be recovered. Secondly, this study included only one public commercial bank that provide loan. Therefore, by considering the result of study and other descriptive analysis and literature review, the following recommendation will be forwarded for the stockholders to strengthening the banking sector:

First of all, inverse relationship between NPLs and capital adequacy ratio in the banking sector of Afghanistan revealed that banks with strong capital base will be able to manage the level of NPLs effectively. Therefore, commercial banks in Afghanistan needs to strengthen their capital base by implementing international Basel accords.

Secondly, both bord of supervisory and bord of management of commercial banks, who are responsible for decision making process, are required to analyze deeply and effectively the macroeconomic environment while approving loans. This is because the result of regression shows the NPLs level among the commercial banks in Afghanistan influenced by inflation.

Thirdly, commercial banks in Afghanistan are required to diversifies their lending activities not only into different economic sectors but also into different geographical location to mitigate the credit risk. This is because as we saw in analysis section, banking sector activities mostly concentrated in main cities, particularly in capital city, Kabul.

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