EFFECTS OF FINANCIAL SECTOR DEVELOPMENT ON BANK CAPITALIZATION RATIO IN TANZANIA

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A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY DEPARTMENT OF ACCOUNTING AND FINANCE THE OPEN UNIVERSITY OF TANZANIA

2024

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by the Open University of Tanzania a thesis entitled, ***Effects of Financial Sector Development on Bank Capitalization Ratio in Tanzania.*** " In fulfilment of the requirement for the award of the Degree of Doctor of Philosophy (PhD) of The Open University of Tanzania.

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DECLARATION

I, **Daud Mkali Fadhil** declare that the work presented in this thesis is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as original mine. It is hereby presented in fulfilment of the requirement for the Degree of Doctor of Philosophy (PhD) of the Open University of Tanzania.

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Signature

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Date:

DEDICATION

This thesis is dedicated with deepest love and affection to my beloved parents, my late lovely father Mr. Mkali F. Mkali and my mother Mrs. Fatma M. Issa. It is also dedicated to all my family members. They have been my source of inspiration, encouragement, motivation and supported me throughout my career. The thesis is also dedicated to all Banks operating in Tanzania including the Bank of Tanzania, and all senior bank managers and bank stakeholders in Tanzania.

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ABSTRACT

Financial sector development in many countries is a series of reforms aimed at improving the sector. Theoretically, reforms that aim to develop the banking sector and stock market are expected to strengthen banks' stability and lower bank-risk of default through enhancing bank capitalization ratio. This thesis aimed to assess whether financial sector development plays any role in influencing bank capitalization ratio in Tanzania. The study collected secondary data from published balance sheets and income statements of 28 banks selected country-level data was collected from the DSE and World Bank database for ten years period from 2012 to 2021. The study employed a dynamic panel dataset and the Generalized Method of Moments (GMM) technique to estimate the regression model while considering bank-specific characteristics and macroeconomic conditions. Before estimating the regression model, the data was analysed using both descriptive and inferential statistics. It was found that financial sector development proxies such as banking sector development and stock market development in Tanzania improve bank capitalization ratio consistent with the aims of maintaining stability of banking sector. This is as a result of the increasing credit facility to private businesses that enable banks to increase interest income which improve bank capitalization ratio. In addition, this might be associated with the improvement of bank supervision. The thesis further found that the banks in Tanzania incurred low costs and possess high pace of adjustment to target capitalization ratio because the majority of banks are not listed. Hence, they depend on equity capital from founders or private investors which have lower floatation costs as compared to public stock market.

Keywords: *Tanzania, Bank capitalization ratio, Generalized Method of Moments (GMM), Banking sector development, Stock market development*

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LIST OF ABBREVIATIONS

BCBS	Basel Committee on Banking Supervision
BFIA	Banking and Financial Institutions Act
BOT	Bank of Tanzania
DSE	Dar es Salaam Stock Exchange
FSDMP	Financial Sector development Master Plan
FSDT	Financial Sector Deepening Trust
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IMF	International Monetary Fund
KA	Kenya Airways
KCB	Kenya Commercial Bank
REITs	Real Estate Investment Trusts
RWA	Risk Weighted Assets
CMSA	Capital Market Securities Authority
UK	United Kingdom
US	United State
USA	United State of America
WHC	Watumishi Housing Company

CHAPTER ONE

INTRODUCTION

1.1 Overview

This first chapter comprises of eleven sections. Section 1 gives an overview of the chapter and sections 2 to 5 covers a comprehensive introduction to the problem, a brief review of bank capitalization requirements, history and current situation of financial sector development in Tanzania. Section 6 provides the problem statement. Research objectives and research questions are provided in sections 7 and 8 respectively, where the study's significance is outlined in section 9. Section 10 gives the limitations of the study and finally, section 11 shows the organization of this study.

1.2 Introduction to the Problem

The concept of how the development of the financial sector affects bank capitalization ratios emerged from the irrelevance theory of capital structure, developed by Modigliani and Miller in 1958. According to the theory, bank capitalization is unaffected by the capital ratio (debt-equity) in a perfect market. In contrast to the irrelevancy theory, Agarwal and Mohtadi (2004) and Myers and Majluf (1984) argued that many factors such as asymmetric information, imperfect capital market functioning, and the development of the financial sector influence the mix of debt-equity, which in turn may affect the bank capitalization ratio. As a result, they contend that the assumption of perfect market is false.

Espenlaub, Khurshed and Mohamed (2012) and Williams and Nguyen (2005) consider financial sector development in the form of a reduction of information asymmetry between bank managers and outside investors affecting bank capitalization ratio. Basel III Accord, through Buffer Capital Theory, suggests that bank capitalization ratio and financial sector development move in the same direction. On the other hand, several studies relating to capitalization ratio decisions carried out after Modigliani and Miller (1958) identify that factors influencing the capitalization ratio in banks may be divided into bank-specific and non-bank-specific factors. Bank-specific factors including size of the bank, profitability, among others that are directly within the control of the banks management (Tran & Nguyen, 2020). Non-bank-specific factors, such as stock market development, banking sector development, inflation, economic growth, nature of ownership status of the banks and the country of originality of banks among others originate from outside the bank (Baselga-Pascual, Trujillo-Ponce, & Cardone-Riportella, 2015; Philip, Hong & Chunxia, 2014; Vithessonthi, 2014a). To bear witness to the importance of stock market development on bank capitalization ratio, Ahmad, Ariff and Skully (2008) found that developed stock market may reduce bank restriction to capital hence improve capitalization ratio to signal bank quality. Vithessonthi and Tongurai (2016); Wang and Luo (2019) argued that the development of the financial sector usually leads to a reduction in flotation costs and information asymmetry. Consequently, it improves bank capitalization ratio. However, Abbas, Masood and Ali (2021) found that financial development reduces bank capitalization ratio in USA.

Based on Murinde (2012), the existing literatures of the effects of financial sector development on bank capitalization ratio is mainly concentrated in developed countries where bank capitalization ratios are less affected by financial sector development compared to developing countries. Thus, the findings of the present study have important policy implications for regulatory authorities such as the Bank of Tanzania (BOT) and the Capital Market Securities Authority (CMSA) through Dar es Salaam Stock Exchange (DSE). This is because, while the authorities need to improve regulations, quality should be maintained to adhere to changes in the financial sector that can encourage banks to hold an adequacy capitalization ratio. On the other hand, the thesis adds to the literature of banking and finance and extends the related work of Abdulhamid, Azmi and Ali (2019); Etudaiye-Muhtar, Ahmad, Olaniyi and Abdulmumin (2017); Etudaiye-Muhtar and Abdul-Baki (2020). More importantly, the thesis helps bank managers to understand the effect of bank-specific factors (profitability and bank size) and their impact on the adjustment speed and cost to regulatory bank capitalization ratio. The present thesis used banking sector development and stock market development as proxies for financial sector development, as used in the study of Abbas et al. (2021); Abdulhamid et al. (2019); Farooq, Malik and Muhammad (2018); Kapaya (2021) and Wang and Luo (2019). According to World Bank (2022), these two variables are among top ten indicators of financial sector development.

1.3   Bank Capitalization Ratio Requirement

The bank capitalization ratio requirement was introduced by The Basel Committee for Banking Supervision (BCBS). This committee was formed by Governors of

central banks of ten countries in 1974 following the consequences of serious trouble in banking sector and international currency. The committee is accountable for setting capitalization standards, regulating banks, and facilitating discussion relating to banking supervisory issues so as to improve financial stability of banks by enhancing the quality of supervision and regulation for banking operations worldwide. In addition, it acts as a conference for proper and regular cooperation among its member states on banking supervisory issues. As of 2022, the committee is made up by 45 members (central banks in addition to other related authorities responsible for banking business supervision). In 1980s, the Committee became sensitive concerning the capitalization of the banks that operate internationally which were observed to fail during increasing international risks. The members of Committee agreed on the improvement of capitalization ratio standards (capital adequacy ratio) of bank, both primary and supplementary capital.

In 1988, Basel I Accord introduced a minimum bank capitalization ratio for Tier 1 and 2 to risk-weighted assets (RWA) of 8% to be upheld by countries with international banking systems. Around June 1999, BCBS announced a change in capitalization adequacy ratio to substitute the one agreed in 1988 Accord. This made public of a reviewed capitalization ratio in early June 2004 called "Basel II accord". The reviewed framework consists of three pillars namely minimal capital requirements (First pillar), regulatory supervision (second pillar) and market discipline (Third pillar) which were expected to expand and develop the standardized rules for lowest bank capitalization requirements announced under Basel I. The significant distinction between Basel I accord and Basel II accord is as follows, the

later takes into consideration the credit risk related to assets owned by banks to determine required capitalization ratios. Therefore, Basel II required bank to have a minimum capitalization ratio of 8% (4% for tier 1 and 4% for tie 2) to RWA calculated under consideration of operational risks together with credit risks associated with risk-weighted assets.

In the middle 2015, Basel III Accord raised a minimum tier 1 capital for international banks from 4% as it agreed in Basel II Accord to 6% of its risk weighted assets. This was followed by an extra 2.5% of buffer capital requirement that results in to the total lowest tier 1 capitalization ratio to 8.5%. This buffer capital is important for banks when faced with financial stress. Retaining the identical minimum Tier 2 capitalization ratio of 2% as in Basel II Accord form a total minimum capitalization ratio requirement of 10.5% for tier 1 and 2. In 2019, Basel III Accord announced a minimum total capitalization ratio of 12.9%, which specifies a minimum tier 2 capitalization ratio of 2%, and that of 10.9% for tier 1 capitalization ratio. This new requirements take effects from January 1, 2023. In order to protect banks from under capitalization risk in Tanzania, BOT through banking capital adequacy regulations of 2023 required banks to upheld at all the time a minimum total capital which is at least twelve percent of total RWA and off-balance sheet exposure. In addition to the minimum capital requirements, banks in Tanzania are required to maintain a capital buffer of 2.5 percent of its total RWA and off-balance sheet exposures. Through holding excess ratio of capitalization, banks can avoid the costs of failure and lower the probabilities of bankruptcy as a result they can take beneficial opportunities for growth in the future (Estrella, 2004).

1.4   History of Financial Sector Development in Tanzania

For many years financial system in Tanzania has passed through numerous reforms contributing to the development of the financial sector and economic growth. Soon after the independence in 1961 and before the Arusha declaration of 1967, Tanzania's economy improved by allowing public and private businesses to exist together, hence providing room for private business such as commercial banks to run business. This period brought stability in macroeconomic conditions, because the country operated with very low rate of inflation, reasonable balance of payment and experienced highest record of average economic growth, rated 7.8% (BOT, 2011). During socialism age (1967-1985), the financial sector operation in the economy was turned, this including ownership and the operational style. The major fluctuations in economy were noticeable by Arusha declaration, wishing for increasing the country's speed of economic growth to poverty alleviation, fighting against diseases and illiteracy. At that time Socialism philosophy was seen to be the best option available for infant nation to attain its macroeconomic goals.

During the socialism age, the central government took administration and control of major means of economic production, all private-owned banks were organized to form a National Bank of Commerce, and the Bank of Tanzania (BOT) had no power to control monetary policy because all operation were controlled by Central Government (BOT, 2011; Msami & Wangwe, 2016). Following these major changes in financial sector and economic in socialism age, Tanzania experienced bad economic condition, identified with inadequacy production resulted by price and trade control by the Central Government, declined exports and substantial shortage

of consumer goods caused by import restrictions of the existing policy in (1967-1985) that favor at improving domestic industries at that time. Collectively, with other events like war between Tanzania and Uganda 1979 and oil crises in 1974 and 1979. Tanzania's economy was shaken because of high rate of inflation, and massive fiscal deficit as the government had to subsidize some basic social welfare. The average economic growth rate reported during this period of time was 2.9% (Wangwe, Mmari, Aikaeli, Rutatina, Mboghoina, & Kinyondo, 2014).

According to Mwakalobo (2009), the Government under the help of IMF and World Bank attempted to recover economy through Nation Economic Survival program (1981-1982) and Structural Adjustment Programme of (1982-1985) but they failed. These attempts enforced the Government to save down turn of the economy by allowing market forces to interact the economy. Additionally, the Nyirabu Commission for the financial sector was established to assess sector challenges and develop strategies for necessary reforms. Following the recommendation of the Nyirabu commission, financial sector in Tanzania was reformed in 1991, and Bank of Tanzania (BOT) was empowered under BOT Act of 1995 to control the financial system and economic stability (BOT, 2011). Based on BOT (2019), the first 1991 and second 2003 financial sector reforms improved the economy of Tanzania to the point that for a long time Tanzania benefited from a low inflation rate (single digit) and economic growth rate (GDP) not below 5%, except in 2008, 2009, 2011, and 2012. Additionally, the number of banks providing services increased from 3 before 1990 to 49 in 2012 (BOT, 2019).

According to a Financial survey conducted in 2013 formal banking services are readily accessible by 57% of adult population compared to the average rate of 32% reported in 2012 and 16% in 2009 (FSDT, 2014). Based on the information obtained from BOT annual report of 2019/2020 which includes information as at 30, June 2020, the country implemented a new National Financial Inclusion Framework (2018-2022), aiming to increase the percentage of adult Tanzanians using formal financial services from 65 percent in 2017 to 75 percent by the end of 2022. The financial sector development is really one among the sector which has stimulated the economic growth in Tanzania since 1991 after the major reform of the sector.

1.5   Tanzania's Financial Sector

Tanzania's financial sector is composed of mainly banks, social security funds, insurance institutions, and other financial institutions such as open-ended collective schemes and microfinance institutions. However, the banking institutions dominate the financial sector and account for about 70% of the overall total assets value of the sector, followed by social security funds having total assets of about 27% and the insurance companies having total assets of 2%, while other financial institutions held about 1%. Figure 1.1 presents the asset composition of the financial sector in Tanzania by type of financial institution as at the end of December 2021.
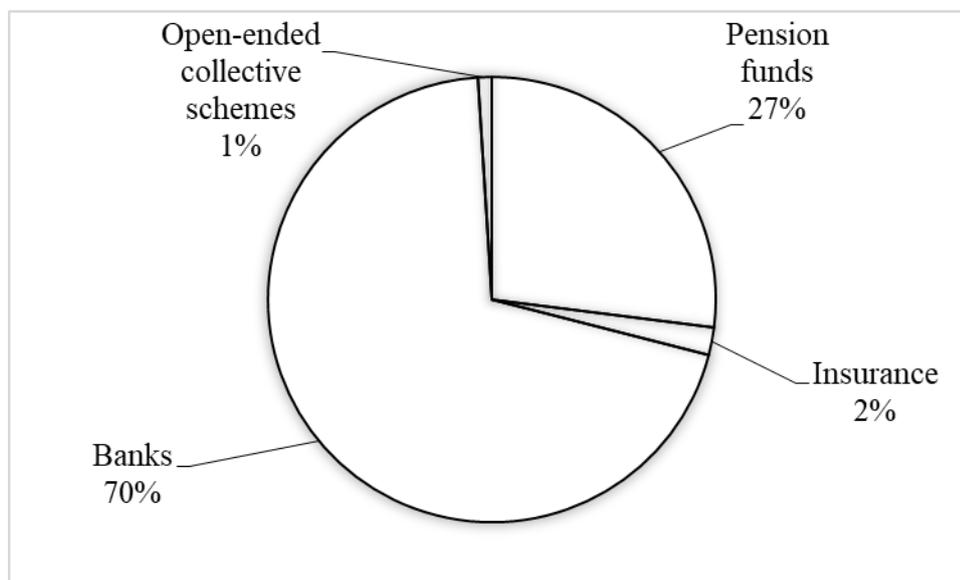
Figure 1.1: Financial sector landscape in Tanzania (2021)
Source: Bank of Tanzania 2021

The Tanzania's financial sector is less developed compared to a number of developed and emerging economies countries. The financial sector's asset composition is primarily dominated by banks which is underperforming right now when compared with developed and emerging economies countries. The current underdevelopment of banking industry in Tanzania has been contributed by many factors, including financial repression issues together with a weak and uncertain institutional framework (URT, 2020). URT (2020) defined financial repression as the concept that a set of existing Government laws, regulations, and other constraints not associated with market avoid the financial intermediaries' activities of an economy from working at their required capacity. An example of the financial repression includes ceilings for interest rate, ratio for liquidity requirements, higher bank reserve requirements by regulator, capital controls, ceilings for credit services to private business by bank or restrictions on credit allocation. Economists have

complained that financial repression restricts the effectiveness of allocation of capital, as a result impairs the growth of economy in the country.

Unlike developed and emerging economies, Tanzania financial sector is still lagging because there is no major development of housing finance institutions, real estate investment trusts, leasing institutions, companies for retail credit and hire purchase. In addition, the long-term credit facility provided by financial institutions is still underdeveloped, because of the small and weak saving financial institutions and small single securities exchange which is a Dar-es-Salaam Stock Exchange (DSE) incorporated in the year 1996 and started functioning in 1998. This has caused money market and capital market intermediaries' activities, such as those of brokers, dealers and commercial banks, somehow underdeveloped.

1.5.1 Banking Sector in Tanzania

According to BOT (2020), the banking sector dominates the financial sector in Tanzania and plays an important role in the country's economy. The sector is regulated and controlled largely by the Banking and Financial Institutions Act (BFIA) of 1991. Other Acts that regulate the banking sector including the National Payment System Act of 2015 and the Foreign Exchange Act of 1992. These Acts grant the Bank of Tanzania the authority to supervise and regulate payment systems, banking operations, and foreign exchange activities. As of the year 2021, the providers of banking service in the banking sector in Tanzania consist of commercial banks, community banks, deposit taking microfinance institutions and development bank (Table 1.1).

Table 1.1: Number of banks in Tanzania for 2013 to 2021

Categories/Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Commercial banks	34	34	36	38	37	39	38	35	34
Development Banks	-	-	2	2	2	2	2	2	2
Microfinance Banks	2	3	3	4	5	5	5	4	5
Community Banks	12	12	12	12	11	6	6	5	5
TOTAL	**48**	**49**	**53**	**56**	**55**	**52**	**51**	**46**	**46**

Source: Bank of Tanzania

The decrease in the number of banks conducting business in Tanzania in 2020 and 2021 was largely caused by the failure of banks to operate with enough capitalization ratio (BOT, 2021). Despite banking sector in Tanzania having 46 number of banks operating in 2021 (Table 1.1), the sector is still underdeveloped compared to a number of developed, emerging and some frontier market economies in the continent. According to the World Bank indicator, one among the best indicator of banking sector development is the domestic credit facility provided by banks to private business (% of GDP). Based on Table 1.2, the average domestic credit given to private businesses by banks in Tanzania over the period from 2008 to 2020 is relatively low compaared to the developed, emerging and some frontier market economies countries. On average, the domestic credit offered to private business by banks (% of GDP) in developed and emerging market countries is above 50% which is a good indicator of banking sectors development in these countries.

Table 1.2: Comparison of domestic credit provided by banks to private business (% of GDP) in Tanzania and the selected countries

Classification	Developed M. Countries			Emerging M. Countries				Frontier M. Countries			
Year/Country	USA	GER	UK	IND	MAL	BRA	S. A	TAN	BUR	UGA	KEN
2008	59.78	97.00	189.54	49.56	96.60	45.78	69.56	11.65	13.46	13.79	25.28
2009	54.01	98.77	190.94	48.12	111.45	47.49	66.95	11.01	14.43	8.20	21.79
2010	52.47	88.49	183.95	50.56	107.04	52.76	63.27	11.50	18.18	10.05	23.9
2011	50.81	84.90	169.58	51.29	108.35	58.08	61.42	12.21	21.34	11.36	27.23
2012	50.07	83.81	159.92	51.89	114.05	62.52	62.61	12.73	19.96	11.87	26.35
2013	49.36	82.09	148.55	52.39	119.79	64.23	61.56	12.46	19.12	11.86	28.26
2014	49.80	79.30	134.52	51.88	120.53	66.03	61.73	13.23	19.00	12.30	34.46
2015	51.00	78.11	129.55	51.87	123.07	66.83	62.51	14.47	16.08	12.82	36.65
2016	52.25	77.30	130.52	49.10	121.94	62.19	61.00	13.56	16.85	12.50	35.53
2017	52.35	77.14	132.01	48.79	117.13	59.48	60.08	12.98	15.05	12.31	33.11
2018	51.94	77.66	132.35	50.37	120.25	60.22	59.80	12.63	17.59	12.39	31.16
2019	51.94	79.16	131.03	50.13	120.64	62.64	60.44	12.52	20.26	12.71	30.80
2020	54.57	85.25	142.90	54.80	133.96	70.19	62.40	12.36	23.15	13.03	32.12
Average	52.33	83.77	151.95	50.83	116.52	59.88	62.56	12.56	18.04	11.94	29.74

Note: *USA-United States of America, GER-Germany, UK-United Kingdom, IND-India, MAL-Malaysia, BRA-Brazil, S.A-South Africa, TAN-Tanzania, BUR-Burundi, UGA-Uganda and KEN-Kenya.*
Source: World Bank database

Tanzania's Financial Sector Development Master Plan (FSDMP) of 2020/21-2029/30 shows poor development of banking sector, and

outline many factors that cause the credit given to private businesses by banks (% of GDP) to be low. These factors including limited

outreach of banking services to rural areas as the majority of banking services are provided to urban areas of the country, inadequate knowledge among the citizen on financial matters, information asymmetry, high lending interest rates (United Republic of Tanzania [URT], 2020).

1.5.2 Development of the Tanzania's Stock Market

The Tanzania stock market also known as Dar es Salaam Stock Exchange (DSE) was established in 1998. The market is regulated by Capital Market and Securities Authoritiy (CMSA), which established in 1995. The authority has the power to formulate principles that guide the capital markets industry, protecting the participant's interest, licensing and regulating brokers, dealers and stock market. The stock market which is one among the key player of the capital market has three main roles relative to the capitalization of banks and other financial institutions. First, it helps to increase liquidity and extend the opportunities for diversification of risk. Secondly, it is responsible for managing conflicts of interest that may happen between investors and management in the banks and other financial institutions. Lastly, it provides information to prospective share holder about investment appraisal on their various investment opportunities. These three roles assist in minimizing adverse selection and moral hazard risk that may be associated with information asymmetry problems (Grossman & Stiglitz, 1980). Through minimizing these risks, DSE increases funding opportunities for financial institutions especially banks since investors are informed about various investment opportunities before making investment decisions. Because of this information provided to investors, banks can

improve their capitalization ratio from the stock market by issuing equity and by providing more credit facilities to private organizations.

Apart from the roles explained in the preceding paragraph, the establishment of Tanzania's stock market was part of the major 1991 financial sector reform aimed at reshaping the economy and promoting the private business as a crucial driver of economic growth in Tanzania. The DSE begun operation in 1998 to assist Government to privatize Government-owned enterprises in order to reduce the non-performing Government-owned entities and diminishing budget allocation to support them, which resulted into improving growth of economy. Tanzania Oxygen Limited (TOL) was the first government enterprise privatized through the DSE in early 1998. Following this first government-established listings, CRDB Bank, Kenya Airways (KA), Kenya Commercial Bank (KCB) among other private and foreign companies listed in DSE to enable the corporate to grow and raise capitalization ratio using equities. As a market strategies growth, the DSE managed to expand financial instruments available in the market with derivatives, corporate bonds, Government bonds and real estate investment trusts (REITs) such as Watumishi Housing Company (WHC-REIT) to improve the stock market.

Despite these efforts to develop the stock market, still DSE is underdeveloped compared to a number of developed, emerging and some other frontier market countries. According to the World Bank development indicators, the stock market turnover ratio is considered a crucial indicator of stock market development. This ratio addresses two essential things of the market condition (liquidity of the market

and how frequently the shares are traded on the market). According to the data from the World Bank (Table 1.3), Tanzania lags behind developed, emerging and some other frontier market countries. It has an average single unit stock market turnover ratio as other selected frontier market countries. This means shares in DSE and other selected frontier market countries are traded less frequently compared to the developed and emerging market countries. On average, between 2008 and 2020, when investors hold shares of listed companies in DSE, there are approximate 2% probability of trading to get cash. This indicates low liquidity compared to developed and emerging market countries with almost more than 60% of probability of trading shares in the market (high liquidity). South Africa has an approximate 30% probability of trading shares in the market which is higher than the rate of stock market turnover ratio in DSE and some other stock market in the selected frontier countries.

Table 1.3: Comparison of Stock Market Turnover Ratio in Tanzania and the Selected Countries

Classification	Developed M. Countries			Emerging M. Countries				Frontier M. Country			
Year/Country	AUS	JAP	SWI	BRA	IND	TUR	S. AF	TZ	CYP	MAL	MAU
2008	122.79	199.27	160.48	149.27	131.08	188.15	41.98	0.80	22.46	1.90	7.48
2009	66.68	117.00	72.38	90.58	76.85	134.98	27.22	0.90	17.15	0.89	5.17
2010	77.78	111.56	71.21	95.52	60.19	133.33	29.97	0.94	10.86	1.16	4.71
2011	94.18	129.62	75.99	83.37	59.51	183.22	28.62	0.62	15.74	1.42	6.50
2012	65.30	96.19	47.99	52.81	45.85	113.87	24.99	0.51	14.76	1.21	4.12
2013	57.68	133.90	45.41	54.67	45.14	191.19	24.63	1.15	1.96	1.59	3.59
2014	54.59	110.66	49.09	49.02	45.14	168.25	26.31	3.05	1.40	1.69	5.29
2015	63.23	113.82	62.87	42.07	45.97	185.15	31.79	3.66	4.86	2.02	6.37
2016	59.78	105.44	60.70	40.48	46.29	168.60	38.37	2.68	3.22	1.91	4.36
2017	53.64	92.84	55.39	32.90	47.14	165.76	25.74	2.51	2.45	2.04	4.61
2018	61.29	119.02	65.11	34.18	56.77	247.76	34.09	1.19	1.68	1.95	4.62
2019	56.08	82.34	52.64	26.36	56.21	187.94	33.13	3.40	1.31	1.89	4.33
2020	71.27	94.33	65.33	40.41	74.95	365.77	27.94	3.67	0.83	1.41	5.05
Average	**69.56**	**115.85**	**68.05**	**60.89**	**60.85**	**187.23**	**30.37**	**1.93**	**7.59**	**1.62**	**5.09**

Note: AUS-Australia, JAP-Japan, SWI-Switzerland, BRA-Brazil, IND-India, TUR-Turkey, S. AF-South Africa, TAN-Tanzania, CYP-Cyprus, MAL-Malta and MAU-Mauritius.
Source: DSE and World Bank

1.6   Statement of the Problem

In the effort made to develop the financial sector, many countries established several laws, policies and regulatory reforms to improve

the sector and exposed it to the globalization level. These policies and reforms include deregulation of interest rate, stock market

liberalization, privatization of government-owned banks among other reforms (Etudaiye-Muhtar & Ahmad, 2015; Murinde, 2012). Tanzania is among the countries that implemented several financial reforms since 1964 after independence. The major reforms of 1991 in Tanzania aimed at improving the financial sector through privatization and vesting power to BOT to supervise financial affairs. According to BOT (2019), following the financial reforms in the country, some of the goals of the reforms have been achieved. The primary goals of reforms related to the banking industry in any country are to guarantee that banks immediately return to the target capitalization ratio (also known as the regulatory capitalization ratio) after departing from it and maintain a sufficient capitalization ratio to lower the likelihood of default, which could put the industry in financial distress (Abbas, Ali, & Rubbaniy, 2021; BOT, 2019; Ozili, 2017; Tran & Nguyen, 2020). However, as far as the researcher is aware, there is a dearth of study and inconsistent findings in the literature on the effects of financial sector development on bank capitalization ratio, especially for developing nations.

For instance, Abdulhamid et al. (2019) and Etudaiye-Muhtar et al. (2017) reported that banking sector development improve banks' capitalization ratio. Conversely, Vithessonthi (2014a) found that there is a negative effect of banking sector development on banks' capitalization ratio in South-East Asia countries. Furthermore, stock market development, as a proxy for financial sector development, has been shown to increase bank capitalization ratio (Etudaiye-Muhtar et al., 2017). However, in the South-East Asia region, there is no significant effect of stock market development on bank capitalization ratios (Vithessonthi, 2014). Moreover, according

to the researcher knowledge, despite existing studies on bank capitalization ratio in developing countries such as Abdulhamid et al. (2019) and Etudaiye-Muhtar et al. (2017), still they fail to address the adjustment process involved in rebalancing the ratio, including the speed and cost of adjustment. Given the scarcity and inconsistency of results in studies on financial sector development and bank capitalization ratio in developing nations, the present study aims to fill the gap and revisit the debate by investigating the impact of financial sector development on bank capitalization ratio in Tanzania. It seeks to provide more evidence on the rate of adjustment in rebalancing capitalization ratio, particularly in developing countries.

1.7   Objectives of the Study

1.7.1 General Objective

The main objective of this study was to determine whether financial sector development plays any role in influencing bank capitalization ratio in Tanzania.

1.7.2 Specific Objectives

The specific objectives of the study are:

 i) To assess the extent to which banking sector development influences bank capitalization ratio in Tanzania.

 ii) To investigate the extent to which stock market development influences bank capitalization ratio in Tanzania.

 iii) To examine the bank's speed of adjustment to target bank capitalization ratio in Tanzania.

iv) To determine the adjustment cost incurred by banks in Tanzania in adjusting to the target capitalization ratio.

1.8   Research Questions

1.8.1 General Research Question

What is the role of the financial sector development in influencing bank capitalization ratio in Tanzania?

1.8.2 Specific Research Question

i)   To what extent does banking sector development influence bank capitalization ratio in Tanzania?

ii)   To what extent does stock market development influence bank capitalization ratio in Tanzania?

iii)   Which speed do banks in Tanzania use to adjust to target capitalization ratio?

iv)   To what extent does it cost banks in Tanzania to adjust to target capitalization ratio?

1.9   Significance of the Study

This thesis makes several contributions in terms of knowledge enrichment, economic and policy implications. Starting with knowledge enrichment, this study provides empirical evidence on how stock market development and banking sector improvement influence bank capitalization rates in Tanzania. In addition, it examines the speed and cost of adjustment towards achieving the required bank capitalization ratio. Thus, it expands on the relevant research of Etudaiye-Muhtar et al. (2017),

which studied the impact of financial system improvement on bank capitalization rate in some countries in Africa. Their study countries covered from emerging economies (Egypt, Morocco and South Africa) and from frontier economies (Botswana, Nigeria, Ghana, Kenya and Tunisia). The present study also adds to the body of literature on banking and finance. Although Etudaiye-Muhtar et al.'s (2017) paper covered African nations with Kenya the only country in the East African region, the present study is still relevant today. According to the researcher's best knowledge, there are limited studies in Tanzania and the other remaining East African countries apart from Kenya on bank capitalization ratio. Studies similar to the present one have been conducted in emerging market countries in Asia. Examples of such studies include those of Abdulhamid et al. (2019) who examined the significance impact of financial improvement on bank risk taking in dual banking countries in Asia, Vithessonthi (2014a) who examined the effects of financial markets improvement on bank risk using dataset from Thailand and of Vithessonthi (2014b) who investigated the effect of financial market development on bank risk, evidence from Southeast Asian countries.

Second, this thesis is not limited to the effects of the non-bank specific factors such as banking sector development together with stock market development on bank capitalization rate. It goes beyond to include the effects of other non-bank specific determinants such as country inflation and Gross Domestic Product (GDP) as the study control variables of which banks have no control over, but are used mostly by economic policy makers and regulatory authorities. Therefore, the thesis investigated the effects of country inflation and GDP on the capitalization ratio of Tanzania's

banks and provided empirical evidence of the impact of the inflation and GDP on capitalization rate of banks in United Republic of Tanzania. In addition to that, the research went further to provide evidence of the effect of the most important bank-specific determinants which are the profit generated by banks and the size of bank in terms of assets on capitalization ratio.

Thirdly, the significant contributions of the study include an investigation of how rapidly the adjustment process to target capitalization ratio for banks in Tanzania takes place. The thesis provides empirical evidence on the extent of speed and cost at which banks in Tanzania adjust to the required capitalization ratio. This finding enables banks' managers to be aware of the most important income statement and balance sheet elements that banks can rely on when they need to adjust their capitalization ratio to reach the target level. In addition, this sheds more light on the ongoing debate about whether the adjustment process of bank capitalization rate takes place through rebalancing more of assets or income sides, especially through profit retained by banks.

Understanding the existing link between capitalization rate and country's financial sector improvement is crucial for policy implications, particularly for regulatory authorities (stock market regulator and bank's supervisor). These authorities enable banks to compete with the challenges including high floatation costs, illiquid markets, inadequate external financing sources, and information asymmetry (Murinde, 2012; Ojah & Kodongo, 2014). In Tanzania, the banking industry may face declines as a result of capital access being more difficult than in other countries

where the issues are not as severe. Therefore, the empirical findings of the study offer valuable insights to regulatory authorities on improving regulatory quality to adhere changes in financial sector in order to have better control mechanism of the bank capital adequacy ratio. Additionally, the study reassures regulatory authorities (securities authorities and bank supervisors) that the major reforms of financial sector of 1991 in Tanzania implemented over the decades are in the good directions, because it seems to improve bank capitalization ratio. Finally, the study findings reassure investors about the stability of the banking industry, which may be attained by banks functioning with a sufficient capitalization ratio. Additionally, this might boost the trust of local and international investors in the industry, which would enhance a county's economic growth and lower the issue of capital flight (Narayan & Narayan, 2013).

1.10 Limitations of the Study

Every study has some limitations and this is not exceptional. Firstly, because majority of Tanzanian banks are not publicly listed, this thesis used annually disclosed accounting data which is easy to manipulate, instead of market-based data, which is unavailable during the study. Secondly, although 28 banks that were active in Tanzania as of June 2021 were used in this thesis, some of which are publicly listed and others not, there might be a limitation on generalizing the findings to banks not listed on the Dar es Salaam Stock Exchange (DSE). To generalize the results to other banks, particularly those not listed in DSE, perception of the fact that these banks have no access to the public stock exchange market is used. Therefore, they do not have the alternative of using equity capital available from the public stock

exchange market. These banks may have slightly different procedure to capitalization ratio improvement in terms of equity, because of the regulations that govern their capital structure. The implication for unlisted banks is that they use retained earnings, joint arrangement and private capital as the alternative source of equity capital, but these options take different procedures from rising equity from Dar es Salaam Stock Exchange.

Thirdly, the dataset related to this thesis were limited to ten years (2012–2021). Due to these limitations, this thesis could not investigate the long-run relationship between the development in banking sector and stock market on bank capitalization ratios in United Republic of Tanzania. Rather, it only examined the short-time effects. While country-level data was available for a long time, still bank-level data was limited to 10 years. Therefore, determining the long-term effects using co-integration analysis became difficult. Fourthly, the present thesis is performed on non-commercial banks and commercial banks conducting business in Tanzania as of June 2021. Due to the missing many observations for non-commercial banks, it was unable to include as many non-commercial banks because most of them conducted business as microfinance institutions and have got license to operate as a bank in recent years. Hence, very few data are available for these banks. Lastly, due to the time constraint in this thesis it was unable to include institution features such as government effectiveness and regulatory quality in the investigation that have effects on financial sector improvement.

1.11 Organization of the Thesis

There are five chapters in this thesis structured as below:

Chapter one is the introductory part of this thesis, it presents the background to the problem that relates to the effects of financial sector development on capitalization ratio decisions by banks. The chapter provides a brief investigation of the historical and current situation of financial sector improvement in the United Republic of Tanzania and makes a comparison with the development in some developed, emerging, and frontier market nations. This laying the basis of the motivation for conducting this thesis. In addition, the chapter addresses the problem statement, research objectives, and research questions. This is followed by providing the contribution and limitations of the study. The chapter concludes by giving the organization of the thesis which describes the structure of each chapter in the thesis. Chapter two of the thesis presents the definition of the key study concept and the literature review part in which the details of the theoretical and empirical literature review relating to financial sector development and bank capitalization ratio are addressed. In addition, the chapter presents the theoretical framework on which the research questions originated. Chapter three explains the research philosophy, research strategies in terms of research approach, method, design, sampling design procedure and data collection method employed in the study. Also, it gives details of the research process by providing a description of data used, variable choice, data analysis method, model specification and estimation technique employed in providing solution to the research questions.

Chapter four presents the research findings and provides discussion on the empirical findings of the estimations. The discussion is grounded in the reviewed literatures. In addition, the chapter also provide post estimation test that confirm the validity of the estimation approach. Chapter five provides the conclusion part of the thesis and it presents the overall summary and the key results of the thesis. Furthermore, the chapter provides the recommendations of the study in relation to the policy implications is followed by addressing the suggestions for future study.

CHAPTER TWO

LITERATURE REVIEW

2.1   Overview

This chapter is made up of seven sections. Section 1 gives overview of the chapter, section 2 to 4 covers the definition of the key study concept employed in this research, along with an examination of various theories and literatures from different authors regarding their perspectives on the impact of financial sector improvement on bank capitalization rate. Section 5 provides research gap, whereas Section 6 provides presentation of conceptual framework and finally, it ends with chapter summary in Section 7.

2.2   Definition of Key Terms

The following are definitions given to some key terms of this thesis:

a)   **Financial Sector Development:** World Bank (2022) defined financial sector development as improvements made in financial sector to ease firms' access to external finance (debt and equity) and improve the capital allocation process. These improvements include lowering of costs associated with transaction and information acquisition, reduction in information asymmetry and other improvements in financial markets that increase firms' capacity to obtain external capital by making it easily available. BOT (2020) defined financial sector development as part of the Government strategy to stimulate economic growth and reduce poverty through improving financial policy in a country, legal and regulatory framework that support financial sector in terms of (banking sector, capital markets, pension fund, insurance

and microfinance institutions) and facilitate the provision of long- term development finance.

b)   **Banking Sector Development:** Banking sector development means the improvement of the ability of the banking industry to provide required information about possible investments and allocation of capital, monitoring investments after providing credit, facilitating trading through maintaining proper risk management procedure, pooling deposits and facilitating the exchange of goods and services (Aluko & Ajayi, 2017). Pradhan, Arvin, Hall, and Bahmani (2014) defined Banking sector development as a process of improving the efficiency of banking services through increasing quantity and quality of the services. The process may involve the interaction of many other activities, and can be presented by a multiple measure such as broad money supply, claims on private business, domestic credit issued by the banking sector, and domestic credit to households and the private business.

c)   **Stock Market Development:** Stock market development is defined as a process of improving the efficiency of stock market services through increasing the quantity and quality of the services (Pradhan et al., 2014). It also involves the interaction of many activities and can be expressed in different forms including the stock market size (market capitalization), liquidity (stock market turnover ratio), volatility, concentration, the number of listed companies, integration with the world capital markets, and the regulation and supervision in the market. Wassal (2013) defined stock market development as a process of making market sufficiently large and liquid enough based on the size of economy surrounding the market. This means

the stock market should possess characteristics of non-concentrated market capitalization, because the concentrated market capitalization resists economic growth, competitions, new investment and innovation. Therefore, stock market signifying substantial linkage to the performance of its real economic sector.

d)   Bank Capitalization Ratio: One way to define Bank capitalization is that, it is what is left over after subtracting bank liabilities from bank assets. Poghosyan and Čihak (2011); Etudaiye-Muhtar and Abdul-Baki (2020); Vithessonthi (2014a) defined bank capitalization ratio as the rate of total equity divided by total assets. A lower equity-to-asset ratio means the banks are less strong to resist financial distress. This indicates an early warning sign of bank failure.

2.3   Theoretical Literature Review

The following section discusses related theoretical literature on capitalization ratio in which capital structure theory provide the underlying theoretical basis for explaining bank capitalization ratio.

a)   The Capital Structure Irrelevancy Theory: As proposed by Modigliani and Miller (1958), capital structure irrelevancy theory forms one of the earliest capitalization ratio theories developed. The theory states that, the mix of debt and equity has no impact on the bank capitalization under perfect market conditions. Economic and financial theorists have empirically tested and criticized the rationality of the capital structure irrelevance theory propounded by Modigliani and Miller (1958). Evidence on corporate financing decisions suggests that numerous factors

including financial sector development, asymmetric information, and imperfection of capital market influence the mix of debt-equity that affect the capitalization (Myers & Majluf, 1984; Agarwal & Mohtadi, 2004). Empirical literature of Etudaiye-Muhtar et al. (2017) and Abdulhamid et al. (2019) argue that financial sector reforms in terms of banking sector measured as domestic credit issued by banks to private business as a percentage of GDP and development in the stock market measured as stock market turnover ratio exhibit a positive relationship with bank capitalization ratio. Moreover, other theories and empirical literatures hold that the capitalization ratio of a bank can be affected by several factors including, profitability, size of bank, economic growth and inflation as described below. Despite the criticism of capital structure irrelevancy theory, still there is no consensus on the research finding which has been reported on the effects of financial sector improvement on bank capitalization rate, especially in less developed countries context. This study therefore, adopted financial sector development to examine how it influence bank capitalization ratio. This contribute in testing the rationality of the theory for developing countries because the theory has been initiated and fit for the developed countries as tested by Modigliani and Miller (1958) where financial sector and economies conditions differ with that of developing countries like Tanzania.

b)   **Pecking Order Theory:** After empirically testing the validity of capital structure irrelevancy theory, Myers and Majluf (1984) brought the pecking order theory and use asymmetric information between entity managers and investors as one of the indicators of financial sector development to show how the theory works. They found that investors and managers take the asymmetric information into

consideration in making financing decisions because investors believe that the entity managers have better information relating the entity than they have. Hence, managers may issue securities at high price as a result entity fails to finance project through equity to increase capitalization ratio because the equities are overpriced, therefore the entity continue to suffer with outstanding debt. To prevent this failure, Myers and Majluf (1984) suggested that entity would have to finance through retained earnings first which will have the advantages of increasing their capitalization ratio and in case not sufficient, it should use debt finance as a second option, though it will lower the capitalization ratio. Equity which have also advantages of rising capitalization rate can be the last resort in case retained earnings and debt are not sufficient. Though, the use of more equity finance to increase capitalization ratio is not supported with the capital structure irrelevancy theory. Adedeji (1998) argued that, the pecking order theory ignores the effects of some factors like cost of debt and equity, inflation, stock market development and banking sector development that can assist on the entity ability to use debt or retained earnings or equity. Therefore, despite the pecking order theory to ignore these factors, the present study used stock market and banking sector development to examine their effect on increasing bank capitalization rate in the United Republic of Tanzania.

c)   **Capital Buffer Theory:** One among the most important theory explaining the impact of financial sector development on bank capitalization rate is the capital buffer theory. This theory can be explained using literatures that describe financial sector development in emerging market and frontier market nations, where the problem of information asymmetry and poor interest rate regulation that can result

into banking crisis is serious (Fonseca & Gonzalez, 2010 and Stiglitz, 2000). In such countries, the financial sector development may have a negative effect towards bank capitalization ratio that may cause capital erosion. This effect may keep banks at high risks of default if no efficient supervision to improve earnings (Vithessonthi, 2014a, 2014b). To protect against capital erosion, banks will need to build up the capitalization ratio as suggested by the capital buffer theory and use it when in financial distress. From that concept, the theoretical literature on bank capitalization ratio suggests that financial sector development through credit provision to improve earning positively influence bank capitalization ratio. However, the empirical evidence supporting this assertion for Tanzanian banks is missing, despite of the presence for various reforms over time to enhance the financial sector. Hence the contribution of the present study on capital buffer theory is based on the conclusion about whether the financial sector development influence bank capitalization ratio in less developed market countries like Tanzania. The fact is that, the theory developed and fit in the well-developed countries where the development in the banking industry is relatively in higher level compared to Tanzania. This add new findings to support or to oppose the theory and previous empirical findings.

d)   **The Financial Intermediation Theory:** The theory of financial intermediation has been explained in the work of Gurley and Shaw (1960). They defined the financial intermediation as the process by which financial institutions such as banks and stock exchanges collect funds from depositors or investors and then use whole or large proportion of the funds for investment. Historically, banks and stock market are the most known financial intermediaries. Apart from the

primary function of the banks which is collection of funds from general public and honor the cheque of customer when presented for payment. It also acts as a middle man because it connects between lender and borrower and help to smooth the transaction. Grossman and Stiglitz (1980) argued that financial intermediaries minimize the information asymmetry problem through minimizing the risk associated with moral hazard and adverse selection. In addition, according to Gurley and Shaw (1960) intermediaries have benefit over the individual because they allow fixed cost of transaction to be shared. Demirgüç-Kunt and Maksimovic (1999) suggest that stock markets using the role of intermediaries they have in minimizing the information asymmetry problem help to increase investor interest in investing in new equity capital. This result into increasing the liquidity of the stock market which in turn help bank and other financial institutions to easy access of external equity finance for increasing capitalization ratio. The study contributes to determining the rationality of the intermediation theory in the frontier market nations such as Tanzania, because most of frontier market countries have underdeveloped stock market compared to developed countries.

e) **Dynamic Trade-off Theory:** Dynamic Trade-off theory is the one form of Trade-off Theory which does not take the observed capital ratio as the target capitalization ratio, it consider shocks that may push corporate entities such as banks away from the target capitalization ratio. This theory was developed by Fischer, Heinkel and Zechner (1989). Dynamic trade-off theory explicitly emphasizes the idea that corporate entity has a target that maximize their capitalization ratio and diverge from the target rate are costly. Therefore, the divergence will be regularly

removed over certain period of time. Preceding literature such as Philip et al. (2014); Memmel and Raupach (2010) generally supports the existence of long-run target capitalization and agree to the notion that most banks adjust to that target at a certain speed and cost of adjustment. For instance, Abbas and Masood (2020) found that banks in USA incur higher cost of adjustment that make them taking a longer period of time to attain their target capitalization ratio when a shock in an economy occurred. Memmel and Raupach (2010) found that banks in Germany have low adjustment cost and make quick adjustments in their capitalization ratio. In addition, according to Kraus and Litzenberger (1973), the rapid adjustment to required bank capitalization ratio can also depend on the costs and benefits of adjustment (trade-off between cost and benefit). This implies that, with increased debt, banks may default on loan repayment hence can increase the chance of financial distress and bankruptcy costs. Though, this does not mean banks should use less debt in its capitalization ratio, because there is tax benefit on making repayment of debt. The study contributes in determining whether the theory fit for banks in developing nations such as Tanzania, because developing countries associated with high cost of transaction due to information asymmetry problem.

f)   **Too big to Fail Hypothesis:** This is a famous theory in the field of finance and banking which states that "some corporations, mostly financial institutions like banks, that's so closely connected in the greater economic system of the country, that its failure would be causing rapid great damage in the system, and that they are therefore essential be supported by Central Governments when they face potential failure". The doctrine "too big to fail hypothesis" was disseminated by member of the

United State House of Representatives called Stewart McKinney in a 1984. "Big" doesn't mean the size of the corporation or bank, but rather its contribution to country's economy. Critics see the theory as counterproductive and that large banks should be left to fail if their risk management practice is not effective (Greenspan, 2001). In explaining the significant impact of the size of banks on capitalization ratio Laeven, Ratnovski and Tong (2016) believes that, using the "too big to fail" hypothesis the size of bank has great impact, for instance, large banks are less capitalized because they are too big to fail. Hence, they engaging in more market-oriented banking activities which probably help them to ease improving capital immediately when required. The study makes a greater contribution to the theory because most of the studies that examines the effects of the size of the banks on capitalization ratio concentrated in developed and some developing countries in Asia, and they show ambiguous results of the effects of the size of bank on capitalization rate. Though, most of the studies align with the theory of too big to fail hypothesis. Therefore, incorporating the theory to investigate the influence of bank size on capitalization rate in United Republic of Tanzania is important. Since it provides farther evidence of the rationality of the theory to support or oppose other empirical literature for developing countries.

2.4   Review of Empirical Literature

The preceding sections discussed the related theoretical literature in terms of factors that underpin bank capitalization ratio. These theories act as a guide for this thesis. The following subsections evaluate the empirical literature that relate to the research objectives as stated in chapter one, this is taken in line with different objectives.

2.4.1 Financial Sector Development and Bank Capitalization Ratio

A number of researches have tried to examine the influence of the development of
financial sector on capitalization rate of the banks in developed nations, developing
nations and in combination of both developed and developing nations as shown
below. The empirical evidence found from these researches identified that the stock
market capitalization, size of bank, bank profitability, and the development in the
banking sector are very crucial factors that influencing bank capitalization ratio.

2.4.1.1 Developed Countries

Commencing with empirical support from developed countries, Kleff and Weber
(2008) conducted research for some German banks categorized into cooperative
banks, savings banks, and other banks, which have different ownership structures
and access to the capital market. The study used accounting data from 1992 - 2001
and employed difference and system GMM estimator to analyze the explanatory
variables. The study then found out that banks' profitability in Germany has a
significant positive impact on the bank capitalization ratio for cooperative banks and
savings banks. The banks particularly seem to depend on retained earnings for
capitalization. They argued, these banks have fewer opportunities to improve their
capitalization ratios compared to the other banks. This offers support to the assertion
of Poghosyan and Čihak (2011) in Europe and Abbas et al. (2021) in USA that the
earning of profit for banks are important factors of bank capitalization ratio, this is
due to the fact that banks that earning huge profit are less likely to experience
financial distressed in the future. These banks normally operate with enough
capitalization ratio. Nevertheless, the study of Kleff and Weber (2008) revealed

further that financial development encourages the bank's capitalization. Also, this is supported by the study of Wang and Luo (2019) who showed that the bank capitalization ratio increases due to the increase in the development of the financial system in China. Such positive development of the financial system on bank capitalization may be disturbed by poorer macroeconomic conditions. The results are inconsistent with that of Abbas et al. (2021) who observed that financial improvement has significant negative relationship with bank capitalization.

In a later and similar study of commercial banks conducting business in Europe. Baselga-Pascual et al. (2015) employed system GMM estimator on investigation of the effects of bank specific and macroeconomic determinants on capitalization rate of banks using a dynamic panel data model with time span from 2001 to 2012. They found that profitability has significantly positive relationship with bank capitalization ratio. Therefore, minimize the risk of default of banks. This observation is in line with Philip et al. (2014) when investigated Chinese commercial banks using annual panel data from 2000 to 2012. Specifically, Baselga-Pascual et al. (2015) found that underdeveloped stock markets, higher rates of inflation and a situation of economic crisis such as a declining GDP decreases bank capitalization ratio which cause an increase in bank risk. These contrast with the observation of Philip et al. (2014), except agreed on the finding that bank capitalization is positively associated with GDP growth. In additions, using GMM techniques over the long period of time from 2002 to 2019. Abbas et al. (2021) found that there is positive significant relationship between inflation and capitalization rate of the banks. Despite the above findings, the empirical results obtained in the developed countries cannot be generalized because

developed countries have well-developed financial system and well-developed economies compared to developing countries such as Tanzania.

Brei and Gambacorta (2016) employed the GMM estimator using a large set of dynamic panel data which cover international banks of 14 highly developed economies from 1994-2012. The study found that bank capitalization rate not only depending on non-bank specific factors and macroeconomic factors, but also depends on bank-specific factors as emphasized by Philip et al. (2014). Factor such as bank size was seen to have negative influence on bank capitalization in the fourteen highly developed economies; this means larger banks seem to maintain relatively lower capitalization ratios, which might be linked to the 'too-big-to-fail' hypothesis. This also perceived by Konishi and Yasuda (2004) when investigated empirically the Japanese commercial banks using panel data of 48 banks from 1990 up to 1999. Their result revealed bank under capitalization is positively linked with bank size. Although the significance of the impact of the bank size seen to vary across the countries with the degree of importance being country specific. More importantly, the study of Brei and Gambacorta (2016) showed that bank-specific factors were more important in bank capitalization. From this finding, they argued that generalizing the results found from a certain type of the economy to another one with different economic condition and institutional characteristics may not be appropriate. This scenario serves as one of the justifications for this thesis, i.e. the fact that Tanzania financial markets have economic and institutional characteristics that are not the same as developed and emerging economies countries.

In addition, Gropp and Heider (2010) didn't find evidence to support the claim that bank size negatively affects the bank capitalization, as observed in the literature of Brei and Gambacorta (2016) and Philip et al. (2014). Instead, they revealed that bank size is an important factor that influences bank capitalization rate in their study of the influence of bank capitalization structure of large European banks between 1991 and 2004. In the meantime, they discovered that the capitalization of banks is positively correlated with the size of the bank, this is also at odds with the results of Abbas et al. (2021) in USA. Gropp and Heider (2010) argued that this is probably caused by the concept that most giant banks are well known to the investors. Therefore, they are in good position to access equity finance easier.

2.4.1.2 Developing Countries

Abdulhamid et al. (2019) investigated the influence of financial system development on bank risk taking bahaviour, measured in terms of bank capitalization ratio in dual banking countries. They used annual bank level data ranging from 2000 to 2014 to examine the relationship. The analysis was done using panel system GMM estimator. The results depicted that the effect of banking-sector improvement on bank capitalization ratio is significantly positive and affect more in Islamic bank compare to the conventional bank. But the effect of stock market development on bank capitalization is insignificant in the case of Islamic bank capitalization and conventional bank capitalization. They argued this might be contributed by capitalization capacity of Islamic bank. According to Alqahtani, Mayes and Brown (2016), even if Islamic banks are well capitalized, they respond more to the development in banking sector. Also, the risk sharing status in Islamic banks and

other some unique contracts, theoretically they are different from conventional banks. Hence, the results obtained from the study cannot be generalized among banking system in Tanzania because it has been dominated by conventional bank. In the early literature of Vithessonthi (2014a), which examined the relation between financial markets reforms and bank risk attitude represented by bank capitalization in Thailand during 1990–2012. It has found that the results contrast with the findings obtain by Abdulhamid et al. (2019), since the stock market development found to be positively associated with banks' capitalization ratio, and is negatively correlated to bank risk. Whereas, banking sector development has no effect on the bank capitalization ratio.

Inconsistency findings in the study by Abdulhamid et al. (2019) and Vithessonthi (2014a) can be premised on the argument of Vithessonthi (2014b) that in Southeast Asian countries following the impact of the two financial crises, i.e 1997–1998 and that of 2007–2009, empirical results showed that higher degrees of financial markets development are associated with weaker bank capitalization ratio. This finding also contrasts with the result of Baselga-Pascual et al. (2015) in Euro zone and Vithessonthi and Tongurai (2016) in seven South American nations over a 22-years period covering 1991 and 2012 using the dynamic panel generalized method of moments (GMM) technique. But indeed, it provides support to Philip et al. (2014). Inconsistency of findings may be resulted by the difference in financial sector and economic condition between developed and developing nations.

In a very closely similar study using aggregate bank-level data, Tran and Nguyen (2020) reported evidence of stock market development is positively related to bank

capitalization rate in ninety-five listed commercial banks of six South-East Asian countries (Philippines, Indonesia, Malaysia, Thailand, Vietnam, and Singapore) for 15 years of 2004 to 2018. This shows that stock market improvement increases bank capitalization rate. While the measure of banking sector development is not associated with bank capitalization. Also, highly profitable banks increase bank capitalization, which results in the reduction of bank risk. Moreover, bank capitalization is positively influenced by Bank size. Even though the study of Tran and Nguyen (2020) is similar to this thesis to some extent, only a few matters differentiate the two studies. First of all, the study of Tran and Nguyen (2020) includes credit extended to the public and government sectors, the variable used to proxy the development of the banking sector is deemed improper. According to Beck and Levine (2004), it is challenging to separate credit intended only for private business when these factors are used. Since the study's focus is on bank loans to private businesses, the variable used to gauge that credit should only include credit intended for that purpose. Second, Holderness (2014) demonstrated that, in comparison with the use of individual country data, aggregate data—such as that used in Tran and Nguyen (2020)—is difficult to adjust for cross-sectional countries.

Moreover, Etudaiye-Muhtar et al. (2017) examined the level at which the banking sector development in chosen African nations affects the bank capitalization ratio. They employed a dynamic panel for the examination while taking in to control bank-specific and the macroeconomic influence over the period of 2000–2014. Their findings indicate that banking sector development in these countries enhances bank capitalization ratio, aligning with objectives to enhance bank performance and

mitigate excessive bank risks. The study contains one important issue that differs with this study, i.e. out of 8 sample countries in the research conducted by Etudaiye-Muhtar et al. (2017) only Kenya provided evidence from East African region perspective.

Apart from literatures that investigated the influence of financial development on the bank capitalization rate in developing nations. There some literatures investigated the bank-specific factors known as control variables that influence the bank capitalization ratio. Starting with Ahmad et al. (2008), the study reported new findings on the factors affecting bank capitalization ratios in 42 Malaysia local banks. The study used an unbalanced panel set of data spanning 8 years during the Asian financial crisis. The estimation was done using regression model in addition to pooled ordinary least squares methods. The study found that, bank capitalization ratio decision seems not to be driven by bank profitability, this finding is inconsistent with developed country literature that has for long stressed the importance of banks' earnings as driving capitalization ratio. In addition, Ahmad et al. (2008) argue that bank size is observed as not an influential factor in bank capitalization in Malaysia. This contrasts with the studies of banks in other developing countries like Tran & Nguyen, 2020 and Etudaiye-Muhtar et al., 2017 who observed that bank capitalization is positively associated with bank size, and that in developed countries (Abbas et al., 2021; Brei & Gambacorta, 2016; Philip et al., 2014) who observed that bank capitalization ratio is negatively related with bank size. The results of these studies motivate the present study to examine the influence of bank size and profitability on bank capitalization in United Republic of Tanzania based on the

following reasons. Firstly, there is ambiguity of the results in the literatures conducted in developed nations and developing nations in terms of the effects of the bank size and profitability on bank capitalization rate. Secondly, the economic situations and financial system of the developed and developing nations are different in terms of development. Therefore, more findings in the literature of the size of banks and capitalization rate is important in order to get more evidence in developing countries.

Further evidence of the influence of bank-specific factors on the bank capitalization rate found on the work of Mohanty and Mahakud (2019), who observed that the overall size of the bank has a negative and significant impact on capitalization in India's commercial banks in case of public-owned banks and foreign banks. This align with the too-big-to-fail hypothesis which states that, large banks hold relatively less capitalization ratio than the small banks due to lesser probability of failure. In case of private banks, size has a significant positive influence on the bank capitalization ratio, which shows that as their size increases, the profitability of the private sector banks also increase and ultimately enable them to increase their capitalization ratio from their internal funds.

In addition, another study closely related to this conducted by Yu (2000) relating to the banks' capital structure of Taiwan banks reveal that large banks have much lower capitalization ratios than small banks. This is consistent with the too big to fail hypothesis, which suggests that large banks obtain protection from Government, rather than concentrating maintaining high capitalization ratios because they feel they are ``too big to fail''. But this also is inconsistent with the study of Adrian and

Shin (2010); Vithessonthi and Tongurai (2016) who detected that banks strongly adjust their capitalization ratio to adhere changes in the total assets. Yu (2000) further found that more profitable bank tends to have higher capitalization ratios, which suggests that banks depend on cash generated internally for improving capitalization. The study of Yu (2000) used balance sheet data of domestic Taiwanese banks. The sample period was from 1986 to 1996, the dataset of sample of 243 banks was quite comprehensive designed in a time-series cross-section regression. Although the study is somewhat similar to this thesis but possess some minor difference. For instance, the study consists somehow large sample that is probable brings challenges during analysis as a result may lead in false inference. Also, the estimation technique used in study was unclear and does not reflect a number of similar studies.

Without leaving behind the effect of the macroeconomic variables as the control variable of the present study. Vithessonthi and Tongurai (2016) found that the coefficient value of Gross Domestic Products growth rate is statistically significant and negative, this implying that during periods of nourishing economy (i.e., the expansion of GDP), banks in South American countries hold lower capitalization ratios. These results contrast with that of Baselga-Pascual et al. (2015) and Philip et al. (2014) in developed countries but rise debate of the effect of GDP on capitalization of bank in developing market nations like Tanzania as the developed and emerging economies countries shows contradiction on the said debate.

2.4.1.3 Combination of Developed and Developing Countries

Ruiz-Porras (2009) examined the effects of financial structure and financial development on banking fragility. The research conducted using fixed-effects panel-data regressions model. They used individual and principal components indicators such as, the size and efficiency of the intermediaries and the stock markets. They include data from 211 nations spanning from 1990 to 2003. The main results propose that financial development reduces bank capitalization which causes banks to be unstable. In addition, their findings proved that the normal size of the banking industry was noticed to reduce the banking capitalization and discourage bank stability. Therefore, Ruiz-Porras (2009) concluded that financial development is responsible in assessing banking fragility. However, the scope of the financial indicators in the literature was very narrow one. Institutions and financial features like size of bank and profit of bank have not included in investigation because of lacking data and being out of the scope of their study.

Moreover, in a sample of 101 giant banks from more advanced and moderate economies nations, Cohen and Scatigna (2016) found that retained earnings increase the bank capitalization ratios. This resulted in banks expanding their lending which in turn contributed to banks' ability to utilize retained earnings to improve bank capitalization ratio. In other words, banks that have higher capitalization ratios and stronger profitability were in a good expand lending facilities. Despite the fact that the study involves banks across countries but does not include banks from Tanzania, they have concentrated on developed and emerging economies that have well-

developed financial sectors compared to Tanzania. Therefore, to generalize the result can be inappropriate.

2.4.2 Adjustment Cost and Speed to Target Bank Capitalization Ratio

Numerous studies have been carried out in developed and emerging market nations to examine the cost and speed of adjusting to the target bank capitalization rate. These studies on the process of adjusting bank capitalization ratios are extensive since many bank features, institutional factors, and macroeconomic factors can influence how quickly an adjustment occurs (Berger, De Young, Flannery, Lee, & Oztekin, 2008; Jokipii & Milne, 2011; Memmel & Raupach, 2010; Philip et al., 2014). Philip et al. (2014) investigated the relationship between bank ownership and adjustments speed to the target capitalization ratio using annual panel data on Chinese commercial banks for 2000-2012, estimated using the System GMM techniques. The importance of the study is that, it used three different capital measures and investigated different factors that affect bank adjustment speed and cost to target capitalization ratio. The study came up with the following conclusions. Banks with different owners have insignificant effects on the speed to adjust non-risk-weighted capital towards the target level. Banks listed in stock exchange adjust equity ratios more slowly compared to the non-listed banks and they incurred high cost of adjustment. This is because, although banks listed in stock exchange may have great opportunity to adjust capitalization ratio very fast through capital markets. Still, they face challenges of adjustment costs since new capital issues through equity can cause a diluting effect on the existing shareholders' interests. Therefore, these banks adjust the capitalization ratio to target capital at a low speed.

Moreover, according to Philip et al. (2014), listed banks generally hold more capitalization ratio in terms of buffer capital. Thus, they prefer not to adjust capitalization ratio toward targets level quickly. In addition, they found that foreign banks have low speed of adjusting risk-weighted capitalization ratio towards targets level compared to local banks and they incurred high adjustment cost. They argued that, these banks retained significantly very high capitalization buffers and the risk of operating below target capitalization rate is very small. Philip et al. (2014) further reveal that, the rebalancing speed of larger banks is very low and banks incurred higher cost compared to the smaller banks, this contrasts with the findings of De Jonghe and Oztekin (2015).

Additionally, they discovered that Chinese banks tend to modify risk-weighted Tier 1 capitalization ratios and overall capitalization ratios to target levels at high cost and slow speed during economic booms. But they adjust more quickly during recessions. They contended that this is as a result of banks fail to consider all of the risk attached to assets, making it more difficult to swiftly modify the capitalization ratio during an asset expansion phase when the economy is expanding rapidly. Furthermore, it was observed that profitability exhibited a notable rapid pace and little adjustment costs on the unweighted equity ratio, but not on the risk-weighted capitalization ratios. This finding aligns with the research conducted by (Flannery & Rangan, 2008; Fonseca & Gonzalez, 2010). Though, notionally less profitable banks need to rebalance capitalization ratio very quickly to eliminate the risk of failure due to operating below the minimum capitalization ratio requirements. Philip et al. (2014)

noticed the opposite scenario that less profit generating bank hold very low adjustment pace.

Based on a sample of 64 countries for the period 1994–2010, De Jonghe and Oztekin (2015) obtained information on banks' financial position and income statements from Bank scope using system GMM, they found that capitalization adjustment speed is not similar among the countries. They found banks rebalance capitalization ratio faster during high inflation and incurred low cost of the process of adjustment. In addition, countries with adequate developed capital markets adjust capitalization ratio very fast compared to underdeveloped capital market. They argued that a well-developed stock markets normally decrease the flotation costs associated with external financing such as equity and lead to faster adjustment speed and low cost of adjustment. Memmel and Raupach (2010) found that European banks have high pace and minimum cost to required bank capitalization rate and German banks have been found private commercial banks rebalancing their capitalization ratios more quickly compared to the banks owned by Government.

Abbas and Masood (2020) observed evidence of capitalization ratio adjustment speed and cost for banks in United State of America in 2002-2018 using two-step GMM estimator. The results found that there is slow adjustment process of capitalization ratio (0.202) compared to the total risk-weighted capitalization ratio (0.267). In additions, adequately capitalized banks have ability to adjust capitalization rate quickly compared to well-capitalized banks. On the other hand, less capitalized banks have ability to adjust the total risk-weighted capitalization ratio

faster compared to the others. Profitability of banks becomes the significant determinants of quick adjustment speed as argued by Huang and Ritter (2009). Moreover, Mohanty and Mahakud (2019) investigated the adjustment speed to the required capitalization rate of banks in India. The study employed the panel data model in a GMM estimator to investigate the adjustment process and speed to bank capitalization rate using 18 years data from 1997-2014. They found that public sector banks adjust faster to target capitalization and incurred low cost of rebalancing compared to the foreign and private banks. The findings reveal further that bank-specific determinants example size of banks, net interest margin, loan to asset rate, leverage and regulatory stringent determine the target capitalization rate of the banks in India. Although scholars suggested that adjustment of capitalization ratios through adjusting liabilities is suitable for banks, their findings showed that rebalancing their assets side of balance sheet also is preferable for capitalization ratios.

The above findings of the studies relating to adjustment speed cannot be generalized because the studies used different measure of capitalization rate and reports varying speed of adjustment. Furthermore, Tanzania has not been included in the majority of research which conducted in developed and rising market economy countries, as well as in a few frontier market countries. More notably, just a few institutional and bank-specific determinants included in the earlier studies are also used in this research. This prompts the researcher to look at how these variables affect Tanzanian banks' speed at adjusting to their preferred capitalization rate.

2.5 Research Gap

The empirical literature reviewed indicated that the majority of the existing research on bank capitalization excludes banks from the frontier market nations in the investigation. Hence, creating a research gap. Additionally, generalizing the results in the existing literature to the large group of banks may not be perfect because of the level of financial sector development which has been noted by Antoniou, Guney, and Paudyal (2008) to be different. The literature on developed and emerging economies countries varies from frontier economies nations primarily because of the different institutional characteristics between these three groups of countries. For example, the information disclosed by banks and other related institutions to the potential investors and public in general in frontier market nations is poor. This conveys to the potential consequence of increasing asymmetric information among frontier market countries, which could significantly impact bank capitalization as described by various theories of capitalization that has been discussed in the beginning of this chapter.

In addition, the common institutional characteristic in frontier market nations is the wide intervention and regulation of the financial system by the Government. According to Booth, Aivazian, Demirgüç-Kunt, and Maksimovic (2001), the Government intervention and regulation of the financial system in these countries can have a major consequence on bank capitalization decisions since it affects in the control of price in the security market and programs that direct credits to some sectors in the economy. To get rid of the potential consequence of these and other restrictions, most frontier market countries undertook some measures of financial

sector development such as elimination of sectoral credit allocation, liberalization of exchange rate control, deregulation of interest rate together with other measures as discussed in chapter one. Witnessing this, Tanzania as one among the frontier market country had undertaken developmental policy draft November 2020 into the banking industry to encourage banks to have an optimal capitalization ratio which reduce bank default. This study investigated financial measure in commercial banks together with the non-commercial banks to determine to what extent the development in financial sector has influenced the bank capitalization to enable stability of the banks in United Republic of Tanzania. The results show that, the major reforms in financial sector of 1991 as the important taken measure to develop the financial sector is valid because it increases bank capitalization ratio.

2.6 Conceptual Framework

According to Miles and Huberman (1994), a conceptual framework is a written or visual product that illustrates the primary subjects of study, important variables, concepts, or factors, and the assumed relationships between them in a narrative or graphic manner. A conceptual framework can serve as maps that provide coherence to empirical inquiry, or may be used in the research to describe potential courses of action or to propose a preferred approach to an idea or thinking. This study presented a preferred method for understanding the impact of Tanzania's financial sector improvement on bank capitalization using the conceptual framework shown below.

The factors are grouped into Non-bank specific factors and bank specific factors as

described below.

Independent Variables   **Dependent Variable**

Banking Sector Development (BSD) (Domestic credit provided by banks to private business as % of GDP)

Stock Market Development (SMD) (Stock market turnover ratio)

Bank Size (BS) (Natural log of total assets)

Bank Profitability (ROA) (Return on Assets)

Inflation (INF) (% change in CPI)

Economic Growth (EG) (Annual growth rate GDP)

Dummy variable for banks ownership status (DOS) (Binary number 1 for private banks and 0 for Government-owned banks)

Dummy variable for country of originality of banks (DCO) (Binary number 1 for local banks and 0 for foreign banks)

Dummy variable for banks classification (DVC) (Binary number 1 for commercial banks and 0 for non-commercial banks)

Bank Capitalization Ratio (BCR) (Total equity to total assets)

Figure 2.1: Conceptual framework on determinants of bank capitalization ratio

Source: Author's construction (2022)

2.6.1 Non-Bank Specific Factors

These factors are external influences of capitalization ratio decisions in banks, beyond the control of management. They include financial sector development, macroeconomic and nature of banks status. These variables represent country specific component of bank financial performance and financial position.

2.6.1.1 Financial Sector Development

Financial sector development as the essential variable in this study can be categorized into banking sector development (BSD) and stock market development (SMD). The World Bank (2022), listed these two variables as important indicators of the country financial sector development.

a)   **Banking Sector Development (BSD):** The banking sector development (BSD) was assessed using the domestic credit provided to private business by banks (as percentage of GDP). The domestic credit provided to private business by banks (as percentage of GDP) represents more interest earning to the banks (Abdulhamid et al., 2019; Etudaiye-Muhtar et al., 2017). The higher the value of interest earning to the banks means enough capitalization ratio the banks maintained to support operation (World Bank, 2022). This study expects a positive connection between banking sector development and the bank capitalization ratio.

b)   **Stock Market Development (SMD):** The stock market development (SMD) was measured in terms of stock market turnover ratio (shares traded over the market capitalization). The stock market turnover ratio represents liquidity and trading

activities of the market (Kapaya, 2021). The higher the value of stock turnover ratio means the better the stock market development in the country. This suggests the presence of low transaction costs in the market and high level of trading activity in the market as a result it increases bank capitalization ratio (Tran & Nguyen, 2020; Wang & Luo, 2019). This study expects a positive relationship between stock market development and bank capitalization ratio.

2.6.1.2 Macroeconomic Variables

Inflation (INF) and country economic growth (EG) including in the study as a control variables, they are very significant macroeconomic factors because they provide the degree of the economic stability of the country.

i)   The consumer price index annual ratio of change was used to calculate inflation. An elevated rate of inflation raises the actual tax benefit of loan financing. In order to benefit from tax deductions, banks typically maintain low capitalization ratio and greater leverage ratio during periods of strong inflation (Etudaiye-Muhtar & Abdul-Baki, 2020; Frank & Goyal, 2009; Hortlund, 2005). As a result, an increase in the bank capitalization is anticipated in the event of constant or low inflation.

ii)   GDP represents annual growth rate of economy, and it is anticipated that GDP growth will lower the rate of bank capitalization. Because the likelihood of loan failure is lower in a thriving economy, banks take greater liability, which lower their rate of capitalization (Brei & Gambacorta, 2016; Schaeck & Cihak, 2012). According to Haas and Peeters (2006), the agency problem gets worse when the economy is in a recession. Pecking order theory highlights that as a consequence of the circumstances, the usage of debt financing, which lowers the bank capitalization

ratio is preferred. The variable description section in the study's methodology include a thorough explanation of each variable applied in the analysis.

2.6.2 Bank Status Dummy Variables

The nature of bank's status in a country is another important factor that may influence the bank capitalization rate. In this study, the banks status is classified using dummy variables. One such variable is the Dummy Variable for banks' Ownership Status (DOS), distinguished between private banks and Government-owned banks. Another classification is the Dummy Variable for country of Origin of banks (DCO), distinguished between local banks and foreign banks. These variables help to capture the diverse ownership structures and origin of banks within the study's framework. Memmel & Raupach, (2010) found that Government-owned banks have low pace towards rebalancing capitalization rate compared to private owned banks because of high cost of rising equity capital while Mohanty and Mahakud (2019) found opposite. In addition, Abbas et al., (2021) and Philip et al., 2014 found that foreign banks have low speed of rebalancing capitalization rate compared to local banks. Relating these arguments on adjustment speed and cost, the study expects that the process of adjustment is quick for the banks owned by Government than that of private bank in Tanzania. Moreover, the foreign banks rebalancing capitalization rate very slowly compared to local banks.

2.6.3 Bank Classification Variables

The study used non-commercial and commercial banks in order to investigate the effects of financial sector development on bank capitalization ratio. A dummy

variable that use binary number 1 for commercial banks and 0 for non-commercial banks was used in the model to investigate whether the effects of financial sector development on bank capitalization ratio is different between non-commercial banks and commercial banks. The approach adopted from Antoniou et al. (2008) and Etudaiye-Muhtar (2016).

2.6.4 Bank-Specific Factors

These are specific factors influencing capitalization ratio decisions in bank by which management have control over them. These factors including bank profitability, size of bank, tangibility of assets, liquidity of the banks among others. For the interest of this study the researcher employed only two bank-specific factors which are bank profitability represented by (ROA) and the size of the bank represented by (BS). These variables represent large component of bank performance and financial position respectively.

2.6.4.1 Bank Profitability (ROA)

Profitability is a very important component in measuring performance of banks. It indicates the ability of banks to generate revenue sufficient to cover operational costs. In this study, profitability was measured using return on assets represented by (ROA). Based on the theories such as pecking order theory and previous empirical literatures, the profitability is expected to increase the capitalization of the bank through retained earnings. This means banks become well-capitalized if they earn good profit in their operations. This also noted by (Baselga-Pascual et al., 2015; Tran & Nguyen, 2020; Yu, 2000). However, Ahmad et al. (2008) argue that bank

capitalization rate is not affected by bank profitability, as noted by Brei and Gambacorta (2016).

2.6.4.2 Size of the Bank (BS)

The bank size (BS) can be assessed in different ways, the straight forward way of measuring the bank size (BS) is using the asset possessed by banks (Abbas et al., 2021; Alı, Dagli, Faedfar, & Turan-Kurtaran, 2022; Schaeck & Cihák, 2012). Therefore, the size of bank in this research was measured by log of total assets. Normally, banks holding more assets can be considered to be big one. But in order for the bank to be in good financial health it should have more asset that cover the liability to assist bank to survive when financial distress occurs. Based on the too big to fail hypothesis, increasing size of the bank matters a lot in decreasing the capitalization ratio. This means, more asset holding by bank result into decreasing bank capitalization ratio as noted by Gennaioli, Shleifer and Vishny (2013). This is because bank get advantage of operating in economies of scale when it is large, this make them to hold low capitalization level while achieving better income diversification. Hence, the researcher expects large banks to exhibit higher risk (less capitalized) as suggested by Abbas et al. (2021). However, this expectation contrast with Tran and Nguyen (2020).

2.6.5 Bank Capitalization Ratio (BCR)

This is the dependent variable in the study, for which its effect was determined by the bank-specific factors, macroeconomic factors in addition to financial sector development, proxied by banking sector development (BSD) measured as domestic

credit given by banks to private business as percentage of Gross Domestic Product and the stock market development (SMD) measured as stock market turnover ratio.

2.7   Chapter Two Summary

This chapter reviewed important theoretical and empirical literatures that relates to bank capitalization ratio. Subsequently the review, it was established that there is existence of other crucial factors that influencing capitalization ratio in banks apart from bank-specific determinants, these factors include macroeconomic determinants. Moreover, empirical literatures show that there are few studies conducted in the frontier market nations and did not investigate the impact that the adjustment process in terms of the speed and cost have on rebalancing target bank capitalization rate. In additions, the empirical literatures showed that the ambiguous results exist on the effects of financial sector development on bank capitalization in developed and some emerging economies countries in Asia where most studies concentrated. Given the aforementioned challenges, this thesis focuses on bank specific and non-bank-specific influences of bank capitalization ratio together with the investigation of adjustment cost and speed towards required bank capitalization rate in Tanzania. Chapter 3 provides details of the methodology adopted to develop knowledge to answer the research problem of effect of financial sector development on bank capitalization to foster more evidence on the side of frontier market countries such as Tanzania.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Overview

To describe research methodology, this chapter is divided into six sections. Section 1

gives an overview of the chapter. Section 2 represents a research philosophy adopted

for the study where Section 3 provides research strategies, Section 4 describes the

dependent variable, independent variables adopted in the study as well as the variable

descriptions for speed and cost of the adjustment process towards target

capitalization ratio of the banks, Section 5 represents ethical consideration issues and

Section 6 gives chapter summary.

3.2   Research Philosophy

Saunders, Lewis and Thornhill (2019) defined the term research philosophy as a

methodology a researcher employs to develop knowledge to answer the research

problem. This methodology is shaped by the beliefs and assumptions the researchers

hold. The present study employed a positivism research philosophy shaped by

existing theory of knowledge (gain of knowledge) as a philosophical assumption to

answer the research problem of the influence of financial sector development on the

bank capitalization ratio in Tanzania. According to Al-Ababneh (2020), positivisms

research philosophy shaped by gain of knowledge as philosophical assumptions

follows highly structured methodology. It is more preferable for quantitative research

approach such as official statistics, because it has good reliability and

representativeness to achieve statistical analysis. Moreover, positivist research

philosophy is preferable in this study because it is suitable for looking at the cause and effect relationships among the variables.

3.3   Research Strategy

According to Kothari (2017), research strategy involving techniques and procedures employed to identify and analyze information related to specific research problem. This Section describes research approach, research method, research design, study area, population size, method for sampling design and procedure, research techniques that employed for the method used to collect data and method of data analysis, model and estimation techniques.

3.3.1 Research Approach

The study used deductive research approach to answer research questions by proving or disapproving the already existing theories through the analysis of data collected. The researcher gathers data or observations from individual banks and World Bank databases to confirm the existing theories and answer the stated research questions. The researcher used a deductive approach because of the possibility of explaining the cause and effect relationship between variables and concepts, the possibility of measuring the concepts quantitatively and possibility of generalizing the findings of the research to a certain level (Kothari, 2017).

3.3.2 Research Methods

The study used numerical data in measurable forms to answer the research question that justifies causality among the measurable variables. It used quantitative research method (Sajid, Muhammad, & Zakaria, 2019).

3.3.3 Research Design

According to Saunders et al. (2019) research design is the overall plan on how the researcher intends to carry out the research work. Causal research design was also used in order to study the effects of the financial sector development on the bank capitalization ratio in the United Republic of Tanzania. Causal research design is employed for the examination of cause and effect relationships between variables while avoiding the manipulation of independent variables when predicting the cause, taking dependent variable as the basis (Kothari, 2017).

3.3.4 Study Area

The study was conducted in Tanzania for the following reasons. Firstly, to the best of the researcher's knowledge, the study has not been conducted in East African countries except Kenya when Etudaiye-Muhtar et al. (2017) studied the influence of the financial market improvement on bank capitalization rate in emerging economies nations (Egypt, Morocco and South Africa) and frontier economies nations (Botswana, Nigeria, Ghana, Kenya and Tunisia). They argued that the financial market in the remaining East African countries apart from Kenya are weak and have no up to date data related to financial development and bank capitalization that are kept in international databases such as the World Bank database. Hence, the present

study collected data personally from published financial reports and statements of each bank under study. Secondly, based on the economic evolution and alternative investment opportunity channel, Tanzania is classified as a country whose financial sector (the banking sector and the stock market) is growing steadily (BOT, 2019). In recognizing the alternative investment opportunity channel, Allen, Otchere, and Senbet (2011) identified that, regardless of lagging behind in the indicators of the financial sector development compared to other developing countries. The notable performance of the financial market of African countries for many years causes the region to be an unexploited market for many investors global who desire to increase the return for a given level of risk in their investments. Thirdly, according to Fan, Titman, and Twite (2012), it is complicated to perform the research cross-country, concentrating on one country allowed researchers to perform a detailed investigation of institutional variables.

3.3.5 Population of the Study

The study selected sample from a population of fourty-six banks registered by the Bank of Tanzania as at June 2021, in which thirty-four are commercial banks and twelve non-commercial banks (BOT, 2021).

3.3.6 Sampling Designs and Procedures

The study adopted stratified sampling design. Saunders et al. (2019) defines stratified sampling design as the sampling method, where the population is divided into subgroups (or strata) who all share similar characteristic. In this study banks classified in to non-commercial and commercial banks according to the Bank of

Tanzania. An entire population of exactly forty-six banks of which twelve non-commercial and thirty-four commercial banks have been chosen to investigate the effects of the financial sector development on bank capitalization ratio. Since most of non-commercial banks operated in Tanzania as microfinance institutions and some of them obtained licenses from BOT to operate fully as banks (BOT, 2021). Hence, too many missing observation can be reported because they have few number of years (less than six years) since operating as banks. This resulted in to diminishing the sample space for non-commercial banks from twelve to four banks.

In order to avoid the occurrence of too many missing observations in the data set, the researcher dropped nine banks from thirty-four commercial banks to twenty-five commercial banks which have been servicing Tanzania for at least seven years. This means researcher removed from the study commercial banks that operated for less than seven years or whose services in Tanzania has been dismissed at any time during entire period of study. In addition, this study ignored one commercial bank that operated using Islamic rules, because theoretically, Islamic banks are different from conventional banks due to their risk-sharing nature and some other contracts specific to Islamic banks (Abdulhamid et al., 2019). Also, structurally, banks operating in the Islamic perspective are different from the conventional perspective. According to Beck, Demirgüç-Kunt, and Merrouche (2013) banks operating under Islamic rules are strongly capitalized and experience low risk appetite (Ashraf, Ramady, & Albinali, 2016). Thus, the final sample space of the banks was twenty-eight which consists of twenty-four commercial and four non-commercial banks as shown in Appendix A. The reason for categorizing the banks into commercial banks

and non-commercial banks was to enable the researcher to investigate whether the influence of commercial banks on the bank capitalization rate is different from that of non-commercial banks.

3.3.7 Data Collection Methods

The study collected secondary data from published balance sheets and income statements of 28 banks selected, while country-level data was collected from DSE and the World Bank data center for a ten-year period from 2012 to 2021. Before analyzing the data, the researcher checked for reliability, suitability and adequacy of the data to see whether the data utilized are standard, relevant and sufficient available respectively. Since the data collected is secondary data, they have not been checked for validity. According to Sajid et al. (2019), the secondary data has already passed the validity process by the original collector.

3.3.8 Data Analysis Method, Model and Estimation Technique

This Section provides data analysis method of inferential and descriptive statistics, models and justification for the estimation technique employed in answering the research questions. In addition, it describes the post-estimation test employed to check the validity of the estimation method adopted in the study. Lastly, it describes the robustness test for bank classification.

3.3.8.1 Descriptive Statistics and Inferential Statistics

A number of statistical tests were used to examine the study's data. The first test was a descriptive analysis, which produced an image of the data based on the variables'

standard deviation, mean, median, minimum, and maximum values. The fundamental properties of the variables are described by these statistics. Correlation analysis was the second statistical test used to determine the bivariate association among the variables. This enables the determination of the strengths and weakness, as well as the direction of the relationship between the dependent variable and the independent variables and between the independent variables themselves. Also, it enables the detection of the existence or non-existence of multicollinearity problems.

The research questions mentioned in chapter one were answered using inferential statistics in a balanced panel set of data regression methods. Gujarati and Porter (2009) defined the study of panel set of data as a longitudinal study involving concurrently time series analysis and cross-sectional data that relates to variables overtime. Since the present study uses bank level data of 28 banks over 10 years, the panel data is considered an appropriate technique. According to Flannery and Hankins (2013), panel data has advantages of handling complex problems including unobserved heterogeneity and omitted variables bias. In addition, the panel data study gives more observation for a particular cross-section units, it tackles the problem of collinearity among the variables and ensures that it minimizes to the lowest level and lastly it allows a dynamic study of the interest units. For example, in this particular study the units of interest are banks. In describing the problem of omitted variables, Delcoure (2007) suggested that using a longitudinal study in panel data minimizes the problems that are related to omitted variables and keeps the model away from being incorrectly specified. To address the issue of omitted

variables in this thesis is very important since the proxy for the omitted variables such as agency problems and information asymmetries are unavailable.

Moreover, Flannery and Hankin (2013) discovered that, most studies of corporate finance especially capitalization ratio typically consist of datasets that have explanatory variables that are affected with endogeneity problem. Therefore, the use of Generalized Method of Moments (GMM) estimator to carry on the regression equations for analyzing the panel data applied in this study is a proper technique, because it handles the issues explained above. Recalling from the second paragraph of this section, the panel data comprises both characteristics of cross-sectional and time series. It is also known that the time-series data identified to have a problem of non-stationarity of data, meaning that the dataset may have the problem of unit roots. Based on Gujarati and Porter (2009), this problem may result in a biased estimation of regression coefficients. Hence, while the researcher needs to prevent spurious results of regression, the set of data is investigated for unit roots by using Fisher-type unit root test for panel data suggested by Maddala and Wu (1999). The test is preferred because it is capable of handling both balanced and unbalanced panel data. Additionally, to reduce the potential impact of outliers on the results, robust regression estimation was adopted in the estimating coefficients following the procedures of Frank and Goyal (2009). Antoniou et al. (2008) also established that GMM technique is robust to the non-normality of data as described in Subsection 3.3.8.3.

3.3.8.2 Research Models

The research models used to estimate the coefficients and answer various research questions in the panel regression were given as follows: -

Banking Sector Development and Bank Capitalization Ratio:

Research question 1: To what extent does banking sector development influence bank capitalization ratio in Tanzania?

To answer this research question as adapted from Abbas et al. (2021) and Etudaiye-Muhtar (2016). The researcher used the following model given in equations (3.1).

$$BCR_{i,t} = f\left(BCR_{i,t-1} + BSD_{i,t} + DOS + DCO + X_{i,t} + Z_{i,t}\right) \dots\dots\dots\dots\dots\dots3.1$$

Where:

$BCR_{i,t}$ means Bank capitalization ratio

$BCR_{i,t-1}$ means Lagged bank capitalization ratio

BSD means Banking sector development

DOS refers to a dummy variable indicating banks' ownership status, where binary number 1 represents private banks and 0 represents Government-owned banks.

DCO stands for a dummy variable indicating the country of origin of banks, with 1 denoting local bank and 0 denoting foreign banks.

X and Z are country macroeconomic and bank specific variables respectively.

The banking sector development variable is domestic credit given by banks to private business in a percentage of GDP, this is in line with Abdulhamid et al. (2019); Becerra, Cavallo, and Scartascini (2012); Vithessonthi and Tongurai (2016). Bank-

specific variables (Z) consist of bank profitability and the bank size. Macroeconomic variables (X) consist of inflation rate and economic growth.

The dummy variables form part of this study to find out whether there is a statistically significant distinction in the effects of the financial sector development on bank capitalization ratio for private and Government-owned banks, as well as for local and foreign banks. This means the significant coefficient of DOS would signify the bank ownership structure (private and Government-owned banks) have different effect on the capitalization ratio. In addition, the significant coefficient of DCO would signify bank country of origin (local and foreign banks) have different effects on capitalization ratio as well. This approach is in line with the research of Abdulhamid et al. (2019) and that of Etudaiye-Muhtar et al. (2017).

The Stock Market Development and Bank Capitalization Ratio: Research question 2: To what extent does stock market development influence bank capitalization ratio in Tanzania?

A modified model of equation (3.1) as adopted from Abdulhamid et al. (2019); Wang and Luo (2019) is employed to answer research question 2. The stock market development variable in this model substituted the banking sector development variable. The model is given as below:

$$BCR_{i,t} = f\left(BCR_{i,t-1} + SMD_{i,t} + DOS + DCO + X_{i,t} + Z_{i,t}\right) \ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

Where:

SMD is a stock market development variable

$BCR_{i,t}$, $BCR_{i,t-1}$, DOS, DCO, X and Z are as well-defined in regression equation 3.1

The main explanatory variable of interest here is the stock market development variable. The researcher used stock market turnover rate as a proxy for stock market development in line with the literature of Agarwal and Mohtadi (2004); Booth et al. (2001); Chinn and Ito (2006); and Kapaya (2021).

Bank's Speed and Cost of Adjustment to Target Capitalization Ratio:

Research question 3: Which speed do banks in Tanzania use to adjust to target capitalization ratio?

Research question 4: To what extent does it cost banks in Tanzania to adjust to the target capitalization ratio?

Research questions 3 and 4 were answered within the same framework of a model that allows for the determination of the speed and the costs of the adjustment to required capitalization ratio by banks in Tanzania. Although the model is similar to equation (3.1) and (3.2) above, but it has one unique feature. It does not include the banking sector and the stock market development variables. This enabled the determination of the target capitalization rate behavior in the absence of financial sector development. The model customized from Abbas et al. (2021); Etudaiye-muhtar et al. (2017) and Haron, Ibrahim, Nor, and Ibrahim (2013) is given below:

$$BCR_{i,t} = f\left(BCR_{i,t-1} + DOS + DCO + X_{i,t} + Z_{i,t}\right) \dots\dots\dots\dots\dots\dots\dots\dots 3.3$$

Where:

$BCR_{i,t}$, $BCR_{i,t-1}$, DOS, DCO, X and Z are as well-defined in equations 3.1 and 3.2

The investigation of the influence of lagged bank capitalization ratio ($BCR_{i,t-1}$) on current bank capitalization ratio ($BCR_{i,t}$) enables to determine whether or not a bank has a target capitalization ratio, the speed and the cost of the adjustment to reach the target capitalization ratio (Flannery & Ragan, 2006). According to Ozkan (2001); Ramjee and Gwatidzo (2012), the regression Equation (3.3) represents a function for the bank-specific and the macroeconomic variables that are applied to investigate the determinants of the speed and costs of adjustment to target capitalization ratio of the banks. The regression equation parameter for the adjustment represented by lagged bank capitalization ratio coefficient (β), indicates a proxy for the cost of adjustment and its opposite represented by ($1 - \beta$) reflects the speed of adjustment towards the target bank capitalization ratio. Based on Antoniou et al. (2008), the estimated value of the lagged capitalization ratio coefficient ranging between whole number 0 and number 1 shows the presence of target capitalization rate behavior. This indicates whether the adjustments occur swiftly with low costs or slowly with higher costs.

3.3.8.3 Generalized Methods of Moments (GMM) Estimator.

This section provides the justification for the use of a panel data set applied to perform the analysis in a regression model. However, before performing the regression analysis, there are several issues to be considered when deciding the proper estimation technique to be used. These include the issue of unobserved heterogeneity, endogeneity and residual autocorrelation. The unobserved heterogeneity problem and the issue of endogeneity are caused by the presence of a

correlation between the explanatory variables and fixed-bank effects. Autocorrelation can be caused by the persistence of the response variable or measurement errors (Dang, Kim, & Shin, 2015). The selected technique of estimation in this study properly addressed the above mentioned issues as discussed below.

Considering the basic dynamic panel regression model as:

$$Y_{i,t} = \gamma Y_{i,t-1} + \beta X_{i,t} + \mu_i + \eta_t + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(3.4)$$

Where:

$Y_{i,t}$ means the response variable for bank i at time t.

Y_i,t_{-1} means a time period lagged response variable of bank i at time t.

$X_{i,t}$ means independent variables of bank i at time t.

μ_i means a time-invariant unobserved bank-specific effects (For example. Bank managerial capacity, bank risk tolerance, bank managerial decision making, among others).

η_t is a time-specific effects that relate to all banks and change with time (For example macroeconomic factors including rates of interest, inflation, GDP, among others).

$\varepsilon_{i,t}$ is a time-varying error term.

$\gamma \; and \; \beta$ represents the value of the estimated coefficient.

The response variable is lagged behind one period as represented by (*t-1*) to involve the impact of the previous performance of the response variable (Bank capitalization ratio) on the present performance represented by (*t*). Preceding studies such as Dang et al. (2015) and Flannery and Hankins (2013) indicated that estimating the regression equation (3.4) using pooled ordinary least squares regression method

results into biased estimates, because bank fixed effects factors represented by a parameter (μ_i) may be unobserved. In addition, the degree level at which bank fixed effects (μ_i) correlate with the study lagged response variable ($Y_{i,\,t-1}$) results to most unreliable coefficient of estimates.

The scholars mentioned earlier in the prior paragraph also mentioned that, the technique of generalized least squares for either a random or fixed effects estimator controls unobserved bank effects through first differencing. However, the technique still introduces an endogeneity problem in the model because the time-lag response variable ($Yi,t-1$) is correlated with the error term (εi,t). Additionally, this leads to skewed estimations. Though, they discovered that as the time period grows, the degree of association decreases. This is due to the average error term becoming lower as panel length grows.

Referring from these scholars, the use of a time lagged response variable together with bank fixed effects to handle the issue of auto correlation and time-invariant unobserved differences for cross-section banks in capitalization ratio studies that involves a dynamic panel caused biased and unreliable parameter estimate. This means that the application of ordinary least squares or the generalized least squares techniques to estimate the regression Equations (3.1) to (3.3) result in unreliable and spurious estimates. To control these issues, Anderson and Hsiao (1982) suggested the use of instrumental variables as the technique to remove time-invariant effects. This technique employs the second lag variable of the time-lagged response variable ($Y_{i,}$

$_{t-2}$) as the instrument variable for the first difference of the time-lagged response variable ($Y_{i,\,t-1}$).

However, as noticed by Arellano and Bond (1991), first-differencing of the variables as suggested by Anderson and Hsiao (1982) still may not provide efficient estimation, because the technique does not utilize all moment conditions available for estimation. The use of the generalized method of moment (GMM) proposed by Hansen (1982) and Arellano and Bond (1991) is preferred because it found estimators that employ extra moment conditions made by deeper time-lagged degree of the response variable. The scholars introduced the difference for the response variable and for each of explanatory variables of the regressions specification and used instrument variables from the time lagged levels of the explanatory variables. This estimation technique is called the difference GMM. The technique seems to have advantages compared to Anderson and Hsiao (1982) because it allows all moment conditions available to be part of the estimation. Hence, it results into more efficient estimation of the regression model. Furthermore, it is found that, the time-lagged levels of the explanatory variables may be weak instruments when there is a presence of autocorrelation issues in the error terms when using the difference GMM. Still, this may result to a biased estimation of the regression specification model (Baum, 2006).

Based on this argument, Arellano and Bover (1995); Blundell and Bond (1998) contend that the information related to the first-differenced variable in the difference GMM introduced by Arellano and Bond (1991) is not enough, especially when the

problem of autocorrelated exist. Therefore, Arellano and Bover (1995) and Blundell and Bond (1998) proposed that, apart from the first-differencing of the independent variables the time lagged first-differences has to be employed as instrumental variables in a level regression equation. This technique is called the system GMM and comprises of two equations estimated simultaneously, one in lagged difference of the response variable as instruments for equation in levels and another one in lagged levels of the response variables as instruments for equation in first-difference. The effects of time-invariant variables are eliminated in first-difference but are estimated in levels. This process strengthens the quality of the estimation technique.

To estimate regression Equations (3.1) to (3.3), the current thesis employs the two-step system GMM as employed in the studies of Abbas et al. (2021); Etudaiye-Muhtar et al. (2017) and Jokipii and Milne (2008, 2011). When it comes to dynamic panel data sets with endogeneity problems, bias in omitted variables, problems with serial correlation, unobserved panel heterogeneity together with unobserved time-invariant fixed effects, measurement errors, and N (number of cross-sections) greater than T (time span), this estimation technique is well-considered. In addition, using two-step system of GMM technique is not necessary for user to have detail knowledge of the data distribution (Antoniou et al., 2008).

3.3.8.4 Validity Tests (Post Estimation)

To be certain that the outcome of the two-step system GMM estimator are valid and robust, the thesis considers the below outlined matters:

i) The two-step system generalized method of moments (GMM) techniques is robust to panel-specific heteroskedasticity and autocorrelation. This is done despite the existence of the advantages noted in the previous section when using GMM techniques.

ii) The Sargan/Hansen test for over identifying restrictions testing the overall validity of the study's instruments.

Based on the test, the null hypothesis (H_0:) is that all instruments as a group are exogenous and they are valid only when the null hypothesis is not rejected. If the null hypothesis is rejected, this implies the model is over identified. Therefore, it does not qualify for the GMM estimations (Roodman, 2009).

iii) The test of Arellano & Bond for serial correlation, AR (1) and AR (2). Based on this test, the null hypothesis (H_0:) of no serial correlation applied to the residuals on first-differences. Arellano and Bond (1991) hold that the validity of the instruments used is confirmed only when the null hypothesis is not rejected in the second order autocorrelation AR (2), though negative first-order autocorrelation by default is expected in AR (1) (Roodman, 2009).

iv) The time dummies; Time dummies are variables that take value 1 for a particular year and 0 for the rest of years in the study. These variables are introduced in the model to eliminate time-specific effects. This means it handles shocks which effects are controlled to a particular time period. According to Roodman (2009), time dummies are employed to uphold the assumption that there is no correlation among cross-individual to be probably.

v)   Goodness of Fit test (Wald Test); A Goodness of Fit test is employed for testing whether the study explanatory variables in a model are appropriate predictors of the dependent variable. The hypothesis is tested using the chi-square. The acceptance of the null hypothesis (H_0:) suggests that the independent variables are not appropriate in determining the response variable in the regression model, while a rejection of the null hypothesis indicates otherwise.

3.3.8.5 Robustness Test: Banks classification

The BOT's June 2021 classification of non-commercial and commercial banks served as the basis for the study bank classification. The impacts of Tanzania's financial sector development on the capitalization rate of commercial banks are probably going to differ somewhat from those of non-commercial banks. To verify that, an interpretation of the results are solid in light of the categorization of the banks, the researcher tested the robustness of the regression model in equations (3.1) through (3.3). In using these equations (3.1 to 3.3), non-commercial and commercial banks were combined in another single regression model to identify the effects of financial sector development on bank capitalization. This is performed to avoid carrying out separate regression analyses for these two groups. In a regression, a dummy variable was established, with the number 0 for Tanzanian banks classed as non-commercial banks and number 1 for those designated as commercial banks. The coefficient estimated value also significant for the suggested dummy variable (DVC), indicates that there is a substantial difference between Tanzanian banks classed as commercial and non-commercial in terms of the influence of financial sector development on the

bank capitalization. A non-significant coefficient estimate of the variable, however would imply the opposite.

The regression equations for the robustness check of the bank's classes are modified versions of the previous equations (3.1) to (3.3) as shown below:

$$Y_{i,t} = \gamma Y_{i,t-1} + \beta X_{i,t} + DVC + \mu_i + \eta_t + \varepsilon_{i,t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.5)$$

The main distinction between equations (3.1) to (3.3), and (3.5) is that the classification of dummy variables (DVC) for non-commercial and commercial banks is added to the independent variables of the study equation (3.5). But the dummy variables for bank ownership (DOS) and country of origin of the banks (DCO) are left out of the specification model. If the banks are commercial, the dummy variable (DVC) has a binary value of number 1, and if not, it has a value of 0. The remaining variables stay the same. The Generalized Method of Moments technique (two-step system GMM), which is still used in the prior equations is also employed to carry on the regression estimations. The comparison of the output obtained through robustness estimation and that found in equations (3.1) to (3.3) are performed and that output is statistically robust to determine if possessing similarity qualitatively. If the output is similar, it implies that the results generated from the robustness estimations equation and those obtained from the key analysis in equations (3.1) to (3.3) are consistent.

3.4   Variables Descriptions and Measurement Procedures

This section explains the independent and dependent variables employed in the study. All the study variables are extracted from various literature reviewed as

presented in chapter two. Table 1.5 gives the summary of the different variable measurement and their related literature.

3.4.1 Dependent Variable

3.4.1.1 Bank Capitalization Ratio

The Basel Committee for Banking Supervision (BCBS) provide basis on measuring bank capitalization using equity and total assets. Literatures reviewed in chapter two suggested that, there are different ways in which bank capitalization ratio can be measured, meaning that there is no single approach of measuring it. The most important methods of measuring it include EquityCap represented by the ratio of total equity to unweighted total assets, Tier1Cap (the rate of tier one capital over the total risk-weighted assets) and TotalCap which represents the rate of the total bank capital (Tier one+Tier two) over the total risk-weighted assets. The present thesis uses EquityCap measures (total equity to unweighted total assets) that are available to all banks in this study. This is in line with the literature of Abdulhamid et al. (2019); Cho, El Ghoul, Guedhami, and Suh (2014); Etudaiye-Muhtar and Abdul-Baki (2020); Farooq et al. (2018); Matemilola, Bany-Ariffin, and McGowan (2013); Vithessonthi (2014b); Vithessonthi and Tongurai (2016).

After the choice of the capitalization ratio measure, the issue of deciding whether to use market value or book value is very crucial for capitalization ratio studies. Opinion for the selection of capitalization ratio in terms of book value over market value including the point that book value is less vulnerable to market volatility. Hence, represents most stable measure (Cho et al., 2014; Matemilola et al., 2013).

Thies and Klock (1992) argue the use of book value reflects bank management's target capitalization ratio because the market value is not stable and depends on some other factors such as operation and credit risk that the bank management may not have full control. In addition, the book value represents the real facts supporting the management decisions making. Another important justification on the use of book value instead of market value is that, not all banks selected for this study are quoted in the stock exchange, which form a precondition for the access to the market values. Hence, the use of book value is inevitable, whether they are better or not. Moreover, Öztekin and Flannery (2012) found that the adoption of the market value and book value provide similar results. However, some researchers still argue that the adoption of the market value reflects the reality picture of the present and forecasted positions of the entity (Barclay, Morellec, & Smith, 2006; Frank & Goyal, 2009). Hence, for the interest of this study, book value is employed according to the arguments above of using the book value together with unavailability of the market data for bank total equity and total assets.

3.4.2 Independent Variables

This subsection provides the descriptions of several independent variables used in this thesis. This includes the stock market development, banking sector development and bank-specific variables together with the macroeconomic variables. The key independent variables in this study are the banking sector and the stock market development, whilst other independent variables (bank-specific and macroeconomic variables) are included as control variables for the objective of the examination in this thesis.

3.4.2.1 Banking Sector Development

Different measures have been used to proxy development in banking industry in various literatures, it comprises of domestic credit given to the private business by banks in a percentage of GDP, liquid liabilities of banks to GDP ratio, bank assets expressed as a percentage of Gross Domestic Product and domestic credit given to Government and the private business by banks in a percentage of GDP. For the interest of this study, the ratio of domestic credit given to the private business by banks in a percentage of GDP is employed to proxy the development in banking sector as used in the study of (Abbas et al., 2021; Alves & Ferreira, 2011; Farooq et al., 2018; Wang & Luo, 2019). According to Alves and Ferreira (2011); Beck, Feyen, and Moizeszowicz (2008), the specific feature of this ratio is that, the measure is on top ranking among core indicators used to measure banking sector development. In additions, the measure focuses on credit facility provided to the private business and house hold by banks. Accordingly, this is considered more appropriate for the present thesis, since the units of analysis are banks. The higher the level of percentage of domestic credit given to the private business by banks to GDP based on Alves and Ferreira (2011) represents an improvement in the financial sector especially in the banking industry development because it increases the financial intermediation process as a result more credit facility provided to private business which in turns result into increases in interest income following that credit facility. Hence, the increase in interest income results in a percentage increase of credit facilities given to private businesses by banks and growth in the banking sector.

3.4.2.2 Stock Market Development

Stock market development can be proxied by two most important variables, these are the capitalization of the market and stock market turnover. While the former represents how big the market is in relation to the total capitalization of the market for all quoted company. The latter represent the liquidity position and trading activities associated with the size of the market. For the interest of this study, the turnover rate of the stock market is used because of the following advantages. Firstly, the liquidity measure that the stock market turnover rate has compared to the capitalization measure of the stock market capitalization. The fact is that despite of a market being highly capitalized, it has to be liquid enough. This means that, if the market is not liquid enough even though it is well capitalized, it discourages trading activities of equities. Therefore, less frequently the shares are traded in the market. Apart from that, according to Booth et al. (2001), if the market is liquid enough, the existing and new investors are motivated to participate in trading activities of shares in that market. Secondly, illiquid markets reduce the interest of new investors to put their money in a business for a long-term contract, while a well-liquid market eliminates these challenges and encourages more new investors to invest their funds for long-term investment (Beck & Levine, 2004). In addition, the measure of the stock market turnover rate to be used as a proxy for the stock market development is that, the measure is on top ranking among core indicators used to measure the stock market development (Beck et al., 2008).

Accordingly, stock market turnover is calculated as the rate of the total value of all traded shares for a given period over the average capitalization of the stock market

for that period, as used in (Agarwal & Mohtadi, 2004; Beck & Levine, 2004; Booth et al., 2001; Etudaiye-Muhtar et al., 2017; Kapaya, 2021; Saci & Holden, 2008; Tran & Nguyen, 2020). An increase in the stock market turnover rate mostly suggests the existence of low transaction costs and high-frequency trading activities in the market (Saci & Holden, 2008). The lower transaction cost and the frequency trading activities encourage investors to participate more in market activities. Thus, capitalization for banks become possible, because of equity finance availability in the market. This argument contradicts with the capital structure irrelevancy theory.

3.4.2.3 Bank-Specific Variables

These are control variables which are used in explaining capitalization ratio as employed from various literatures and theories. As mentioned earlier in this chapter, there are number of bank-specific variables that are used to determine the bank capitalization rate. For example, based on earlier works of Abdulhamid et al. (2019; Ahmad et al. (2008); Distinguin, Roulet, and Tarazi (2013); Etudaiye-Muhtar et al. (2017) and Laeven et al. (2016) on bank capitalization, the following variables used as a bank-level control variable including, size of bank measured in the log of the total assets (LTA), return on assets (ROA), liquidity (CASHDEP) and the log of loan-loss reserves to total assets (LLRTA). For the purpose of this study and based on the specific objectives of the study, the researcher employed the size of the bank and bank profitability as a bank-specific variable, because they represent an important component of the bank as no one doesn't know the importance of profit in banks. In addition, these two variables have been used because it is possible to obtain data for these variables directly from bank statements of financial position and

income statements without involving any kind of manipulation. The bank-specific determinants used in this study are explained in detail below;

Bank Profitability: Based on the pecking-order theory, a firm's profitability is positively linked to the capitalization ratio. This means adequate profit a firm retains for investment purposes the higher the growth of capitalization and the few debt instruments maintained in its capital structure (Alı et al., 2022). This is because firms prefer the use of internal finance as against external finance due to the asymmetric information associated with external finance. Relating this effect of profitability to the bank capitalization is based on the pecking-order theory. It indicates that profitable banks seem to be better capitalized than less profitable banks, because bank that has the capacity to generate higher profit also has the advantage of holding an adequate capitalization ratio through earnings reserved at the end of the financial year (Abdulhamid et al., 2019; Baselga-Pascual et al., 2015; Philip et al., 2014). However, Ahmad et al. (2008) argue that the bank capitalization ratio seems not to be influenced by bank profitability in Malaysia, this is supported by (Brei & Gambacorta, 2016). The present thesis used the return on assets (ROA) as the proxy for bank profitability in line with the literature of (Abbas & Masood, 2020; Brei & Gambacorta, 2016; García-Herrero, Gavilá, & Santabárbara, 2009; Tran & Nguyen, 2020; Wang & Luo, 2019).

Bank Size: The too-big-to fail hypothesis suggest that the larger the size of firm implies less capitalization ratio the firm will have. This notion is undertaking on the assumption that the larger firms are more diversified, have a low risk of default (Zou

& Xiao, 2006). Apart from that, the pecking order theory establish a positive relationship between capitalization and firm size (Frank & Goyal, 2009), the reason behind this is that larger firms typically are older and they build up profit over the years to finance their projects and investments in comparison with smaller firms. Rajan and Zingales (1998) argue that since the information asymmetry in larger entities is small, the probability for them to undervalue new equity issues is very low as a result such firms usually can issue equity to finance their investment need. In relating the effect of the size of bank to the bank capitalization rate based on the theories above, bank size has significant effect on the capitalization ratio of the banks. The following factors as addressed by Gennaioli, Shleifer, and Vishny (2013), explain why large banks have lower capitalization ratios and follow "too big to fail hypothesis". Bigger banks enjoy economies of scale and allows them to conduct banking activities with lower capitalization ratios and achieve greater income diversification. Additionally, because the increasing of nontraditional banking operations for large banks relates to high fixed costs and leads to higher leverage and uncertain funding, large banks have a comparative advantage in non-traditional banking activities. Because of these, it is assumed that big banks exhibit high risk (making them less capitalized, and involved in more atypical banking activities). This negative relationship of bank size and the bank capitalization ratio is also supported by (Abdulhamid et al., 2019; Baselga-Pascual et al., 2015; Brei & Gambacorta, 2016; Ozili, 2018) and opposed by the work of (Tran & Nguyen, 2020). This thesis measured bank size as the logarithm of the total bank assets as adopted by (Abbas et al., 2021; Alı et al., 2022; Brei & Gambacorta, 2016; Farooq et al., 2018; Ozili, 2018).

3.4.2.4 Macroeconomic Variables

Apart from bank-specific variables, the literature reviewed in chapter two also showed that bank capitalization can be affected by macroeconomic variables. The inflation rate and economic growth are the two most known macroeconomic variables that affect bank capitalization ratio. These variables show the level of economic stability in the country (Booth et al., 2001).

Economic Growth: The influence of the conditions of the economic growth i.e. gross domestic product (GDP) growth rate on bank capitalization as described in various literatures is of two forms. Firstly, during a booming economy, normally there is an overprice for stock, an increase in cash and a reduction of bankruptcy costs in addition to lowering the probability of loan default in general, Accordingly, banks are in a good position to borrow more to benefit from tax deduction advantage while the opposite is true during a recession period (Frank & Goyal, 2009). This means during a booming economy banks issue debt instruments alongside real existing investment opportunities, as a result, capitalization is less preferred by banks (Brei & Gambacorta, 2016; Schaeck & Cihak, 2012). Secondly, to diminish the agency conflict i.e. conflict of interest between bank managers and stockholders. Haas and Peeters (2006) claimed that the weakening of economy in the country increases the principal-agency conflict of interest, because bank managers takes the opportunity of increasing their wealth since the banks avoid taking huge debt contract and prefer the use of profit generated by banks or issue of new equity to increase the capitalization ratio.

Inflation: This variable is measured by the consumer price index as adopted by the World Bank database related to development indicators. It signifies the increases of price due to a rise in money supply and consumer demand for goods and services. Inflation is one of the macroeconomic factors that is important in influencing the capitalization rate of the banks (Jokipii & Monnin, 2013). The growth in inflation rate increases the actual tax benefit value of the debt instrument. Therefore, during the time of high inflation rates banks take higher debt and uphold less capitalization ratio so as to benefit from tax deductions (Frank & Goyal, 2009). Demirgüç-Kunt and Maksimovic (1999) give another line of argument by establishing that, inflation reflects government's efforts at managing the economy and the local currency's stability in maintaining long-term contracts. Therefore, a constant or very low inflation rate encourages entering into more debt contracts as a result discourages bank capitalization ratio.

The inflation and the economic growth are the macroeconomic variables that are common to all banks but differ with respect to time. Hence, they have to be controlled. In order to control the effects of these variables, time dummy variables are introduced in the model of regression (Roodman, 2009). The time dummies variables take n = T-1, where T represents the number of years used in the thesis. i.e 1 for a particular year and 0 for the rest of the years in the study. This means that, there are exactly nine-time dummies variables in this thesis (10-1). The addition of these time dummy variables also assists the estimation to include the influence of other unobserved determinants that differ with respect to time but remain the same for all banks (Flannery & Hankins, 2013; Roodman, 2009).

3.4.2.5 Bank's Status Variables

The following banks status variables were used in the study.

Banks Ownership Status: To account for the effects of bank ownership status, sampled banks are categorized into private banks and Government-owned banks. Banks that are privately owned are represented by a dummy variable that takes a binary number 1, while those Government-owned banks take the binary number 0.

Country of Originality of Banks: To account for the effects of the country of origin of banks, sampled banks are categorized into local and foreign banks. Local banks are illustrated using dummy variable that takes a binary number 1, while those foreign banks take the binary number 0.

3.4.2.6 Dummy Variable for Bank Classification

To account for the effects of bank classification dummy variable, sampled banks are categorized into non-commercial and commercial banks. Banks that are commercial represented by a dummy variable that takes a binary number 1, while those non-commercial banks take the binary number 0.

Table 3.1: Variables Measurement as Adopted in Various Literature Reviewed

DEPENDENT VARIABLE		
Variable	**Measurement**	**Related literature**
• Bank Capitalization ratio (BCR)	Ratio of total equity to total assets	Abbas et al. (2021); Abdulhamid et al. (2019); Baselga-Pascual et al. (2015); Chinn and Ito (2006); Cho et al. (2014); Farooq et al. (2018); Matemilola et al. (2013); Philip et al. (2014); Vithessonthi (2014b)
INDEPENDENT KEY VARIABLES		
Financial sector development		
• Banking sector development (BSD)	Ratio of domestic credit provided by banks to private enterprises as a percentage of GDP	Abbas et al. (2021); Abdulhamid et al. (2019); Beck et.al. (2008); Etudaiye-Muhtar (2016); Etudaiye-Muhtar et al. (2017); Farooq et al. (2018); Ozili (2018); Tran and Nguyen (2020); Vithessonthi (2014a, 2014b); Vithessonthi and Tongurai (2016); Wang and Luo (2019)
• Stock market development (SMD)	Ratio of value of traded shares for a period to average market capitalization for the same period (stock market turnover ratio)	Chinn and Ito (2006); Etudaiye-muhtar (2016); Etudaiye-Muhtar et al. (2017); Kapaya (2021); Tran and Nguyen (2020); Wang and Luo (2019)
CONTROL VARIABLES		
Bank-specific factors		
• Profitability (PROF)	Return on asset (ROA)	Abbas and Masood (2020); Abbas et al. (2021); Abdulhamid et al. (2019); Ahmad et al. (2008); Brei and Gambacorta (2016); Jokipii and Milne (2008); Philip et al. (2014); Tran and Nguyen (2020); Wang and Luo (2019)
• Bank size (BS)	Natural logarithm of Bank total asset	Abbas et al. (2021); Abdulhamid et al. (2019); Alı et al. (2022); Brei and Gambacorta (2016); Farooq et al. (2018); Ozili (2018); Tran and Nguyen (2020); Wang and Luo (2019)
Non-bank specific factors (Macroeconomic)		
• Inflation (INF)	Annual rate of change of consumer price index	Abbas et al. (2021); Abdulhamid et al. (2019); Alı et al. (2022); Baselga-Pascual et al. (2015); Fonseca and Gonzalez (2010); Gropp and Heider (2010); Philip et al. (2014)

Variable	Measurement	Related literature
• Economic growth rate (EG)	Annual percentage growth rate of GDP	Abdulhamid et al. (2019); Baselga-Pascual et al. (2015); Etudaiye-Muhtar and Abdul-Baki (2020); Gropp and Heider (2010); Philip et al. (2014)
Banks status factors		
• Banks ownership status (DOS)	Dummy variable (binary number 1 for private banks and 0 for Government-owned banks)	Cho et al. (2014); Etudaiye-Muhtar (2016); Philip et al. (2014)
• Country of originality of banks (DCO)	Dummy variable (binary number 1 for local banks and 0 for foreign banks)	Cho et al. (2014); Etudaiye-Muhtar (2016); Philip et al. (2014)
Variable	**Measurement**	**Related literature**
CONTROL VARIABLES		
Dummy variable for bank classification		
• Banks classification	Dummy variable (binary number 1 for commercial banks and 0 for non-commercial banks)	Cho et al. (2014); Etudaiye-Muhtar (2016); Philip et al. (2014); Antoniou et al. (2008)

Source: Review of related literature in chapter two

3.4.3 Variable Descriptions for Bank Speed of Adjustment to Target Capitalization Ratio

The variables that impact how quickly banks adjust to their target capitalization level were grouped by the researcher into three primary groups in this study. These groups are, Institutional features variables, macroeconomic variables (inflation and GDP growth) and bank-specific variables illustrated by bank size and bank profitability. In considering the rate at which banks alter their capitalization ratios to meet their targets, several scholars have looked into different factors and have produced varying conclusions. But most of them have investigated some variables that do not form part of this study, for instance, De Jonghe and Oztekin (2015) investigated how strict capitalization ratio requirements, better supervisory monitoring, and developed capital markets influence the speed of the adjustment of bank capitalization rate to the target ratio. Also, Mohanty and Mahakud (2019) investigated the influence of net interest margin, loan to asset ratio together with regulatory pressure on the rebalancing speed of bank capital to the required capitalization ratio. Some literature has examined variables that are the main explanatory variables of interest in this study. These literatures examined the variables in three distinct capital measures which are EquityCap which measures the ratio of total equity over unweighted total assets, Tier1Cap which evaluates the ratio of Tier 1 capital over the total risk-weighted assets, TotalCap which assesses the ratio of the total capital of the bank (Tier 1 + Tier 2) over total risk-weighted assets.

Due to time constraints and the limitation of the objective of this study, the researcher used a normal capitalization ratio, taking the form of equity over the

unweighted asset. The ratio is also known as EquityCap. This ratio is also applied in the work of Vithessonthi and Tongurai (2016); Vithessonthi (2014b); Abbas et al. (2021); Öztekin and Flannery (2012); Rime (2001); Gropp and Heider (2010) when they investigated the effect of the above variables on the adjustment pace towards desired bank capitalization rate. The target capitalization ratio's rebalancing speed based on the three capital measures as reported in different literature is summarized in Table 3.2. Additionally, the researcher's expectations for Tanzania Bank's target capitalization ratio adjustment speed are specified in Table 3.2.

Table 3.2: Variables Descriptions of Adjustment Speed to Target Bank Capitalization

Parameters	Expectations for unweighted capital	EquityCap	Tier1 to risk weighted asset	Total capital to risk weighted asset	Related literatures
<u>Institution Variables</u>					
Government-owned Bank/ Private Bank	High/Low	Nil Low/High,			Philip et al. (2014) Memmel and Raupach (2010)
				High/Low	Philip et al. (2014)
		High/Low			Mohanty and Mahakud (2019)
				High/Low	Abbas et al. (2021)
Foreign Banks/Local Bank	Low/High			Low/High	Philip et al. (2014)
		Nil	Nil	Nil	Philip et al. (2014)
				Low/High	Abbas et al. (2021)
Listed Banks/Non-Listed Bank	Low/High	Low/High			Philip et al. (2014)
<u>Macroeconomic Variables.</u>					
GDP Growth/GDP Decline	High/Low	High/Low Nil	Low/High Nil	Low/High Nil	Philip et al. (2014) De Jonghe and Oztekin's (2013)
High Inflation/Low inflation	High/Low	High/Low High/Low	High/Low	High/Low	Philip et al. (2014) De Jonghe and Oztekin's (2013)
<u>Bank-Specific Variables.</u>					
Large Banks/Smaller Banks	Low/High			Low/High	Philip et al. (2014)
			Low/High		Philip et al. (2014)

			High/Low		De Jonghe and Oztekin's (2015)
		Low/High			Bakkar, De Jonghe, and Tarazi (2019)
		Low/High	Low/High	Low/High	Abbas et al. (2021)
		Low/High	Low/High	Low/High	Abbas and Masood (2020)
High profitability/ Low Profitability	High/Low	High/Low		Low/High	Philip et al. 2014
		High/Low			Abbas and Masood (2020)
		High/Low		Low/High	Flannery and Rangan (2008, 2006)
		High/Low			Huang and Ritter (2009)
		High/Low		Low/High	Fonseca and Gonzalez (2010)
		High/Low			De Jonghe and Oztekin (2015)

Nil represent no significant effect of adjustment speed to target capitalization ratio. While Blank space represent non-investigated capitalization measure.

Source: Author's construction 2022

3.5   Ethical Consideration Issues

This study upholds the following ethical principles of researching to ensure the research is conducted in acceptable behavior.

i)   Plagiarism: The study ensured it avoided stealing content from the work of other writers and researchers, and whenever someone's works or content has been used in the study, it was paraphrased and referenced.

ii)   Ethics in statistics: Unethical behavior in statistics might arise at any point from the data collection process to the data interpretation stage. This study ensured no manipulation of data, meaning that the study was conducted objectively instead of projecting the researcher's desire.

iii)   Acknowledgement: The study ensured it protects and thanks all people who helped with the research, including anyone who provided data, intellectual assistance, technical help, or special equipment or materials. Researcher assured them that the material provided by them was used in this research only and not any other intentions. Furthermore, the works of other authors used in any part of the research were acknowledged by the referencing system.

3.6   Chapter Three Summary

Chapter three of this thesis describes and provides justifications of the data used, variable choices, data analysis method, model specification and estimation techniques employed in providing solution to the research questions. Although, there are several techniques that are suitable to estimate the dynamic panel model, the present study applied the GMM technique of the two-step system because of many advantages it has compared to other techniques. Specifically, as regard to the

characteristics of set of data involved in the thesis. In additions, the chapter confirm validity of the estimation technique using various post estimation test and robustness test performed. Chapter four provides the empirical findings and detail discussions of the results generated from the GMM estimations.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Overview

To present the findings and provide discussion of the results, chapter four is categorized into eight main sections. Section 1 provides an overview of the chapter, section 2 presents the outcome of the descriptive statistics, section 3 presents the correlation analysis and section 4 presents the outcome of the unit-roots test. Furthermore, section 5 highlights the regression estimates resulting from the two-step system GMM estimate in addition to the discussion of findings for the thesis. Moreover, section 6 provides the output of the test performed after estimation (post-estimation test) to confirm the regression specification validity, while the robustness of earlier presented estimates in section 5 is checked in section 7. Section 8 which is the last part of chapter four provides chapter summary.

4.2 Descriptive Statistics

The panel data set was obtained from published audited financial statements and reports of individual banks for the period 2012 to 2021 representing 28 banks licensed by the Bank of Tanzania (BOT) to carry on banking business. Figure 4.1 presents the percentage distribution of the banks according to the country of origin and it is perceived that foreign banks take the highest number of the banks in the study, representing 57% of the overall sample size. The local banks representing the rest of 43%. Based on the distribution of the banks used in this study, foreign banks may be driving the results. Hence, as mentioned in Subsection 3.3.8.2 of chapter

three, a dummy variable (DCO) is used in the Equations to observe the degree level of the effects of financial sector development on bank capitalization ratio for foreign banks is somehow different from the local banks. This was indicated by a significant coefficient of the dummy variable whether there is a significant difference in the effect of financial sector development on bank capitalization ratio between foreign and local banks.
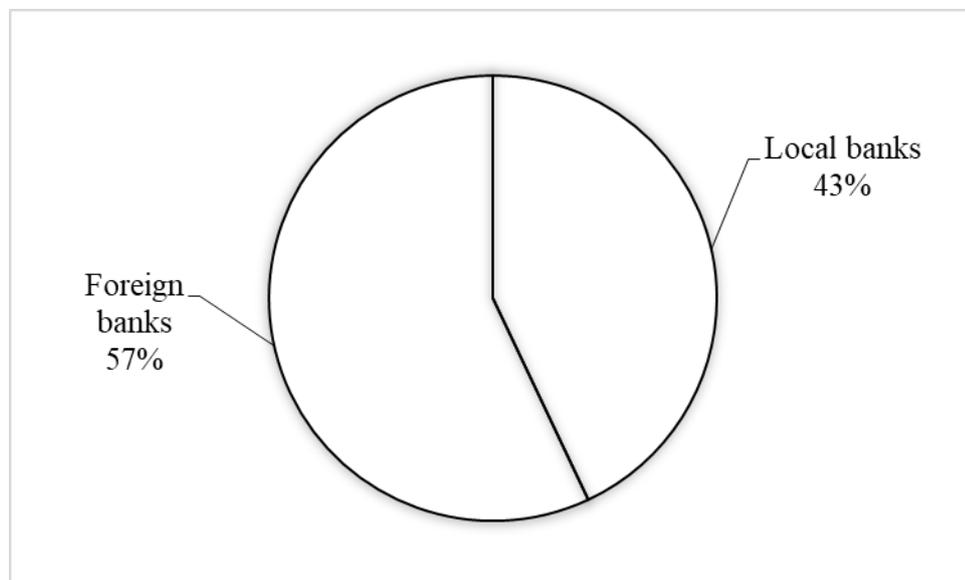
Figure 4.1: Distribution of Banks According to Country of Originality
Source: Author's computation of bank data obtained from BOT

Another distribution of the total sampled banks employed in this study is according to the ownership structure of the banks so as to test the declaration of the BOT (2021), that shows private banks outnumber the Government-owned banks in Tanzania banking sector as presented in Figure 4.2.
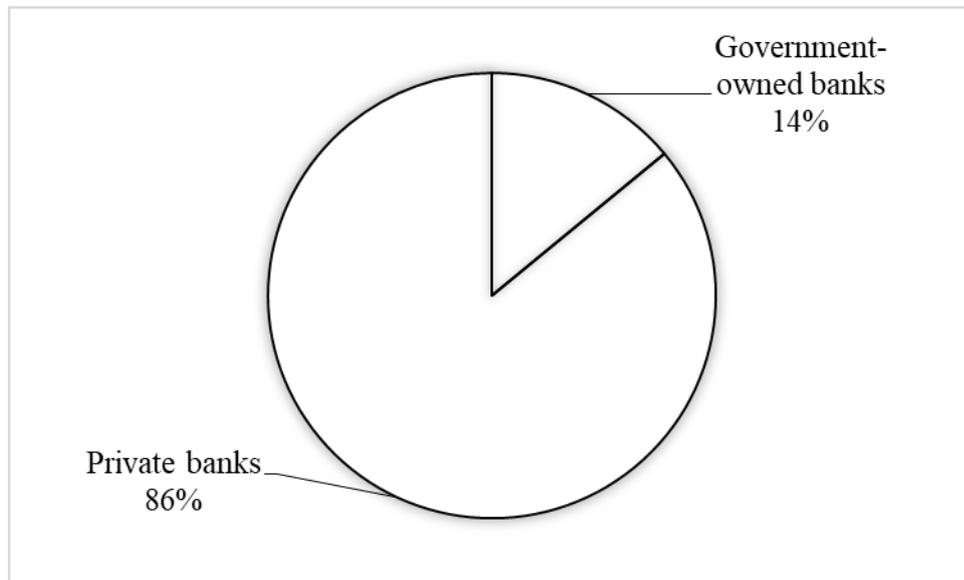
Figure 4.2: Distribution of Banks According to Ownership Status
Source: Author's computation of bank data obtained from BOT

Similar to the preceding paragraph, a dummy variable (DOS) was introduced in the regression specification model to determine the effects of the ownership status of the selected banks in this study. It is used to determine whether there is presence of significant variation between the influence of the financial sector development on the bank capitalization ratio in Tanzania for the private and Government-owned banks.

Tables 4.1 provides the results in favor of descriptive statistics analysis performed on the data set for the independent and dependent variables. First, let's look at the bank capitalization ratio (BCR), which is the dependent variable. Its mean value is 15.77%. The total minimum bank capitalization ratio of 12% set by BOT in the Banking Capital Adequacy Regulations of 2023 appears to be less than the mean ratio identified in the present study. It shows that on average, Tanzanian banks operate above the minimum statutory capitalization ratio requirement by 3.77%. This

can be due to close supervision by the authority (BOT). Based on the study definition given to the bank capitalization ratio (equity over total assets), the values imply that banks in the sample have too much smaller amount of equity than assets value, this is normal for many banks in the banking industry. However this indicates the existence of outlier effects, because banks assets exceed equity capital approximately six times. Nevertheless, the study performed robust regression analysis for the determined coefficient of the estimations as described in chapter three to avoid the prospective impact of outliers caused by the low rate of bank capitalization.

The banking sector development (BSD) was assessed in terms of domestic credit given by banks to private businesses as a percentage of GDP. The determined value of the mean of 12.98% is low compared with the domestic credit given by banks to private business as a percentage of GDP of some developed and emerging economies nations as reported in chapter one. Meaning that the banking industry in Tanzania has little contribution to influencing the capitalization rate of the bank when making comparison with the banks such as those used in the study of Abdulhamid et al. (2019). In addition, the stock market development (SMD) measured as stock market turnover ratio seems to have an average mean of 2.53% with maximum value of 3.67%. The estimated mean of the stock market turnover ratio is still low compared to that reported in Etudaiye-Muhtar (2016) for a sample of some emerging and frontier economies nations, as well as for developed countries which reported a mean value above 61% as presented in chapter one. The higher the value of stock market

turnover ratio indicates a higher probability of trading shares in the stock market, hence, resulting in high liquidity in the market.

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
BCR	280	15.77	14.25	6.52	10.91	51.69
BS	280	12.84	12.84	1.35	9.31	15.98
ROA	280	0.72	0.69	0.02	-2.41	6.20
BSD	280	12.98	12.85	0.64	12.10	14.47
SMD	280	2.53	2.87	1.11	0.51	3.67
EG	280	5.54	5.98	1.48	2.00	6.87
INF	280	6.00	5.25	3.62	3.29	16.00

Note: BCR represents bank capitalization ratio, BS-bank size, ROA-Return on assets, BSD-banking sector development, SMD-stock market development, EG-economic growth and INF represents inflation. All these variables are as measured in Table 3.1

Nevertheless, the standard deviation of all variables are low compared to the reported mean, which indicates the data are close to the mean. Therefore, the data are more precise for analysis. In addition, the maximum and minimum range of values of all variables are found to be reasonable in comparison to the mean. Moreover, the ratio of mean over median is approximately one, which indicates the data are normally distributed. As a result, the study's normality of distribution about the results in Table 4.1 has been confirmed. Variables are hence appropriate for doing analysis. The explanatory variables of interest were the stock market development variable (SMD) and banking sector development variable (BSD). The stock market development which is measured as the stock market turnover ratio has a mean ratio of 2.53%, which is less than that of the banking sector development variable (BSD), which is measured as the domestic credit given by banks to private business expressed in a percentage of Gross Domestic Products with a mean ratio of 12.98%. This indicates

that the credit to private business by banks is used more as a source of external finance to private businesses including banks than equity from stock market by the sampled banks, as a result enables banks to improve their capitalization ratio.

4.3 Analysis of Pairwise Correlation

The pairwise association among the variables in the regression models is investigated before introducing the regression Equations for estimating the coefficient. This is performed through analysis of bivariate correlation coefficients that enables to determination of the strength and the directions of the correlation between two variables without involving other variables. Furthermore, this helps to identify the presence or absence of a multi-collinearity effect among independent variables in the model.

The results from the pairwise correlation analysis are reported in Tables 4.2 and 4.3 for the period (2012 to 2021). Table 4.2 is divided into two categories, category 1 and category 2. Category 1 provides the results of the correlation analysis between the capitalization ratio and bank-specific variables, while category 2 provides the correlation result between the bank capitalization ratios and domestic credit given by banks to private business in a percentage of GDP, the stock market turnover ratio, macroeconomic factors (economic growth and inflation) that influences the bank capitalization rate. Table 4.3 provides the coefficient value of correlation analysis between regressors excluding the response variables.

Category 1 in Table 4.2 shows that the coefficients value of correlation reported for the bank-specific variables and bank capitalization rate is low but statistically

significant. The low coefficient values suggest the existence of a correlation between the independent and dependent variables that may not cause spurious estimation of the regression equations because the correlation is between dependent and independent variables. In terms of bank-specific variables, bank size (BS) which is measured as a log of total assets possesses a negative correlation value with the bank capitalization ratio, and is significant at 5% level. Return on assets (ROA) has a negative correlation with the bank capitalization ratio at a significant level of 1%.

Category 2 in Table 4.2 reports the correlation coefficient value between the bank capitalization and non-bank-specific independent variables of the study. The results of correlation analysis were observed to be very similar to that in category 1 of Table 4.2, this implies that the coefficient value of correlation is low. Hence, there are existence of correlation between dependent and independent variables. The key independent variables of interest of the study, i.e. domestic credit given by banks to private business measured in a percentage of GDP have negative and significant correlation coefficients at 1% level with bank capitalization ratio whilst the stock market turnover ratio has very low negative and insignificant correlation coefficients value with bank capitalization ratio. The control variables of the economic growth and the inflation rate also report low negative correlation coefficient values but significant at 1% level and 5% level respectively.

Table 4.2: Pairwise Correlation Between Bank Capitalization Ratio and Regressors

Category 1
Bank capitalization ratio and bank-specific variables

Variables	BCR	BS	ROA
BCR	1.000	-0.153**	0.015***

Category 2
Bank capitalization ratio and non-bank-specific variables

Variables	BCR	BSD	SMD	EG	INF
BCR	1.000	0.031***	0.006	-0.036***	-0.008**

Note: *** indicate significant level at 1% ($p<0.01$), ** indicate significant level at 5% ($p<0.05$). BCR represents bank capitalization ratio, BS-bank size, ROA-Return on assets, BSD-banking sector development, SMD-stock market development, EG-economic growth and INF represents inflation.

Table 4.3: Pairwise Correlation Between Regressors

Variables	BS	ROA	BSD	SMD	EG	INF
BS	1.000					
ROA	0.171***	1.000				
BSD	-0.001	0.097	1.000			
SMD	0.019	0.059	0.709***	1.000		
EG	-0.049	0.166***	0.241***	0.234***	1.000	
INF	-0.170***	0.114*	-0.032	-0.237***	0.036	1.000

Note: *** indicate significant level at 1% ($p<0.01$), ** indicate significant level at 5% ($p<0.05$). BCR represents bank capitalization ratio, BS-bank size, ROA-Return on assets, BSD-banking sector development, SMD-stock market development, EG-economic growth and INF represents inflation.

Table 4.3 reports the pairwise correlation analysis among the regressors indicates that, all the independent variables have low coefficient values of correlation except for domestic credit given by banks to private business measured in a percentage of GDP and the stock market turnover ratio, which reports a positive coefficient value of 0.709. Hence, indicating the presence of multicollinearity problem. Nevertheless, despite the two variables having multicollinearity problem, they do not result into

spurious estimation because the two variables are used in the separate regression specification model.

A summary of the presentation of pairwise correlation examination for dependent variable and independent variables in tables 4.2 and between the independent variables in table 4.3 indicates that the value of correlation coefficients is low (below 0.3). According to Ratner (2009), correlation coefficients between 0 to 0.3 and 0 to −0.3 signify a weak or low positive and negative relationship respectively. This weak or low relationship indicates the absence of multicollinearity which may be an issue during the estimations of Equations. All variables whose pairwise correlation coefficient values reported above 0.7 are strongly correlated (Schober, Boer & Schwarte, 2018). Despite the correlation between BSD and SMD variables depicted above 0.7. The multicollinearity problem has no effect because these two variables are used in separate regression specification models as addressed in the prior paragraph.

4.4   Unit Root Test

The results obtained from the unit root test is reported in Table 4.4. The Fisher unit root test conducted according to the Phillips-Perron test because it is more robust to auto- correlation problem compared to the augmented Dickey-Fuller test. The test reports four important test statistics known as inverse chi-squared P, inverse logit t L*, modified inverse chi-squared PM and inverse normal Z. Even though, all the mentioned statistics test rejects the null hypotheses, (Ho: All panels contain unit roots), the results of the inverse normal Z is presented only because it is suitable for

finite or infinite number of panels. Hence, it provides powerful results. The observable results in Table 4.4 shows that variables in the set of data are stationary at level and at first-differenced. Meaning that the set of data in the study are free from unit roots problem, therefore it will not result into the spurious estimation of the coefficient.

Table 4.4: Fisher Panel Unit Roots Test at Levels and at First-Difference

Fisher test (based on the Phillips-Perron tests)		
Variables	**Statistic**	**p-value**
BCR	-10.499	0.000**
BS	-3.353	0.000***
ROA	-3.386	0.000***
BSD	-5.199	0.000**
SMD	-13.865	0.000***
EG	-18.734	0.000**
INF	-42.998	0.000***

Note: *** Shows the rejection of the null hypothesis that the panel dataset contains unit roots (non-stationary) at 1% level while the ** shows the rejection of the null hypothesis that the panel dataset contain unit roots at first-difference. The tests are performed using Stata 15.0. All variables were measured as detailed in Table 3.1. BCR is bank capitalization ratio, BS denotes bank size, ROA denotes Return on assets, BSD denotes banking sector development, SMD denotes stock market development, EG denotes economic growth and INF represents inflation.

4.5   System GMM Regression Results and Discussion

The results obtained from pairwise correlation analysis reported in Table 4.2 and Table 4.3 indicated that there is no multicollinearity problem among the variables under study. Hence, it enabled the determination of the direction and strength of the correlation between the independent variables and the dependent variable. In addition, the result reported in Table 4.4 revealed that the data are stationary, which means they are free from unit-roots issue. Therefore, the results provide the underlying basis to run the regression specification and estimate the coefficient value

of the regression. Recalling in chapter three, subsection 3.3.8.3, it was identified that even the use of pooled ordinary least squares or generalized least squares analysis method for fixed or random effects to perform estimation of the coefficients in the regression specification model may result in biased estimates. This is due to the common issues such as serial correlation, unobserved heterogeneity, and endogeneity involved in capitalization ratio studies. For that reason, the two-step system generalized method of moments (GMM) estimate is used to give the solution to the research questions.

The detail information of the study findings generated from the two-step system generalized method of moments estimation together with the discussions of the results are presented in Subsections (4.5.1 to 4.5.3) based on the research objectives. The discussion of the results is performed based on the reviewed empirical and theoretical literature in chapter two to provide important justification and arguments which incorporate and generalize the results in a very meaningful manner. This is to ensure the foundations of the thesis are upheld without omitting essential and relevant information of the thesis. Hence, the Subsections are classified into two main aspects. The first aspect (a) reports the empirical findings of the two-step system generalized method of moments and the second aspect (b) provide discussion and justification of the results in relation to the existing literature and research objective.

4.5.1 Effects of Banking Sector Development on Bank Capitalization Ratio

a) **Presentation of Findings**

Objective number one of the study intended to assess the degree to which banking sector development influences bank capitalization rate in Tanzania. The two-step system generalized method of moments is used to estimate the regression Equation (3.1) as shown in chapter three. The results of the regression for the study's response variable measured by the bank capitalization ratio (BCR), are presented in Table 4.5. Based on Table 4.5, it was noted that on average the banking sector development (BSD), which is one of the major independent variable in this study has a positive value of the coefficient of 0.241 and is significant at the 10% level for bank capitalization. This indicates that banking sector development which is measured by domestic credit given by banks to private business in a percentage of GDP in the United Republic of Tanzania possesses a positive influence on bank capitalization measured by equity to total assets ratio.

In addition, the employed dummy variables for the category of local and foreign banks and that of the category of the private and Government-owned banks are noticed statistically insignificant. Table 4.5 indicates the coefficient value related to bank ownership status dummy variable (DOS) is exactly positive 0.019 and that related to country of origin of the banks (DCO) is exactly negative 0.005 for bank capitalization. Meaning that banking sector development when measured in terms of credit given to the private business by banks in a percentage of GDP has the same impact on capitalization for both banks grouped as local and foreign banks in addition to banks grouped in terms of private and Government-owned banks.

Consequently, this suggest no further separate regression Equations for these categories of banks is needed (local and foreign; private and Government-owned banks).

Table 4.5: Two-Step System GMM Regression Estimation for the Effect of Banking Sector Development on Bank Capitalization Ratio

BCR	Coef.	St.Err.	p-value	Sig
Lagged dependent variable				
$BCR_{i,t-1}$	0.588	0.108	0.000	***
Banking sector development variable				
BSD	0.241	0.133	0.080	*
Bank-specific variables				
BS	-0.270	0.695	0.000	***
ROA	0.188	0.107	0.090	*
Macroeconomic variables				
EG	-0.148	0.088	0.106	
INF	-0.292	0.143	0.051	*
Dummy variables				
DOS	0.019	0.008	0.369	
DCO	-0.005	0.037	0.491	
Test statistics				
(AR1)				-2.57
0.010				
(AR2)				-1.14
0.256				
Hansen test				17.76
0.187				
Wald Chi^2				5.34
0.000				
Number of groups in the study		28		
Number of observations in the study		252		
Number of instruments used in the study		19		

Note: Table 4.5 reports the results of equation (3.1) using the two-step system GMM estimation method employed STATA 15.0, the coefficients and standard errors that are robust to heteroskedasticity in column wise. The dependent variable is BCR, $BCR_{i,t-1}$ is lagged dependent variable, BSD represents banking sector development, ROA used for Return on assets, while (EG) denotes Economic growth, (INF) denotes inflation, (DOS) stands for dummy variable for ownership status, (BS) stands for bank size, and (DCO) denotes dummy variable for country of origin of bank. These variables are defined in Table 3.1 of the chapter three. The table also include

Arellano-Bond AR1 and AR2 in addition to Wald chi-square tests statistics and the Hansen test statistics for over-identifying restrictions, which evaluate the overall validity of the instruments. P-values for these tests are provided. Significance levels are indicated by *, **, and ***, representing 10%, 5%, and 1%, respectively. Additionally, the table reports the number of groups, instruments used, and observations.

In terms of bank-specific variables reported in Table 4.5, bank size (BS) is statistically significant at a significant level of 1% and possesses negative coefficients value of -0.270 while return on asset (ROA) is significant at 10% significant level for capitalization ratio of bank with a positive coefficient value 0.188. On the other hand, regarding macroeconomic variables that influence bank capitalization ratio, there is insignificant negative effect for economic growth on bank capitalization with a coefficient of -0.148 while inflation represents a significant negative value of coefficient which is -0.292 at 10% significant value for the bank capitalization. Following the results in Table 4.5, the second aspect of subsection 4.5.1 discusses the implication of findings with reviewed literature.

b)   Implication of Findings

 The first research question employed in assessing objective 1 of the study needed to understand the degree to which the improvement in the banking sector defined as domestic credit given by banks to private business in a percentage of the Gross Domestic Product influences bank capitalization ratio in the United Republic of Tanzania. The existing theoretical literature including capital buffer theory depicts that, in frontier economies countries that face challenges such as the deregulation in the interest rate and market information asymmetry, probably bank default rate is

very high. The improvement in the banking industry in terms of credit given to private business can have negative impact to the bank capitalization ratio in these countries. This is the reason for why capital buffer theory requires banks to keep enough extra balance of capital to meet required capitalization ratio when banks face financial distress. These challenges according to the Vithessonthi (2014a, 2014b) cause a reduction of the bank capitalization ratio if no control is taken to increase interest earnings that are related to the offering of enough credit facilities to private business together with the elimination of market information asymmetry problem. The effects of the banking sector development measured by domestic credit given by banks to private business on bank capitalization ratio is as suggested by capital buffer theory. In addition, it is the same as the findings presented in Table 4.5. Hence, support of the theory is noted in the present study. This is indicated by the direct and significant coefficient estimate of the substitute for banking sector development (BSD) in Table 4.5.

However, the positive influence on bank capitalization is also supported by the results of Abdulhamid et al. (2019) and Etudaiye-Muhtar et al. (2017) who argued that banking sector reforms enhance the capitalization ratio of banks, particularly when the reforms seeking to deregulate interest rate, improve credit allocation, deregulating ceiling for the credit given by banks. They hold that the reforms boost the lending capacity of the banks which increases the interest-earning that also results in the growth of the capitalization ratio of the banks. In a similar proposition, Poghosyan and Čihak (2011); Wang and Luo (2019) noticed that banking industry development when there is transparency and easy availability of financial

information would positively influence bank capitalization ratio, because it improves bank lending to the private business. However, the positive correlation may be weakened if the country's economic condition is not good. Back to chapter one of the thesis on some of the important measures that countries take in the financial sector development in terms of banking sectors development comprising elimination of credit allocation to specific sectors, deregulation of interest rates and other measures adopted to strengthen supervision and governance practice. It is expected that the restrictions encountered in the provision of credit facilities by banks as a source of finance to private business are eliminated so that credit services attainability increases and private business access to credit becomes easier as a result it enables banks to improve capitalization ratio.

As shown in Table 4.5, it is observed and consistent with expectations that bank capitalization rises with the improvement of the banking industry. This could be the outcome of banks being able to enhance their earning capacity from traditional banking activities (interest), by expanding their lending facilities to private business. Furthermore, this could also be a result of enhanced bank regulations and the activities of supervision. However, the findings of this research contradict the results of Vithessonthi (2014a), who found that the growth of the banking industry does not influence the rate of bank capitalization. Even though the requirement of objective number 1 of the study is to assess the influence of the banking industry improvement on bank capitalization ratio. The findings of the GMM estimation indicate that control variables of bank-specific and macroeconomic variables are also crucial determinants of bank capitalization rate as observed in prior literatures. The

important effects of these variables in the present study however is discussed hereunder.

Following the bank capitalization ratio definition given in this study, this is the ratio of total equity over total assets. Bank size, return on assets (ROA), economic growth, and inflation are essential determinants. The negative statistics coefficient estimate of bank size (BS) of approximately -0.270 which is significant at the significant level of 1% recommends that, banks that possess a huge value of assets holding low ratio of capitalization because being giant in the industry serve as an advantage for these banks to easy improving the capitalization ratio using the process of issuing new equity shares when needed to operate with required regulatory capitalization ratio. In addition, being too big for these banks enables them to get financial support from the Central Government when experiences financial distress to avoid disturbance in the economic stability of the country. This result is the same as the too-big-to fail hypotheses, which is in addition consistent with prior studies of Philip et al. (2014); Yu (2000); Brei and Gambacorta (2016). Moreover, support of the results in the pecking order theory is also reported in the findings presented in Table 4.5 through the statistics coefficient estimate and the degree of significance of return on assets. The positive impact of 0.188 at 10% significance level implies that ROA increases earnings retained in the business to continuously raise bank capitalization. According to Abbas and Masood (2020), the proxy for bank profitability which is ROA, represents profit obtained through utilizing assets in a financial year that can be fully or partially retained to increase the capitalization ratio of banks. Moreover, gross

domestic product as the macroeconomic factor shows insignificant effects on bank capitalization ratio.

In addition to the effect of macroeconomic factors. At the 10% significant level, inflation has a considerable negative statistics coefficient value of -0.292. The finance concept maintains that a high rate of inflation in the economy inspires banks to hold a high leverage rate to benefit from tax deductions, which results in banks maintaining a low capitalization ratio (Frank & Goyal, 2009). The result of this study contradicts that of Demirgüç-Kunt and Maksimovic (1999), who propose that a country's inflation as a means of controlling the value of local currency stability in a long-term debt instrument, therefore a low rate of inflation may discourage banks from capitalization by encouraging them to use debt contracts to expand investment. The results obtained by Philip et al. (2014) support this argument. The banks in the entire sample were not divided into two samples consisting of local and foreign banks in addition to private and Government-owned banks because they seem to influence the same bank capitalization ratio due to the insignificance effects of the dummy variables for the country of origin of the banks together with ownership features of banks as presented in Table 4.5.

4.5.2 Effects of Stock Market Development on Bank Capitalization Ratio

a)   **Presentation of Findings**

Objective number 2 of the study intended to determine the effects of stock market development on the capitalization ratio of banks in Tanzania. To achieve the desired

objective, a well customized regression model of Equation 3.1 was employed to answer research question 2, in which the stock market development (SMD) variable substituted the banking sector development (BSD) variable as stated in Equation 3.2 for the same definitions of bank capitalization ratio (BCR). Empirical findings for the bank capitalization are reported in Table 4.6. The coefficient estimated for the key explanatory variable in the regression Equation 3.2 of the study, stock market development measured as the stock market turnover ratio, though significance at 1% level, it is also positive (0.126). This provides answers to the research question when bank capitalization rate is defined as the ratio of total equity over total assets. The degree of significance of bank-specific variables is the same for bank capitalization. However, their coefficient signs differ from one another. For example, the coefficient estimated value of the bank size is significant at 10% level and negative for bank capitalization (-0.291). The return on assets (ROA) for the banks, though significant at a 10% significant level for the ratio of bank capitalization has a positive sign value of (0.205).

Regarding the macroeconomic variables, economic growth (EG) measured as GDP growth is significant at a 5% level and negative for bank capitalization rate of (-0.063). Inflation (INF) which is measured as the consumer price index also seems to be significant at a 1% significance level and has a negative sign coefficient value of (-0.368). The dummy variables (DOS and DCO) still does not have significant effects on the bank capitalization ratio measured by the ratio of the total equity over total assets.

Table 4.6: Two-Step System GMM Regression Estimation for the Effect of Stock Market Development on Bank Capitalization Ratio

BCR	Coef.	St.Err.	p-value	Sig
Lagged dependent variable				
$BCR_{i,t-1}$	0.479	0.101	0.000	***
Banking sector development variable				
SMD	0.126	0.024	0.000	***
Bank-specific variables				
BS	-0.291	0.622	0.057	*
ROA	0.205	0.109	0.070	*
Macroeconomic variables				
EG	-0.063	0.078	0.114	
INF	-0.368	0.151	0.038	**
Dummy variables				
DOS	0.007	0.008	0.297	
DCO	-0.002	0.015	0.396	
Test statistics				
(AR1)				-2.80
0.005				
(AR2)				-1.20
0.229				
Hansen test				17.15
0.103				
Wald Chi^2				7.29
0.000				
Number of groups in the study		28		
Number of the observations in the study		252		
Number of instruments used in the study		19		

Note: The Table 4.6 reports the results of equation (3.2) using the two-step system GMM estimation method employed STATA 15.0, the coefficients and standard errors that are robust to heteroskedasticity in column wise. The dependent variable is BCR, $BCR_{i,t-1}$ is lagged dependent variable, SMD represents stock market development, ROA used for Return on assets, while (EG) denotes Economic growth, (INF) denotes inflation, (DOS) stands for dummy variable for ownership status, (BS) stands for bank size, and (DCO) denotes dummy variable for country of origin of banks. These variables are defined in Table 3.1 of the chapter three. The table also include Arellano-Bond AR1 and AR2 in addition to Wald chi-square tests statistics and the Hansen test statistics for over-identifying restrictions, which evaluate the overall validity of the instruments. P-values for these tests are provided. Significance levels are indicated by *, **, and ***, representing 10%, 5%, and 1%, respectively. Additionally, the table reports the number of groups, instruments used, and observations.

b)   **Implication of the Findings**

The second objective sought to determine to what extent the stock market development represented by trading activities of shares in stock market (stock market turnover rate) affect capitalization ratio of banks in the United Republic of Tanzania. As presented in Table 4.6, the stock market liquidity ratio as sometimes known as the stock market turnover rate is positively influencing the ratio of bank capitalization with a coefficient value of 0.126 at a significant level of 1%. This positive effect is supported by the theory of financial intermediation that the stock market development reduces information asymmetry problems by minimizing adverse selection and moral hazard risk (Grossman & Stiglitz, 1980). If this occurs, based on Demirgüç-Kunt and Maksimovic (1999) existing shareholders and potential investors are willing to increase their holdings and provide new equity capital to the banks respectively. This resulted into increasing the stock market liquidity because of the frequent trading of shares in the stock exchange market. Consequently, banks can raise more capital from the stock market which leads to an increase bank capitalization ratio. In addition, the results contradict with capital structure irrelevancy theory which argues that the use of equity to finance projects does not increase capitalization.

For the selected banks in the present study, the same argument as noted in the previous paragraph may serve for the results in Table 4.6, because among the challenges faced by banks in accessing external capital in the stock markets in Tanzania as a means of increasing capitalization ratio include information asymmetry problems, transaction cost and illiquidity of the stock market. These

automatically limit banks' access to external finance from the market for improving the capitalization ratio. In the efforts made to improve equity finance accessibility, Tanzania implemented stock market reforms as discussed in chapter one. These reforms to some extent enhanced market trading activities as shown in Table 1.3 for the value of stock turnover for the period of the thesis. Hence, despite the stock market in Tanzania being small, it may be concluded that the more conducive environment maintained for eliminating some challenges in the stock markets that resist banks' ability to raise equity finance as an alternative to increase bank capitalization ratio, the more stock market develop through increasing stock market turnover or liquidity. This causes the growth in the bank capitalization ratio. This result is supported by that obtained by Tran and Nguyen (2020) for a selected sample of ninety five listed banks of six Asian countries but contradict with capital structure irrelevancy theory.

Table 4.6 presents the findings relating to the improvement in bank capitalization ratio after substituting banking sector development for stock market development in the model is that, the improvement seems to support the results observed in Table 4.5 for banking sector development. Following this finding, it may perhaps be that the increase in bank capitalization in Table 4.6 is due to the bank increasing the use of equity as an alternative source of raising capital. However, it is also observed that the cost incurred for the adjustment of bank capitalization ratio noted in Table 4.6 is 0.479, which is low when compared to that in Table 4.5 given as 0.588. This indicates low costs of adjustment for stock market development as against banking sector development.

A big comparison of the output presented in Tables 4.5 and 4.6 can be obtained in terms of the coefficient value of variables. For instance, the coefficient value of estimated variables in the Two-step system GMM for the influence of banking industry development on bank capitalization are different in terms of magnitude, but the same in terms of sign when compared with the results of variables in Two- step system Generalized Method of Moments estimate for the influence of stock market development on the ratio of bank capitalization. In terms of significance level, all variables used in the regression Equation report consistence results as shown in the Tables 4.5 and 4.6. The consistency of the findings in terms of significant level may be due to the fact that the stock market and banking sector both represent important external sources of capital in the markets. Hence, developments or reforms in both sectors seek to achieve the same desired results, which leads to easy access to bank external finance to boost the capitalization ratio at high speed and very affordable costs. Based on that, both variables in the two sectors assess to what extent financial sector development influences bank ability to boost capitalization ratio from the markets. The insignificance level for the dummy variables in Table 4.6 implies that the banks classification through local and foreign as well as private and Government-owned banks have no specific impact on the sampled banks in terms of development in the stock market. Following the similarity in the significance level for macroeconomic variables in Table 4.5 and 4.6 and to avoid repetition of the previous reported argument, the discussion and the detail explanation provided in the preceding section 4.5.1 for the Table 4.5 is also useful for the macroeconomic variables in Table 4.6.

4.5.3 The Bank's Speed and Cost of Adjustment to Target Capitalization Ratio

a)　　**Presentation of Findings**

The regression Equation number 3.3 of the study has two uses. First, is applied for the objective number 3 thoughts to investigate banks' speed of rebalancing to target bank capitalization rate in Tanzania. Secondly, is used for objective number 4 thoughts to investigate banks' adjustment cost to required bank capitalization ratio in Tanzania. In other words, all reflect the study's question do Tanzania's banks exhibit a target capitalization ratio process of adjustment? If the answer is yes, then, what is the nature of adjustment speed and cost? The investigation is because of the concept that Tanzania's financial markets are imperfect as noted in chapter one. Though, theoretically the perfect market does exist, but in the real world do not exist. However, the degree level of imperfection is different between nations. Imperfect competitive markets as suggested by Öztekin and Flannery (2012) make banks incur high adjustment costs when re-balancing to capitalization ratio. Therefore, it results in to low pace of adjustment. The results of the model in equations 3.3 used for research questions number 3 and 4 as shown in Table 4.7. Recall from chapter three that the model specifications do not include financial sector development variables which are banking sector development and the stock market development. This is done to determine the effect of bank-specific and other non-bank-specific variables separately on bank capitalization without involving financial sector development variables. The findings reveal that there is existence of a significance and positive speed of rebalancing to the desired bank capitalization ratio (BCR).

Table 4.7: Two-Step System GMM Regression Estimation for the Speed and Cost of Adjustment to Target Bank Capitalization Ratio

BCR	Coef.	St.Err.	p-value	Sig
Lagged dependent variable				
$BCR_{i,t-1}$	0.458	0.065	0.000	***
Bank-specific variables				
BS	-0.710	0.371	0.066	*
ROA	0.162	0.050	0.003	***
Macroeconomic variables				
EG	-0.027	0.066	0.685	
INF	-0.219	0.098	0.034	**
Dummy variables				
DOS	-0.007	0.088	0.663	
DCO	-0.007	0.056	0.725	
Test statistics				
(AR1)				-1.77
0.077				
(AR2)				-1.19
0.236				
Hansen test				20.16
0.266				
Wald Chi^2				7.89
0.000				
Number of groups of the study		28		
Number of observations of the study		252		
Number of instruments used in the study		24		

Note: The Table 4.7 reports the results of equation (3.3) using the two-step system GMM estimation method employed STATA 15.0, the coefficients and standard errors that are robust to heteroskedasticity in column wise. The dependent variable is BCR, $BCR_{i,t-1}$ is lagged dependent variable. Independent variables are ROA which is used for Return on assets, while (EG) denotes Economic growth, (INF) denotes inflation, (DOS) stands for dummy variable for the ownership status, (BS) stands for bank size, and (DCO) denotes dummy variable for the Country of origin of banks. These variables are defined in Table 3.1 of the chapter three. The table also include Arellano-Bond AR1 and AR2 in addition to Wald chi-square tests statistics and the Hansen test statistics for over-identifying restrictions, which evaluate the overall validity of the instruments. P-values for these tests are provided. Significance levels are indicated by *, **, and ***, representing 10%, 5%, and 1%, respectively. Additionally, the table reports the number of groups, instruments used, and observations.

Equation 3.3 of regression specifications model for determination of costs and speed of adjustment enable also investigating the trade-off theory (dynamic version) of capitalization, using the coefficient estimated value of the lagged dependent variable. Hence, as presented in the Table 4.7, the positive coefficient estimated value below 1 which is statistically significant at 1% for the lagged dependent variables ($BCR_{i,t-1}$) indicating that banks instantly adjust to required capitalization ratio. The adjustment cost (parameter of adjustment) represented by $\beta 1$ is realized to be 0.458 for lagged bank capitalization ratio (BCRi,t-1).

Regarding bank-specific variables (bank size and the return on assets), their coefficients estimated value in Table 4.7 are reported to be different in terms of magnitude and signs of direction, but both have statistical significance on the definition of bank capitalization ratio, which is ratio of total equity over total assets. Therefore, in analyzing the result and based on the prior literatures, bank-specific variables are employed in explaining theories of bank capitalization ratio, with importance on understanding if banks in Tanzania possess target capitalization ratio behavior.

b) **Implication of Findings**

Research objective 3 intends to answer the research question about bank speed of adjustment to target ratio of capitalization, and that of objective 4 which intends to answer the research question about the cost of adjustment to the desired capitalization ratio. According to researcher knowledge, these are against the previous literature in developing nations that investigated the effects of financial

sector development on the bank capitalization rate, thereby they don't consider the examination of how the speed and cost of rebalancing in an imperfect market effect re-adjustment process of the bank capitalization. As reported in Table 4.7, there is a presence of a positive coefficient estimated value of the lagged dependent bank capitalization ratio between number 0 and 1 (0.458), which is significant at 1% level for the measure given to the capitalization rate in this thesis. According to Antoniou et al. (2008), this means that when the deviations happens to move the banks away from the desired level of capitalization ratio, an adjustment process plays its role to re-balancing. This supports the dynamic version of trade-off theory of capitalization. The presence of positive and also significant coefficient value, in addition confirm that financial market constraints caused by imperfect markets have influence on the pace in which the banks moves to achieve the target capitalization rate. Despite this constraint, banks capitalization ratio reported in this research has the low adjustment cost of 0.458. As identified in chapter three, the costs of adjustments can also be used to determine the adjustment speed of the banks towards desired capitalization ratio. Therefore, based on that concept the coefficients value of the estimated lagged dependent capitalization ratios in this study suggest that bank capitalization ratio maintain quick speed of adjustment 0.542 (1-0.458).

In order to interpret well the findings of adjustment cost in Table 4.7, the result of the study is compared with the adjustment cost results found in some prior studies for developed countries. For instance, Abbas and Masood (2020) reported adjustment costs of 0.798 for large banks in USA. Despite being the USA has a more developed financial system as shown in Table 1.2 and Table 1.3 in chapter one, but retains

higher adjustment costs, which may be because of the trade-off between tax benefits and costs associated with taking debt finance for banks in USA. The US banks appear to choose tax deductions over the costs associated with bankruptcy, which is why they are financed by more debt instruments, which slows down the process of adjusting the bank capitalization. Additionally, the significant costs associated with issuing equity to USA banks make equity financing more difficult for them. This concept aligns with the findings of Öztekin and Flannery (2012) who suggested that the process of issuing equity is influenced by the financial sector's development level in a nation.

In making further comparison with adjustment costs in other developed nations, Philip et al. (2014) reported that the Chinese commercial banks incurred higher adjustment costs of 0.572 for rebalancing capitalization ratio. In the case of Gropp and Heider (2010) for large European banks, the adjustment costs reported 0.530. This shows that the developed nations have a higher cost of rebalancing than in this thesis. This may be because of the higher cost of equity issuance as stated previously. Though the studies of Abbas and Masood (2020); Gropp and Heider (2010) and Philip et al. (2014) examined banks in developed nations but the distinction in the adjustment cost might be due to the big sample size employed in their study compared to this thesis. In addition, their studies include large numbers of institutional characteristics variable in the investigation.

The assessment of the comparison in the results obtained in this research with those banks in developed nations shows that the rebalancing costs of adjustment is lower

and contradicts literatures such as (Öztekin & Flannery, 2012), who proposes that the higher the cost of the adjustment process is as a results of market imperfections. This reduction of adjustment cost could be partially explained by Tanzanian banks' reliance on stock issuance as a primary means of raising capitalization ratios due to the underdeveloped banking industry. De Jonghe and Oztekin (2015) state that banks utilize equity financing for capitalization in situations when equity has a greater economic impact while the banking industry is not developed enough (i.e., domestic lending to private is not enhanced). According to Barclay et al. (2006), the banks issue equity capital to founders or private investors with lower floatation costs, compared with the rising equity capital in the public stock exchange market when they are not listed. Since many banks in the sample for this thesis are not listed in the stock market. Therefore, the cost is probably lower compared to when raised from the public stock exchange market. This is not the case for banks in developed nations like United State of America, China and European countries, where the stock markets (public stock market) are more developed, but have higher floatation costs. Another argument to support the proposition for Tanzania banks to possess low adjustment cost and quick speed of adjustment process is introduced by Faulkender, Flannery, Hankins, and Smith (2012), banks who need capitalization ratio growth after observing that the retained profit is not enough, they require to uphold low adjustment costs that will allow them to have easy access to equity capital. This will increase speed to the desired capitalization level because of the low adjustment cost. Hence, it shows that banks in this thesis might maintain low rebalancing costs to have smooth access to equity capital.

Bank-specific variables are also crucial in calculating the cost of the adjustment process and the rate of progress toward the required bank capitalization ratio. The presence of target capitalization ratio, defined as the ratio of the total equity over the total assets, can be supported by the evidence for bank-specific variables presented in Table 4.7. This is demonstrated by the significant coefficient values of the return on asset of (0.162) and bank size (-0.710). This was in line with earlier research by Abbas et al. (2021); Abbas and Masood (2020) and Bakkar et al. (2019). The significant coefficient which is also positive for the return on assets (ROA) indicates that ROA reduces the cost of target capitalization ratio for banks, which means it eliminates the financial distress due to the fact that the return on assets is very easy to be valued by the potential investors. As a result, it may be used as indicator for assessing the performance of the bank, which can also increase the availability of the external capital from investors. The negative value of the coefficient for bank size supports the idea that the size of a bank deteriorates the bank capitalization rate, which in turn increases financial suffering (De Jonghe & Oztekin, 2015). In addition, it confirms the prediction of the too-big-to-fail hypothesis that because bigger banks are almost older in operation compared to the small banks, they are in a good position to maintain more profit to increase retained earnings. For this argument, large banks can use retained profit in their investment activities (Abdulhamid et al., 2019; Baselga-Pascual et al., 2015). This result contrast with studies such as Adrian and Shin (2010); Vithessonthi and Tongurai (2016) who found positive and significant coefficient values for bank size, meaning that larger banks have higher capitalization ratios than smaller banks. They argued that larger banks can access the stock exchange market easily because of the low information asymmetry problem

they faced. Based on these arguments, and as reported in the findings (Table 4.7). It may be concluded that the rebalancing cost toward capitalization ratio by sampled banks in the United Republic of Tanzania has effects, when the rate of capitalization is defined in terms of the ratio of total equity over total assets and it relates to the dynamic trade-off theory of capital ratio.

Even though the aim of research questions 3 and 4 as represented in the regression model Equation 3.3 is to assess the speed and the adjustment cost to target capitalization ratio respectively. The results from the ratio of equity over assets estimation prove the existence of pecking order and dynamic trade-off theories. Pecking order theory on the other hand appears to offer a stronger explanation for the low adjustment costs associated with the lagged in the bank capitalization ratio, since it suggests that retained earnings remain the first in line for the financing option, which reduces the amount of adjustment costs that the bank must incurred. According to this theory, debt financing can be utilized as a backup plan before considering the final option of equity issuance, which is linked to a higher agency cost in cases where retained earnings are insufficient to fund projects or investments to improve the capitalization ratio as well. In addition, the significant coefficient value sign for the bank size denotes a dynamic trade off theory, that the capitalization adjustment does not take place frequently, because banks allow the capitalization ratio to diverge from the target despite the adjustment costs such as transactional costs outweigh the existing benefits of returning back to the target. Connecting this to the study's objective of investigating adjustment cost and speed of adjustment. The negative as well as significant sign of the estimated coefficient value of the bank

size of (-0.710) implies that the selected sample of banks in the study in terms of the ratio of equity over the assets cause capitalization ratio to diverge from the target. According to Abdulhamid et al. (2019), there would be an inverse relationship between capitalization ratio and bank size since big banks can operate at a fixed cost, giving them a comparative advantage in non-interest banking activities. However, engaging in additional non-interest banking activities increases bank debt, which increases the danger of bankruptcy and other financial difficulties. Moreover, there is also a negative correlation between bank size and the bank capitalization rate as suggested by the too-big-to-fail hypothesis. The too-big-to-fail hypothesis explained that big banks are not in the great possibility of failing. In other words, they can be supported by central government in financial distress situations to avoid the destruction of the country economy. Thus, the growing in total assets of the banks implies less capitalization ratio they hold. The sign reported for the bank size variable in this thesis indicates the low pace toward the target bank capitalization. Hence, this indicates the presence of a dynamic trade-off theory.

Table 4.7 provides more evidence supporting the dynamic trade-off theory about inflation and the ratio of the total equity over the total assets. Align with the findings of Etudaiye-Muhtar and Abdul-Baki (2020) and Hortlund (2005), the inflation's considerable negative sign (-0.219) suggests that tax deduction advantages linked to inflation may be the source of the inflation's influence on the bank's capitalization ratio. The higher the benefit received from the tax deduction the lower the cost of debt to the banks than equity, meaning that the equity finance becomes costly. In

other words, the negative sign means banks will prefer debt finance instead of equity financing which result into decreasing the capitalization ratio.

4.6   Post Estimation Test for Validity and Suitability of Regression Model

To check the validity and suitability of the regression model together with conducting robustness of the model specifications in equations (3.1) to (3.3). Post-estimation statistical tests were conducted. The results presented in the Tables 4.5 to 4.7, indicate that the models used are valid and appropriate for the estimations. For example, the statistics test for no serial correlation in AR(2) residuals in Tables 4.5 to 4.7 showed that null hypothesis should be accepted, as the AR(2) coefficients are not significant. This indicates there is no second-order autocorrelation in the AR(2) residuals. Additionally, the Hansen statistics test, used to determine whether the instruments in regression Equations 3.1 to 3.3 are over-identified revealed that the null hypothesis has to be accepted, suggesting that the instruments are free from over-identification issues. Furthermore, the Wald chi-square statistics test was used to assess the joint statistical significance of explanatory variables and their effectiveness in determining the response variable. The results indicated that the null hypothesis should be rejected in favor of the alternative hypothesis, showing that explanatory variables are proper predictors of the response variable because of the significance value of Chi-square statistics. Based on these findings, we can conclude the regression models and the two-step system GMM method employed are appropriate econometric methods for addressing the research questions and provide the solution in this study.

4.7 Robustness Test for Bank Classification

The research used grouped sampling method, where banks are grouped into samples of non-commercial banks and commercial banks as described in chapter three. A categorical variable identified as dummy variable (DVC) is introduced, which has the binary value of number 0 for non-commercial banks and 1 for those commercial banks. The variable employed to detect whether there is existence of significant difference statistically in the influence of banking sector development, stock market development, adjustment cost and speed of adjustment on capitalization rate for the study sampled banks. Single regression which take in to account the dummy variable are created to examine the effects as defined in Equation (3.5) of the thesis. The findings for the regression for all objectives are reported in the Tables 4.8 to 4.10.

The estimates reported for the regression of the major analysis in the Table 4.5, 4.6 and 4.7 in Section 4.5 are then compared with the output of robustness test in Table 4.8 to 4.10 in Section 4.7 for each study objectives. Following the comparison, the results are identified to be qualitatively similar despite the occurrence of very minor variation. This signifies that the estimates presented for the major regression specification estimations are robust. The robustness check is established in the presence of non-significance DVC variable as presented in the Tables 4.8 to 4.10 and the positive estimated coefficient signs of the key independence variables (BSD and SMD) as reported in the Tables 4.5 and 4.6. The non-significance DVC variable specifies that there is insignificant distinction in the influence of banking sector development, stock market development, the adjustment speed and the cost of adjustment on the bank capitalization ratio for non-commercial banks and

commercial banks in Tanzania. Nevertheless, it is identified that statistics coefficient value of bank specific and the macroeconomic factors differs. Validity test after estimation for the robustness specification model involving Hansen, AR (2) for over identification of instrumental variables and Wald Chi-square test for goodness of fits of variables, confirm that the regression is valid and may not give spurious output of the estimation.

Table 4.8: Robustness Check for the Effect of Banking Sector Development on

Bank Capitalization Ratio

BCR	Coef.	St.Err.	p-value	Sig
Lagged dependent variable				
$BCR_{i,t-1}$	0.572	0.111	0.000	***
Banking sector development variable				
BSD	0.253	0.123	0.071	*
Bank-specific variables				
BS	-0.269	0.794	0.002	***
ROA	0.196	0.102	0.078	*
Macroeconomic variables				
EG	-0.151	0.065	0.103	
INF	-0.286	0.133	0.042	**
Dummy variable for bank classification				
DVC	-0.002	0.008	0.572	
Test statistics				
(AR1)				-2.93
0.000				
(AR2)				-1.27
0.311				
Hansen test				16.56
0.176				
Wald Chi^2				6.08
0.000				
Number of groups used in the study		28		
Number of observations of the study		252		
Number of instruments used in the study		19		

Note: Table 4.8 presents the output of equation (3.5) using the two-step system Generalized Method of Moments estimation in STATA 15.0, the table displays coefficients values and statistics standard errors which are well robust to

heteroskedasticity organized by column. The study response variable is BCR, BCR$_{i,t-1}$ is lagged dependent variable. BSD represents stock market development as independent variable, ROA used for Return on assets, while (EG) denotes Economic growth, (INF) denotes inflation, (BS) stands for bank size and (DVC) denotes dummy variable for bank classification. These variables are defined in Table 3.1 of the chapter three. The table also include Arellano-Bond AR1 and AR2 in addition to Wald chi-square tests statistics and the Hansen test statistics for over-identifying restrictions, which evaluate the overall validity of the instruments. P-values for these tests are provided. Significance levels are indicated by *, **, and ***, representing 10%, 5%, and 1%, respectively. Additionally, the table reports the number of groups, instruments used, and observations.

Table 4.8 shows the results presented in Table 4.5 are statistically robust to non-commercial and commercial banks as indicated by the statistics signs of the coefficient and the level of the significance of bank and non-bank-specific variables. Particularly, the presented estimates of the banking sector development variable seen to be similar with those presented in Table 4.5.

Furthermore, in Table 4.9, it is indicated that all of the study significant variables have the same signs of the coefficient value as reported in the Table 4.6 for the effects of stock market development on bank capitalization ratio. Moreover, the DVC variable is insignificant which signifying that the development of stock market has the similar effects on bank capitalization rate in non-commercial banks and commercial banks in the selected sampled banks for this study.

Table 4.9: Robustness Check for the Effect of Stock Market Development on Bank Capitalization Ratio

BCR	Coef.	St.Err.	p-value	Sig
Lagged dependent variable				
$BCR_{i,t-1}$	0.492	0.120	0.000	***
Banking sector development variable				
SMD	0.119	0.019	0.000	***
Bank-specific variables				
BS	-0.279	0.631	0.045	**
ROA	0.210	0.110	0.068	*
Macroeconomic variables				
EG	-0.104	0.059	0.152	
INF	-0.390	0.147	0.044	**
Dummy variable for bank classification				
DVC	-0.006	0.012	0.372	
Test statistics				
(AR1)				-2.74
0.007				
(AR2)				-1.24
0.224				
Hansen test				16.92
0.101				
Wald Chi^2				8.42
0.000				
Number of groups used in the study		28		
Number of observations of the study		252		
Number of instruments used in the study		19		

Note: Table 4.9 presents the output of equation (3.5) using the two-step system Generalized Method of Moments estimation in STATA 15.0, the table displays coefficients values and statistics standard errors which are well robust to heteroskedasticity organized by column. The study response variable is BCR, $BCR_{i,t-1}$ is lagged dependent variable. SMD represents stock market development as independent variable, ROA used for Return on assets, while (EG) denotes Economic growth, (INF) denotes inflation, (BS) stands for bank size and (DVC) denotes dummy variable for bank classification. These variables are defined in Table 3.1 of the chapter three. The table also include Arellano-Bond AR1 and AR2 in addition to Wald chi-square tests statistics and the Hansen test statistics for over-identifying restrictions, which evaluate the overall validity of the instruments. P-values for these tests are provided. Significance levels are indicated by *, **, and ***, representing 10%, 5%, and 1%, respectively. Additionally, the table reports the number of groups, instruments used, and observations.

When Tables 4.10 and 4.7 are compared, it can be seen from the comparison that the findings of the variables' significant level and coefficient values' signs are similar when it comes to the examination of the cost and the speed of the adjustment to the required bank capitalization ratio. However, Table 4.10's dummy variable DVC is insignificant, suggesting that bank categorization in the examined banks has no particular consequences or effects. The results obtained from the robustness checks reported in the Table 4.8 to 4.10 strengthen the findings from the major study regression analysis equation (3.1) to (3.3).

Table 4.10: Robustness Check for the Speed and Cost of Adjustment to Target Bank Capitalization Ratio

BCR	Coef.	St.Err.	p-value	Sig
Lagged dependent variable				
$BCR_{i,t-1}$	0.449	0.062	0.000	***
Bank-specific variables				
BS	-0.700	0.373	0.068	*
ROA	0.159	0.048	0.001	***
Macroeconomic variables				
EG	-0.105	0.182	0.710	
INF	-0.187	0.064	0.040	**
Dummy variable for bank classification				
DVC	-0.004	0.007	0.784	
Test statistics				
(AR1)				-1.89
0.058				
(AR2)				-1.24
0.219				
Hansen test				22.08
0.244				
Wald Chi^2				8.02
0.000				
Number of groups in the study		28		
Number of observations in the study		252		
Number of instruments used in the study		24		

Note: The Table 4.10 reports the results of the robustness test equation (3.5) for investigating banks speed and cost of adjustment to target bank capitalization ratio using the two-step system GMM estimation method employed STATA 15.0, the coefficients and standard errors that are robust to heteroskedasticity in column wise. The dependent variable is BCR, $BCR_{i,t-1}$ is lagged dependent variable, independent variables are bank size (BS), ROA is Return on assets, (EG) denotes Economic growth, (INF) denotes inflation and (DVC) denotes the study dummy variable for bank classification. All variables are as measured in Table 3.1 of chapter three. Arellano-Bond (AR1) and (AR2) in addition to Wald chi-square tests statistics and the Hansen test statistics of over-identifying restrictions which test for the overall validity of the instruments are also part of the Table together with the P-values. Parenthesis *, **, *** represent 10%, 5% and 1% significance level respectively. In addition, the Table reports the number of groups, number of instruments and number of observations.

4.8 Chapter Four Summary

The chapter four of this study reported the results of the descriptive analysis and econometric of the model specifications employed in providing solution to the research questions. The study used the two-step system generalized method of moments (GMM) technique to run the estimation. The technique was employed based on the prior literature that shows the technique is the most suitable for the sample dataset in this study. The findings of the regression estimation indicate that besides bank-specific variables, other variables such as macroeconomic determinants, banking sector development and stock market development are important variables to consider in capitalization decision of non-commercial banks and commercial banks in this study. The results reveal evidence consistent with the theory of financial intermediation that the development of stock market leads banks to substitute equity for debt, this is observed in the increase of capitalization ratio subsequent development in banking sector and the stock market.

Relating the findings to the effects of development in the banking sector and the stock market on the bank capitalization ratio of the selected banks in objectives 1 and 2 of this thesis. The investigations reveal that there is an improvement in bank capitalization ratio when the capitalization decisions is defined as the ratio of the total equity over the total assets. Furthermore, the influence of banking sector and the stock market development on the bank capitalization seem to be the same for non-commercial banks and commercial banks in Tanzania. This specifies, while there is significantly improvement in banking industry in Tanzania, results in to growth in capitalization ratio for banks. The same impact of an improvement of bank capitalization ratio is detected for the influence of development in stock market on bank capitalization ratio in objective 2. The improvement in bank capitalization ratio suggests banks in Tanzania substitute equity for debt.

In assessing the presence of speed and the cost of the adjustment to required bank capitalization ratio as specified in Objective 3 and 4 respectively, the results indicate the sampled bank's speed of the rebalancing to target capitalization rate is high, which implies the cost of the adjustment is low. This indicating the presence of dynamic version of trade-off theory in addition to the pecking order theory. Moreover, the results depict that adjustment costs associated with the level of banking sector and stock market development. Previous studies related to banks capitalization ratio in developing countries had not taken in to consideration the effects of adjustment speed and cost caused by imperfect markets condition, but developed countries literatures had investigated them. Robustness check results for the study regression model specifications provide some degree of validity to the

results generated from each of the regression analysis conducted. The following chapter which also form the conclusion part of this thesis, provides an overall summary, the summary of key results and the recommendation on findings based on the objectives of the study stated in chapter one. Furthermore, the chapter concludes by highlighting the area for improvement of future research.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

To conclude the thesis, this chapter comprises of five sections. Section 1 gives an overview of the chapter, section 2 provides overall summary of the thesis by reminding some of the most important points observed and discussed in previous chapters. Section 3 recalling the key results from the examinations based on the specified objectives of this study. Accordingly, section 4 highlights discussion of the substantial recommendation after the results to related policy makers, academic researchers together with banks and others stakeholders. Section 5 gives out directions by proposing some area that may be examined for future improvement of the present research.

5.2 Overall Summary of Thesis

Many studies carried out after the irrelevancy theory of capital structure introduced by Modigliani and Miller in 1958 provide a variety of perspectives on the rationale behind capitalization ratio choices. These studies note that some factors exist that influence bank capitalization decisions. These factors including both non-bank-specific and bank-specific factors, and they mostly include the improvement of the financial sector of the nation where the banks conducting their business. Chapter one of the thesis insists that the situation of financial sector might hinder banks capitalization ratio, particularly if the sector is under developed or if no appropriate effort to develop the sector. Theoretical literature and some empirical literature hold

that the financial sector development enhance bank capitalization ratio by providing banks access to external financing in equity. Therefore, banks that take benefit of favorable situation in the sector will observe their capitalization ratio altered by issuing more equity finance and consequently diminish the debt ratio.

Following the implementation of financial sector reforms, the literature reviewed in chapter one regarding the situation of the financial sector in Tanzania, specifically in the 2012s to 2021s, identifies that the sectors are relatively weak, especially in the capital allocation process. In addition, it is inadequate relating to the banks access and availability of capital that improve bank capitalization ratio. This is because, the financial markets in Tanzania are surrounded by challenges of high degree of information asymmetry, shortage of transparency in market information availability, high transaction cost among others. These cause barriers to banks' access and availability to equity finance as external source of capital improvement. In the effort made to eliminate these barriers and improve access and availability of equity finance to increase bank capitalization ratio, Tanzania like other countries introduced and implement some measures necessary to the improvement in stock market and banking industry development. Despite the efforts to take these measures, still Tanzania's financial sector lags behind financial sectors in developed, emerging, and some other frontier market countries as perceived in chapter one.

The availability and accessibility of external equity finance necessary to enhance capitalization rate by banks in Tanzania might be an issue caused by the underdevelopment of the financial system, particularly the stock market. As

suggested by the World Bank's World Development Report for 2022, this indicates that the problem is still a challenge to resist by observing that imperfect markets in Tanzania limit banks' access to capital for improving capitalization ratio. However, few researches that examined the degree to the necessary measures of reform implemented in developing countries financial sectors led to an improvement in banks' access to external finance, in terms of equity financing which increases bank capitalization have been conducted. The scarcity of capitalization study in developing countries especially frontier economies countries like Tanzania forms the background for the examination of objectives 1 and 2.

Objective 3 and 4 examined banks' speed of rebalancing to target capitalization and cost of adjustment to required capitalization in the United Republic of Tanzania were employed, because of the researcher knowledge that the earlier studies in developing nations did not investigate the speed of rebalancing and cost of adjustment to desired bank capitalization rate. The non-examination of the speed of rebalancing and cost of the adjustment means that the previous literature in developing nations, particularly frontier market countries did not consider features of the imperfect market in their investigations, for example, information asymmetry, transaction costs among others that may contribute to high rebalancing costs that resist banks adjustment process to the desired capitalization ratio. Additionally, following some literatures related to this thesis, it indicates western nations dominates the literatures for capitalization. This led to the important question about the reliability of generalizing the findings from the prior studies in developed nations to developing nations like Tanzania, provided that developed and developing nations are quite different in terms of

financial and economic improvement and institutional characteristics as found by Antoniou et al. (2008) and Narayan and Narayan (2013). Moreover, according to Kearney (2012) the developing markets nations provide a proper testing ground for investigating whether developing nations fit the existing western theories, because for long time developing nations experience scarcity of financial data that become available in recent years.

Based on the above background, the study assesses the effect of stock market development and banking industry improvement on bank capitalization in a sample of 28 commercial banks together with non-commercial banks. In addition, the thesis also evaluates the speed of adjustment and its cost to target capitalization ratio by banks in United Republic of Tanzania. The study examinations are well performed using a Two-step system GMM estimation technique to handle problems such as autocorrelation, unobserved heterogeneity, and endogeneity problems associated with the nature of the dataset employed in the study. The following section provide a summary of the key results related to each stated objective.

5.3   Summary of the Key Results

This part provides the key results from the analysis of the study as discussed according to the objectives stated in chapter one. The results are summarized in the subsections provided below:

5.3.1 Banking Sector Development and Bank Capitalization Ratio

The first specific objective of this study assessed the effects of the banking sector development in the United Republic of Tanzania, defined as domestic credit given by banks to non-Government businesses expressed in percentage of Gross Domestic Product on the bank capitalization ratio, expressed in terms of the rate of total equity to total assets of commercial together with the non-commercial banks. The results of the examination show that, a rise in domestic lending to private business by banks expressed in terms of percentage of GDP in the United Republic of Tanzania is statistically significant for the capitalization rate of banks with a positive coefficient value of 0.241. Further investigation indicates that this effect is viable for commercial together with non-commercial banks in Tanzania. Moreover, the finding support the theoretical view of capital buffer that a rise in equity finance is achieved through the reduction of information asymmetry problems and transaction costs related to development in the banking industry. Consequently, the empirical results found from examining objective number 1 are consistent with results of previous literature (Kleff & Weber, 2008; Vithessonthi & Tongurai, 2016). On the other hand, the rise in loan allocation to private businesses that followed the government's efforts to strengthen the financial sector, which caused the raise of bank interest earnings may be linked to Tanzanian banks' improved capitalization ratio. The enhancement of lending standards, risk management procedures, and banking supervision processes can also be explicitly linked to the expansion of bank capitalization in Tanzania.

5.3.2 Stock Market Development and Bank Capitalization Ratio

The second objective of the thesis seeks to examine the effects of stock market development on the capitalization ratio of banks from the notion that the development in the stock market may be used as a proxy for the financial sector development. Meanwhile, it serves as a substitute for an alternative source of external equity finance that can help banks increase the capitalization ratio. Accordingly, an examination of the effects of stock market development measured in terms of stock market turnover on the bank capitalization ratio, expressed as the ratio of total equity to total assets of non-commercial banks and commercial banks in Tanzania is conducted. Noting that Tanzania had taken some measures necessary to improve the stock market turnover rate (liquidity) and enhance equity trading activities in the stock markets. The findings of the study observe that banks in Tanzania substitute equity for debt capital when the capitalization ratio is measured as the total equity over total assets, with a coefficient of 0.126 at a statistically significant level. This increases capitalization of banks. The effects seem to contradict with capital structure irrelevancy theory which argue, the use of more equity does not increase capitalization. In addition, the findings support the previous literature of Tran and Nguyen (2020); Wang and Luo (2019) together with the theory of financial intermediation, that development in the stock market reduces adverse selection and moral hazard problems (Grossman & Stiglitz, 1980). Therefore, banks access to equity capital available in the stock exchange market for capitalization becomes more easily. Nevertheless, the improvement in capitalization of bank may also be associated with the lower cost of rebalancing to required ratio, equivalent to (0.479) following development in stock market if compared to (0.588) adjustment

cost for banking sector development noted from the objective number 1. This lower cost indicates that, to obtain equity capital for banks in Tanzania is cheaper compared to debt finance from financial institutions and other banks. The classification of banks in this thesis does not indicate to have significant influence on bank capitalization. This means, there is no distinction in bank capitalization rate among the two groups of banks (non-commercial and commercial banks).

5.3.3 Banks' Speed and the Cost of Adjustment to Target Capitalization Ratio

The third and fourth specific objectives examined the speed of rebalancing and cost of banks' adjustments to the target capitalization rate for the selected banks in this thesis respectively. This is alongside the foundations that earlier research in frontier and emerging markets nations did not take into account the market constraints, the speed of rebalancing, and the cost of adjusting to a target bank capitalization rate. The primary concern of study objectives three and four is the presence of high speed and cheap cost of rebalancing to target bank capitalization rate in the United Republic of Tanzania, as indicated by the output of the analysis of these objectives. Furthermore, it demonstrates the applicability of pecking order theory to banks, when the capital measure is expressed as the rate of total equity over total assets. The pecking order theory's effects are in line with earlier research by authors De Jonghe and Oztekin (2015) and Flannery and Rangan (2008).

Furthermore, the costs of rebalancing to required capitalization rate for the banks in this thesis, expressed using coefficients value of the lagged capitalization ratios ($BCR_{i,t-1}$) are lower if compared with banks in developed countries (China , United

State of America and European countries). This implies, despite the level of financial sector development in developed countries being higher (which means the market constraints are less and their financial market are well organized and transparent). The higher rebalancing costs may be attributed with higher transaction cost for equity issuance in the public stock exchange compared to Tanzania, where a large number of banks are not quoted in the stock exchange and depend on the founders or private investors for equity issuance. Hence, experienced very low floatation cost. Flannery and Rangan (2006); Öztekin and Flannery (2012) argue that, if the floatation costs are insignificant, banks may speed up the rebalancing process to desired capitalization ratio. According to their argument, this is the one among the reason of the speed of adjustment process to target capitalization rate for the selected banks in this thesis to be higher.

In summarizing the results, this study depicts that the findings support the theories for objectives 1, 2, 3, and 4. But against the researcher's expectations for objectives 3 and 4. Moreover, the results support prior literature on capitalization ratios for banks in some developing and developed countries. Table 5.1 presents the summary of the results related to the objectives of the thesis.

Table 5.1: Summary of the Results Related to the Objectives of the Thesis

Research questions	Researcher expectation/theory	Thesis results	Consistent/ Inconsistent
1. To what extent does banking sector development influence bank capitalization ratio in Tanzania?	Capital buffer theory: Capitalization ratio of banks has positive relationship with domestic credit provided by banks to the private business (percentage of GDP).	Increase in domestic credit to the private business by banks (percentage of GDP) has a significant positive effect on capitalization ratio of banks in Tanzania.	Consistent with theory and researcher expectation.
2. To what extent does stock market development influence bank capitalization ratio in Tanzania?	Theory of financial intermediation: Stock market turnover (liquidity) and capitalization ratio of banks are positively related.	Increase in stock market turnover has a significant positive effect on capitalization ratio of banks in Tanzania.	Consistent with theory and researcher expectation.
3. Which speed do banks in Tanzania use to adjust to target capitalization ratio?	Banks in Tanzania slowly adjust to target capitalization ratio/ Presence of adjustment process of BCR.	Banks in Tanzania significant and instantaneously adjust to target capitalization ratio.	In consistent with researcher expectation but consistent with theory.
4. To what extent does it cost banks in Tanzania to adjust to target capitalization ratio?	Banks in Tanzania incurred high cost to adjust to target capitalization ratio/Presence of cost of adjustment.	Banks in Tanzania incurred low cost to adjust to target capitalization ratio.	In consistent with researcher expectation but consistent with theory.

5.4 Recommendation on Findings

The key findings from this thesis enable the researcher to make recommendations to several stakeholders from the following three main categories namely: policy makers, the researchers and banks and other stakeholders. The policy maker's category represents regulatory authorities such as Bank Supervisor (BOT), Capital Market and Securities Authority (CMSA) together with other government agencies responsible for developing the financial sector. Researchers' represent research institutions and the academic community, such as student of banking studies and finance or other fields related to capitalization decisions. While banks and other stakeholders refer to bank's management, financial analyst and investors.

Starting with policymakers, the overall findings of the present thesis confirm that policies related to stock market improvement in Tanzania seemed to be in a position to increase the demand for equity capital, signifying the effects of equity replacement for debt. Hence, it promotes banks to hold enough capitalization rate. The same can be held for policies directed at the banking industry development for equity capital. In this view, the findings may reassure regulatory authorities (bank supervisors and securities authorities) that the financial reforms performed in Tanzania many years ago are still beneficial, because it seems to improve bank capitalization, which results in stability of the growth of the banking sector. More specifically, these findings provide strong justification for policy makers to continually improve monitoring and supervisory strategies. Consequently, upon the continually improve, they should set an alternative initiative that will enable banks to offer more credit facility to private business, while at the same time eliminate market restriction. For

example, lowering interest rates, supporting the creation and the use of credit facility bureaus, or putting in place other procedures that make it easier for banks and borrowers to share information and reduce the risk of moral hazard and adverse selection issues resulted from information asymmetry. This may improve the availability of credit to private business and assist banks within meeting required capitalization ratio. The effective use of credit facility bureaus is expected to improve the lending process of banks, by ensuring there is effective screening and proper control of loans, that assured banks get the required income from their investment. If symmetry of information and liberalization of interest rate are effectively used, the credit allocation process to private are likely to improve and increase the return associated with interest, which can increase bank capitalization ratio through retained earnings. In addition to that, it is important also for regulatory authority (Capital Market and Securities Authority) through stock exchange market to improve the bond market to act as an alternative to equity finance, through issuing subordinated bonds for banks who seek external capital for improving capitalization ratio instead of depending greatly on the private bond market. If the public bond market is improved, it is anticipated that banks will be in a good position to get long-term external finance in terms of subordinated bonds to improve capitalization.

Scholars who study how the growth of the financial system affects the bank capitalization, especially in frontier market economies nations and in light of the scarcity of empirical research coming from these nations. This study offers empirical support for their reliance on the conclusions. The reliance derives from the sample of twenty-eight banks conducting business in Tanzania for a 10 years period from 2012-

2021, that enables generalization of the findings to the rest of the eighteen banks conducting business in United Republic of Tanzania as at the end of June 2021. The findings have equally determined important factors which are non-bank and bank-specific that significantly effects capitalization ratio of non-commercial banks and commercial banks in Tanzania. This allowed researchers to concentrate with the key areas of investigations. Regarding the construction of the models employed in examining bank capitalization rate in Tanzania, the findings indicate that it is necessary to include the speed of rebalancing to target capitalization ratio because of the adjustment costs effects.

As for banks and other stakeholder (banks manager, financial analysts, and investors), the results of this thesis reveal that stock market development is associated with lower adjustment costs to the bank than the banking sector development. This indicating that equity may represent cheaper external finance availability to the banks than debt, and it assured banks manager and investors that banks in Tanzania can easily access equity capital to minimize risk of default due to bankruptcy risk associated with failure to make loan repayment when it is due. Therefore, as a means of saving cost and improve bank stability in terms of bank capitalization ratio, the public stock market offers a cheaper substitute to the private debt. Relating this observation to the less improved bond market in Tanzania, it may be used as a motivation to regulators in financial sector to improve the public bond market, together with reviewing the available measures of development, particularly in the banking sector as discussed in the prior paragraph. Hence, the available options for banks to obtain subordinated bond are increased. This may be a cheaper

source of improving bank capitalization compared to the equity from public and private investors or founders. In addition, the significance of bank-specific factors supporting capitalization ratio theories, only profitability indicates that banks may improve their capitalization if they considered it during capitalization ratio decision. Meanwhile the profitability of banks in Tanzania shows to have high pace to assist banks to adjust to regulatory capitalization ratio.

5.5   Suggestions for Future Research

Following the limitations of this study addressed in the chapter one, forthcoming research may have to take in to account the limitations mentioned in this study and consider them for further improvement in the new studies. This include, other researchers should extend this research in the future by considering the whole banking sector or relatively large number of banks, including all types of banks conducting business in Tanzania. In addition, the institution features should be part of the investigation by including factors like the regulatory quality and the government's effectiveness at implementing financial sector policies, because these factors may influence the developmental level of the financial sector. Moreover, future research can extend the current work by dividing the bank's sample into those that are listed and those that are not listed in the stock exchange market. The response between them may differ, as the procedure for rising equity finance is quite difference for un-listed banks and listed banks. Moreover, future research may examine the influence of financial sector improvement on bank capitalization for countries that have economies with similar features as in this thesis. This will allow the generalizing the results to other frontier market countries.

It is anticipated that, through taking into consideration the limitations addressed in this study together while working effectively on the proposed areas for future improvement of this study, the scope of knowledge gathered and that presented in this research will be improved and extended.

REFERENCES

Abbas, F., & Masood, O. (2020). How do large commercial banks adjust capital ratios: Empirical evidence from the USA. *Economic Research-Ekonomskaistraživanja*, *33*(1), 1849-1866.

Abbas, F., Ali, S., & Rubbaniy, G. (2021). Economics of capital adjustment in the USA commercial banks: Empirical analysis. *Journal of Applied Economics*, *24*(1), 71-90.

Abbas, F., Masood, O., & Ali, S. (2021). Financial development and bank risk-taking: Empirical evidence from the USA. *Intellectual Economics, 15*(1), 64-87.

Abdulhamid, B., Azmi, W., & Ali, M. (2019). Bank risk and financial development: Evidence from dual banking countries. *Emerging Markets Finance and Trade*, *56*(2), 286-304. http://doi.org/10.1080/1540496X.2019.1669445

Adedeji, A. (1998). Does the pecking order hypothesis explain the dividend payout ratios of firms in the UK? *Journal of Business Finance & Accounting*, *25*(9-10), 1127-1155. http://dx.doi.org/10.1111/1468-5957.00230

Adrian, T., & Shin, H. S. (2010). Liquidity and leverage. *Journal of Financial Intermediation*, *19*(3), 418-437.

Agarwal, S., & Mohtadi, H. (2004). Financial markets and the financing choice of firms: Evidence from developing countries. *Global Finance Journal*, *15*(1), 57-70.

Ahmad, R., Ariff, M., & Skully, M. J. (2008). The determinants of bank capital ratios in a developing economy. *Asia-Pacific financial markets*, *15*(3-4), 255-272. doi:10.1007/s10690-009-9081-9

Al-Ababneh, M. (2020). Linking ontology, epistemology and research methodology. *Science & Philosophy*, *8*(1), 75-91.

Alı, S. H., Dagli, H., Faedfar, S. & Turan-Kurtaran, A. (2022). The impact of bank-specific and macroeconomic factors on the capital structure of banks. *Sosyoekonomi*, *30*(54), 225-242. doi: 10.17233/sosyoekonomi.2022.04.12

Allen, F., Otchere, I., & Senbet, L. W. (2011). African financial systems: A review. *Review of Development Finance*, *1*(2), 79-113.

Alqahtani, F., Mayes, D. G., & Brown. K. (2016). Economic turmoil and Islamic banking: Evidence from the Gulf Cooperation Council. *Pacific-Basin Finance Journal 39*:44–56. doi: 10.1016/j.pacfin.2016.05.017

Aluko, O. A., & Ajayi, M. A. (2017). Determinants of banking sector development: Evidence from Sub-Saharan African countries. *Borsa Istanbul Review*, *18*(2), 122-139. doi: 10.1016/j.bir.2017.11.002

Alves, P. F. P., & Ferreira, M. A. (2011). Capital structure and law around the world. *Journal of Multinational Financial Management*, *21*(3), 119-150.

Anderson, T. W., & Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of Econometrics*, *18*(1), 47-82.

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis*, *43*(1), 59-92.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29-51.

Ashraf, D., Ramady, M., & Albinali, K. (2016). Financial fragility of banks, ownership structure and income diversification: Empirical evidence from the GCC region. *Research in International Business and Finance, 38*, 56-68. doi: 10.1016/j.ribaf.2016.03.010.

Bakkar, Y., De Jonghe, O., & Tarazi, A. (2019). Does banks' systemic importance affect their capital structure and balance sheet adjustment processes? *Working Paper Research 369*, National Bank of Belgium.

Barclay, M., Morellec, E., & Smith, C. (2006). On the debt capacity of growth option. *Journal of Business, 79*(1), 37-60.

Baselga-Pascual, L., Trujillo-Ponce, A., & Cardone-Riportella, C. (2015). Factors influencing bank risk in Europe: Evidence from the financial crisis. *The North American Journal of Economics and Finance*, *34*, 138–166. https://doi.org/10.1016/j.najef.2015.08.004.

Baum, C. F. (2006). An introduction to modern econometrics using Stata: Stata press, Texas.

Becerra, O., Cavallo, E., & Scartascini, C. (2012). The politics of financial development: The role of interest groups and government capabilities. *Journal of Banking & Finance*, *36*(3), 626-43.

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance*, *28*(3), 423-442.

Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking & Finance, 37*(2), 433–47.

Beck, T., Feyen, E., Ize, A., & Moizeszowicz, F. (2008). Benchmarking financial development. World Bank Policy Research Working Paper 4638. Washington, DC: World Bank.

Berger, A., DeYoung, R., Flannery, M., Lee, D., & Oztekin, O. (2008). How do large banking organizations manage their capital ratios? *Journal of Financial Services Research, 34*(2), 123–149.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115-143.

Booth, L., Aivazian, V., Demirgüç-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance*, *56*(1), 87-130.

BOT (2011). Tanzania mainland's 50 years of independence of independence. Bank of Tanzania, Ed: Dar es Salaam.

BOT (2019). Tanzania financial stability report, https://www.bot.go.tz

BOT (2020). Annual report 2019/20, https://www.bot.go.tz

BOT (2021). Financial sector supervision 2020/21, https://www.bot.go.tz

Brei, M., & Gambacorta, L. (2016). Are bank capital ratios pro-cyclical? New evidence and perspectives. *Economic Policy*, *31*(86), 357–403. doi:10.1093/epolic/eiw001

Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, *81*(1), 163-192. https://doi.org/10.1016/j.jdeveco.2005.05.010

Cho, S.S., El Ghoul, S., Guedhami, O., & Suh, J. (2014). Creditor rights and capital structure: Evidence from international data. *Journal of Corporate Finance*, *25*, 40-60.

Cohen, B. H., & Scatigna, M. (2016). Banks and capital requirements: Channels of adjustment. *Journal of Banking & Finance*, *69*(S1), S56-S69. doi: 10.1016/j.jbankfin.2015.09.022

Dang, V. A., Kim, M., & Shin, Y. (2015). In search of robust methods for dynamic panel data models in empirical corporate finance. *Journal of Banking & Finance*, *53*, 84-98. http://dx.doi.org/10.1016/j.jbankfin.2014.12.009

De Jonghe, O., & Oztekin, O. (2015). Bank capital management: International evidence. *Journal of Financial Intermediation*, *24*(2), 154-177.

Delcoure, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics & Finance*, *16*(3), 400-415.

Demirgüç-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets, and firm debt maturity. *Journal of financial economics*, *54*(3), 295-336.

Distinguin, I., Roulet, C., & Tarazi, A. (2013). Bank regulatory capital and liquidity: Evidence from US and European publicly traded banks, *Journal of Banking and Finance*, *37*(9), 3295–3317.

Espenlaub, S., Khurshed, A., & Mohamed, A. (2012). IPO Survival in a repetitional market, *Journal of Business Finance and Accounting*, *39*(3-4), 427-463.

Estrella, A. (2004). The cyclical behaviour of optimal bank capital, *Journal of Banking and Finance*, *28*(6), 1469-1498.

Etudaiye-Muhtar, O. F. (2016). The effect of financial market development on capital and debt maturity Structure of firms in selected African countries. *PhD Thesis University of Malaya.* Kuala lumpur.

Etudaiye-Muhtar, O. F., & Abdul-Baki, Z. (2020). Market structure, institutional quality and bank capital ratios: Evidence from developing countries. *European Journal of Management and Business Economics*, *30*(1), 92-107.

Etudaiye-Muhtar, O. F., & Ahmad, R. (2015). The effect of financial market development on corporate capital structure: Dynamic panel evidence from African countries. *Journal of Applied Economic Sciences*, *10*(33), 382-396.

Etudaiye-Muhtar, O. F., Ahmad, R., Olaniyi, T. A., & Abdulmumin, B. A. (2017). Financial market development and bank capitalization ratio: Evidence from developing countries. *Paradigm*, *21*(2), 126-138.

Fan, J., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. *Journal of Financial and Quantitative Analysis*, *47*(1), 23-56.

Farooq, U., Malik, J. A., & Muhammad, L. (2018). Impact of banking sector development on capital structure of non-financial sector firms in Pakistan. *Journal of Accounting and Finance in Emerging Economies*, *4*(2), 177-188. doi: 10.26710/jafee.v4i2.400

Faulkender, M., Flannery, M. J., Hankins, K. W., & Smith, J. M. (2012). Cash flows and leverage adjustments. *Journal of Financial economics*, *103*(3), 632-646.

Fischer, E. O., Heinkel, R. & Zechner, J. (1989). Dynamic capital structure choice: Theory and tests. *The Journal of Finance*, *44*(1), 19-40. http://dx.doi.org/10.1111/j.1540-6261.1989.tb02402.x.

Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance*, *19*(2013), 1-19. doi: http://dx.doi.org/10.1016/j.jcorpfin.2012.09.004

Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures, *Journal of Financial Economics*, *79*(3), 469-506.

Flannery, M. J., & Rangan, K. P. (2008). What caused the bank capital build-up of the 1990s? *Review of Finance*, *12*(2), 391-429.

Fonseca, A. R., & Gonzalez, F. (2010). How bank capital buffers vary across countries: The influence of cost of deposits, market power and bank regulation. *Journal of Banking and Finance*, *34*(4), 892-902. http://dx.doi.org/10.1016/j.jbankfin.2009.09.020.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, *38*(1), 1-37.

FSDT (2014). Financial capability Tanzania baseline survey findings. Dar es Salaam.

García-Herrero, A., Gavilá, S., & Santabárbara, D. (2009). What explains the low profitability of Chinese banks? *Journal of Banking & Finance*, *33*(11), 2080–2092.

Gennaioli, N., Shleifer, A. & Vishny, R. W. (2013). A model of shadow banking. *Journal of Finance, 68*(4), 1331–63.

Greenspan, A., (2001). The Federal Safety Net. The Financial Safety Net, Chicago: Federal Reserve Bank of Chicago, May 2001, 1-8.

Gropp, R., & Heider, F. (2010). The determinants of bank capital structure. *Review of Finance*, *14*(4), 587-622. https://doi.org/10.1093/rof/rfp030.

Grossman, S. J., & Stiglitz, J. E. (1980). On the impossibility of informationally efficient markets. *The American Economic Review*, *70*(3), 393-408.

Gujarati, D., & Porter, C. (2009). Basic Econometrics (Fifth ed.): The McGraw-Hill, New York, USA.

Gurley, J. G., & Shaw, E. S. (1960). Money in a theory of finance. Brookings Institution, Washington, D.C.

Haas, R., & Peeters, M. (2006). The dynamic adjustment towards target capital structures of firms in transition economies. *Economics of Transition*, *14*(1), 133-169.

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, *50*(4), 1029-1054.

Haron, R., Ibrahim, K., Nor, F. M., & Ibrahim, I. (2013). Factors affecting speed of adjustment to target leverage: Malaysia evidence. *Global Business Review*, *14*(2), 243-262.

Holderness, C. G. (2014). Problems using aggregate data to infer individual behaviour: Evidence from law, finance, and ownership concentration. *Critical Finance Review*. (Forthcoming).

Hortlund, P. (2005). The long-term relationship between capital and earnings in banking (No. 611). SSE/EFI Working Paper Series in Economics and Finance.

Huang, R., & Ritter, J. R. (2009). Testing theories of capital structure and estimating the speed of adjustment. *Journal of Financial and Quantitative Analysis*, *44*(2), 237- 271.

Jokipii, T., & Milne, A. (2008). The cyclical behaviour of European bank capital buffers. *Journal of Banking & Finance*, *32*(8), 1440-1451.

Jokipii, T., & Milne, A. (2011). Bank capital buffer and risk adjustment decisions, *Journal of Financial Stability, 7*(3), 165–178.

Jokipii, T., & Monnin, P. (2013). The impact of banking sector stability on the real economy. *Journal of International Money and Finance*, *32*(1), 1-16.

Kapaya, S. M. (2021), Financial development and economic growth in Tanzania: An ARDL and bound testing approach, *Asian Journal of Economics and Banking*, *5*(1), 46-65. https://doi.org/10.1108/AJEB-09-2020-0063

Kearney, C. (2012). Emerging markets research: Trends, issues and future directions. *Emerging Markets Review*, *13*(2), 159-183.

Kleff, V., & Weber, M. (2008). How do banks determine capital? Evidence from Germany. *German Economic Review*, *9*(3), 354–372. doi: 10.1111/j.1468-0475.2008.00437.x)

Konishi, M., & Yasuda, Y. (2004). Factors affecting bank risk taking: Evidence from Japan. *Journal of Banking & Finance*, *28*(1), 215–232. doi:10.1016/s0378-4266(02)00405-3

Kothari, C. (2017). Research methodology methods and techniques by CR Kothari. Published by New Age International (P) Ltd. Publishers, 91.

Kraus, A., & Litzenberger, R. H. (1973). A state-reference model of optimal financial leverage. *The Journal of Finance*, *28*(4), 911-922. https://doi.org/10.1111/j.1540-6261.1973.tb01415.x

Laeven, L., Ratnovski, L., & Tong, H. (2016). Bank size, capital, and systemic risk: Some international evidence. *Journal of Banking & Finance*, *69*(S1), S25-S34. doi: 10.1016/j.jbankfin.2015.06.022

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*, *61*(S1), 631- 652.

Matemilola, B., Bany-Ariffin, A., & McGowan, C. B. (2013). Unobservable effects and firm's capital structure determinants. *Managerial Finance*, *39*(12), 1124-1137.

Memmel, C., & Raupach P. (2010). How do banks adjust their capital ratios? *Journal of Financial Intermediation*, *19*(4), 509–528.

Miles, M. B., & Huberman, A. M. (1994). Qualitative Data Analysis: An Expanded Sourcebook. Thousand Oaks, CA: Sage Publications.

URT (2020). Draft of banking sector development policy, 2020.

URT (2020). Financial sector development master plan, 2020/21 – 2029/30. http://library.mof.go.tz.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, *48*(3), 261-297.

Mohanty, S., & Mahakud, J. (2019). Dynamic adjustment towards target capital adequacy ratio: Evidence from Indian commercial banks. *Global Business Review*, *20*(3), 757-768. doi: 10.1177/0972150919837082

Msami, J., & Wangwe, S. (2016). Industrial development in Tanzania, manufacturing transformation: Comparative studies of industrial development in Africa and

Emerging Asia. *Oxford Academic*, 155-173 https://doi.org/10.1093/acprof:oso/9780198776987.003.0008.

Murinde, V. (2012). Financial development and economic growth: Global and African evidence. *Journal of African Economies*, *21*(suppl 1), i10-i56.

Mwakalobo, A. B. S. (2009). Economic reforms in East African countries: The impact on Government revenue and public investment. Open access dissertations, 66: Available: https://scholarworks.umass.edu/open_access_dissertations/66/

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187-221.

Narayan, P. K., & Narayan, S. (2013). The short-run relationship between the financial system and economic growth: New evidence from regional panels. *International Review of Financial Analysis*, *29*, 70-78.

Ojah, K., & Kodongo, O. (2014). Financial markets development in Africa: Reflections and the way forward. In C. Monga & J. Y. Lin (Eds.), The Oxford Handbook of Africa and Economics: Policies and Practices Oxford: Oxford University Press.

Ozili, P. K. (2017). Bank profitability and capital regulation: Evidence from listed and non-listed banks in Africa. *Journal of African Business*, *18*(2), 143–168. doi:10.1080/15228916.2017.1247329

Ozili, P. K. (2018). Banking stability determinants in Africa. *International Journal of Managerial Finance*, *14*(4), 462–483. doi:10.1108/ijmf-01-2018-0007

Ozkan, A. (2001). Determinants of capital structure and adjustment to long run target: Evidence from UK company panel data. *Journal of Business Finance & Accounting*, *28*(1-2), 175-198.

Öztekin, Ö., & Flannery, M. J. (2012). Institutional determinants of capital structure adjustment speeds. *Journal of Financial Economics*, *103*(1), 88-112. doi: 10.1016/j.jfineco.2011.08.014

Philip, M., Hong, L., & Chunxia, J. (2014). Bank capital, adjustment and ownership: Evidence from China. *BOFIT Discussion Paper No. 16/2014*. http://dx.doi.org/10.2139/ssrn.2509295

Poghosyan, T., & Čihak, M. (2011). Determinants of bank distress in Europe: Evidence from a new data Set. *J FinancServ Res, 40*(3), 163–184. https://doi.org/10.1007/s10693-011-0103-1

Pradhan, R. P., Arvin, M. B., Hall, J. H., & Bahmani, S. (2014). Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables: The case of ASEAN countries. *Review of Financial Economics*, *23*(4), 155–173. https://doi.org/10.1016/j.rfe.2014.07.002

Rajan, R. G., & L. Zingales. (1998). Financial dependence and growth. *American Economic Review*, *88*(3), 559–586.

Ramjee, A., & Gwatidzo, T. (2012). Dynamics in capital structure determinants in South Africa. *Meditari Accountancy Research*, *20*(1), 52-67.

Rime, B. (2001). Capital requirements and bank behaviour: Empirical evidence for Switzerland. *Journal of Banking & Finance*, *25*(4), 789–805.

Ratner, B. (2009). The correlation coefficient: Its values range between+ 1/− 1, or do they?. *Journal of targeting, measurement and analysis for marketing*, *17*(2), 139-142.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, *9*(1), 86-136.

Ruiz-Porras, A. (2009). Financial structure, financial development and banking fragility: International evidence. *AnalisisEconomico*, *24*(56), 147-173.

Saci, K., & Holden, K. (2008). Evidence on growth and financial development using principal components. *Applied Financial Economics*, *18*(19), 1549-1560.

Sajid, M. R., Muhammad, N., & Zakaria R. (2019). Construct validation in secondary data: A guideline for medical data mining. *2nd International Conference on Applied & Industrial Mathematics and Statistics* (ICOAIMS 2019), 23-25 Julai 2019, Kuantan, Pahang. pp. 1-8.

Saunders, M. N. K., Lewis, P. & Thornhill, A. (2019). Research methods for business students (8th Edition). London: Pearson Education.

Schaeck, K., & Cihák, M. (2012). Banking Competition and Capital Ratios. *European Financial Management*, *18*(5), 836–866. doi:10.1111/j.1468-036x.2010.00551.x

Schober, P., Boer, C. and Schwarte, L. (2018) Correlation coefficients: Appropriate Use and Interpretation. *Anesthesia & Anesthesia*, *126*, 1763-1768. https://doi.org/10.1213/ANE.0000000000002864

Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability, *28*(6), 1075–1086. doi: 10.1016/s0305-750x(00)00006-1.

Thies, C. F., & Klock, M. S. (1992). Determinants of capital structure. *Review of Financial Economics*, *1*(2), 40-52.

Tran, S. H., & Nguyen, L. T. (2020). Financial development, business cycle and bank risk in Southeast Asian countries. *The Journal of Asian Finance, Economics and Business*, *7*(3), 127–135. https://doi.org/10.13106/JAFEB.2020.VOL7.NO3.127

Vithessonthi, C. (2014a). Financial markets development and bank risk: Experience from Thailand during 1990–2012. *Journal of Multinational Financial Management, 27*, 67–88.

Vithessonthi, C. (2014b). The effect of financial market development on bank risk: Evidence from Southeast Asian countries. *International Review of Financial Analysis*, *35*, 249–60.

Vithessonthi, C., & Tongurai, J. (2016). Financial markets development, business cycles, and bank risk in South America. *Research in International Business and Finance*, *36*, 472–84.

Wang, R., & Luo, H. R. (2019). Does financial liberalization affect bank risk-taking in China? *SAGE Open*, *9*(4), 1-15. doi:10.1177/2158244019887948

Wangwe, S., Mmari, D., Aikaeli, J., Rutatina, N., Mboghoina, T., & Kinyondo, A. (2014). The performance of the manufacturing sector in Tanzania: challenges and the way forward. Working Paper: Available: www.repoa.or.tz/documents/Manufacturing_Paper.pdf

Wassal, K. A. E. (2013). The Development of stock markets: In search of a theory. *International Journal of Economics and Financial Issues*, *3*(3), 606-624.

Retrieved from https://dergipark.org.tr/en/pub/ijefi/issue/31958/351940?publisher=http-www-cag-edu-tr-ilhan-ozturk

Williams, J., & N. Nguyen. (2005). Financial liberalisation, crisis, and restructuring: A comparative study of bank performance and bank governance in South East Asia. *Journal of Banking & Finance, 29*(8–9), 2119–54. doi: 10.1016/j.jbankfin.2005.03.011.

World Bank. (2022). International bank for reconstruction and development: *Finance for an Equitable Recovery.* Washington, DC: World Bank.

World Bank. (2022). World development report 2022: *Finance for an Equitable Recovery*. Washington, DC: World Bank.

Yu, H. C. (2000). Banks' capital structure and the liquid asset-policy implication of Taiwan. *Pacific Economic Review*, *5*(1), 109–114. doi:10.1111/1468-0106.00093

Zou, H., & Xiao, J. Z. (2006). The financing behavior of listed Chinese firms. *British Accounting Review*, *38*(3), 239-258. doi: 10.1016

APPENDICES

APPENDIX A: List of banks under study

List of 28 commercial and non-commercial banks under study:

Commercial Banks	**Non-commercial Banks**
1. Akiba Commercial Bank	1. Mufindi Community Bank Plc
2. Azania Bank	2. Uchumi Commercial Bank Limited
3. Banc ABC	3. Access Bank Tanzania
4. Bank of Africa Tanzania Limited	4. TIB Development Bank
5. Bank of Baroda Tanzania Limited	
6. Bank of India (Tanzania)	
7. Citibank	
8. CRDB Bank	
9. DCB Commercial Bank	
10. Diamond Trust Bank Tanzania	
11. Ecobank	
12. Equity Bank (Tanzania)	
13. Exim Bank (Tanzania)	
14. Habib African Bank	
15. I&M Bank (Tanzania)	
16. International Commercial Bank	
17. KCB Bank Tanzania	
18. Mkombozi Commercial Bank	
19. National Bank of Commerce (Tanzania)	
20. National Microfinance Bank	
21. People's Bank of Zanzibar	
22. Stanbic Bank Tanzania Limited	
23. Standard Chartered Bank	
24. TPB Bank Plc	

APPENDIX B: List of publications made following the present thesis

1. Fadhil, D. M., Macha, S. E., & Yusuf, S. Y. (2024). How Do Commercial and Non- commercial Banks Adjust Capitalization Ratio: Evidence from Tanzania. *International Journal of Scientific Research and Management*, *12*(3), 6220-6237. DOI: 10.18535/ijsrm/v12i03.em22

2. Fadhil, D. M., Macha, S. E., & Yusuf, S. Y. (2024). Banking Sector Development and Bank Risk-Taking Behaviour: Evidence from Commercial and Non-commercial Banks in Tanzania. *International Journal of Social Science Research and Review*, *7*(4), 378-395. DOI: https://doi.org/10.47814/ijssrr.v7i4.2042

3. Fadhil, D. M., Macha, S. E., & Yusuf, S. Y. (2024). Effects of Financial Market Development on Bank Capitalization Ratio: Evidence from Commercial and Non-commercial Banks in Tanzania. *International Journal of Business Management and Economic Review*, *7*(2), 55-75. DOI: http://doi.org/10.35409/IJBMER.2024.3564