THE NEXUS OF FINANCIAL DEVELOPMENT, EMPLOYMENT, AND ECONOMIC GROWTH IN SELECTED DEVELOPING COUNTRIES

NURZA BINTI MOHAMED YUSOFF

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The Nexus of Financial Development, Employment, and Economic Growth in Selected Developing Countries

by

Nurza Binti Mohamed Yusoff

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THE NEXUS OF FINANCIAL DEVELOPMENT, EMPLOYMENT, AND ECONOMIC GROWTH IN SELECTED DEVELOPING COUNTRIES

ABSTRACT

Financial development plays a significant role in economic growth, specifically for developing countries. As evidenced by their lower Financial Development Index (FDI) compared to developed countries, developing countries face significant challenges because of their less developed financial systems. This study extends existing research by incorporating minimum wage as a moderating factor in the finance-employment-growth nexus, an area that remains underexplored in developing countries. However, the complex relationship between financial development, economic growth, employment dynamics, and minimum wage regulations highlight the nuanced effect of financial development on growth while also revealing the varied impacts of minimum wage policies on both employment and economic growth. Thus, this study extends existing research by incorporating minimum wage as a moderating factor in the finance-employment-growth nexus, as an are that remains underexplored in the developing countries. Hence, it is crucial to understand this intricate relationship to formulate more effective policies that aim to promote sustainable development and inclusive growth. This leads to three main objectives, which are to examine the impact of financial development on economic growth, to investigate whether employment moderates the effect of the financial development on economic growth and to investigate whether minimum wage moderates the effect of employment on the financial development economic growth nexus in developing countries. The study employed the Generalised Method of Moments (GMM) for the model estimation, while domestic credit to the private sector (DCPS) and broad money (M3) was used as a proxy for financial development. This research analysis used a panel data set of 96 developing countries spanning from 2000 to 2022 obtained from the World Development Indicators provided by the World Bank. This finding of research shows the importance of financial development for the economic growth of developing countries. Evidence suggests that functioning financial systems contribute tremendously to economic performance and job creation. Financial development, on the one hand, creates direct growth opportunities and increased employment opportunities through stimulating the economy. Surprisingly, another interesting aspect is how minimum wage regulation is enforced. The findings suggest that when enforcement is even-handed, meaning not too weak or too strict, it positively enhances the impact from financial development. Such insights can furnish working-level policymakers with excellent guidance for building inclusive and sustainable economic strategies for developing countries.

Keywords: Financial Development, Employment, Minimum Wage, Economic Growth, Generalized Method of Moments and Threshold Analysis

HUBUNGAN PEMBANGUNAN KEWANGAN, PEKERJAAN, DAN PERTUMBUHAN EKONOMI DI NEGARA-NEGARA MEMBANGUN TERPILIH

ABSTRAK

Pembangunan kewangan memainkan peranan penting dalam pertumbuhan ekonomi, terutamanya bagi negara-negara membangun. Seperti yang dibuktikan oleh Indeks Pembangunan Kewangan menunjukkan lebih rendah berbanding dengan negara maju, negara membangun menghadapi cabaran besar kerana sistem kewangan mereka yang kurang maju. Kajian ini melanjutkan penyelidikan sedia ada dengan memasukkan gaji minimum sebagai faktor penyederhana dalam perhubungan pertumbuhan kewangan-pekerjaan, kawasan yang masih kurang diterokai di negara membangun.Walau bagaimanapun, hubungan yang kompleks antara pembangunan kewangan, pertumbuhan ekonomi, dinamika pekerjaan, dan peraturan gaji minimum menyoroti kesan halus pembangunan kewangan terhadap pertumbuhan disamping menjelaskan pelbagai impak dasar gaji minimum ke atas pekerjaan dan pertumbuhan ekonomi. Oleh itu, adalah penting untuk memahami hubungan yang rumit ini bagi merangka dasar yang lebih berkesan dalam usaha mempromosikan pembangunan mampan dan pertumbuhan inklusif. Ini membawa kepada tiga objektif utama iaitu untuk mengkaji kesan pembangunan kewangan terhadap pertumbuhan ekonomi untuk menyiasat sama ada pekerjaan menyederhanakan kesan pembangunan kewangan terhadap pertumbuhan ekonomi,dan untuk menyiasat sama ada gaji minimum menyederhanakan kesan pekerjaan terhadap hubungan pembangunan kewangan dan pertumbuhan ekonomi di negara-negara membangun. Kajian ini menggunakan kaedah *Generalised Method of Moments* (GMM) untuk penganggaraan model, manakala kredit domestik kepada sektor swasta (DCPS) dan wang luas (M3) digunakan sebagai pengukur kepada pembangunan kewangan. Kajian ini menganalisis satu set data panel dari 96 negara membangun yang meliputi tempoh dari tahun 2000 hingga 2022 yang diperoleh daripada *World Development Indicators* yang disediakan oleh Bank Dunia. Penemuan kajian ini menunjukkan kepentingan pembangunan kewangan terhadap pertumbuhan ekonomi negara-negara sedang membangun. Bukti yang diperoleh mencadangkan bahawa sistem kewangan yang berfungsi dengan baik menyumbang secara signifikan kepada prestasi ekonomi dan penciptaan pekerjaan. Pembangunan kewangan, di satu pihak, membuka peluang pertumbuhan secara langsung serta meningkatkan peluang pekerjaan dengan merangsang aktiviti ekonomi. Menariknya, satu lagi aspek penting ialah bagaimana peraturan gaji minimum dikuatkuasakan. Hasil kajian menunjukkan bahawa penguatkuasaan yang seimbang tidak terlalu lemah atau terlalu ketat dapat memperkukuh kesan positif pembangunan kewangan terhadap pertumbuhan ekonomi. Dapatan ini dapat memberikan panduan yang berguna kepada pembuat dasar di peringkat pelaksanaan dalam merangka strategi ekonomi yang inklusif dan mampan bagi negara-negara sedang membangun.

Kata kunci: Pembangunan Kewangan, Pekerjaan, Gaji Minimum, Pertumbuhan Ekonomi, *Generalized Method of Moments dan Analisa Ambang*

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LIST OF ABREVIATION

DCPS	Domestic Credit to Private Sector
1/VIF	Mean of Vector Inflation Factor
D-GMM	Difference Generalized Method-Of-Moment
EMP	Employment
FDI	FDI
GDP	Gross Domestic Product
GE	Government Expenditure
GERD	Gross Domestic Expenditure on Research and Development
GMM	Generalized Method-Of-Moment
HC	Human Capital
HDI	Human Development Index
ILO	The International Labor Organization
M3	Broad money
MW	Minimum wage
OECD	Organization For Economic Cooperation and Development
PG	Population Growth
PI	Private investment
R&D	Research And Development
S-GMM	System Generalized Method-Of-Moment
UNESCO	The United Nations Educational, Scientific and Cultural Organization
VIF	Vector Inflation Factor
WDI	World Development Indicator
WESP	World Economic Situation and Prospects
Y	Gross Domestic Product

LIST OF SYMBOLS

R^2	R-squared
r	Correlation
β	Beta coefficient
ρ	p-value
ϵ	Error term
L	Labor
K	Capital
Y	Growth of Gross Domestic Product
A	Productivity
%	Percentage
*	Significant at 10 percent
**	Significant at 5 percent
***	Significant at 1 percent
>	Less than
>	Greater than

CHAPTER 1

INTRODUCTION

1.1 Overview

In this chapter, the researcher will analyse various aspects of the study, such as its background, research problem and questions, objectives and scope, significance, and the operationalization of key terminology. The primary objective of this chapter is to provide a comprehensive overview of the study's context, purpose, and objectives. To begin, a general overview of the study's background will be presented, which will focus on the research issue's setting and timeline. This will be followed by a discussion of the research topic and questions, which will help to clarify the study's precise area of investigation. Furthermore, the research objectives and scope will be explained to provide a better understanding of the study's aims. This will aid in making the study's objectives and constraints more apparent.

1.2 Background of the Study

Developing countries are still confronted with a serious issue and many continue to struggle with inconsistent Gross Domestic Product (GDP) growth, many people unable to access financial services, and widespread unemployment. Growth rates of GDP may experience severe fluctuations in many developing countries.

The main reasons for this involve the heavy dependence of primary commodity exports, limited industrial diversification, and greater vulnerability to exigencies like global financial crises, commodity price volatility, and climate-related events (IMF, 2022). In Sub-Saharan Africa and parts of Southeast Asia, pro-cyclical fiscal policies and dependence on external debt often exist in regions where macroeconomic instability is further aggravated (IMF, 2022). In contrast to advanced economies in possession of far stronger buffers and diversified economic structures, underdeveloped nations often simply lack the institutional structures to effectively mitigate those shocks causing erratic growth and a slow convergence with high-income nations (IMF, 2023).

The World Bank (2023) estimates there are still over 1.7 billion unbanked adults and many of these live in low-income or lower-middle-income countries. In Sub-Saharan Africa, 55% of adults are reported to have access to financial services. This means that in many rural and marginalized areas, informal finance is the only access people have to financial services (Demirgüç-Kunt et al., 2022). This underlining issue illustrates the dire need for strong financial systems to facilitate economic development that is both sustainable and conducive to lowering poverty levels around the world.

The World Bank (2023) report that around 1.7 billion adults worldwide are unbanked, concentrated mainly in low and lower-middle-income countries. Financial exclusion is especially acute in Sub-Saharan Africa, where only 55% of adults have access to formal financial services (Demirgüç-Kunt et al., 2022). In rural, remote, and marginalized areas, informal mechanisms of finance, such as borrowing from family, friends, or local moneylenders, often represent the main source of financial support.

While informal sources provide some access, such channels are usually limited, unregulated, and extremely risky, thus hindering the pursuit of sustainable financial security or wealth accumulation (Demirgüç-Kunt et al., 2022; Dupas et al., 2013). This widespread exclusion points towards an inherent weakness in the financial development of many developing economies. Financial development, which encompasses the broadening and deepening of formal financial institutions and markets, is essential for bringing into being an inclusive financial ecosystem that offers accessible, safe, and diverse financial products such as savings accounts, credit, insurance, or digital payment platforms.

In the absence of these infrastructures, both households and economic enterprises face great barriers towards complete participation within the formal economy, thereby inhibiting investment in human capital and entrepreneurial activities while presenting an increased vulnerability to economic shocks (Beck, Demirgüç-Kunt, & Levine, 2007; Demirgüç-Kunt et al., 2018). Therefore, it becomes imperative for policy considerations to emphasize strengthening such systems both institutionally and technologically in order to advance financial development and ensure broad-based financial inclusion across developing countries.

The availability, effectiveness, and accessibility of financial services are characteristics of financial development, which is generally acknowledged as a major force behind economic expansion and a job-creation engine in developing nations. Well-developed financial systems allow businesses and entrepreneurs to invest, innovate, and create jobs by enhancing resource allocation, lowering transaction costs, and increasing access to credit and other financial products (Beck, Levine, & Loayza, 2000; King & Levine, 1993; Aghion, Howitt, & Mayer-Foulkes, 2005).

Within the current climate of international finance, there are various indicators have been used by several researchers to study the performance of financial systems in developing countries, including domestic credit to the private sector (DCPS), the broad money supply (M3), and indexes of financial inclusion (Beck, Demirgüç-Kunt, & Levine, 2007; Demirgüç-Kunt et al., 2022; Sahay et al., 2015).. Empirical evidence regarding the relationship between financial development, economic growth, and employment creation in developing economies has produced mixed evidence and varies depending on the context (Haider et al., 2023; Karlsson et al., 2021).

In nations with underdeveloped financial institutions and markets, the end result of financial intermediaries often results in inefficiency. This results in misallocation of resources, low capital formation, and subdued entrepreneurial activity, among others. For example, in Kenya and Bangladesh, although mobile banking has improved access to finance, formal credit is unavailable to most people, especially small and medium enterprises (SMEs) and rural households (Ngigi et al., 2023; Joseph et al., 2023). Therefore, assessing the developmental role of financial systems in these settings is valuable.

For this study, one of the main variables is GDP growth, that GDP growth in developing countries is fundamentally influenced by capital accumulation, technological progress, and improvements in institutional quality (Barro, 1991). However, due to weak financial infrastructure and inconsistent access to investment capital, monthly or short-term GDP growth in such economies often exhibits significant volatility (Raddatz, 2007; Levine, 2005). This volatility underscores the importance of financial development in stabilizing and enhancing growth trajectories.

Domestic credit to the private sector, which is a measure of available financial resources for the economy, is often directed towards large firms that are located in urban areas, while informal and rural businesses are excluded from even having access to credit. Without access to inclusive credit, entrepreneurial endeavors are challenged, and the potential for jobs is limited, therefore limiting development broadly (Beck et al., 2007).

The minimum wage is another potential policy tool to provide a minimum income for workers. Theoretically, it mediates unacceptable work and poverty. However, the consequences of minimum wage regulation in developing countries are less clear-cut. For instance, in rising minimum wage contexts such as Nigeria and Indonesia, also identifiable are informalization of labor, and reduced employment for youth and low-skilled cohorts (Santanu and Wardani 2023). This highlights the need to think about minimum wage policy not in a vacuum but against the backdrop of financial development and economic circumstances. Nonetheless, while the logic of financial development is compelling, it does not automatically produce widespread economic advancement in developing countries. The impact of financial development is influenced by institutional robustness, regulatory soundness, and labor market structure among others. Thus, this research proposes to disentangle the intertwined effects of financial development, employment changes and growth, and, more specifically, the role of minimum wage policy in this regard, in developing countries. Through its analysis of comparative empirical data from a cross section of developing countries, this research builds a more localized understanding of how these constructs interact. The findings will inform potential policy pathways to provide broader financial access, achievable labor market outcomes, and the economic well-being of the Global South.

Economic growth in developing countries is not the result of a single cause, but rather of the dynamic interplay of different structural, policy, and demographic factors. Growing populations, advancements in human capital (education and skills), strategic government spending, and aggressive private sector investment are frequently cited as key factors. These aspects jointly create a country's capacity to produce sustainable and inclusive growth (Todaro & Smith, 2020; Barro, 1991; Easterly & Levine, 2001; Aghion & Howitt, 2009). The future of many developing regions is still being shaped by high population growth, particularly in areas like South Asia and Sub-Saharan Africa. Although a larger workforce and possible financial benefits can result from having more people, the reality is more nuanced. Rapid population growth frequently puts a strain on public services like hospitals, schools, and employment markets (UN DESA, 2019; World Bank, 2023).

However, the economy's ability to provide jobs and invest in productive areas would be crucial to reaping the benefits of a growing population, such as demographic dividends when the number of people of working age rises (Bloom & Canning, 2008). Without this clause, population growth would result in higher rates of poverty, underemployment, and social unrest.

At the heart of any strategy for sustainable development is human capital encompassing the education, skills, and health of the workforce. Research continuously demonstrates that spending on healthcare and education greatly increases productivity and promotes long-term economic growth (Barro, 1991; Romer, 1990). However, insufficient public spending, inadequate infrastructure, and issues with systemic governance impede the development of high-quality human capital in many emerging nations.

There are, however, encouraging examples: countries like Bangladesh and Kenya have shown that deliberate expenditures on basic education and vocational training can improve labor market results and raise income levels. Government spending plays a crucial role in shaping a country's economic path. When funds are directed toward areas like building roads and schools, improving healthcare, or upgrading digital infrastructure, they help strengthen the skills and well-being of the population what economists call human and physical capital.

These investments lay the groundwork for more inclusive and sustainable growth. However, when too much of the budget is used for routine expenses, such as administrative overhead or inefficient subsidies, it can end up squeezing out private sector activity and disrupting the economy's balance (Barro, 1990; Tanzi & Zee, 1997). This is still a common challenge in many developing countries, where a large portion of public funds goes to recurrent costs, leaving little room for long-term development projects.

Private investment whether from local businesses or foreign firms is another key engine of growth. It drives innovation, creates jobs, and enhances a country's competitiveness. But in many developing nations, investors face serious roadblocks: loans can be hard to get, property rights may be uncertain, and government rules can change unpredictably. A strong and accessible financial system can help ease these problems by making credit more available, reducing the costs of doing business, and building trust among investors (Levine, 2005). Countries like Vietnam and Rwanda have shown how reforms in the financial sector alongside stable and responsible economic policies can unlock investment and fuel broader economic progress.

At the heart of it all, successful development depends on the interplay between these three forces: public investment, private sector participation, and a growing, youthful population. Young people entering the workforce need schools and skills training (human capital), funded by smart government policies (public expenditure), and they need good jobs, often created by private businesses (private investment). If any part of this system breaks down, the ripple effects can stall development and limit future opportunities for growth.

1.2.1 Financial Development and Economic Growth

Financial development and economic growth are two closely related concepts that have been extensively studied in the field of economics. Financial development refers to the growth and sophistication of a country's financial sector, including the development of financial markets, institutions, and regulations, while the terms financial depth, financial intermediation, and financial development are used to describe the availability of a wide range of financial services to suit varied financial requirements. In literary works, these terms are used interchangeably. It is thought that there are two main macroeconomic ways through which financial development affects economic growth.

Expanding resources is the main goal (McKinnon, 1974). In addition, it guarantees that intermediation offers the best potential return on investment. It is, therefore, impossible to undervalue the importance of financial development to the strength and stability of an economy. According to a number of economists, the importance of the financial sector derives from the necessity of an effective financial sector for attracting and mobilising foreign capital, optimising the allocation process, and attracting financial resources for investment.

Well-functioning financial systems facilitate the efficient allocation of resources, mobilise savings, and provide funding for productive investments. Empirical studies have shown a positive relationship between financial development and economic growth in developing countries (Levine, 2005; Beck, Demirguc-Kunt, & Levine, 2007) Financial development, which includes the development of financial institutions, markets, and instruments, plays a crucial role in fostering economic growth. There is a well-established relationship between financial development and economic growth. A well-developed financial sector can provide greater access to credit and other financial services, which can facilitate business growth and investment. This can in turn create more employment opportunities and stimulate economic growth.

According to a study by Levine (1997), financial development can enhance economic growth by increasing the efficiency of capital accumulation and by improving the allocation of resources. However, the relationship between financial development and economic growth is not always straightforward (Karlsson et al., 2021). Financial development can also lead to greater income inequality if not managed properly. Moreover, a poorly regulated financial sector can also lead to financial instability, which can have a negative impact on economic growth. Thus, it is important for policymakers to carefully balance financial sector development with other policies aimed at promoting inclusive growth.

Since the development of the financial sector is the development of the financial system, which consists of markets, institutions, and financing tools, one may consider the financial sector to be the second half of economics that completes its genuine component. In today's globalised world, the financial sector is viewed as the economic system's foundation. The influence of a more intense

and deeper financial sector on macroeconomic factors like employment and economic growth must thus be experimentally investigated, both positively and negatively.

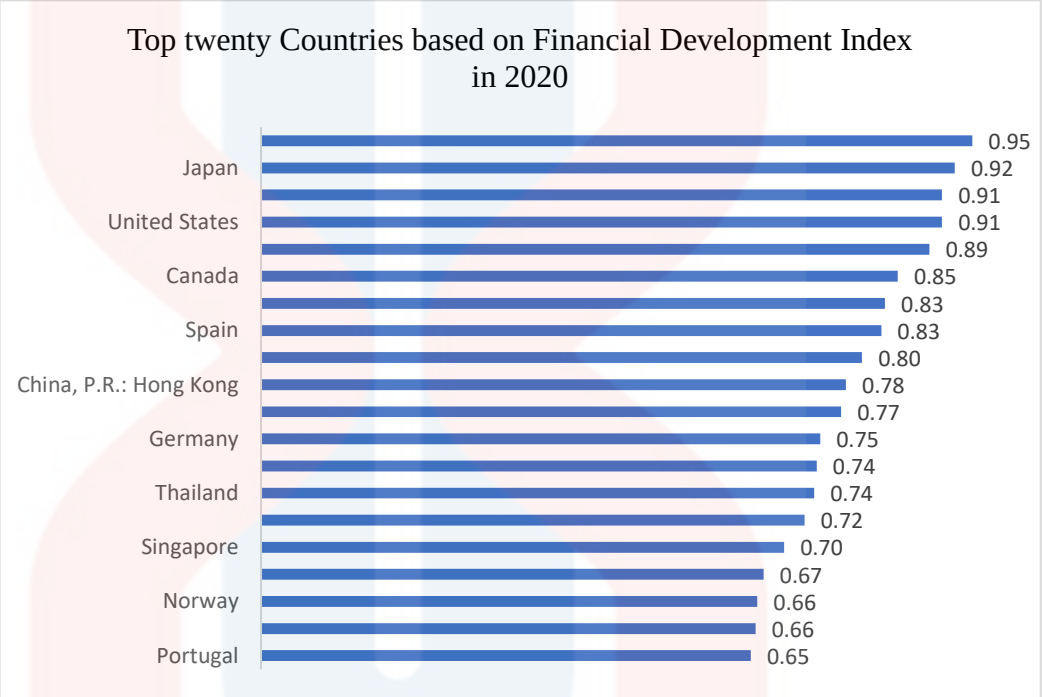


Figure 1.1: Top twenty countries of financial development index in 2020

Source: International Monetary Fund Database.

Figure 1.1 shows only two developing countries, China and Thailand, which are included in the top twenty countries according to their effectiveness of financial development (financial institutions and financial market) in 2020. This finding shows that developing countries are falling behind rich countries and must improve and restructure their financial system (institution and market) to catch up.

The development of some social, cultural, and economic mechanisms is necessary for achieving economic progress. In the economic sphere, strong financial markets are seen as such systems. Strong financial institutions are

required to have robust financial markets. Financial system functions including gathering savings, tracking investments, allowing the trade of commodities and services, and learning about investment opportunities will lower transaction costs, improve resource allocation, and ultimately spur economic growth. Any country's real sector and financial sector must be effective, reliable, and closely supervised for the economy to operate at its best. These two sectors must cooperate if any economic system is to be successful. Failure in one section would have a negative impact on the other.

Therefore, whenever these two sectors cooperate effectively and in a balanced way, the long-term stability of the economic system is established. Economic growth has been credited with being mostly driven by financial development. Levine (1997) argued that a nation with a strong financial system may distribute resources more efficiently by lowering transaction costs, granting access to financial institutions, enabling trade, and exchanging goods. Conversely, an ineffective financial system drives up costs, discourages investment, and reduces output and employment. in this case, it ultimately causes the economy to slow down (Shrestha, 2005).

The theory holds that financial institutions and markets play a crucial role in economic growth and development by channelling savings from savers to other economic sectors to increase overall investment, employment, and output. Due to their superior financial systems, established countries had greater economic growth than developing countries.

Every country must have financial development to experience economic growth. Studies demonstrate that in countries with weak financial sectors, financial resources are not allocated to needs effectively. Occasionally, countries struggle to obtain sufficient resources due to a lack of financial tools. For a country

to see spectacular and continuous economic growth, its financial sector must be developing. Because they enable other countries to experience economic progress, those with a better developed financial system would move more quickly along the road of economic development. Commodity, labor, money, and capital markets are the foundation of a market-based system at the macro level. Currently, the money market and the capital market are frequently separated in each country's financial sector. One of the main objectives of every country is to attain political and economic stability, and this may be done by creating a financial market, which is a foundation of modern communities.

Economic growth, income growth, the eradication of poverty, and economic progress are all aided by financial development. Financial development has been credited as being primarily responsible for economic progress. According to Levine (1997), a country possessing a robust financial system has the potential to efficiently allocate resources towards saving by reducing transaction costs, enabling access to financial institutions, promoting trade, and facilitating the exchange of goods. Previous empirical studies have contributed to a more comprehensive understanding of the correlation between financial development and economic growth in developing nations (Wen et al., 2021; Bist, 2018; Guru & Yadav, 2019).

According to Khan et al. in 2020; Marcelin et al. in 2021; Ekanayake and Thaver in 2021, even though financial development has been emphasissed as a crucial component of long-term economic success, only a few developing countries have a financial system that is equal or better than wealthy countries. In conclusion, financial development and economic growth are closely intertwined concepts that have significant implications for a country's overall economic well-being. A well-developed financial sector can play a crucial role in promoting

economic growth, but policymakers must also be mindful of potential risks and take steps to manage them effectively.

1.2.2 Financial development and employment

Financial development and employment are two fundamental pillars of economic growth in developing countries. Financial development refers to the growth and expansion of financial markets and institutions, such as banks, stock markets, and insurance companies, which facilitate the allocation of capital and investment in the economy (Karlsson et al., 2021). Employment, on the other hand, refers to the provision of productive work for individuals and households, which enables them to earn a livelihood and contribute to economic growth.

Numerous studies have highlighted the relationship between financial development and employment. Financial development can have a positive impact on employment by promoting investment and economic growth, and by creating more opportunities for individuals and businesses to access financing and credit. For instance, according to Rajan and Zingales (1998), financial development can enhance resource allocation and lessen information asymmetry, resulting in more effective investment and employment generation.

However, the relationship between financial development and employment is complex, and the impact of financial development on employment can vary depending on the type and level of development of financial markets and institutions. For instance, Beck and Demirguc-Kunt (2006) suggest that while financial development can increase job creation and reduce unemployment in developing countries, it can have a negative impact on employment in more

advanced economies by increasing the demand for skilled labor and reducing the relative wages of low-skilled workers.

Moreover, the role of minimum wage policies in promoting employment and economic growth is a subject of ongoing debate among policymakers and researchers. Minimum wage policies aim to set a floor on wages and ensure that workers receive a minimum level of income. However minimum wage policies' effects on employment and economic growth can depend on a range of factors, such as the level of development of financial markets and institutions, the structure of the labor market, and the productivity of workers.

1.2.3 The role of minimum wage of financial development on employment

The relationship between minimum wage policies, financial development, and employment is a multifaceted area of study with significant implications for economic policy in developing countries. Minimum wage laws are designed to protect workers from exploitation and ensure a basic standard of living. However, the effects of these laws on employment levels are contentious. Some argue that higher minimum wages can lead to job losses as businesses may cut back on hiring due to increased labor costs, while others suggest that raising the minimum wage can boost consumer spending and stimulate job growth (Neumark and Wascher, 2008).

Financial development, on the other hand, involves the growth and sophistication of financial institutions and markets, including banks, stock markets, and insurance companies. These institutions play a critical role in facilitating the allocation of capital and investment, which are essential for economic growth.

Financial development can enhance the efficiency of capital allocation, reduce transaction costs, and improve access to credit for businesses and individuals (Levine, 2005). This improved financial intermediation is crucial for supporting entrepreneurial activities and job creation, especially in developing economies where financial systems are often underdeveloped.

The interplay between financial development and employment is complex. While financial development generally promotes economic growth by enabling better resource allocation and risk management, its impact on employment can vary. In some contexts, financial development may lead to increased employment by supporting business expansion and innovation. In other cases, especially where financial systems are not inclusive, the benefits may be concentrated among larger firms, potentially leading to jobless growth or even job displacement in small and medium enterprises (SMEs) (Demirgüç-Kunt, Beck, Honohan, 2008). Additionally, access to financial services can empower individuals by enabling investments in education and health, which indirectly boosts employment prospects.

Empirical studies examining the effects of minimum wage increases in the context of financial development have revealed diverse outcomes. For instance, in countries with well-developed financial systems, businesses might better absorb the costs of higher minimum wages due to easier access to credit and financial services, thereby mitigating potential negative impacts on employment.

Conversely, in countries with underdeveloped financial markets, the same policies might lead to significant job losses as businesses struggle with higher labor costs without adequate financial support (Karlsson, Gupta, & Owusu-Sekyere, 2021).

Therefore, the overall impact of minimum wage policies on employment is contingent upon the level of financial development, necessitating a nuanced approach to policy-making that considers both economic and financial contexts.

1.3 Problem Statement

Across the world, financial development is often viewed as a catalyst for economic growth and job creation. Theoretically, well-developed financial system can help channel resources efficiently, support businesses, and stimulate overall economic activity (Khan et al., 2021; Iqbal et al., 2021). But in reality, this relationship doesn't always play out so smoothly especially in developing countries. However, empirical evidence on the relationship between financial development and growth can vary depending on local policies, institutional strength, and socio-economic conditions.

For instance, in low- and middle-income economies like Latin America and the Caribbean, studies have shown that financial development hasn't consistently led to economic growth (Karlsson et al., 2021). This raises important questions for policymakers: what makes financial development effective, and how can it better support inclusive growth and employment in countries that need it most?

Despite extensive research, important gaps remain. Much of the existing literature either concentrates on developed countries or overlooks critical socio-economic dimensions, such as employment dynamics and minimum wage policies, when assessing the impact of financial development. What's often missing is a closer look at developing countries and how factors like employment

dynamics and minimum wage policies fit into the picture.

In fact, when financial systems grow too fast without the right regulatory support, they can do more harm than good (Abdullahi et al., 2023). This is especially true in countries where institutions are weaker and labor regulations less robust. For example, the average Financial Development Index for developed countries stands at 0.57, compared to just 0.15 for developing countries (IMF, 2023). Minimum wage regulation scores also show a similar gap (Fraser Institute, 2023), as reported by Fraser Institute, (2023) minimum wage regulation scores remain slightly higher in developed countries (6.51) compared to developing ones (6.04).These differences highlight the urgency of building financial systems and labor policies that are not only efficient but also fair and inclusive.

At the same time, minimum wage policies add another layer of complexity. On one hand, raising the minimum wage can help improve living standards and stimulate demand especially during tough economic times (Yusoff et al., 2021). On the other hand, there are concerns that it might lead to job losses, especially for groups like youth, women, and older workers (Paun et al., 2021; Fernández-Villaverde, 2021; Wang, 2022). Moreover, policy decisions around wages often involve competing interests, with employers and labor unions pushing in different directions (Rusdi, 2023).

Even when well-intentioned, minimum wage laws can lead to wage spillovers and affect how jobs are structured within organizations (Lain, 2022). Additionally, research in Bangladesh explores the effectiveness of minimum wage policies, favouring the application of such laws with proper implementation processes (Syed, 2020). While the debate continues in places like the EU, Latin America, and the U.S., there's still a lack of clear evidence on how these policies

interact with financial development and economic growth in developing countries.

While prior research has explored financial development and economic growth, few studies integrate employment as a moderator, and even fewer examine the role of minimum wage in this relationship in developing economies This study aims to bridge that gap. This study seeks to address these research gaps by examining the interrelationship among financial development, economic growth, and employment, with a particular focus on the moderating role of minimum wage regulation. Using panel data from 96 developing countries over a twenty-year period, the study aims to provide empirical evidence on how financial development interacts with labor market dynamics and wage policies to influence economic performance. By integrating these variables into a single analytical framework, the research intends to offer valuable insights for policymakers designing inclusive growth strategies. The findings are expected to contribute meaningfully to the literature on development economics by illuminating the conditions under which financial development can support sustainable economic growth and decent employment in the context of minimum wage regulation.

1.4 Research Questions

The research questions are as follows:

1. To what extent does financial development affect economic growth in developing countries, controlling for population growth, human capital, private investment, and government expenditure?

2. Does employment moderate the relationship between financial development and economic growth in developing countries, while

controlling for population growth, human capital, private investment, and government expenditure?

3. Does the minimum wage further moderate the interaction between employment and the financial development–economic growth nexus, after accounting for population growth, human capital, private investment, and government expenditure?

1.5 Research Objectives

To answer the above questions, the following objectives need to be addressed:

1. To examine the impact of financial development on economic growth in developing countries, while controlling for population growth, human capital, private investment, and government expenditure.
2. To investigate whether employment moderates the relationship between financial development and economic growth in developing countries, while controlling for population growth, human capital, private investment, and government expenditure.
3. To evaluate whether minimum wage moderates the effect of employment on the financial development–economic growth nexus, in the presence of population growth, human capital, private investment, and government expenditure as control variables.

1.6 Scope of the Study

The scope of the study is focused on exploring the relationship between financial development, employment, and economic growth in developing countries. The study aims to analyses how financial development, as indicated by metrics like domestic credit to the private sector and broad money supply, influences economic growth and employment levels in these countries. Additionally, the study seeks to investigate how minimum wage regulations moderate this relationship. By examining a diverse range of 96 selected developing countries from 125 developing countries as reported in WESP (2023) from various regions such as Africa, Asia, and Latin America and the Carribean, the study aims to provide a comprehensive understanding of the subject matter across different contexts and geographical locations.

The reason of selection developing from WESP instead from World bank because of WESP classification is not based strictly on income as World Bank classification, but WESP considers economic structure, industrialization level and developmental challenges as WESP uses a broad, multidimensional approach to define development, aligned with socio-economic vulnerabilities and geographic regions.The selection of developing countries are based on availability of complete dataset (particularly on financial development, employment, and minimum wage). List of selected 96 developing countries is reported in appendix.

The study's temporal scope spans from 2000 to 2022, allowing for an in-depth longitudinal analysis of trends and patterns in the relationship between financial development, employment, and economic growth. By covering this period, the study can assess how these relationships have evolved over time and identify any significant changes or trends that have occurred. This longitudinal

approach enables a more robust analysis of the dynamics between these variables, providing valuable insights into the long-term implications of financial development on employment and economic growth in developing countries.

Methodologically, the study employs quantitative techniques such as statistical analysis and econometric modeling to analyses the data. These methods allow for a rigorous examination of the relationships between financial development, employment, and economic growth, providing empirical evidence to support the study's findings. By utilizing these analytical tools, the study aims to contribute to the existing literature by offering new insights and perspectives on the complex interactions between financial development, employment, and economic growth in developing countries.

1.7 Significance of the Study

This study attempts to investigate the ways in which financial development and economic growth relate both to minimum wage policies in developing economies, a situation that is compounded for many countries by unemployment and income inequality and limited access to financial services. Such challenges generate stagnation in the economic environment while touching the lives of millions of people in an adverse manner. This study presents evidence over the last two decades for 96 developing countries to inform discussion on the much needed, timely basis for developing inclusionary and sustainable economic policies.

What makes this research stand out is its focus on the role of the minimum wage an area that has often been studied separately from financial development and growth by means of threshold analysis. The analysis not only investigates how

these elements interact with one another but also sets out to discover at what minimum wage level one can be sure if there is an impact on or facilitation of encouraging economic growth. The approach thus takes the more realistic and clearer picture into account on how wage policies would impact on developing economies differently depending on their financial and economic architectures.

This study, therefore, adds to the existing body of knowledge, since it shows that the relationship between minimum wage and growth isn't simple. It challenges the universal model and argues that the impact of wage policies depends on the level of development of the financial system and other local conditions. These findings would also extend traditional theories of development such as Patrick's Stage of Development Hypothesis in demonstrating where labor policies fall within the larger financial and economic strategies.

Academically and practically, this study is significant to various groups. Policymakers can use this information to improve the design of wage and financing policies that pursue fairer economic outcomes. Development agencies and international institutions can also make use of results to enhance their support for labor market reforms. Then again, reference to innovative methodologies such as interactive models and threshold analysis will open further studies by researchers, as well as students, into this area of development economics. Overall, this research fills a critical gap. It has very much practical and theoretical dimensions. It brings for understanding the cause of disparity between economic growth and labor standards in the developing world, thereby making it academically and socially relevant.

1.8 Operational Key Terms

There are ten operational key terms, which are shown below.

1.8.1 Developing Countries

A developing country, also known as a less developed country or a developing economy, is a country with a less developed industrial base and a lower Human Development Index (HDI) relative to other countries. According to the World Economic Situation and Prospects (WESP) report, developing countries are typically defined based on their income levels, economic structures, and social indicators. Developing countries are often characterised by lower levels of income per capita, higher levels of poverty, and less access to healthcare, education, and other essential services compared to developed countries. These countries typically face challenges such as inadequate infrastructure, limited access to capital, high levels of unemployment, and environmental degradation. Developing countries are diverse in terms of their economic structures, natural resources, and levels of development; however, they share a common goal of achieving economic growth and improving the well-being of their populations. This study follows a list of developing countries from the World Economic Situation and Prospects (WESP,2023).

1.8.2 Economic Growth

Economic growth is the increase in a country's output of goods and services over time. It is typically measured by Gross Domestic Product (GDP) at constant

prices, which adjusts the value of goods and services produced for inflation, allowing for a more accurate comparison of economic performance over time (Manurung et al, 2022; Wandita et al, 2022; Oliinyk and Kozmenko 2019).

1.8.3 Financial development

Financial development refers to the improvement in key financial activities such as facilitating the exchange of goods and services, mobilising and pooling resources, facilitating trade, diversification, and risk management, as well as efficiently allocating knowledge for future investments. In this study, financial development is measured by two proxies: domestic credit to the private sector, which represents the financial resources provided to the private sector by financial corporations (Prasetyowatie et al., 2022; Iheonu et al., 2020), and broad money (M3) (Adil et al., 2022; Sare et al., 2022), which encompasses all currencies and other liquid instruments in a country's economy.

1.8.4 Employment

Employment refers to the proportion of the working-age population actively engaged in the labor market. It is typically measured by the labor force participation rate, which reflects the percentage of the population that is either employed or actively seeking employment (Hobjin and Sahin, 2021; Triha et al., 2021).

1.8.5 Minimum Wage

The minimum wage is the basic minimum payment that an employer must pay wage earners for labor performed over a certain time, which cannot be decreased by collective bargaining or individual contracts. It aims to protect the income and living conditions of the most vulnerable workers in the labor market.

1.8.6 Population Growth

Population growth is the increase in the number of people in a population over time. It is usually expressed as a percentage reflecting the growth rate of the population.

1.8.7 Human Capital

Human capital refers to the skills, knowledge, and experience possessed by an individual or population which contribute to their economic productivity. In this study, human capital is proxied by school enrolment, reflecting the level of education and skill development in a population (Mifrahi and Rahmat, 2022; Evans et al., 2002)

1.8.8 Government Expenditure

Government expenditure refers to the spending by the government on goods and services. It is typically divided into categories such as consumption, investment, and transfer payments. In this study, government expenditure is measured by

general government final consumption expenditure, which encompasses government spending on consumption goods and services (Ceesay et al., 2022).

1.8.9 Private Investment

Private investment refers to investment by private entities, such as businesses and individuals, in physical assets like machinery, equipment, and infrastructure. It is typically measured by gross fixed capital formation, which reflects the value of new fixed assets purchased by businesses and individuals. Gross fixed capital formation (GFCF) can serve as a proxy for private investment (Angaye and Frank, 2020; Morris, 2022).

1.8.10 Generalize Method of Moments (GMM)

GMM is a statistical technique used for estimating parameters in econometric models. It is particularly useful in situations where traditional estimation methods may not be feasible or efficient, such as when dealing with dynamic panel data models or models with endogeneity issues. GMM works by specifying a set of moment conditions based on the underlying economic theory and using these moment conditions to construct a criterion function. GMM allows for the use of instrumental variables to address endogeneity, making it a valuable tool in applied econometrics.

1.9 Organization of research

This research comprises five chapters, each serving a distinct purpose in the exploration of its research topic. The initial chapter serves as an introduction, providing background information on the issues under investigation. It also

outlines the problem statement, research question, research objectives, the significance of the study, and its limitations. This chapter sets the stage for the subsequent chapters by framing the research within its broader context and highlighting its importance.

Chapter 2 explores the theoretical framework and reviews existing literature related to the impact of the finance and engineering index on economic growth in developing countries. This chapter synthesizes previous research and theoretical perspectives to provide a comprehensive understanding of the subject matter. It lays the foundation for the empirical analysis that follows, guiding the study's approach and hypothesis development.

The methodology is detailed in Chapter 3, outlining the research design, data collection methods, and analytical techniques used in the study. This chapter explains how the research questions were addressed and the rationale behind the chosen methodology. It provides transparency and rigor to the study's methodology, ensuring that the findings are robust and reliable.

Chapter 4 presents the empirical results of the study, aligning them with the research objectives outlined in Chapter 1. The findings are discussed in detail, interpreting their implications and significance. This chapter offers insights into the relationships between finance, engineering, and economic growth in developing countries, shedding light on their complex dynamics.

Finally, Chapter 5 concludes the dissertation by summarizing the research findings, discussing their implications, and highlighting the theoretical contributions of the study. Additionally, it proposes policy recommendations based on the findings, offering practical insights for policymakers and stakeholders. This chapter serves as a culmination of the research, tying together the key findings and contributions of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This chapter begins with a review of previous theoretical and related literature, which led to the establishment of the theoretical framework. Additionally, empirical evidence related to each construct will be examined. Finally, the chapter presents the research framework and discusses the model proposed in this study.

2.2 Theoretical Literature

The area of theoretical literature in regard to finance-development relationship, employment, and economic growth has been a central issue in economics for a long time, especially for developing countries in their pursuit of inclusive and sustainable growth. The understanding of the complex finance-development relationship has evolved with some schools of thought through time, each shedding its unique light and limitation on the matter. In this section, the main theoretical frameworks applied in this study are presented, including classical, neoclassical, and endogenous growth models with due consideration being given to the employment sector with increasing recognition in influence over the growth-finance-nexus.

The classical economists, including Smith and Ricardo, saw land, labor, and capital as the primary sources of economic growth, but they barely mentioned the financial institutions. Their successors in the neoclassical tradition, especially

with Solow (1956), attempted a more systematic treatment of growth by emphasizing capital accumulation and technological progress. Long-term economic growth in Solow's growth model is mostly driven by technological advancement, which was seen as external (or exogenous) to the system.

Nevertheless, a big shortcoming of the model is the focus on physical capital and diminishing returns that shut every other avenue that would have allowed for a view of how financial systems, institutions, or policies may shape growth from inside the economy somehow. Financial development, in this perspective, is somewhere in the background important, perhaps, but not an active ingredient in the growth process.

The debate on the role of finance on economic development gained popularity with Schumpeter (1934), who postulated that a properly functioning financial system is central to innovation, entrepreneurship, and long-term growth. According to Schumpeter, financial institutions are not mere passive intermediaries; they also actively participate in the promotion of productive investment and technological change. Some theorists contend that the financial system has no bearing on economic growth. For instance, Robinson (1952) asserted that financial development simply reveals the rate at which the real economy is developing.

McKinnon and Shaw (1973) talked about how crucial an effective financial system is to economic growth. They discussed how an ineffective financial sector might have a negative impact on economic growth. According to them, government restrictions on the financial sector (such as interest rate caps, central bank reverse rates, and credit distribution) can cause issues with the growth of the financial industry, which in turn can impede the development of the real

sector. There are three views that can be used to categories theories on how financial development affects economic growth.

The supply-leading hypothesis builds upon this view, stating that financial development is an active agent stimulating economic growth. This argument has been espoused by McKinnon (1973) and Shaw (1973), who argued that liberalizing financial markets by removing interest rate caps, eliminating credit rationing, and promoting competition would increase the efficiency of investment and mobilization of savings.

According to the opposite viewpoint, that financial systems develop in response to economic growth, and not the other way around. For instance, Stern (1989) disregarded the contribution of financial development to economic expansion. Like Stern, Lucas (1988) asserts that certain economists have placed an undue emphasis on the contribution of the financial markets to economic expansion. In his opinion, the importance of these markets shouldn't be overstated under ideal circumstances. Demand for sophisticated financial services rises as countries industrialize and grow their economies, which brings about a more developed financial system. Patrick (1966) described this as a two-way relationship that evolves over time, particularly in developing countries.

Similarly, there exists a neutralist position, suggesting that economists like Lucas (1988) thought the role of finance in growth may have been overstated. Financial development, as per this view, would not be able by itself to substitute for the deeper structural drivers such as productivity, education, and governance.

By the 1980s, a new wave of economic thinking was challenging the limitations of earlier models. Endogenous growth theory (EGT), proposed by Romer (1986, 1990), Lucas (1988), and others, counterargued that long-run

growth was driven predominantly by internal factors-especially knowledge, innovation, and the accumulation of human capital. Unlike the Solow model, EGT does not assume that there are diminishing returns to capital. Instead, it focuses on how sustained investment in education, technology, and institutions can produce sustained productivity gains.

At its simplest, the AK model expresses this line of argument: output depends linearly on capital (both physical and human). $Y=AK$; where A captures productivity, and K includes capital in all its forms. In this model, growth, if directed efficiently, can be sustained rather than being dependent on external technological shocks. The financial system is a key facilitator in this scenario. It helps reduce transaction cost, extends credit for innovation, and channels savings towards productive investment. More importantly, it facilitates the creation of human capital through financing education and providing support to SMEs, which play an important role in job creation.

While employment was largely treated as a by-product of growth in most early literature, recent theoretical models, particularly in the endogenous growth theory context, have put it as the centerpiece of development strategies. Financial systems promote capital formation and also create jobs when they expand access to credit-whether for companies, vocational training, or education. This especially applies in developing nations, where underemployment and informality continue to pose challenges. Financial inclusion can enable people to set up enterprises, gain skills, and enter the formal economy, especially through microfinance and lending to SMEs.

Yet, this link does not come automatically. Labor Market Theory outlines how jobs, salaries, and employment levels are shaped by worker-employer interaction in a typical analytical framework which works within broader

macroeconomic ideologies. Essentially, it attempts to understand how citizens access jobs, how payment is determined for labor services, and finally, what determines whether labor markets are balanced or strained in differing economies and policy environments (Borjas, 2016).

Traditional forms of LMT assume a fairly straightforward process in which workers choose an amount of time to work between the trade-offs of their income preference and their leisure preference. Employers would then decide on how many workers they will hire, their productivity, and their costs of doing business. When both sides of the market meet in a competitive one, there would be a natural adjustment of wages until supply and demand for labor are in equilibrium (Ehrenberg & Smith, 2021). Reality, however, does not usually follow this format.

Modern labor economics has adapted some of these assumptions with LMT: The state of real-life markets has its imperfections. Lack of knowledge about perfect information, minimum wage laws, labor unions, restrictions on mobility from one job or area to another can disrupt the market. It is not only that it brings a dose of realism to the theory. It also provides answers for questions as why there are unemployed people even when jobs exist, why wage gaps remain evident, and why there is a segmentation of labor markets (Cahuc, Carcillo, & Zylberberg, 2014).

In regard to economic development, that is when LMT comes into focus. This can tell us how education improves the quality of labor; with vocational training and upskilling initiatives, income patterns are changed. As economies increasingly become globalized and new technologies become available, labor markets undergo rapid transformation. LMT sheds light in helping to understand

how such developments lead to skill mismatches and jobs, and therefore how these phenomena may be addressed (Autor, 2015).

Thus, LMT recognizes not merely how markets operate but also how to regulate those markets. Knowledge of labor market dynamics allows governments to institute policy interventions that are savvy: policies designed to reduce unemployment, enhance job quality, and strengthen protections for vulnerable workers. Thus, LMT contributes to the descriptive and prescriptive support for fair, inclusive, and sustainable economic development (Blanchard & Johnson, 2013).

While LMT offers a structural view of employment outcomes based on supply-demand dynamics, New Growth Theory provides an endogenous framework that explains how investments in human capital, innovation, and knowledge generation drive labor productivity and sustainable employment growth. Thus, this study adopts both LMT and NGT to capture short-term labor adjustments and long-term developmental trajectories shaped by human capital enhancement and institutional support (Romer, 1990; Lucas, 1988).

The interconnectedness between financial development, employment, and economic growth elucidates the complexity of development processes in modern economies. While classical and neoclassical models provided a significant base, their inability to fully appreciate the set of institutions and policy frameworks, as well as dynamic processes in labor markets, limits their explanatory power concerning developing countries.

Addressing these deficiencies, this study unites insights from both Labor Market Theory (LMT) and New Growth Theory (NGT). LMT provides structural clarity on the outcomes of employment, resulting from supply and demand activities in labor markets; hence, a clearer understanding of labor adjustments or

wage adjustments that take place in relatively short periods of time. On the contrary, NGT provides a framework for reaching an endogenously driven understanding of the very crux of investments made into human capital, innovation, creation, and productivity with regard to sustainable employment and economic growth in long periods of time (Romer, 1990; Lucas, 1988).

By way of blending both theoretical lenses, one understands that financial systems should not just become conduits of capital allocation, but also evolve into platforms for inclusive development through institutional support and strategic enhancement of human capital. Exhibit challenge and opportunity for developing countries: transforming financial structures into engines making innovation-led growth and employment generation possible using this approach of dual-theory. For the very purpose, it is essential to inform action about developing inclusive, equitable, and future-ready strategies.

2.3 Empirical literature

2.3.1 Financial Development and Economic Growth

Financial development can positively impact economic growth through various channels, as suggested by both economic theory and empirical evidence. This relationship is extensively studied, focusing on the financial system's depth and structure. Metrics such as the ratio of total liquid liabilities to GDP, bank credit to GDP, and stock market capitalisation to GDP measure financial depth. Research generally indicates that financial depth significantly boosts economic growth more than the relative importance of financial structures, like banks versus capital markets.

Specific advancements in stock markets and banking systems also benefit the economy. While transitioning from bank-based to market-based systems is seen as progress, market-based systems do not consistently outperform bank-based ones. The overall advancement in financial development is crucial for economic performance. Empirical literature, such as the work by Demirgüç-Kunt and Levine (2008), categorises studies into cross-country regressions, panel data techniques, microeconomic studies, and individual country case studies. These studies largely affirm that financial development fosters economic growth, as shown by Levine and Zervos (1998). Advanced financial systems reduce capital costs, improve resource allocation, and spur innovation.

On the other hand, a study conducted by Chilizani and Gregory (2024) revealed that the empirical findings indicate a two-way causal relationship between financial development and economic growth within the SADC region. The results also indicate that, although there is a long-term positive correlation between financial development and economic growth, there may be different short-term consequences, with considerable contributions coming from government spending and the buildup of physical capital. The SADC region's economic growth was found to be impacted by trade openness, life expectancy, and population increase, underscoring the intricate nature of development dynamics.

Hasan, Aydın, and Okuyan (2022), found a bidirectional causality between economic growth and financial development in four countries. Specifically, economic growth was observed to precede financial development, suggesting that expanding economies drive improvements in financial systems. Financial development was also found to foster further economic growth, indicating a

reciprocal relationship where advancements in financial sectors can stimulate economic expansion (Hasan, Aydın,and Okuyan, 2022).

Nimra et al. (2024) indicate that financial development positively influences economic growth, emphasising the importance of a well-functioning financial system in driving economic progress. Their findings highlighted that financial development stimulates economic growth in Pakistan. However, they also noted that foreign direct investment and personal remittances adversely affect GDP growth.

However, in developing countries, this relationship is less straightforward. Beck, Demirgüç-Kunt, and Levine (2000) found that financial development has a weaker effect on economic growth in developing countries, often due to inefficient financial institutions. Conventional indicators like the bank loan to GDP ratio are unreliable in predicting financial system performance during economic expansions. Despite this, empirical studies continue to use these measures as noted by Rajan and Zingales, (1998); Levine and Zervos, (1998), and Demirgüç-Kunt and Levine (2008).

La Porta et al. (2001) linked higher public ownership of banks to slower economic growth and financial underdevelopment, suggesting that effective financial institutions are vital for economic progress. This body of research, however, faces critiques regarding causality and econometric methodologies. Pure cross-country regressions, for instance, may yield biased and inconsistent estimates due to endogeneity issues. Researchers often use instrumental variables to mitigate these biases, but this approach has limitations.

Grouping countries in analyses can also skew results, as shown by Gupta (1970) and Harris (1997). The latter found weak correlations between stock market activity and growth, contradicting earlier studies. Categorising countries

by their financial development levels (Rioja and Valev, 2004), offers more nuanced insights. Recent studies such as Cheng et al. (2021) and Nawaz et al. (2019) continue to explore these complex relationships, often finding mixed results.

The impact of financial development on employment and poverty reduction is another area of interest. While some studies find a positive relationship (Pagano and Pica, 2012), others like Bayar (2016) do not establish a clear link. King and Levine (1993) and Levine (2005) highlighted the role of financial structures in economic growth, emphasising that a robust financial sector facilitates external funding and market integration, thus fostering growth. Studies by Bist (2018) and Herwartz and Walle (2014) showed that financial development's impact varies across income levels and regions.

Pradhan et al. (2017) found that banking, bond, stock, and insurance markets collectively enhance economic growth in ASEAN countries. Similar diverse findings are reported in studies on BRICS countries and developing nations, indicating that the finance-growth nexus is context-specific.

Overall, financial development generally promotes economic growth, but its effects are influenced by the efficiency of financial institutions, regional characteristics, and income levels. Further research using advanced econometric techniques and context-specific analyses is essential to deepen our understanding of this complex relationship.

H_1: Financial development has a significant effect on economic growth.

2.3.2 Minimum Wage and Its Effect on Employment in Developing Countries

According to Harmesh (2002), Harisson and Leamer (1997), and Gidling and Terrell (2004), there hasn't been much evidence of minimum wage writing in developing countries over the past ten years. Recently, economists have started to investigate the minimum wage to offer fresh empirical data. A considerable majority of workers in developing countries are not covered by minimum wage laws, according to Lemos (2009). As a result, it becomes an interesting research project to investigate the findings. Research conducted in Vietnam found that the minimum wage had a negative influence on employment, income, and wellbeing (Del Carpio et al.,2013). According to the study, raising the minimum wage reduces the overall number of wage workers, particularly in domestic enterprises, while increasing self-employment. The number of wage workers is decreasing because of the layoffs of many individuals on informal contracts. Workers earning less than the minimum wage are more likely to be young, illiterate, and members of ethnic minorities.

Developing countries are particularly affected by wage disparities. The Philippines has moderately significant wage inequality, with top decile earners making almost seven times as much as the lowest decile earners, which slows down economic growth (Rutkowski, 2015). Similar to other countries, salary inequality is expanding in Thailand. Leckcivilize and Atakrit (2015) conducted an objective analysis of the effect of minimum wage laws on bridging the income gap for low-paid workers. However, the results do not support compressing the bottom of the wage distribution towards the median and demonstrate that the minimum wage has no appreciable impact on the total pay distribution.

In terms of policy repercussions, it would seem that the practice of small businesses in the covered sector paying less than the minimum wage is sustained by a shortage of efficient law enforcement, contributing to the apparent inefficiency of minimum wage legislation. Lemos (2009) used a monthly home panel survey to gather new empirical data on the minimum wage in Brazil and considered a cross-section of the formal and unofficial sectors. The results are consistent with earlier research in that minimum wages significantly compress the pay distributions of both sectors without having an impact on employment.

Numerous empirical studies have demonstrated that foreign direct investment (FDI) inflows have a positive impact on economic growth and employment inside the host country as evidenced by changes in the economy's human capital, skills, job opportunities, export trade, and import commerce. According to Fuangfoo (2016), institutional changes, market integration, developments in technology, and regional concentrations can also be used to transmit FDI flows.

In conclusion, most studies that focused on industrialized countries showed that the implementation of a minimum wage had a negative or no effect on their economic growth. Majchrowska et al. (2012) used a sizable body of empirical evidence to draw some fundamental conclusions about the effects of the minimum wage on employment. To begin, most authors believe that minimum wage legislation has a negative impact. Neumark and Wascher (2007) concluded that just eight out of the 102 studies evaluated had a positive employment effect, with two-thirds of the studies having a negative employment effect.

Second, based on survey research by Brown et al. (1982), it was found that minimum wage strongly impacts employment and that the elasticities associated with this relationship were scattered among a wide range of estimations (-0.1 to -0.3 ranges). (-0.1 to -0.3 ranges). Third, low-skilled and young workers account for an unfair proportion of the negative effects of minimum wage regulations on the labor market.

In general, all employees in a relationship of employment, including adult women, children, and migratory workers, should be protected by the minimum wage. In particular, for disadvantaged worker groups, exclusions need to be kept to a minimum. For a few reasons, including domestic work, unregulated work, or unconventional types of employment like self-employment or part-time work, not all levels of employees in practice have minimum wage protection.

The effectiveness of the minimum wage is still up for debate among academics, regardless of these minimum wage policy instruments. Stigler (1946) demonstrated in his landmark research on the minimum wage that if it is calculated incorrectly and set above the market wage, it will lead to fewer jobs, higher unemployment, higher inflation, lower company profit, lower salaries for the unemployed, and, most significantly, there has been a general incorrect allocation of resources and a loss of effectiveness across the whole economy (Abdul Karim et al., 2016).

Despite an abundance of studies on minimum wages in developed countries, minimum wages first appeared in New Zealand and Australia in the 1890s, moved to the United Kingdom in 1909, and eventually reached states in the United States during the following 20 years. About one-third of the country has minimum wage laws in place, and the Fair Labor Standards Act (FLSA),

which includes a federal minimum wage law, was enacted by the US Congress in 1938.

Since then, several additional developed countries together with many developing countries have imposed minimum wages in a variety of ways. Because of this, minimum wages were established in more than a hundred countries by the 1990s, and academics are becoming increasingly interested in forecasting the effects and success of minimum wage implementation.

According to the International Labor Organisation (ILO, 2006), the establishment of a universal norm for labor was accompanied by the implementation of the minimum wage. As defined by the ILO, the minimum wage is the lowest level of compensation that an employer must provide to employees for their services rendered within a certain timeframe. This compensation cannot be diminished by either collective bargaining or individual contractual agreements.

The minimum wage refers to a fundamental level of compensation that does not encompass supplementary forms of compensation such as overtime pay, benefits, and other additional rewarding elements. The enactment of the Industrial Conciliation and Arbitration Act in 1894 aimed to address industrial disputes pertaining to wage levels. Consequently, New Zealand emerged as the pioneering country to establish a minimum wage. Following that, New Zealand implemented a federal minimum wage with its primary goal of discouraging businesses from using apprentices or young people for no wage.

Australia became the second country in the world to implement a minimum wage in 1896. State laws in Australia regulated the two main minimum wage categories. In 1896, the state of Victoria created several "wage boards," each

of which was presided over by a third party and included an equal number of employees and employer delegates from a certain trade. The primary objective of implementing these boards would be to determine an appropriate minimum wage level, which would then be mandated for all state-affiliated enterprises operating within the corresponding industry (Neumark and Wascher 2009). Ultimately, South Australia, Queensland, and Tasmania authorised this arrangement, which may be referred to as a part of forced arbitration between business entities and labor organisations. The minimum wage order was eventually adopted by wealthy countries like the United States and Canada, and later by less developed countries like Malaysia. Studies on the minimum wage are recognised, yet their worth is still debatable.

H2: Financial development has a significant influence on employment through its impact on economic growth.

2.3.3 The role of minimum wage and financial development on employment

Understanding how financial development and minimum wage policies affect employment is essential, especially for developing countries trying to boost their economies and reduce poverty. Over the years, researchers have explored how strengthening the financial system can help lift countries out of poverty and promote economic stability. For instance, King and Levine (1993) found that financial development played a key role in long-term economic growth across many countries. More recent studies, like those by Ekanayake and Thaver (2021) and Ikhsan and Satrianto (2023), continue to show that access to finance can improve GDP and support development, particularly in low- and middle-income countries.

At the same time, there's been ongoing debate about how minimum wage laws impact employment. While a lot of research has focused on developed countries, evidence from developing countries is still relatively scarce. Economists have long argued that raising the minimum wage might lead to job losses, especially for lower-skilled workers, because it increases the cost of hiring. Early studies like Brown, Gilroy, and Kohen (1982) suggested that even a modest increase in the minimum wage could reduce employment among teenagers in sectors like manufacturing and agriculture.

However, not all researchers agree with that conclusion. A well-known study by Card and Krueger (1994) challenged the traditional view. They looked at fast-food restaurants in New Jersey and Pennsylvania and found that a higher minimum wage didn't actually lead to job losses. Their work sparked heated debates and further analysis. Later, Neumark and Wascher (2000) re-examined the data and found some evidence of reduced employment. Other researchers like Burkhauser et al. (2000) also supported the idea that increasing the minimum wage can hurt job opportunities for certain groups.

In developing countries, the impact of minimum wage policies often depends on the local economic context. For example, a study by Fang and Lin (2013) in China showed that raising the minimum wage led to job losses, especially for young women in wealthier regions. Similarly, in Poland, Majchrowska (2012) pointed out that having a single national minimum wage didn’t work well in regions with lower incomes or high unemployment. She argued that a more localized approach would be more effective.

Japan’s experience also shows how broader economic trends, like global competition and demographic changes, can affect how minimum wage policies play out. Yukiko (2011) found that job security declined as companies moved

production overseas and domestic demand slowed down. Interestingly, not all minimum wage earners were from low-income households, which means the policy didn't always help the people who needed it most.

In countries like Vietnam and Indonesia, raising the minimum wage has had mixed effects. Del Carpio et al. (2013) found that in Vietnam, higher wages led to job losses, especially among young and less-educated workers, and pushed some people into self-employment. In Indonesia, researchers looked at working hours instead of just employment levels and found that higher minimum wages were linked to longer hours, especially for women in manufacturing. In Thailand, Del Carpio et al. (2014) found that older and female workers were more likely to lose their jobs after minimum wage increases, though the effects were relatively moderate.

These mixed results raise an important question: Can minimum wage policies influence how employment and financial development contribute to economic growth in developing countries? Some studies suggest that when minimum wages are balanced carefully with financial development, they can help boost growth. Research by Yerrabati (2021, 2022a, 2022b) shows that self-employment and informal work, which are common in many developing countries, can support growth especially when people are given opportunities to transition into more stable jobs over time.

There's also evidence that raising the minimum wage can increase overall spending and help reduce poverty. Yusoff et al. (2021) argued that higher wages can boost the economy through increased consumption. Kargi (2018) and Rani (2017) made similar points, noting that minimum wages help set a basic standard of living and reduce inequality. In Indonesia, Sjoholm (2020) found that wage hikes didn't necessarily reduce jobs but encouraged companies to improve

productivity. However, some challenges remain such as weak enforcement of wage laws, limited collective bargaining, and widespread wage violations (Dingeldey, 2021).

Overall, the evidence suggests that while financial development usually supports economic growth, the impact of minimum wage policies is more complex. Their success depends on a range of factors, including the structure of the labor market, the strength of institutions, and how well the policies are enforced. To truly benefit workers without harming employment, minimum wage policies in developing countries need to be carefully designed and aligned with local conditions.

2.4 Literature Gap

2.4.1 Financial Development and Economic Growth in Developing Countries

Financial development plays a crucial role in driving economic growth (Ikhsan and Satrianto, 2023; Fouzia et al., 2023; Xue et al., 2022; Batool et al., 2022). It has been debated extensively in the literature, with some studies suggesting a positive relationship between financial development and economic growth. However, recent empirical literature (Luliana, 2020; Jenifer, 2020; Celsa et al., 2021) has raised doubts about this relationship, indicating a minor role of financial development or a non-monotone linkage with economic growth.

Financial development has a positive impact on economic growth, as shown in studies conducted in Algeria (Haguiga and Amani, 2019), the Asia Pacific (Taufiq et al., 2022), China (William et al., 2022), and a general analysis (Alberto et al., 2019). These studies highlight that the growth of the financial sector, including banking and stock markets, stimulates economic growth and

emphasises the role of financial innovation in driving expansion. However, caution is advised in promoting financial sector growth, as excessive development can lead to negative outcomes (Edmunds et al., 2020). Overall, a well-developed financial sector, with a balanced approach to banking and capital market development, can be a positive force for economic growth.

Financial development also facilitates financing for the private sector and supports investment activities (Haguiga and Amani, 2019). The credit system plays a crucial role, with a positive moderating effect on financial outward foreign direct investment (OFDI) (William et al., 2020). However, the impact of stock and bond markets on economic growth is less significant (Edmund et al., 2020) but contrast with the finding Robeen et al., (2022) that the development of the banking system and stock markets play a significant role in strengthening economic growth. Financial innovation is positively correlated with economic growth (Dina et al., 2021).

Since the financial crises, there has been a more cautious approach to stimulating the financial sector due to potential negative effects on socio-economic security (Aubhik, 1999). In Arab countries like Jordan, Egypt, Algeria, Tunisia, Saudi Arabia, and Bahrain, financial development significantly contributes to economic growth by reducing external finance provision costs and increasing the growth rate. A study by Hamad et al., (2020) concluded that financial development has a more significant and positive effect on developing countries compared to developed countries. As the role of financial development on economic growth show ambiguous findings, these studies highlight the need

for a more nuanced understanding of the relationship by using domestic credit to private sector and broad money as an indicator for financial development. This is because according to Hamad et al., (2020), the impact of financial

development on economic growth may depend on various factors and the proxies of financial development that were examined is one of the authors' concerns.

2.4.2 Minimum wage, Employment and Economic Growth

The correlation between minimum wage policies and economic growth is complex, shaped by the unique economic framework of each country. Data from industrialized countries indicates that the implementation of minimum wage rules may have a beneficial effect on long-term economic growth (Yusoff et al., 2021). In a Schumpeterian paradigm, raising minimum wages may diminish the employment of low-skilled individuals, elevate unemployment rates, and decrease output levels (Azizah & Rachmawati, 2022). Furthermore, in areas where micro, small, and medium enterprises (MSMEs) predominate, the impact of minimum wage on growth seems to be less pronounced than the influence of the MSMEs themselves (Chu et al., 2020).

These data indicate the intricacy of the wage-growth link, dependent on economic models and the prevalence of informal or formal sectors. In developing countries, a substantial segment of the workforce receives remuneration below the legally established minimum wage, particularly in low and lower middle income countries where more than 50 percent of employees are engaged in the informal sector. This sector frequently lies beyond the scope of labor legislation, undermining the enforcement and efficacy of minimum wage policies. As a result, the protective purpose of wage regulations is compromised, prompting inquiries regarding their true impact on economic results in these economies.

The empirical literature reveals inconsistent results. Previous research, primarily focused on U.S. data, identified minimal or adverse impacts of

minimum wages on employment (Neumark & Wascher, 1996; Brown, 1982; Card & Krueger, 1995). The evidence in Latin America is equally diverse. Colombia faced job losses due to rising real minimum wages (Bell, 1997; Maloney & Mendez, 2004), whereas Mexico exhibited no notable employment impacts in the 1990s, because of steady or decreasing real minimum wages. Cunningham (2007) discovered that a 10 percent rise in the minimum wage resulted in a 2percent decline in employment throughout Latin America, primarily within the formal sector. In contrast, Brazil's steady real minimum wage hikes from 1995 to 2004 shown no discernible adverse effects on employment in either the official or informal sectors (Lemos, 2009).

Despite the substantial body of literature, the impacts of minimum wage legislation are inadequately studied in low-income countries, particularly in environments where informal work prevails. This empirical gap is crucial for comprehending the interaction between minimum wage laws, employment, and financial development in developing countries. Consequently, subsequent study ought to investigate the impact of wage policies on the employment-financial development relationship in diverse contexts, considering the diversity of labor markets and institutional structures.

2.4.5 Other determinants of economic growth

The impact of population growth on economic growth in developing countries is multifaceted and largely depends on how the population is utilized. While some studies highlight the positive contributions of population growth to economic development, others report adverse effects. For instance, research in ASEAN countries suggests that population growth negatively affects economic growth

(Malida and Marselina, 2023), whereas in India, it is found to stimulate growth and development (Khursanaliev, 2023). The demographic structure also plays a critical role, with a high share of young people often hindering long-term economic performance, while a higher proportion of older individuals is positively associated with economic output (Pham and Vo, 2021).

This complexity is further underscored by Hosen (2019), who analysed population growth and GDP across income groups, finding a positive correlation in low-income countries but a negative one in high-income and upper middle-income countries. Supporting this, Ali et al. (2015) reported a significant negative relationship between population growth and economic advancement in Bangladesh. Similarly, Kyaw (2019) noted that countries with lower population growth tend to experience improved economic growth, leading to policy recommendations aimed at reducing fertility rates in developing nations.

These varied findings highlight the need for country-specific and context-sensitive analyses to better understand how population dynamics influence economic outcomes in developing countries. Government expenditure plays a crucial role in shaping economic growth in developing countries, though its impact varies across contexts. While some studies argue that spending in sectors like agriculture may not significantly boost growth (Megbowon et al., 2022), others highlight its contribution to promoting human development and long-term economic performance (Sharma et al., 2022). Additional factors such as tax revenue, fiscal decentralisation, and exports also positively influence growth (Maneerat & Fazal, 2022). However, excessive government spending, especially in Sub-Saharan Africa, can hinder development (Chindengwike, 2023).

The composition of expenditure is critical, with development spending proving more effective when supported by strong institutions (Sidek & Asutay,

2021), while consumption-based expenditure may have negative implications (Ansari et al., 2021). Given differences in economic structures, the optimal level and type of public spending vary by country (Hilton, 2021). Thus, a strategic and disciplined approach to public expenditure, prioritising developmental investments, is essential for sustainable growth in developing countries.

Human capital is a key driver of economic growth in developing countries, with numerous studies confirming the positive effects of education, skills development, and knowledge accumulation on GDP (Wirajing et al., 2023; Kurtes et al., 2023; Khan et al., 2023). The growth-enhancing impact of human capital is further strengthened when combined with trade openness, foreign direct investment, and technology transfer (Oladipo et al., 2023; Dirir, 2023). Long-term development is closely tied to human capital investments, particularly through education spending and labor tax contributions.

While evidence generally supports a positive link between education, health spending, and growth (Shahzad et al., 2022; Monika & Elena, 2023), some findings suggest that weak institutional quality may limit these benefits (Uddin et al., 2021). This indicates the need to account for institutional context and development levels when assessing the influence of human capital on economic growth in developing countries.

Private investment is a critical driver of economic growth in developing countries, complementing the role of public investment. Evidence suggests that both investment types positively influence growth, with private investment demonstrating particularly strong long-term effects (Mofokeng et al., 2023; Turan et al., 2021; Ahamed, 2022). Notably, its impact remains significant regardless of government effectiveness, underscoring its relevance across varying institutional contexts (Shabbir et al., 2021).

Additionally, public investment often stimulates private investment through a crowding-in effect, enhancing overall development outcomes (Canh & Phong, 2017). While the long-term benefits of private investment are well-documented (Merga, 2022), short-term outcomes can be mixed. In some cases, private investment negatively impacts growth due to macroeconomic factors like excessive private sector credit (Turan et al., 2021). For instance, in Vietnam, private investment was linked to short-term economic decline but showed significant positive effects over time (Nguyen, 2021). These findings highlight the importance of supporting private investment while managing short-term risks to maximise its growth-enhancing potential.

2.5 Conceptual framework

The study's conceptual framework is based on new growth theory and labor market theory, which give theoretical foundations for understanding the linkages between financial development, economic growth, employment, and minimum wage rules in developing countries. Financial development, employment, economic growth and minimum wage are among the core principles. According to the new growth theory, financial development can drive economic growth via channels such as capital accumulation, technical innovation, and human capital development.

The labor market theory focuses on the interactions between employers and employees that influence salaries, employment levels, and labor market outcomes. The objectives of the study are to look at the impact of financial development on economic growth, how it affects employment, and whether the minimum wage modifies the effect of employment and the financial development

nexus on economic growth in developing countries. The hypothesized linkages include the favorable impact of financial development on economic growth and employment, as well as the effect of minimum wage rules on employment levels.

Improved financial development is hypothesized to lead to higher economic growth rates in developing countries. This relationship suggests that as financial institutions and markets become more efficient and accessible, they can better mobilize savings and investments, fostering an environment conducive to economic expansion. In addition to driving economic growth, enhanced financial development is also expected to increase employment opportunities in developing countries.

The availability of credit and financial services can stimulate business activities, support entrepreneurship, and create jobs, thereby reducing unemployment and improving overall economic well-being. The study will further explore whether minimum wage regulations in developing countries moderate the impact of financial development on employment and economic growth. By examining this potential moderating effect, the research aims to understand how wage policies influence the benefits of financial development, providing a nuanced perspective on economic and labor market dynamics.

This conceptual framework systematically explains the links between financial development, economic growth, employment, and minimum wage rules in developing countries. It guides the empirical analysis and hypothesis testing in the investigation.

Figure 2.1 depicts a framework that demonstrates the interaction between the theories used and the objectives of this research to provide a clear explanation of the relationship between new growth theory and labor market theory. This study examined two indicators of financial development: domestic lending to the

private sector and broad money. Domestic credit offered by the banking sector refers to credit availability to the business sector that can contribute to overall financial development, whereas wide money measures the total amount of money flowing into the financial sector.

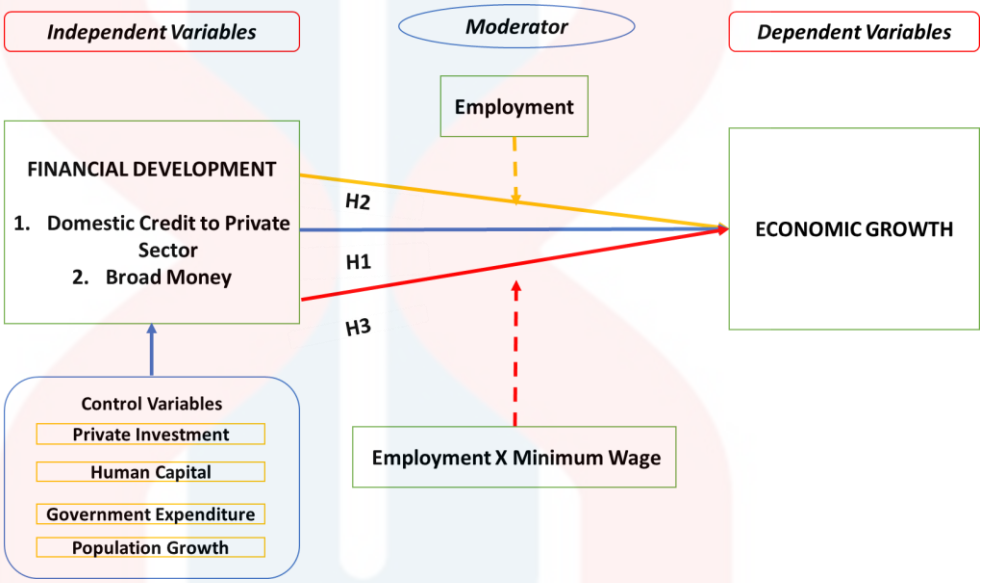


Figure 2.1: Research Framework

2.6 Summary of Literature Review

A comprehensive literature review summary is provided in the table below, which summarizes important findings from numerous scholarly sources.

Table 2.1: Summary of literatures

Number	Relationship	Scholars	Key findings
1.	Financial development on economic growth	Ikhsan and Satrianto, 2023; Fouzia et al., 2023; Xue et al., 2022; Batool et al., 2022; William et al., 2022; Alberto et al., 2019; Edmunds et al., 2020	Positive
		Abdullahi et al, 2023; Rizova, 2023; Bibi and	Negative
		Sumaira, 2022; Shahbaz et la, 2022	
2.	Employment and economic growth	Bayar 2016; Epstein and Shapiro 2019; Raifu 2019; Borsi 2018; Olowu et al. 2019	Positive
		Gatti et al., 2012	Negative
3.	Financial development and employment	Raifu and Afolabi, 2023; Ayadi et al, 2021	Positive
		Bui, 2020; Epstein and Shapiro, 2019	Negative
4.	Minimum wage and economic growth	Yusoff et al, 2021; Kargi, 2018	Positive
		Sjoholm, 2020	Negative
5.	Minimum wage and employment	Yusoff et al, 2021	Positive
		Azizah and Rachmawati, 2022	Negative
6.	Population growth and economic growth	Khursanaliev, 2023 Pham and Vo 2021	Positive
		Malida and Marselina, 2023	Negative
7.	Government expenditure and economic growth	Megbowon et al, 2022; Sharma et al, 2022; Maneerat and Fazal, 2022; Chindengwike, 2023	Positive
		Ansari et al, 2021	Negative
8.	Human capital and economic growth	Wirajing et al, 2023; Kurtes et al., 2023; Khan et al, 2023; Oladipo et al, 2023 and Dirir 2023	Positive
		Uddin et al, 2021	Negative
9.	Private investment and economic growth	Mofokeng et al, 2023; Turan et al. 2021; Ahamed, 2022; Shabbir et al., 2021; Merga, 2022	Positive
		Nguyen. (2021)	Negative

2.7 Summary of Chapter

This chapter covered studies that were carried out by previous researchers on financial development, employment, and economic growth in developing countries and the role of the minimum wage. Chapter 2 also covered theories, and concepts related to this study. This literature review increases the understanding of issues involving the background of financial development in developing countries and the role of the minimum wage, the theory underlying the study, and the conceptual framework of the study. Accordingly, at the end of this chapter, a comprehensive and holistic research concept was developed as a guide for researchers in conducting this study. The next chapter discusses the research methods that were used in this study.

CHAPTER 3

METHODOLOGY

3.1 Overview

This chapter describes the method used to conduct the study, including the research design, data collection, and analysis procedures. The chapter opens with an introduction of the study framework and objectives, followed by a discussion of whether the chosen technique is acceptable for answering the research questions. The study will look into how financial development and minimum wage regulations affect the relationship between employment and economic growth in developing countries. To do this, a quantitative analysis research approach is used. This method allows for a thorough investigation of the intricate relationships between the variables being studied.

The chapters are structured as follows: Section 3.2 described the theoretical and conceptual frameworks, while Section 3.3 outlined the research design, including country selection, variables, and data sources. Section 3.4 described model specifications based on the study's objectives. Section 3.5 describes the analytical approaches used to analyse the panel data, notably the Generalized Method of Moments and threshold analysis. Finally, Section 3.6 discusses the data definition and relevance to economic growth based on previous work.

3.2 Theoretical Framework

Understanding how financial development influences employment and economic growth has been a key area of interest for economists over the years. Early economic theories, such as those from classical and neoclassical economists, focused mostly on how capital and labor contribute to production. However, they largely overlooked the role of financial systems in driving growth. The neoclassical Solow-Swan model, for instance, emphasized capital accumulation and technology as the main growth drivers, but did not fully explain how financial markets or labor structures support this process. This led to the need for more comprehensive theories that could capture the broader dynamics of development, especially in economies with evolving financial systems and labor markets.

Later, endogenous growth theory (EGT) offered a more detailed explanation. Scholars like Romer (1986) and Lucas (1988) argued that long-term growth is not just about accumulating resources it also depends on how well knowledge, innovation, and human capital are nurtured within a country. In this view, financial development becomes vital. It helps mobilize savings, allocate resources efficiently, and support investment in education and innovation. At the same time, labor market theory (LMT) brings attention to the importance of job creation, fair wages, and employment regulations. In many developing countries, where informal employment is widespread and job security is low, a well-functioning financial system can empower small businesses and entrepreneurs, creating more stable and productive jobs.

Bringing these ideas together, we see that financial development does more than just fuel economic activity it can also improve employment outcomes. Patrick's (1966) stage of development hypothesis suggests that financial development and economic growth influence each other over time, depending on a country's level of development. This interaction is especially important in countries where inclusive growth is a priority. When people have access to financial services such as credit, insurance, and savings they are better equipped to invest in businesses, skills, and livelihoods. In turn, this leads to higher productivity and more inclusive economic growth. Thus, this framework helps us understand how finance, employment, and growth are deeply interconnected, especially in the context of developing economies.

3.3 Model specification

In order to examine the impact of financial development on economic growth in developing countries, this study follows a model that is similar to others (see for example De Mello, 1997; Ramirez, 2000 and Fedderke and Romm, 2006). The externality associated with financial development is modeled as follows:

$$Y = Af[L, K_P, E] = AL^{\alpha} K_P^{\beta} E^{(1-\alpha-\beta)} \quad (3.1)$$

where Y is real output, K_P is the domestic capital stock, L is labor and E refers to the externalities generated by financial development. A captures the efficiency of production, α and β are share of labor and capital. Assume that $\alpha + \beta < 1$ and let E be represented by a Cobb Douglas function:

$$E = [L. K_P. K_f^{\gamma}]^{\theta} \quad (3.2)$$

where K_f denotes the foreign owned capital. Combining equation (3.1) and equation (3.2) shows

$$Y = AL^{\alpha+\theta(1-\alpha-\beta)} K_P^{\beta+\theta(1-\alpha-\beta)} K_f^{\gamma\theta(1-\alpha-\beta)} \quad (3.3)$$

Generate the dynamic production function by taking logarithms and time derivative of equation (3.3) yields the linear equation as:

$$g_y = g_A + [\alpha + \theta(1-\alpha-\beta)]g_L + [\beta + \theta(1-\alpha-\beta)]g_{K_p} + [\gamma\theta(1-\alpha-\beta)]g_{K_f} \quad (3.4)$$

where g_i is the growth rate of i= Y, A, L, K_p and K_f. By equation (3.4), financial development is expected to affect the elasticity of output with respect to capital as much adding to knowledge and capital, which generate externalities. Thus equations (3.4) can be simplified as

$$g_y = \beta_0 + \beta_1 FD_{i,t} + \beta_3 X_{i,t} + \mu_{i,t} \quad (3.5)$$

where X is a control variable. Equation (3.5) serves as a baseline model for estimation purposes.

3.3.1 Objective 1: To examine the impact of financial development on economic growth in developing countries**.**

The model uses to examine the impact of financial development on economic growth in developing countries is based on Levine, Loayza, and Beck (2000); Beck, Levine, and Loayza (2000); Abubakar, Kassim, and Yusoff (2015) and Hassan, Sanchez, and Yu (2011). The model can be expressed as follows:

$$Y_{it} = \alpha Y_{i,t-1} + \beta_1 DCPS_{it} + \beta_2 M3_{it} + \beta_{3i} PG_{it} + \beta_{4i} HC_{it} + \beta_{5i} GE_{it} + \beta_{6i} PI_{it} + \mu i + \epsilon_{it} \quad (3.6)$$

Where Y is GDP, $D\ CPS$ is domestic credit to private sector, $M3$ is broad money, PG is population growth, HC is human capital, GE is government expenditure, PI is private investment, μi is unobserved country-specific effect term, ϵit is the usual error term, i is country index and t is time index.

Further estimation of equation (3.6) by using the Generalised Method of Moment (GMM) is that this method has the capacity to account for non-linearities and add lagged moment conditions, makings it particularly well-suited for handling time-series data. Instrument validity is critical for ensuring the consistency and efficiency of parameter estimations. The GMM (D-GMM) and System GMM (S-GMM) tests and strategies for determining instrument validity will be observed. The procedure of GMM estimation is discussed in the following section (see section 3.5). Equation (3.6) is transformed into first difference to eliminate country-specific effects as follows:

$$Y_{it} = \alpha Y_{i,t-1} + \beta_1 DCPS_{it} + \beta_2 M_{it} + \beta_{3i} PG_{it} + \beta_{4i} HC_{it} + \beta_{5i} GE_{it} + \beta_{6i} PI_{it}\, \mu i + \epsilon_{it} \quad (3.7)$$

This model eliminates the influence of country-specific factors, but it also introduces serial correlation in the error term and the possibility of endogeneity in regression. To address the potential bias caused by explanatory variables on simultaneity and the correlation between the variables $\left(Y_{i,t-1} - Y_{i,t-2\,i}\right)$ and $(\varepsilon_{i,t} - \varepsilon_{i,t-1\,i})$, Arrelano and Bond (1991) advised using higher order lags to correct this tendency. This modeling strategy is valid provided that the error term

has no serial correlation and the explanatory variable lag is weakly exogenous. The technique used in this work is known as the GMM difference estimate, and it uses the subsequent moment's conditions.

$$E\ [\ Y_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.8)$$

$$E\ [\ DCPS_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.9)$$

$$E\ [\ M_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.10)$$

$$E\ [PG_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.11)$$

$$E\ [\ HC_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.12)$$

$$E\ [GE_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.13)$$

$$E\ [\ PI_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\ )] = 0 \text{ for } s \geq 2;\ t = 3, \ldots . T \quad (3.14)$$

The additional moment conditions for the second stage of the approach (level regression) are as follows:

$$E\ [Y_{i,t-S} - Y\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.15)$$

$$E\ [\ DCPS_{i,t-S} - DCPS\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.16)$$

$$E\ [\ M_{i,t-S} - M\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.17)$$

$$E\ [\ PG_{i,t-S} - PG\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.18)$$

$$E\ [\ HC_{i,t-S} - HC\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.19)$$

$$E\ [\ GE_{i,t-S} - GE\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.20)$$

$$E\ [\ PI_{i,t-S} - PI\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ + \epsilon_{it}] = 0 \text{ for } s = 1 \quad (3.21)$$

3.3.2 Objective 2: To investigate whether employment moderates the effect of financial development on economic growth in developing countries.

The following estimation model (equation 3.22) is employed to investigate whether employment moderates the effect of financial development on economic growth in developing countries.

$$Y_{it} = \alpha Y_{i,t-1} + \beta_1 DCPS_{it} + \beta_2 M3_{it} + \beta_3 EMPL_{it} + \beta_4 (DCPS_{it} x EMPL_{it}) + \beta_5 (M3_{it} x EMPL_{it}) + \beta_6 PG_{it} + \beta_7 HC_{it} + \beta_8 GE_{it} + \beta_9 PI_{it} + \mu i + \epsilon_{it} \quad (3.22)$$

Where Y is GDP, $iDCPS\ i$is domestic credit to private sector, $M3$ is broad money, $DCPS\ ix\ iEMPL\ i$ is an interaction term between domestic credit to private sector with employment, $M3\ ix\ iEMPL\ i$is an interaction term between broad money with employment, PG is population growth, HC is human capital, GE is government expenditure, PI is private investment, μi is unobserved country-specific effect term, ϵit is the usual error term, i is country index and t is time index. Similar to objective 1, equation 3.22 follows the procedure of GMM estimation. The details procedures estimation using GMM in the following section (see section 3.5.1). Equation (3.22) is transformed into first difference to eliminate country-specific effects as follows:

$$Y_{it} = \alpha Y_{i,t-1} + \beta_{1\,i} DCPS_{it} + \beta_2 M_{it} + \beta_3 EMPL_{it} + \beta_4 (DCPS_{it} x EMPL_{it}) + \beta_5 (M_{it} x EMPL_{it}) + \beta_6 PG_{it} + \beta_7 HC_{it} + \beta_8 GE_{it} + \beta_9 PI_{it} + \mu i + \epsilon_{it} \quad (3.23)$$

This model controls for country-specific effects while simultaneously introducing serial correlation in the error term and endogeneity in the regression's

error correlation. According to Arrelano and Bond (1991), repressors apply higher-order lag techniques as a means to mitigate potential biases arising from explanatory factors on simultaneity and the relationship between $\left(Y_{i,t-1} - Y_{i,t-2\,i}\right)$ and $(\varepsilon_{i,t} - \varepsilon_{i,t-1\,i})$, Arrelano and Bond (1991) propose the utilization of higher-order lags as techniques by repressors. This modeling strategy is valid under the condition that the error term exhibits no serial correlation and that the lagged explanatory variable is weakly exogenous. The technique employed in this study is commonly referred to as GMM difference estimation, wherein the conditions of the subsequent moment are used:

$$E\,[\,Y_{i,t-S}(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.24}$$

$$E\,[\,DCPS_{i,t-S}(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.25}$$

$$E\,[\,M_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.26}$$

$$E\,[\,EMPLY_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.27}$$

$$E\,[\,DCPS_{i,t-S} \text{ x } EMPLY\ i_{i,t-S}\ (\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3 \tag{3.28}$$

$$E\,[\,M_{i,t-S} \text{x } EMPLY\ i_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.29}$$

$$E\,[\,PG_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.30}$$

$$E[\,HC_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.31}$$

$$E\,[\,GE_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.32}$$

$$E[\,PI_{i,t-S}\,(\varepsilon_{i,t} - \varepsilon_{i,t-1}\,)] = 0 \text{ for } s \geq 2;\ t = 3, \ldots. T \tag{3.33}$$

Arellano and Bond (1991) offer a two-step GMM estimator based on Equations (3.34) to (3.43) Moment conditions. The first step assumes that the error terms are independent and homoscedastic across countries and over time. The residuals from the first step regression are used in the second step to provide

a consistent estimate of the variance-covariance matrix, which loosens the independence and homoskedasticity assumptions. Asymptotically, the two-step estimator outperforms the one-step estimator. To incorporate additional moment criteria, it is proposed that the influence at the panel level be independent of the initial disparity seen in the dependent variable. The following are the extra moment requirements for the second stage of the approach (level regression).

$$E\ [\ Y_{i,t-S}\ -\ Y\ i\varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.34}$$

$$E\ [\ DCPS_{i,t-S}\ -\ DCPS\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.35}$$

$$E\ [\ M_{i,t-S}\ -\ iM\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.36}$$

$$E\ [\ EMPL_{i,t-S}\ -\ EMPL\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.37}$$

$$E\ [(\ DCPS_{i,t-S}\ x\ \ EMPLY\ i_{i,t-S})-(DCPS\ \varepsilon_{i,t-s-1}\ x\ \ EMPLY\ _{i,t-S}\ )\mu i\ +\ \epsilon_{it}\ ]\ =\ 0$$

$$\text{for s =1} \tag{3.38}$$

$$E\ [\ (M_{i,t-S}\ x\ \ EMPLY\ _{i,t-S})\ -\ (M\ \varepsilon_{i,t-s-1}\ x\ \ EMPLY\ _{i,t-S}\ )\mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1}$$

$$\tag{3.39}$$

$$E\ [\ PG_{i,t-S}\ -\ PG\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.40}$$

$$E\ [\ HC_{i,t-S}\ -\ HC\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.41}$$

$$E\ [\ GE_{i,t-S}\ -\ GE\ \varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.42}$$

$$E\ [\ PI_{i,t-S}\ -\ PI\varepsilon_{i,t-s-1}\ )(\ \mu i\ +\ \epsilon_{it}\ ]\ =\ 0\ \text{for s =1} \tag{3.43}$$

3.3.3 Objective 3: To investigate whether minimum wage moderates the effect of employment on the financial development economic growth nexus in developing countries.

This study used Hansen's (1999) panel threshold regression model to test the hypothesis that the minimum wage moderates the impact of employment on financial development and economic growth. The threshold estimation method is used because it is more adaptable to the potential contingency effect of the minimum wage in employment on financial development and economic growth.

This approach enables the data to endogenously decide the number and location of the threshold points. Researchers suggest that the following threshold specification is particularly well adapted to capturing the presence of contingency effects and providing a rich manner of modeling the influence of the minimum wage on the link between employment, financial development on output growth. To examine the role of minimum wage impact on employment-financial development economic growth nexus, this study follows a model which is similar have been adopted by Kremer, Bick, and Nautz (2013) and Law and Singh (2014) who examined whether excessive financial development hampers economic growth.

$$Y_{it} = \alpha X_{it} + \begin{cases} \beta_1 FD_{it} \text{ x EMPLY} + \varepsilon_{it};\ MW \leq \gamma \\ \beta_2 FD_{it} \text{ X EMPLY} + \varepsilon_{it};\ \gamma < MW \leq \gamma \\ \beta_2 FD_{it} \text{ X EMPLY} + \varepsilon_{it};\ MW > \gamma \end{cases} \quad (3.44)$$

where Y represents GDP, FD is financial development measured by proxy domestic credit to private households and money supply, and X is a vector of variables expected to influence output growth, such as school enrollment and

population increases. In this model, the minimum wage (MW) serves as the sample splitting (or threshold) variable. The interplay between financial development and employment on growth can have two different values depending on whether the minimum wage is below or over a threshold level γ. The impact of financial development and employment on growth will be β_1 for countries in full enforcement of minimum wage regulation; β_2 for countries in moderate enforcement of minimum wage regulation and β_2 for countries in low enforcement of minimum wage regulation.

3.4 Estimation Procedure

3.4.1 Generalized Method of Moments Panel Estimator

To obtain meaningful insights and make reliable conclusions from empirical data, careful analysis and interpretation are critical components of any quantitative research. The Generalized Method of Moments (GMM) model stands out as a powerful and widely used econometric tool, particularly well-suited for analyzing complex economic relationships while addressing endogeneity issues. As a flexible and robust estimation technique, GMM offers strong capabilities for parameter estimation and hypothesis testing, making it invaluable in the analysis of panel and time-series data. The model was initially introduced by Holtz-Eakin et al. (1988) and further refined by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998), evolving into a reliable method for correcting bias and handling measurement errors in dynamic panels.

Before implementing the GMM estimation, this study followed a structured analytical process to ensure model robustness and data validity. The process began with descriptive statistics, providing a summary of the central

tendencies and variability of all key variables. This step helped in identifying the data's distribution, potential outliers, and general patterns. Following this, a correlation analysis was carried out to examine the strength and direction of the relationships between variables, serving as a preliminary check for multicollinearity.

A baseline linear regression was then conducted to assess initial relationships and detect any unexpected behaviors in the data. To explicitly test for multicollinearity, the Variance Inflation Factor (VIF) method is used. VIF quantifies how much the variance of an estimated regression coefficient increases because of collinearity. A VIF value exceeding 10 is commonly regarded as indicative of severe multicollinearity. This step is crucial because high multicollinearity inflates standard errors, undermining the statistical significance of estimated coefficients and distorting model interpretation. Following this, an initial linear regression model is estimated using pooled OLS or fixed effects to observe baseline relationships.

This regression serves as a benchmark for comparing the final dynamic model results. It also offers insight into variable significance, direction of effects, and any residual patterns that need to be addressed. The study then performs tests for endogeneity and the validity of potential instruments, given that GMM relies on lagged levels and differences of endogenous regressors as instruments. This step justifies the use of internal instruments in the model and supports the application of GMM as the appropriate estimation method. Since GMM relies on internal instruments such as lagged values, confirming their validity and strength is essential. This ensured that the instruments used in later stages were not only relevant but also exogenous. Only after these diagnostics were completed did the study proceed to the GMM estimation.

The GMM model was selected for three main reasons. First, the use of a lagged dependent variable in dynamic models often introduces autocorrelation, which GMM can correct. Second, GMM accounts for country-specific effects, which are difficult to handle using conventional fixed effects in the presence of a dynamic specification. Third, GMM addresses simultaneity bias, particularly when some explanatory variables are endogenous (Holtz-Eakin et al., 1988; Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998).

There are two common approaches to GMM estimation: Difference GMM (D-GMM) and System GMM (S-GMM). The D-GMM approach, proposed by Arellano and Bond (1991), transforms variables into first differences to eliminate unobserved heterogeneity and uses lagged levels of the variables as instruments. However, when explanatory variables are highly persistent over time, these instruments may become weak, leading to biased estimates, especially in small samples. Recognizing this, Arellano and Bover (1995) and Blundell and Bond (1998) introduced the System GMM estimator. S-GMM augments D-GMM by adding level equations and using lagged first differences as instruments. This method improves efficiency and accuracy, particularly when dealing with persistent series, making it the preferred choice for this study.

The accuracy and validity of GMM estimators are evaluated using two key diagnostic tests. The first is the Sargan test (or Hansen test), which checks the validity of the instruments by testing the over-identifying restrictions. A higher p-value suggests that the instruments are exogenous and valid. The second diagnostic is the Arellano-Bond serial correlation test, particularly the AR(2) test, which examines whether the differenced residuals exhibit second-order serial correlation. GMM estimators are considered reliable only when AR(2) is absent, confirming that the instruments are correctly specified and the model is consistent.

Although the D-GMM estimator helps control for fixed effects and endogeneity, it may be inadequate when variables are strongly persistent over time. As shown by Blundell and Bond (1997), lagged levels become weak instruments under such conditions, leading to poor estimation quality. Therefore, the System GMM method is adopted as the core estimation technique in this study. It offers more reliable and efficient estimates, especially when autocorrelation and persistence issues are present. This method also relies on additional moment conditions, assuming that lagged differences of the dependent variable are orthogonal to the level of the error term a condition that improves instrument strength and estimation reliability.

Blundell and Bond (1998) further demonstrated that System GMM outperforms Difference GMM, particularly for short panels with persistent series, offering more robust finite sample properties. To obtain consistent and efficient parameter estimates, the GMM estimator is applied in both one-step and two-step versions. While the one-step estimator uses a simple, fixed weighting matrix, the two-step estimator applies an optimal weighting matrix based on the estimated variance of the moment conditions. Despite its asymptotic efficiency, the two-step estimator can suffer from downward-biased standard errors in small samples, a problem addressed by Windmeijer's (2005) finite-sample correction.

In summary, the combination of rigorous preliminary testing—including descriptive statistics, correlation analysis, VIF tests, and endogeneity diagnostics—followed by advanced GMM estimation, ensures the robustness and credibility of the empirical findings in this study. The use of System GMM, in particular, enhances the precision of the analysis, enabling the study to draw trustworthy inferences on the dynamic relationships among the variables under investigation.

3.4.2 Threshold estimation

To estimate equation (3.34), the first step is to jointly estimate the threshold value γ. Chan (1993) and Hansen (2000) recommend obtaining the least squares estimate of γ as the value that minimizes the concentrated sum of squared errors across all possible values of γ (see Hansen, 2000). After estimating γ, we need to identify whether it is statistically significant. To do this, we test the null hypothesis that $\beta_1 = \beta_2$. Rejecting the null hypothesis allows us to conclude that a threshold effect exists in the financial development-employment-growth relationship. One difficulty in testing the significance of the threshold estimate is that γ is not identified under the null hypothesis. This implies that the classical test does not have standard distribution tables, and critical values cannot be based on the standard distribution tables.

Following Hansen (1996), we use a bootstrap-based procedure to obtain the p-value for testing the significance of the threshold estimate. The procedure is as follows. Firstly estimate the model under the null hypothesis (linearity) and the alternative hypothesis (threshold occurring at γ). This provides the actual value of the likelihood ratio test, denoted as (F_l).

$$F_l = \frac{S_0 - S_1(MW^*)}{\hat{\sigma}^2} \qquad (3.39) \qquad \text{where} \quad \hat{\sigma}^2 = \frac{1}{n(t-1)} S_1(MW^*) \qquad (3.45)$$

Next, a bootstrap is created by drawing from the normal distribution of the residuals of the estimated threshold model. Using this generated sample, the model is estimated under the null and alternative hypotheses, and the likelihood ratio F_l is obtained. The bootstrap estimates the p-value for F_l under the null as the percentage of draws for which the simulated statistic $F_l$exceeded the actual

one. If evidence is found in favor of a threshold, it is necessary to form some kind of confidence interval around the value to place countries into the two regimes. Standard methods for this are not ideal when estimating an unknown threshold (see Dufour, 1997). Hansen (2000) derived the correct distribution function and provided the appropriate critical values ic(α) for the likelihood ratio statistic, which is computed as $LR_n = n \frac{S_n - S_n(\gamma)}{S_n(\gamma)}$. The confidence interval of the threshold estimate γ consists of those values of MW for which the likelihood ratio statistic is less than c(α). After obtaining the value of γ, the researcher estimates the parameters of equation (3.45) trivially as $\beta(\gamma)$.

To understand whether the impact of financial development on economic growth changes at different levels, we use a threshold estimation model. This method, based on Hansen's (2000) approach, allows us to identify one or more points in the data called thresholds where the relationship between financial development and growth may shift. We start by testing for a single threshold, where we estimate the value (γ_1) that gives the best fit to the data. This helps us see if the effect of financial development differs above and below a certain point. To check if this change is meaningful, we use a bootstrap technique to simulate the data and calculate p-values. If the single threshold is statistically significant, we then explore whether the relationship changes again by testing for a double threshold.

This involves finding two cutoff points (γ_1 and γ_2) that divide the data into three different regimes, each with potentially different growth effects. If that model fits well, we go one step further and test for a triple threshold, which introduces three dividing points (γ_1, γ_2, and γ_3) and separates the data into four regimes. Each stage of testing helps us understand whether a more complex model better captures the real dynamics. In deciding between the linear model (no

threshold) and one with one, two, or three thresholds, we look at statistical significance, how well the model fits the data, and whether the resulting groupings make economic sense. This step-by-step approach ensures that our analysis reflects the true nature of the relationship between financial development and economic growth without making unnecessary assumptions.

3.5 Sample of Data

Static panel data models assume that the relationship between variables remains constant over time within the panel and typically use fixed or random effects to control for unobserved heterogeneity, employing methods like Ordinary Least Squares (OLS) or fixed/random effects estimators for estimation (Baltagi, 2008). In contrast, dynamic panel data models account for changes in relationships over time by including lagged dependent variables as regressors, which captures effects like learning or path dependency. These models often use Generalised Method of Moments (GMM) to address endogeneity and autocorrelation issues (Arellano & Bond, 1991). Static panel data models use fixed or random effects to control for unobserved heterogeneity, assuming that the relationship between the variables in the panel remains constant over time.

Ordinary Least Squares (OLS) or fixed/random effects estimators are commonly used for estimation (Baltagi, 2008). On the other hand, lagged dependent variables are included as regressors in dynamic panel data models to account for changes in relationships over time. This allows for the capture of effects such as path dependence or learning. In order to handle endogeneity and autocorrelation concerns, these models frequently employ the Generalised Method of Moments (GMM) (Arellano & Bond, 1991). The difference is that the

dynamic panel data models account for the time dimension of the data in a more complex way, incorporating past values into the analysis, while static panel data models do not. Therefore, this study focuses more on the dynamic panel data because the number of observed over a relatively short number of time periods.

This study focuses on 96 developing countries selected using the World Economic Situation and Prospects (WESP) classification, which offers a more well-rounded view of development compared to the World Bank's income-based categories. WESP takes into account not just income, but also economic structure, industrialization, and the unique developmental challenges each country faces. This broader perspective fits better with the aim of the study, which looks at financial development, employment, and minimum wage issues. The 96 countries were chosen based on the availability of complete and reliable data, ensuring the findings are accurate and meaningful across different national contexts. (refer Appendices) from 2000 to 2022 and were selected because they had complete and continuous data for all the required variables, thus ensuring the validity and reliability of the analysis conducted.

Moreover, the period from 2000 to 2022 is crucial for studying financial development, employment, and economic growth in developing countries in the context of minimum wage due to significant global economic events such as the 2008 financial crisis and the COVID-19 pandemic, which have deeply impacted these economies. This timeframe provides a comprehensive view of long-term trends and structural changes, allowing for a thorough analysis of the evolution and sustained impact of minimum wage policies under varying economic conditions (World Bank, 2020; International Labor Organisation, 2021).

During this timeframe, significant policy shifts and economic improvements in developing countries aimed at encouraging financial inclusion,

improving labor market conditions, and promoting sustainable economic growth were observed. The period also saw the advent of new technologies and increased globalisation, which significantly influenced labor markets and financial structures. Studying this timeframe allows researchers to better understand the role of minimum wage policies in a rapidly changing economic landscape, providing valuable insights for current and future policymaking to address the unique challenges faced by developing countries (World Bank, 2020; International Labor Organisation, 2021).

The sources developing countries based on World Economic Situation and Prospects (WESP,2023) country classifications. The WESP classification is broader and includes multiple dimensions beyond income. It considers factors such as economic performance, structural vulnerabilities, and development challenges. The United Nations categorizes countries into three main groups: developed economies, economies in transition, and developing economies. These classifications are used in the context of the United Nations' analysis and reporting on global economic trends and prospects. There is one other source of country that is commonly referred to by past studies, that is World Development Indicator (WDI).

According to WDI, the classification is based on income level, using gross national income (GNI) per capita as the primary indicator. The World Bank (2023) classifies countries into four income groups: low income, lower-middle income, upper-middle income, and high income. However, the scope of this study is on the developing countries. The WESP is a main source to get the list of developing countries.

The study does not adopt a regional focus due to the potential for regional groupings to obscure substantial differences in economic structures, institutional

capacity, and development challenges among countries within the same region. A more meaningful foundation for comparative analysis is provided by a classification based on development status.

Therefore, this study focuses on short panel data where the model includes a lagged dependent variable. The dynamic panel modeling in this study is centered on short panels, where the number of cross-sectional units is greater than the number of time series observations. The features of the panel data are crucial because the panel data estimations are subject to whether the number of individuals is greater than time periods or the other way around.

3.6 Data Description

Based on the model specification developed in section 3.4, there are nine variables which were categorised as the dependent variable, independent variables, moderating variables and control variables.

3.6.1 Dependent variable

Economic growth was used as a dependent variable in this study and measure by Gross Domestic Product (GDP) at constant prices. GDP at constant prices is a crucial indicator of economic growth (Manurung et al, 2022; Wandita et al, 2022; Oliinyk and Kozmenko 2019). It reflects the market value of all goods and services produced within a specific period, adjusted for inflation (Sabilla and Sumarsono 2022). This allows for a more accurate comparison of economic output over time, as it removes the effects of price changes. Studies have shown that factors like Human Development Index (HDI), number of workers, degree of

trade openness, and gross fixed capital formation significantly influence economic growth when measured using GDP at constant prices (Mote et al, 2019). However, the impact of actual government expenditure on economic growth may not always be significant. Additionally, GDP per capita at constant market prices may not always directly affect multidimensional poverty rates. Therefore, analysing GDP at constant prices provides valuable insights into the economic performance and development of a region.

3.6.2 Independent variable

(i) Financial development

Financial sector development occurs when key financial activities, such as facilitating the exchange of goods and services, mobilising and pooling resources, facilitating trade, diversification, and risk management, as well as efficiently allocating knowledge for future investments, improve. When assessing financial systems, four criteria must be considered: financial depth, financial access, efficiency, and stability. Therefore, analysing financial growth using a single indicator is impossible, and there is no universal agreement on which proxy is the best measure of financial development.

Among the indicators commonly used in literature, proxies for financial depth include domestic credit to the private sector, deposits to GDP, and stock market capitalisation to GDP. For financial access, the ratio of accounts to 1,000 adults is often used. Net interest margin is a common indicator for efficiency, while the capital adequacy ratio is used for stability. For this study, proxies for financial depth were chosen due to their common use in literature and the availability of data spanning from the 1960s. Two proxies, domestic credit to the

private sector and broad money, were selected to allow for robustness testing to ascertain whether consistent results could be achieved using different proxies.

The first proxy, domestic credit to the private sector, refers to the financial resources provided to the private sector by financial corporations through loans, purchases of non-equity securities, trade credits, and other accounts receivable that establish a claim of repayment (Beck et al., 2000). It is calculated by dividing the total value of credit by financial institutions to the private sector by GDP (Beck et al., 2000).

This variable is selected not only because data is available but also because it accurately measures the role of financial intermediaries in channelling funds to private markets. Access to credit is crucial for financial development as credit finances production, consumption, and capital creation, thus promoting economic activity and growth (Beck et al., 2000). As the economy expands, this statistic also provides data on how financial institutions are allocating credit to the private sector. Domestic credit to the private sector is commonly used as a proxy for financial development.

Studies on various countries, such as Cote d'Ivoire, the Gambia, and Pakistan, have shown that domestic credit availability to the private sector plays a significant role in economic growth and private investment (Prasetyowatie et al., 2022; Iheonu et al., 2020). While the impact of domestic credit on economic growth may vary, it is generally agreed that enhancing financial development through increased domestic credit can lead to improved economic performance and investment (Prasetyowatie et al., 2022; Iheonu et al., 2020). Research on ASEAN-4 countries highlighted that domestic credit for the private sector positively influences human development (Prasetyowatie et al., 2022). In the context of ECOWAS countries, the relationship between domestic credit to the

private sector and domestic investment was found to be significant, with domestic credit being a key factor in forecasting future investment trends (Prasetyowatie et al., 2022).

The impact of domestic credit to the private sector on economic growth varies based on different factors. In Nigeria, an abnormal increase in credit supply positively affects real GDP growth but negatively impacts GDP per capita during crises (Ozili et al., 2023). Conversely, effective distribution of bank credit to the real sector in Nigeria promotes economic growth (Magaji and Musa, 2023). In European Union countries, the positive effect of household debt on economic growth turns negative with increased credit to the private sector, especially above 70% of GDP (Asteriou and Spanos, 2022). Additionally, in ASEAN countries, domestic credit has a higher positive impact on economic growth compared to the stock market, with both significantly contributing to GDP per capita growth (Nathan and UCHE, 2022). Therefore, while domestic credit to the private sector can stimulate economic growth, excessive credit levels may have adverse effects, especially during crises and when reaching high percentages of GDP.

The second proxy for financial development chosen for this study is money supply, specifically broad money. Money supply encompasses all currencies and other liquid instruments in a country's economy. Broad money is the comprehensive definition of money supply, including currency notes and coins, as well as other less liquid forms of money such as savings accounts, treasury bills, and government bonds, which are considered "near money" as they can be easily converted to cash. Money supply is vital to the economy as it serves as a policy tool for the government, allowing them to adjust the amount of money circulating in the economy. Increasing money supply by lowering interest rates can stimulate investment due to cheaper financing, resulting in increased

purchasing power that stimulates spending. This increase in demand can lead to higher production, increased business activities, and economic growth. Conversely, a reduction in money supply can have the opposite effect. Therefore, money supply is a crucial driver of investment activities, capital allocation, and economic performance, making it an ideal measure for financial development. Broad money can serve as a proxy for financial development, but its impact varies across regions.

In India, M3 has been found to hinder mortgage development, indicating a complex relationship between financial aggregates and specific financial activities (Adil et al., 2022; Sare et al., 2022). Conversely, in Sub-Saharan Africa, M3 has shown a negative and statistically significant effect on the informal economy, suggesting that financial development, as measured by broad money, can reduce the size of the informal sector (Chhorn, 2021). Additionally, in Southeast Asian economies, broad money has been linked to poverty reduction and human development, particularly in less developed and less democratic countries, highlighting its positive impact on socio-economic indicators (Njangang et al., 2020). Therefore, while M3 can be a useful indicator of financial development, its implications for various economic aspects differ based on the specific context and region.

Broad money supply has shown both positive and negative effects on economic growth in various studies. In Palestine, broad money supply, along with total capital formation and inflation rate, positively impacts short-term economic growth but does not affect long-term growth (Razia and Omarya, 2022). Similarly, in sub-Saharan Africa, broad money supply has a negative relationship with economic growth, while bank credit to the private sector and bank deposits positively influence growth (Al-Khaykanee and Jabbar, 2022). Conversely, in

Ukraine, the real money supply's growth rate can positively impact the economy, but its effectiveness depends on controlled inflation and other factors outside the monetary sphere (Kunwar et al., 2023). These findings highlight the complex and varied impact of broad money supply on economic growth, influenced by different economic contexts and regulatory policies.

3.6.3 Moderating variable

(i) Minimum wage

The International Labor Organisation (2020) defines the minimum wage as the basic minimum payment that an employer must pay wage earners for labor performed over a certain time, which cannot be decreased by collective bargaining or individual contracts. In some countries, the minimum wage is mandated by law, while in others, it is established through dialogue, negotiation, or collective bargaining between labor and employers. The minimum wage aims to protect the income and living conditions of the most vulnerable workers in the labor market.

Minimum wage regulation can serve as a proxy for minimum wage levels, reflecting a country's approach to setting and enforcing minimum pay standards. Research highlights the importance of effective implementation and enforcement of minimum wage regulations to combat exploitation and raise living standards, especially in developing countries (Dingeldey et al., 2021; Mansoor and O'Neill, 2020). The link between minimum wage regulation and macroeconomic indicators in the European Union emphasises the need for adjustments based on economic conditions to avoid potential increases in unemployment (Macerinskaite et al., 2016). In developing countries like India, where compliance rates vary significantly, the effectiveness of minimum wage policies in improving

living standards hinges on enforcement mechanisms (Li and Wan, 2020). In China, minimum wage regulations impact wage growth and distribution differently across various population groups and industries, creating a substitute effect for low-paid workers while boosting wages for slightly higher-paid groups through demand increases (Fernández-Villaverde, 2020). Understanding the complexities of minimum wage regulation is crucial for assessing its impact on workers' well-being and economic dynamics.

The impact of minimum wage regulation on economic growth varies across different countries and contexts. Studies show that in developed countries, the implementation of a minimum wage has a positive and long-term impact on economic growth (Yusoff et al., 2021; Basyith et al., 2022). However, in developing countries, the effects can be different, with minimum wage increases potentially leading to negative consequences such as decreased employment for low-skill workers and higher unemployment rates (Chu et al., 2020). Additionally, the introduction of a minimum wage can stimulate economic growth by increasing wages for beneficiaries and boosting real private consumption, ultimately leading to a more stable growth trajectory (Wang, 2022). It is important to consider the specific characteristics of each economy when assessing the overall impact of minimum wage regulations on economic growth.

(ii) Employment

The labor force participation rate (LFPR) serves as a crucial indicator of employment trends (Hobjin and Sahin, 2021; Triha et al., 2021; Elsby et al., 2010). It reflects the proportion of the working-age population actively engaged in the labor market, shedding light on economic dynamics and workforce utilisation

(Gros, 2019). LFPR fluctuations are influenced by various factors, including job creation, skills development programs, and entrepreneurial initiatives (Damanyanti and Sirodji, 2022). The LFPR's cyclical nature, driven by shifts between employment and unemployment, impacts overall employment levels and recovery patterns. Moreover, educational advancements play a significant role in altering LFPR trends, potentially overshadowing the effects of labor market reforms. Therefore, while LFPR is a valuable proxy for gauging employment dynamics, its interpretation requires consideration of diverse factors shaping workforce participation and economic conditions.

Employment has both positive and negative effects on economic growth. Studies show that an increase in tourism employment leads to a rise in gross national income, indicating a positive impact on economic growth (Vukovic et al., 2023). However, the same rise in tourism employment can result in a decrease in the value added by activity services, showing a negative effect on this aspect of economic growth (Kamal et al., 2023). Additionally, research in Pakistan suggests that the service sector, despite being a fast-growing sector, has a weak impact on employment and growth due to its reliance on capital-intensive technology, highlighting a potential negative effect of certain types of employment on economic growth (Ben-Salha and Zmami, 2021). These findings emphasise the complex relationship between employment and economic growth, showcasing both beneficial and detrimental impacts.

3.6.4 Control variable

(i) Population Growth

The population growth rate is calculated as the growth rate of the number of people in a population. The relationship between population growth and economic growth has shown mixed findings. Darrat and Al-Yousif (1999) found that countries with high population growth rates tend to be economically poor, while Tsen and Furuoka (2005) found no clear relationship between population and economic growth. The anticipated outcome of this study suggests a negative relationship between population growth and economic growth, indicating that an increase in population growth in developing countries is projected to result in a decrease in the pace of economic growth.

Population growth can have both positive and negative effects on economic growth. El Muharromy and Auwalin (2021) highlight that population growth can lead to increased demand, production levels, and national income, thereby positively impacting economic growth. Conversely, Bala et al. (2020) suggest that lower population growth might improve economic growth, as reducing fertility rates can lead to increased income per capita. Additionally, Morwat (2021) indicates that population growth has a positive impact on economic growth in African countries. However, it is important to note that rapid population growth can also have negative consequences, such as hindering economic development due to resource constraints and increased unemployment rates. Therefore, while population growth can stimulate economic growth through increased demand and productivity, it is essential for policymakers to manage population growth effectively to harness its positive effects while mitigating potential drawbacks.

(ii) Human capital

School enrollment can serve as a proxy for human capital development (Mifrahi and Rahmat, 2022; Evans et al., 2002; Sarwar et al., 2021; Sethi et al., 2019; Abubakar et al., 2015). Research indicates that primary and higher education enrollment positively impacts economic growth, with higher education having the most significant effect (Tolliver et al., 2022). Additionally, a study in Nigeria found that school enrollment and graduate turnout positively influence human capital development, while school drop-out rates have a negative impact (Okonkwo et al., 2022). Furthermore, the enrollment of migrant and left-behind children in public schools affects human capital in China, with relaxed enrollment restrictions leading to increased migration and higher average human capital in society (Chakrabarti et al., 2023). These findings collectively suggest that school enrollment can be a valuable indicator of human capital development, emphasising the importance of education in shaping human resources and economic growth.

Human capital development has a significant impact on economic growth in various African countries. Studies on Nigeria, Morocco, Ghana, Kenya, and Tanzania indicate that investing in human capital through education and health sectors positively influences economic growth. In Nigeria, government expenditure on education and health, as well as tertiary school enrollment rates, have shown positive impacts on economic growth (Adeleke and Anuolam, 2023; Wirajing et al., 2023; Elkhalfi et al., 2023). Similarly, in Morocco, human capital spending, particularly in health, has a beneficial effect on economic growth (Eze, 2023). However, in Ghana, Kenya, and Tanzania, the relationship between the Human Capital Index (HCI) and economic growth is complex and varies by country, suggesting the importance of considering multiple factors like infrastructure and innovation for promoting economic growth (Maiga, 2023).

(iii) Government expenditure

General government final consumption expenditure is a significant aspect of government expenditure, encompassing consumption, investment, and transfer payments (Ceesay et al., 2022). Studies on various countries like Nigeria and the Gambia have explored the impact of government expenditure on economic growth and industrial development. While traditional Keynesian macroeconomic theory suggests a positive relationship between government consumption expenditure and economic growth, findings from the Gambia indicate otherwise, with government consumption not significantly impacting economic growth (Ding, 2022). In Nigeria, government expenditure on sectors like education, agriculture, and health has shown positive relationships with economic performance, emphasising the importance of effectively managing sectoral expenditures to enhance economic growth (Omankhanlen et al., 2021; Moro and Rachedi, 2022; Unkpong, 2016). These studies highlight the complexities and nuances involved in analysing the effects of government expenditure on various economic indicators.

Government expenditure plays a crucial role in influencing economic growth in various countries. Studies from Nigeria and Ethiopia highlight the impact of government spending on economic growth. In Nigeria, government expenditure on sectors like education, health, and agriculture has shown positive and significant effects on economic growth over both short and long terms (Santanu and Wardani, 2023; Joseph et al., 2023). Conversely, in Ethiopia, government spending on education has been found to positively impact economic growth in both short and long terms, while spending on agriculture has a negative impact in the long run (Mulugeta Emeru, 2023). These findings emphasise the

importance of strategic allocation of government funds to key sectors to stimulate economic growth effectively. Additionally, maintaining financial discipline and optimising expenditure plans are recommended to enhance the positive impact of government spending on economic growth (Nwude et al., 2023; Omitogun et al., 2022).

(iv) Private investment

Gross fixed capital formation (GFCF) can serve as a proxy for private investment (Angaye and Frank, 2020; Morris, 2022). Studies highlight the significance of GFCF in economic growth analysis and as a crucial factor in estimating potential output for macroeconomic policy design (John, 2022).

In Nigeria, market capitalisation, value traded, and all share index have been examined for their impact on capital formation, with market capitalisation showing a positive significant influence (Borelli and Goes, 2020). Additionally, the relationship between foreign direct investment (FDI) and economic growth has been explored, indicating a moderate contribution of FDI to economic growth in Ecuador. Understanding GFCF from a disaggregated perspective allows for precise estimation of depreciation and net investment, enhancing the accuracy of economic analyses.

Private investment plays a crucial role in driving economic growth (Bhutto et al., 2022; Dzhikiya et al., 2023; Akinlo, 2022; Parasan and Manoppo, 2022; Popoola et al., 2022). Studies highlight that both private and public investments have a significant positive influence on economic growth, with private investment often contributing more during expansion periods. The relationship between private investment and economic growth is emphasised, showcasing the

importance of private sector contributions in enhancing the capital stock of a country. Additionally, the impact of private investment on economic growth is evident in various regions, such as Manado City, where it has been found to significantly affect economic growth. Overall, private investment is a key driver of economic growth, complementing public investment efforts and playing a vital role in sustainable economic development.

The data were sourced from the World Development Indicators database (WDI) and the Fraser Institute's Economic Freedom Index. A detailed discussion of the data descriptions listed in Table 3.1 follows below:

Table 3.1: Variables and Description

Variable Type	Variable	Abbreviation	Measurement	Data Source
Dependent variable	Gross Domestic Product	Y	Gross Domestic Product at constant price	World Development Indicator (WDI)
Independent variable	Financial Development	DCPS	Domestic Credit to Private Sector (% of GDP)	WDI
		M3	Broad money (% of GDP)	WDI
Moderating variable	Employment	EMP	Labor Force Participation Rate (Total)	WDI
	Minimum wage	MW	Minimum wage regulation	Fraser Institute (Economic Freedom Index)
Control variable	Population Growth	PG	Population growth (annual %)	WDI
	Human Capital	HC	School enrollment, secondary (% gross)	WDI
	Government Expenditure	GE	General government final consumption expenditure (% of GDP)	WDI
	Private investment	PI	Gross fixed capital formation (% of GDP)	WDI

3.7 Summary of Chapter

In summary, GMM estimation is opted to examine the nexus of financial development on economic growth, role of financial development on employment by influencing economic growth. In order to capture the role of minimum wage on employment in financial development-growth nexus, this research employ a threshold estimation analysis to capture at what level of minimum wage had a significant role on employment and financial development growth nexus. Data are collated mainly from credible sources such as the World Development Indicator and Fraser Institute. The proxies for the dependent, independent variables, moderating variables and control variables are basically chosen based on the existing literatures.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Overview

This chapter reveals the outcomes obtained from estimating various models aimed at evaluating the objectives introduced in chapter one. It is structured into three primary sections. The initial part elucidates the findings derived from employing the generalised method of moments (GMM) panel estimator to scrutinise the relationship between financial development and economic growth in developing countries. Employing a similar analytical approach, the subsequent section presents the results aimed at assessing the significant impact of financial development on employment by means of its influence on economic growth in these countries. Finally, the last section outlines the findings of threshold regression, which were utilized to examine how the minimum wage moderates the relationship between employment and financial development on economic growth.

4.2 The impact of financial development on economic growth in developing countries.

4.2.1 Introduction

This section presents the estimation results that assess the influence of financial development on economic growth in developing countries. The analysis employs the Generalised Method of Moments (GMM) for panel data estimation, encompassing 96 developing countries from 2000 to 2022. Descriptive statistics

are provided in Table 4.1, correlation analysis in Table 4.2, Table 4.3 – Table 4.6 reported the panel unit root and cointegration analysis and the main findings addressing this objective are presented in Tables 4.7 to 4.9. Robustness tests are conducted, with Table 4.10 reporting the findings including time dummies, Table 4.11 reporting results excluding outliers, and Table 4.12 examining the impact of excluding the effects of the Covid-19 pandemic.

4.2.2 Descriptive statistics

This section presents a descriptive analysis of developing countries from 2000 to 2022, as detailed in Table 4.1.

Table 4.1: Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
i	ii	iii	iv	v
Y	2.3463	0.0820	2.1612	2.5811
DCPS	0.3300	0.3521	-3.2312	0.8841
M3	0.4866	0.1965	-0.0785	2.1618
PG	0.3967	0.8089	-6.0789	1.3047
HC	0.5698	0.1613	-0.2404	2.3619
GE	0.1144	0.1723	-1.1675	0.7744
PI	0.2770	0.2056	-3.2155	2.4494

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment.

The research provides vital insights into several economic indicators, highlighting the significance of mean values, standard deviations, minimum and maximum values. The mean GDP value is 2.3463, with a standard deviation of 0.0820. China experienced the largest GDP growth in 2022 [see column (v) of Table 4.1], while Vanuatu had the lowest in 2002 [see column (iv) of Table 4.1].

The mean value for domestic credit to the private sector (DCPS) is 0.3300, with a standard deviation of 0.3521. In 2004, the Democratic Republic of the

Congo had the lowest DCPS [see column (iv) of Table 4.1], while in 2022, Hong Kong had the highest [see column (v) of Table 4.1]. M3 has a mean value of 0.4866 and a standard deviation of 0.1965, with the lowest value recorded in Cameroon in 2005 [see column (iv) of Table 4.1] and the highest in Panama in 2022 [see column (v)of Table 4.1]. Population growth peaked in the Syrian Arab Republic in 2022, with a mean of 0.3967 and a standard deviation of 0.8089, and fell to its lowest in Mauritius in 2020 [see column (iv) of Table 4.1]. Human capital had an average value of 0.5698, with Panama recording the highest in 2020 [see column (v) of Table 4.1] and Niger the lowest in 2001 [see column (iv) of Table 4.1]. Government spending averaged 0.1144, with Timor-Leste reporting the most in 2002 [see column (v) of Table 4.1] and Zimbabwe the lowest in 2008 [see column (iv) of Table 4.1]. Finally, private investment had a mean value of 0.2770 and a standard deviation of 0.2056, with Oman ranking best in 2022 [see column (v) of Table 4.1] and Sierra Leone ranking lowest in 2000 [see column (iv) of Table 4.1]. Understanding these statistical metrics provides a full picture of economic performance and variability in developing countries over the period under consideration.

4.2.3 Correlation analysis

The correlation analysis in Table 4.2 offers valuable insights into the connections among key variables related to economic growth and financial development in developing countries.

Table 4.2: Correlation Matrix

	Y	DCPS	M3	PG	HC	GE	PI
Y	1.0000						
DCPS	0.3646	1.0000					
M3	0.3885	0.7235	1.0000				
PG	-0.1355	-0.3317	-0.3469	1.0000			
HC	0.1119	0.1752	0.2556	-0.3386	1.0000		
GE	-0.1364	0.1649	0.2052	-0.0718	0.2117	1.0000	
PI	0.1246	0.1790	0.2571	-0.0229	0.3754	0.1709	1.0000

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment.

A medium positive correlation exists between GDP (Y) and variables like Domestic Credit to Private Sector (DCPS) at 0.3646, indicating that an increase in these financial indicators often accompanies economic growth. There is evidence of a positive correlation between economic growth and domestic credit to the private sector. Studies conducted in Belise (HuiChen et al, 2023), the Gambia (Ismaila, 2022), and Pakistan (Tuti et al, 2023) all found that domestic credit to the private sector has a statistically significant and positive impact on economic growth.

Additionally, research conducted in five ASEAN countries (Syafqat, 2020) showed that domestic credit has a higher impact on economic growth than the stock market. Ofori-Abebrese, Pickson, and Diabah (2017) study in Ghana reveals a positive significant nexus between domestic credit to the private sector and economic growth. Gazel (2016) study on troubled ten countries shows a weak positive relationship between financial development, including domestic credit to the private sector, and economic growth in the short term.

However, a few literatures have raised doubt on this relationship. There is evidence of a negative correlation between economic growth and Domestic Credit to Private Sector (DCPS) in certain contexts. Asteriou and Spanos (2022) find that the positive effect of household debt on economic growth turns negative after the

2008 global financial crisis, especially when the credit to private sector exceeds certain thresholds. Tumwine et al., (2022) study in Uganda also suggests that an increase in public domestic borrowing can lower interest rates and increase savings and deposits, indicating a negative relationship between public domestic borrowing and interest rates. Estrada, Erce, and Park (2023) find that economies characterised by negative skewness in private sector credit growth experience faster output growth, but this relationship is more nuanced and is evident only prior to 2000.

There is also medium positive correlation exists between GDP (Y) and Broad Money (M3) at 0.3885, showing a positive and slightly stronger correlation compared to DCPS. Positive correlation between GDP and broad money indicating that as the amount of money in circulation increases, it tends to stimulate economic activity and contribute to higher economic growth. Broad money, also known as M3, refers to the total amount of money in circulation in an economy, including cash, demand deposits, and other liquid assets. This suggests that an increase in broad money can lead to higher investment and capital formation, which in turn can drive economic growth.

A similar finding was found by Tamma et al., (2020); Marwa et al, (2022); Siyasanga (2017); Taral et al., (2017); however, there are literatures had a contradict effect of Broad Money to GDP. Tamma Koti Reddy et al. (2020) found a negative effect of inflation (measured by Wholesale Price Index Inflation) on GDP growth in India, while Broad Money (M3) had a positive effect on GDP growth. Yusheng Kong et al. (2020) also found that Broad Money to GDP had a negative influence on economic growth in Africa. Conversely, Omodero (2019) found that broad money supply (M2) had an insignificant negative influence on economic growth in Nigeria, while in Ghana it had a significant positive impact.

Gazel (2016) found no relationship between financial development (including Broad Money) and economic growth in ten troubled countries in the long term, but a weak positive relationship in the short term. Taral Patel and Jaydip Chaudhari (2015) found a positive association between Broad Money and economic growth in India.

Conversely, the weak negative correlation found between GDP and Population Growth (PG) at -0.1355 highlights the challenges that rapid population growth can present to economic advancement. There is evidence from multiple studies that suggest a negative correlation between population growth and economic growth. In a study by Ali et al., (2015) the results showed a significant and negative relationship between population growth and measures of economic advancement in Bangladesh. Kyaw (2019) indicated that countries with lower population growth have been found to improve economic growth, and reducing fertility rates has been recommended as a policy goal for developing countries. This finding was unexpected as some researchers maintain that population growth has a positive impact on economic development.

The impact of population growth on economic growth depends on how the population is utilised. China, for example, has effectively used its large population as a human resource to drive economic growth similar to India. A study by Bedia and Gupta (2013) found that population growth and economic development are correlated factors. Population growth can have both positive and negative impacts on economic growth. Hosen (2019) analysed the relationship between population growth and GDP growth. It examined this relationship among different income groups of countries. In low-income countries, population growth and GDP growth have a positive relationship however in high income and upper middle-income countries, GDP growth decreases with population growth.

Likewise, the weak positive correlation between GDP and Human Capital (HC) at 0.1119 underscores the importance role of education and skills in driving economic growth. Investments in human capital, such as education and healthcare, can enhance labor productivity and innovation, leading to higher GDP. There is evidence of a positive correlation between GDP and human capital. Previous studies have shown that human capital plays a positive role in per capita GDP growth, especially in the presence of better economic opportunities and high-quality legal institutions (Yu 2022).

Additionally, research conducted in India found a strong positive relationship between human capital and economic growth, with secondary school enrollment having the greatest impact on GDP growth (Ali, Egbetokun, and Memon 2018). Another study conducted in Vietnam also found a positive and significant impact of education levels and life expectancy on GDP (Rashid 2020). Furthermore, there is a strong correlation between human capital expenditures and GDP, as well as a strong inverse relationship between poverty and expenditure on human capital (Ha and Man, 2019).

These findings suggest that investing in human capital can contribute to economic growth and improve overall economic indicators. However, the result of positive correlation had contradicted with the few studies. There is a weak empirical relationship between GDP and human capital, as suggested by Gulaliyev et al., (2019). In developing countries, education does not have a significant effect on GDP and investment in the short and long run, indicating that it is capital formation and GDP that drive education, not vice versa, as found by Mehrara and Musai (2013). In China, a study by Odo, Eze and Onyeisi (2016) found that the correlation between educational human capital and real GDP

growth is not very significant, while the relationship between health capital and economic growth is also not significant. Overall, the relationship between GDP and human capital varies across different countries and contexts.

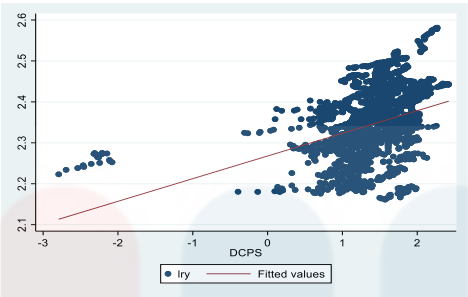
The correlation result show that the weak negative correlation between GDP and GE (-0.1364) suggests that higher government expenditure relative to GDP may have a slightly negative impact on economic growth. This could be due to inefficiencies in government spending or crowding out of private investment. Developing countries often face challenges related to corruption, bureaucratic inefficiencies, and misallocation of resources in their public sector. In such cases, an increase in government expenditure may not translate effectively into productive investments that stimulate economic growth. Instead, resources may be wasted or used inefficiently, leading to a weaker correlation with GDP growth. Mulugeta Emeru (2023) found that in European countries between 1995 and 2020, it was found that an increase in government spending as a share of GDP led to a decrease in economic growth by 0.509%.

Similarly, in a study by Omitogun et al., (2022) in Nigeria, positive changes in recurrent expenditure had a negative impact on economic growth in the long run. Dzhumashev (2014) and an earlier study by Gupta et al. (2005) showed that an increase in public spending leads to greater corruption, and consequently harms economic growth, due to the social losses and government inefficiency caused by corruption.

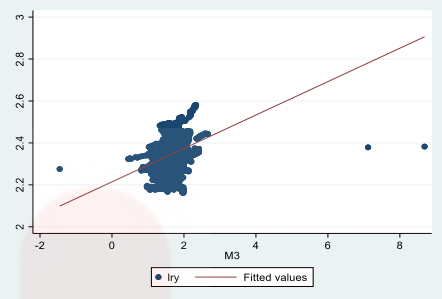
Finally, the correlation between private investment (PI) and GDP (Y) indicate a weak positive correlation of 0.1246, indicating a weak positive relationship. Private investment is critical for capital formation, especially in developing countries where capital is typically scarce.

Increased private investment can encourage the construction of new infrastructure, factories, and other productive assets, boosting productivity and accelerating economic growth. Furthermore, private investment is a significant engine of technical progress. Investments in new technologies, processes, and machines improve efficiency and competitiveness, boosting productivity and accelerating economic growth. This technological progress not only benefits established industries but also prepares the way for the establishment of new sectors, creating new opportunities for growth and development. Giray and Omur (2022) proved the positive effect of private investment on economic growth in Turkey and similar to Chraki (2022) in their study on Canada, Mexico, and the United States, it was found that private investment is positively related to growth in demand and has a positive impact on GDP in both the short and long run. Therefore, the findings from these studies of positive correlation between private investment and GDP is consistent with past studies.

Figure 4.1 displays scatter plotted against financial development indicators with economic growth (GDP) for the entire period (2000-2022). The fitted line shows weak positive relationships between the GDP and domestic credit to private sector (R^2=0.3646) and broad money (R^2=0.3885). The "weak positive correlation" suggests that as domestic credit to the private sector and broad money increase, GDP tends to rise, while the relationship is not very strong. The R^2 values indicate how well the regression models match the data. With an R^2 value of 0.3646, domestic credit to the private sector explains 36.46% of the variation in GDP. Similarly, an R^2 value of 0.3885 for wide money indicates that 38.85% of the variation in GDP can be explained by broad money changes.



(a) GDP vs DCPS



(b) GDP vs M3

Figure 4.1: Scatter Plot for GDP vs. Financial development indicators

(Notes: GDP = Gross Domestic Product, DCPS= Domestic Credit to Private Sector, M3= Broad money)

4.2.4 Panel Unit Root Tests

To conduct the cointegration test, two panel unit root tests were performed to assess the unit root properties of all variables. In panel data analysis, unit root tests are often used as a preliminary step to assess the presence of cointegration relationships among variables across different units. Cointegration implies a long-term relationship between variables. The tests utilized in this study were the Levin, Lin, and Chu (LLC) test and the Im, Pesaran, and Shin (IPS) test. These panel unit root tests assume a null hypothesis of a unit root existing in the autoregressive representation of the data variable.

The results of the LLC and IPS tests are presented in Table 4.3. The panel unit root tests were conducted using models with an intercept and with an intercept plus trend. The results suggest that the null hypothesis cannot be rejected at the level, indicating that all variables contain a unit root. However, when testing for a unit root at the first difference, the results generally suggest that all variables are stationary, as the null hypotheses can be rejected at the usual level. There is an exception for the variables human capital (HC) and private investment (PI) when

using the LLC model with an intercept and trend, where the null hypothesis cannot be rejected at the first difference. Overall, the variables are integrated of order 1, or *I*(1), according to the second panel unit root test using the IPS test, where the null hypothesis is rejected. This suggests that there exists a cointegration between the series.

Table 4.3: Panel Unit Root Tests

Levin, Lin and Chu (LLC) test.				
	Level		**First Difference**	
Variable	**Intercept**	**Intercept +trend**	**Intercept**	**Intercept + trend**
Y	-7.9270***	-3.3383***	9.3028***	-7.6673***
DCPS	-5.8358***	-3.6315***	-9.3028***	-7.6673***
M3	-2.7341***	-5.5523***	-16.1457***	-11.5422***
PG	-5.2233***	-9.7232***	-16.4180***	-16.8011***
HC	9.8637	3.6000	7.7004	3.8004
GE	-3.4231***	-4.9568	-16.5555***	-12.3249***
PI	7.6366	4.0000	1.2004	1.8004
Im, Pesaran and Shin (IPS) test.				
Y	2.7344	0.3833	-18.3711***	-20.9603***
DCPS	2.8944	-4.3602***	-20.5389***	-21.7102***
M3	-0.5893	-11.7976***	-24.9831***	-25.2575***
PG	8.8219	0.9949	-11.7182***	-13.2131***
HC	-6.5817***	-7.3349***	-25.1036***	-26.8436***
GE	-1.9987**	-6.9329***	-22.2924***	-22.8299***
PI	-3.4633***	-6.8445***	-22.6332***	-23.2785***

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. H_0: All panels contain unit roots; Ha: Some panels are stationary

4.2.5 Panel Cointegration Test

Having established that each variable is integrated to order one (I(1)), panel cointegration analysis is performed using the cointegration tests proposed by Pedroni (1999, 2004), Kao and Chiang (1999), and the Westerlund test. The Pedroni, Kao and Chiang, and Westerlund tests are all used to assess cointegration in panel data. However, their methodologies and assumptions are not the same.

This test is based on an augmented Dickey-Fuller (ADF) statistic that takes both heterogeneous and homogeneous coefficients. It allows for variations in individual impacts and trends across cross-sectional units. The Pedroni test is notable for its ability to accommodate a wide range of data patterns. The Kao and Chiang Test is an extension of the ADF test for panel data that takes into account cross-sectional dependence. It assumes that the individual unit faults have a common factor structure and uses a group mean ADF statistic to test for cointegration.

The Kao and Chiang test is beneficial when there is a possibility of cross-sectional dependence in the data. Finally, the Westerlund Test is meant to detect cointegration in the presence of both individual and common factors. It takes into account the existence of a structural break in the cointegrating vectors and allows for variation in the adjustment coefficients. The Westerlund test is particularly effective when the cointegrating relationship has changed over time or between units. The Pedroni test results can be somewhat confirmed by the Kao and Chiang tests and the Westerlund test. If all three tests show substantial evidence of cointegration among the variables, it gives more support for the occurrence of a cointegrating connection in the panel.

Table 4.4 (Pedroni test) shows the test statistics for the Modified Phillips-Perron, Phillips-Perron, and Augmented Dickey-Fuller tests for models with an intercept and an intercept + trend. These tests' t-values are statistically significant, implying strong evidence of cointegration between variables. A greater absolute value for the test statistic suggests better evidence of cointegration.

Table 4.4: Results of Cointegration Test Based on Pedroni (1999, 2004)

Test Statistics	Intercept	Intercept + Trend
Modified Phillips–Perron t	9.8592***	12.1184***
Phillips–Perron t	-4.7491***	-4.5856***
Augmented Dickey–Fuller t	-4.2766***	-5.2482***

Notes: *** indicate statistical significance at the 1% levels.

Table 4.5 presents the cointegration findings from the Kao and Chiang tests, which include the Modified Dickey-Fuller, Dickey-Fuller, Augmented Dickey-Fuller, Unadjusted Modified Dickey-Fuller, and Unadjusted Dickey-Fuller tests. Similar to the Pedroni test, the results indicate strong cointegration, with high t-values and degrees of significance.

Table 4.5: Results of Cointegration Test based on Kao and Chiang (1999)

Test Statistics	Coefficient
Modified Dickey–Fuller t	-2.5994***
Dickey–Fuller t	-3.5524***
Augmented Dickey–Fuller t	3.0969***
Unadjusted modified Dickey–Fuller t	-4.0343***
Unadjusted Dickey–Fuller t	-4.3542***

Notes: *** indicate statistical significance at the 1% levels.

Table 4.6 shows the results of the cointegration test using the Westerlund test. The test statistics for models with an intercept and an intercept plus trend are presented. The variance ratio test statistic is also presented, with asterisks denoting the level of statistical significance. The results, like the other tests, imply substantial evidence of cointegration between the variables, as evidenced by the high variance ratio test statistics and significance levels.

Table 4.6: Results of Cointegration Test based on Westerlund test.

Test Statistics	Intercept	Intercept + Trend
Variance ratio	5.2066***	4.5384***

4.2.6 Linear Estimation (Multicollinearity test)

Multiple linear regression analysis is used to analyses the relationship between a dependent variable (such as GDP) and multiple independent variables (DCPS, M3, PG, HC, GE, and PI) that are thought to influence the dependent variable. By including a variety of independent variables, the study can account for each factor's potential impact on GDP, offering a full picture of their cumulative impacts. This technique contrasts with evaluating each factor separately. The research identifies which independent variables have a significant impact on the dependent variable, providing policymakers and economists with useful insights into the key drivers of economic growth in Table 4.7. Furthermore, assessing the model's overall fit and the individual importance of each variable assures a strong representation of the relationship between the independent variables and GDP.

Table 4.7: Linear Model

Variable	**Coefficient**	**s.e**	**t-stat**
DCPS	0.4010***	0.0354	11.31
M3	0.1331**	0.0613	2.11
PG	0.0540**	0.0211	2.55
HC	0.1844***	0.1334	1.38
GE	-1.2156***	0.0938	-12.95
PI	-0.1042	0.0837	-1.24
Constant	1.7879***	0.0826	6.37
R^2		0.7785	
Adjusted R^2		0.7765	
Number of observations		2207	
p-value		0.0000	

Note: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment.*** and** indicate statistical significance at the 1% and 5% levels, respectively. s.e = standard error and t-stat = t statistics.

The coefficient of 0.4010 implies that an increase in domestic credit to the private sector corresponds to an increase in GDP, which is statistically significant

at a 1 percent level. This implies that a well-functioning credit market can stimulate economic growth by providing finance to private enterprises. DCPS is a crucial indicator of financial development and private business access to credit, with higher levels potentially supporting economic activity by providing cash for investment and growth. Furthermore, the finding is consistent with the findings of Asmarani and Ningsih (2022), who discovered that domestic credit, including both banking and stock markets, has a significant effect on GDP per capita in ASEAN countries such as Indonesia, Malaysia, Singapore, Thailand, and the Philippines. Similarly, in the Gambia, the availability of domestic credit to the private sector has a direct impact on economic growth, implying that additional financial sector development might significantly boost growth (Ozili, Oladipo, & Lorember, 2023).

The coefficient of 0.1331 demonstrates that an increase in broad money (M3) corresponds to an increase in GDP, implying that enough liquidity in the economy, represented by wide money, can stimulate economic activity and growth. Broad money refers to the overall quantity of money in circulation in an economy, which includes cash, checking account balances, and other highly liquid assets. M3 is an important indication of overall liquidity in an economy and is directly related to inflation and economic growth. An increase in M3 can boost economic activity by giving people and businesses more money to spend and invest.

While beneficial broad money expansion relates to stronger economic growth, it can also result in inflationary pressure (Michael et al., 2020). Furthermore, Marwa and Sameer (2022) discovered that, while wide money supply expansion boosts GDP growth, it does not result in revenue diversification across productive sectors or a true increase in GDP. As a result, the relationship

between broad money supply and economic growth is complex and influenced by factors such as inflation, government spending, and the country's unique circumstances.

The coefficient of population growth is 0.0540. The findings suggest that a faster population growth rate is linked to an increase in GDP, implying that a larger population can boost economic growth by driving up demand for products and services, consumption levels, and labor force participation. However, rapid population growth can also put a strain on resources and infrastructure, posing challenges to economic progress. This aligns with Morwat's (2021) study in Afghanistan, which found that a 1% rise in population growth led to a 2.4% increase in economic development. On the other hand, Ali et al. (2013) point out that population growth can create problems such as unemployment and a lack of educational and health resources. In another study, Ali et al. (2015) argue that population expansion has a negative impact on economic growth. As a result, the role of population growth in determining economic growth remains an ongoing debate, requiring further research to fully understand the complexities involved.

Human capital, comprising the collective skills, knowledge, and capabilities of individuals within a society, plays a pivotal role in driving economic progress and advancement. Enhancing human capital through investments in education, training, and healthcare has been shown to boost productivity and foster innovation, leading to sustained economic development over time. Research by Monica and Elena (2023) and Thirtabrata et al. (2022) underlines the positive correlation between human capital and economic growth in developing countries.

Specifically, the result presented in Table 4.7 demonstrates a significant coefficient (0.1844) illustrating how improvements in human capital correspond

with increased GDP levels. This underscores the critical significance of allocating resources towards educational, training, and healthcare initiatives to enhance workforce skills and efficiency, thereby fueling economic growth.

Government expenditure has been highlighted as having a negative impact on economic growth in developing countries. The negative coefficient (-1.2156) implies that more government spending leads to a drop in GDP. This result is fairly unexpected and may suggest inefficiencies in government spending or crowding out effects, in which higher government spending reduces private sector investment. Researchers have discovered a negative link in Sub-Saharan African countries, eurozone countries, and Nigeria. This research used a variety of econometric methods, including the Vector Error Correction Model (VECM), ARDL Error Correction Model, and ordinary least squares regression. Government expenditure has a negative impact on economic growth and development by lowering real GDP per capita, increasing inflation, and decreasing consumption (Chindengwik, 2023; Abdullahi et al., 2022; Cenc, 2022; Nwankwo, 2022). Nonetheless, government spending has certain positive benefits, such as boosting investment and cutting unemployment over time (Joseph, 2023). Given the long duration of the investigation, a thorough examination of the findings in this section is important.

The final variable being investigated is private investment. The negative correlation (-0.1042) implies that more private investment leads to a drop in GDP. This finding is intriguing and may be worth more inquiry to better understand the underlying mechanisms influencing private investment and its influence on GDP. Private investment refers to funds invested by private firms in capital goods, infrastructure, and other productive assets. Numerous studies have shown that it is a key driver of economic growth. High amounts of private investment are

usually linked to strong economic performance. The literature on the relationship between private investment and economic growth is vast (Al-Jabsheh et al., 2021; Turan et al., 2021; Agbloyor, 2020; Kalaipriya and Uthayakumar, 2019).

This research found that both public and private investment have a good impact on economic growth, with public investment having a greater benefit (Do et al., 2021). This link holds true for poor countries, independent of government effectiveness, implying that investment can help countries regardless of institutional quality levels. Furthermore, private investment has been shown to boost economic growth via both direct and indirect transmission routes. However, it is important to note that the impact of private investment on economic growth can vary across countries. In some OECD economies, private investment crowds out public investment, leading to a negative effect on economic growth (Parveen et al, 2021). Given the mixed and doubtful findings from the previous literature, further estimation is necessary to establish robust findings.

The next step is examining the multicollinearity issue. Checking for multicollinearity involves examining whether two or more independent variables in a regression model are highly linked, making it difficult to distinguish their individual effects on the dependent variable. This can lead to inaccurate regression coefficient estimations and issues comprehending the analysis results. This test is an important part of multiple linear estimating since it might generate issues with coefficient estimates and model interpretation. The Variance Inflation Factor (VIF) and mean VIF (1/VIF) are widely used approaches for finding multicollinearity in multiple linear regression. VIF measures the extent to which the variance of an estimated regression coefficient is inflated due to multicollinearity. VIF and 1/VIF values above 10 are typically indicative of multicollinearity.

Table 4.8 shows the VIF and 1/VIF values, suggesting that multicollinearity is not an important problem in the regression model. All VIF values are less than 10, and the average VIF is 1.52, indicating that the variables are not highly correlated with each other and absence of multicollinearity issues in the model. This strengthens the reliability of the regression coefficients and the overall model interpretation.

Table 4.8: Result for Variance Inflation Factor (VIF) and Mean Variance Inflation Factor (1/VIF)

Variable	vif	1/vif
DCPS	1.59	0.4699
M3	2.13	0.4699
PG	1.21	0.8277
HC	1.91	0.5240
GE	1.07	0.9308
PI	1.22	0.8277
Mean VIF	1.52	

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment.

4.2.7 Generalized Method of Moments (GMM) Estimation Results

In order to assess the impact of financial development (DCPS and M3) on the economic growth (GDP) in developing countries equation (3.7) was constructed using both the difference Generalized Method of Moments (GMM) and the system GMM estimators. The results of this analysis are presented in Table 4.9.

Table 4.9: Results of Difference between GMM and System GMM

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	1.1997***	1.1957***	1.0200**	1.0720***
	(0.1124)	(0.0342)	(0.0135)	(0.0018)
Lag Y	0.8748***	0.8750***	0.9923***	0.9683***
	(0.0123)	(0.0034)	(0.0059)	(0.0007)
DCPS	0.0298***	0.0294***	0.0244***	0.0565***
	(0.0081)	(0.0007)	(0.0004)	(0.0004)
M3	0.0231**	0.0222***	0.0144***	0.0128***
	(0.0112)	(0.0011)	(0.0004)	(0.0007)
PG	0.0049**	0.0050***	0.0047***	0.0061***
	(0.0020)	(0.0003)	(0.0001)	(0.0002)
HC	0.0067***	0.0069***	0.0033***	0.0019***
	(0.0203)	(0.0024)	(0.0009)	(0.0001)
GE	0.0023**	0.0023***	0.0062***	0.0072***
	(0.0092)	(0.0010)	(0.0008)	(0.0001)
PI	0.0019***	0.0019***	0.0035***	0.0037***
	(0.0066)	(0.0003)	(0.0004)	(0.0008)
Sargan Test	28.4751	23.6092	22.1462	23.7715
	(0.2253)	(0.2536)	(0.2653)	(0.2815)
AR (1)	-	-1.4756	-	-2.0303
		(0.1401)		(0.0423)
AR (2)	-	0.0997	-	0.0300
		(0.9206)		(0.7635)
N		96		

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money (M3), PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. .***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

The diagnostic tests conducted reveal that neither the presence of first-order serial correlation nor the presence of second-order serial correlation is evident, as indicated by the non-rejection of the Sargan test, even when the p-value exceeds 0.05. Furthermore, in all model estimations, the coefficients for the lagged dependent variable are significantly below unity, signifying the absence of explosive behavior. Consequently, we can confidently assert that our choice of Dynamic GMM as the preferred panel estimator is well-founded from a statistical perspective (Baltagi et al., 2009). Therefore, it is pertinent to delve further into the

details of these estimations, emphasising how they align with the relevant hypotheses.

Starting with the one-step estimation Difference GMM result [see columns (i) of Table 4.9] the lagged dependent variable (Lag Y) indicates positive and significant at a 1 percent significant level indicating that the GDP has a positive effected the current GDP period. The coefficient of the research's interest DCPS and M3 (indicator of financial development) indicated positive values. The coefficient values of the DCPS and the M3 were β = 0.0298, $\rho < 0.01$ and β = 0.0231 $\rho < 0.05$ respectively. The results indicate that as 1 percent increase in DCSP cause 2.98 percent increase in economic growth (GDP) and increase 1 percent in M3 cause to increase 2.31 percent on economic growth (GDP).

This suggests that an increase in DCPS corresponds with an increase in the dependent variable, which is GDP. When private enterprises have better access to finance, they can invest more in expansion, innovation, and productivity enhancements, so stimulating economic growth. DCPS measures the availability of credit for private firms, which is critical to their operations and growth. DCPS can also show the health of the financial sector and its capacity to promote private sector growth. Policies that support an efficient and accessible credit market for private enterprises can strengthen DCPS's positive impact on economic growth.

This finding is consistent with past studies. Studies conducted in Nigeria, European Union countries, and the Gambia all support this finding. In Nigeria, an increase in credit supply to the private sector was found to increase real gross domestic product (GDP) growth and GDP per capita, especially when there is a strong legal system in place (Muhammad and Ngele, 2023 and Asteriou and Spanos, 2022). Similarly, in the European Union, household debt was found to have a positive effect on economic growth, but this relationship becomes negative

when the credit to private sector ratio exceeds certain thresholds (Peterson et al, 2023).

In the Gambia, the availability of domestic credit to the private sector was found to have a direct impact on economic growth, and although the impact may seem small, it can significantly contribute to further economic growth (Magaji and Musa, 2023). Therefore, improving and promoting domestic credit to the private sector can be beneficial for economic growth.

The second measure of financial development is broad money (M3), which shows a positive coefficient value in the results. This implies that an increase in the supply of broad money is linked to a rise in GDP. Broad money encompasses cash, checking account balances, and other highly liquid assets. An uptick in M3 can stimulate economic activity by providing individuals and businesses with more funds for spending and investment. However, it's crucial to note that an excessive increase in M3 can lead to inflationary pressures if it surpasses the growth of real economic output. Central banks and monetary authorities often regulate the growth of M3 to uphold price stability and foster sustainable economic growth. Numerous studies have demonstrated that a rise in the supply of broad money spurs economic growth in the short term. For instance, Omodero (2019) discovered a significant positive influence of broad money supply on economic growth in Ghana. Similarly, Ugwuanyi (2018) observed a positive and substantial impact of broad money supply on economic growth in Nigeria. Dingela and Khobai (2017) identified a statistically significant positive relationship between money supply and economic growth in South Africa, both in the short and long term. These findings suggest that boosting the broad money supply can stimulate economic growth.

However, some studies have presented mixed findings. For instance, Razia and Omarya (2022) examined Palestine and found that while money supply positively impacts economic growth in the short term, it has no effect in the long term. Additionally, Omodero (2019) reported in a study on Nigeria that broad money supply has an insignificant negative influence on economic growth. Thus, from this finding, the results shows that the importance of broad money (M3) as a key indicator of financial development, showing a positive association with economic growth. An increase in the supply of broad money can stimulate economic activity by providing more liquidity for individuals and businesses to spend and invest. However, caution is necessary to prevent excessive increases in broad money, which can lead to inflationary pressures.

The coefficient value of control variables population growth (PG), human capital (HC), government expenditure (GE), and private investment (PI) show a positive coefficient indicating that they have a positive impact on the dependent variable. The significance levels vary, with some variables being significant at the 1% level and others at the 5% level. Several studies have shown that population growth has a notable and positive impact on economic growth in developing countries. Kremer's theory proposes that population growth stimulates economic growth and development, a notion supported by empirical evidence from Azam et al. (2020) and Morwat (2021). Human capital has been found to positively affect economic growth. Research measuring human capital through secondary school enrollment indicates that government expenditure on education has a statistically significant positive effect on economic growth (Adeleke and Anuolam, 2023). Additionally, studies have demonstrated that secondary school enrollment positively influences economic growth in developing countries, aligning with the findings of Nnyanzi and Kilimani (2018).

Government expenditure has a favourable impact on economic growth in developing countries. Studies conducted across various regions, including SAARC countries (Rahman, 2023), Lesotho (Megbowon et al., 2022), Ethiopia (Mulugeta Emeru, 2023), and the BRICS, ASEAN, and SAARC regions (Ansari et al., 2021), consistently show a positive relationship between government spending and economic development. These studies employ various econometric techniques and time-series data to analyse the impact of government expenditure on GDP growth. The results suggest that government spending on sectors like agriculture, education, health, and domestic investment can stimulate economic growth and prosperity. Finally, the control variable used in this study, private investment, demonstrates a positive and significant effect on economic growth in developing countries. Private investment plays a crucial role in economic growth (Bhutto et al., 2022; Awoyemi et al., 2022; Parveen et al., 2021; Turan et al., 2021; Ahamed, 2022). Studies indicate that private investment has a positive influence on GDP growth rates. Private sector development, including privatisation and market capitalisation of domestic listed enterprises, has been found to stimulate economic growth in both the short and long term. Additionally, private investment has been shown to have a positive impact on environmental degradation, suggesting it can be environmentally friendly. The effects of private investment on growth are significant in developing countries with both effective and ineffective governments, indicating that investment can benefit countries regardless of their institutional quality levels. The *p*-value for the Sargan test of 0.2253 suggested that over-identification restriction could not be rejected, rendering the instruments used in estimation valid. The Sargan test is a statistical tool used to check the validity of instruments in a regression model, ensuring that the instruments used are appropriate and not correlated with the error term.

The difference GMM involving the one-step level indicated that the DCPS and M3 substantially boosted the economic growth in developing countries. Meanwhile, a study by Arellano and Bond (1995) noted that the two-step estimator was asymptotically more effective than the one-step estimator. Therefore, the two-step estimator was selected for this study, and the outcomes were collected [see column (ii) of Table 4.10]. Typically, the result from difference GMM at two step is comparable to that of a one-step estimation. The lagged dependent variable was statistically significant at a 1% level and produced a positive coefficient at $\beta = 0.8750$. Specifically, the p-value of the Sargan test was 0.2536, suggesting that the absence of AR (2) and the over-identification restriction could not be dismissed. The two-step estimation also suggested a comparable result to the one-step estimator, indicating that the DCPS and M3 was a significant factor affecting the economic growth in developing countries.

In the second phase of the analysis, this research used the System GMM estimator to estimate based on strong evidence from earlier econometric studies that show its advantages over the Difference GMM method. Researchers like Arellano and Bover (1995) and Blundell and Bond (1998) found that System GMM tends to provide more accurate and reliable estimates, especially in datasets with relatively few time periods a situation common in macroeconomic studies. They pointed out that while Difference GMM can be useful, it often struggles with weak instruments when the explanatory variables are highly persistent, which can lead to biased and inefficient results, particularly in smaller samples.

Additionally, Griliches and Hausman (1986) noted that differencing the data can sometimes reduce the signal-to-noise ratio, making the bias worse instead of better. System GMM improves on this by combining equations in both levels and differences, which strengthens the set of instruments and leads to more precise

estimates. Baltagi (2008) also supports this view, highlighting that System GMM generally produces less biased results and performs better with finite samples compared to Difference GMM.

Because of these clear benefits, this research chose System GMM as the main estimation method. Both one-step and two-step results are presented [see columns (iii) and (iv) in Table 4.9]. To ensure the robustness of the findings, the validity of the instruments was checked using the Sargan test for over-identifying restrictions and the Arellano-Bond AR(2) test for second-order autocorrelation. Both tests confirmed that the instruments and model are appropriate, giving confidence in the reliability of the System GMM estimates.

The results from column (iv) indicated that the coefficient value of the DCPS was β = 0.056, that is slightly higher than difference GMM and system GMM at one step and signifying high statistical significance at the 1% confidence level. These results indicate that as 1 percent increase in DCPS it will increase 5.6 percent of GDP. Compared to the second financial development indicator, although highly significant the coefficient value of M is β = 0.0128 that is lower than coefficient DCPS, which only cause 1.28 percent increase in GDP as 1 percent increase in M3. The discovery that the coefficient of DCPS is greater than broad money (M3) suggests that DCPS could have a more significant impact on the growth of GDP in comparison to changes in the broad money supply. This observation hints at the critical role of credit availability for investment and consumption in propelling economic growth, especially in developing countries.

DCPS signifies the accessibility of funds for investment within a nation. A higher coefficient for DCPS might imply that easier credit access promotes increased investment, subsequently leading to higher GDP growth. Moreover, DCPS serves as a more direct gauge of how monetary policy influences the

economy. Central banks frequently utilize credit supply alterations to impact economic activity. A higher coefficient for domestic credit could indicate that variations in credit availability exert a more immediate effect on GDP compared to changes in the M3. Furthermore, domestic credit reflects the function of financial intermediaries, such as banks, in an economy. These entities are pivotal in efficiently allocating capital. A higher coefficient for domestic credit might suggest that the efficacy of financial intermediation holds a more substantial sway over economic growth than the overall money supply. While both money supply and domestic credit have favourable impacts on GDP, a greater coefficient for domestic credit implies that it could wield a relatively stronger influence on economic growth within the scope of your study. These findings are similar with Khan et. al. (2020) study on Pakistan that indicate positive and significant effect of DCPS and M3 on GDP, with coefficient of DCPS is higher than M. The results also indicate a significant positive influence of population growth (PG), human capital (HC), government expenditure (GE), and private investment (PI) on GDP in developing countries which is consistent with the difference GMM in one-step and two-step estimations and System GMM at one-step estimation result [see columns (i), (ii) and (iii) of Table 4.9].

Based on the discussion of this objective, the findings suggest that both domestic credit to the private sector (DCPS) and broad money have a statistically significant and positive impact on GDP. According to Ndou et al., (2019), expansionary monetary policy shocks lead to bigger increases in credit growth. Thus based on this study, it is recommended that in developing countries monetary policy should be geared towards implementing an expansionary monetary policy that increases domestic funds available for investment within the country. A higher coefficient for domestic credit implies that changes in credit availability

and easier access to credit promote more investment, potentially leading to a more immediate impact on GDP compared to changes in the broader money supply. By implementing expansionary monetary policy, it will boost investor confidence. When investors see central banks taking action to stimulate the economy, they may become more confident in the outlook for economic growth. This can lead to increased investment in businesses, including through equity financing, which can support business expansion and investment.

Besides that, interest rate at a lower rate during the expansionary monetary policy. Lower interest rates make borrowing cheaper, encouraging businesses to invest in new projects and consumers to spend more on goods and services. This increased spending and investment can boost economic activity and GDP growth. Lower interest rates can directly benefit DCPS by making it easier and cheaper for businesses to access credit. This can lead to higher levels of investment, which can in turn drive economic growth. Additionally, increased domestic credit availability can support the growth of small and medium-sized enterprises (SMEs), which are often drivers of economic development.

4.2.8 Robustness test

To make sure the estimation results are reliable and trustworthy, this study run three key sensitivity tests as robustness checks. First, a time dummy variable was added to control for any effects that are specific to certain years—like macroeconomic changes or policy shifts that could influence all observations and potentially bias the results. Next, the study looked at the impact of outliers to see if any extreme values might be skewing the findings or leading to misleading conclusions. Finally, because of the unique economic disruptions caused by the

COVID-19 pandemic, the analysis excluded data from 2020 and 2021 to reduce the risk that these extraordinary events would distort the general relationships being studied.

Together, these tests confirm that the main results are solid and not driven by particular years, unusual data points, or major external shocks. Fixed Effects models, originally developed to control for unobserved individual heterogeneity by using entity-specific intercepts (Balestra & Nerlove, 1966), are a common approach in panel data analysis. However, given these thorough checks, there's no need to run additional Fixed Effects tests here. The time dummies already take care of time-related unobserved factors, and the System GMM method used in this study effectively handles biases from omitted variables and endogeneity issues that Fixed Effects models may not fully resolve, especially with dynamic panel data. So, these robustness tests provide enough confidence in the accuracy and stability of the results without requiring further Fixed Effects testing.

Table 4.10 tabulates the outcomes involving the incorporation of time dummies to address time-specific effects. The results indicated that incorporating dummy variables for time did not alter the overall outcomes. Notably, DCPS and broad money remained positive and significant with coefficient of DCPS is higher than broad money which is consistent with the previous finding [see Table 4.10].

Table 4.10: Results of Difference between GMM and System GMM: Sensitivity Analysis – Inclusion of Time Dummy

	Difference GMM		**System GMM**	
	i	**ii**	**iii**	**iv**
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	2.1489***	2.1495***	0.5153***	0.5639***
	(0.1940)	(0.1144)	(0.0172)	(0.0063)
Lag Y	0.7936***	0.7936***	0.9745***	0.9767***
	(0.0185)	(0.0012)	(0.0074)	(0.0027)

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**

Table 4.10 (continued): Results of Difference between GMM and System GMM: Sensitivity Analysis – Inclusion of Time Dummy

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
DCPS	0.0189***	0.0177***	0.0204***	0.0209***
	(0.0073)	(0.0012)	(0.0004)	(0.0022)
M3	0.0152***	0.0099***	0.0141***	0.0150***
	(0.0039)	(0.0024)	(0.0004)	(0.0020)
PG	0.0060***	0.0055***	0.0038***	0.0039***
	(0.0019)	(0.0005)	(0.0015)	(0.0052)
HC	0.0059***	0.0047***	0.0032***	0.0034***
	(0.0177)	(0.0026)	(0.0009)	(0.0029)
GE	0.0176**	0.0194***	0.0044***	0.0046***
	(0.0085)	(0.0016)	(0.0008)	(0.00026)
PI	0.0144**	0.0138***	0.01328***	0.01314***
	(0.0062)	(0.0013)	(0.0004)	(0.0012)
Tdum 7	0.0038***	0.0400***	0.0007**	0.0068***
	(0.0052)	(0.0028)	(0.0003)	(0.0009)
Tdum 8	0.0131***	0.0326***	0.0005**	0.00765***
	(0.0049)	(0.0023)	(0.0002)	(0.0009)
Tdum 9	0.0291***	0.0302***	0.0006***	0.0010***
	(0.0045)	(0.0022)	(0.0002)	(0.0009)
Tdum 10	0.0229***	0.0239***	0.0004*	0.0038***
	(0.0042)	(0.0020)	(0.0002)	(0.0008)
Tdum 11	0.0206***	0.0213***	-0.0005**	0.0056***
	(0.0038)	(0.0018)	(0.0002)	(0.0008)
Tdum 14	0.0116***	0.0131***	0.0001***	0.0012***
	(0.0030)	(0.0012)	(0.0002)	(0.0007)
Tdum 15	0.0151***	0.0159***	0.0005***	0.0026***
	(0.0027)	(0.0010)	(0.0001)	(0.0057)
Tdum 14	0.0116***	0.0131***	0.0001***	0.0012***
	(0.0030)	(0.0012)	(0.0002)	(0.0007)
Tdum 15	0.0151***	0.0159***	0.0005***	0.0026***
	(0.0027)	(0.0010)	(0.0001)	(0.0057)
Tdum 16	-0.0096***	0.0105***	0.0005***	0.0051***
	(0.0026)	(0.0011)	(0.0001)	(0.0007)
Tdum 17	-0.0124***	-0.0128***	-0.0004***	-0.0037***
	(0.0024)	(0.0007)	(0.0006)	(0.0007)
Tdum 18	-0.0094***	-0.0093***	-0.0061***	-0.0056***
	(0.0023)	(0.0004)	(0.0003)	(0.0005)
Tdum 19	-0.0097***	-0.0092***	-0.0067***	-0.0060***
	(0.0022)	(0.0005)	(0.0002)	(0.00005)
Tdum 20	-0.0056***	-0.0052***	-0.0007	-0.0007***
	(0.0021)	(0.0003)	(0.0002)	(0.0003)
Sargan Test	29.4393	28.7285	29.2595	27.7751
	(0.1658)	(0.2124)	(0.2854)	(0.2568)

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
AR (1)	-	-1.4323	-	-2.0664
		(0.1521)		(0.0388)

Table 4.10 (continued): Results of Difference between GMM and System GMM: Sensitivity Analysis – Inclusion of Time Dummy

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
AR (2)	-	0.0636	-	0.0314
		(0.9471)		(0.9749)
N		96		

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. .***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

This study further assessed whether outliers could influence the previously derived results. The methodology of this study followed the strategy reported by Besley *et al*. (1980) by utilising the Deleted or Diagnostics Fixed and Transformed (DFITS) statistics. This statistical measure was employed to identify countries with a significant combination of residuals and LEV statistics. Considering that the approach followed the methodology of Besley *et al*. (1980), an observation was classified as an outlier if the DFITS exceeded $2/\sqrt{(k/n)}$ (where k denotes the count of explanatory variables and n represents the number of countries). Figure 4.2 displays the scatter plots of residuals squared versus leverage statistics. Consequently, two countries are potential outliers in the estimation, namely Oman and Panama.

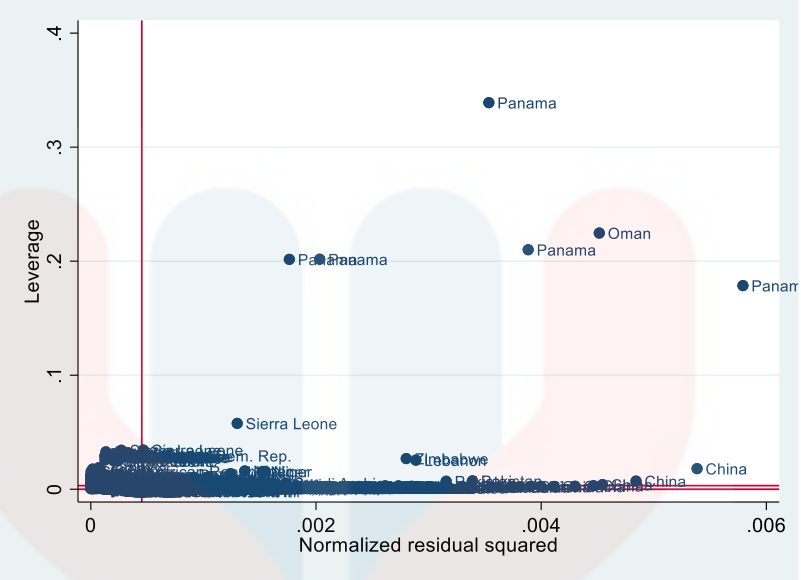


Figure 4.2: Scatter Plot Leverage vs. Residual Squared

Table 4.11 presents the excluded outlier observation-based findings. This outcome revealed a value of DCPS 0.0443 and broad money 0.0139 [see column (iv)], which was slightly lower than the previous estimate in Table 4.11. Nonetheless, the value remained positive and significant. The sensitivity analysis ensured the new GMM estimation was appropriately specified, while simultaneity bias concerns did not influence the results. Consequently, the earlier interpretation regarding the pivotal role of the DCPS as an important financial development variable remained unaltered. This process then underscored the robustness of the results, which remained unaffected by the outliers.

Table 4.11: Results Sensitivity Analysis by Excluding Outliers of Difference between GMM and System GMM

	Difference GMM		**System GMM**	
	i	**ii**	**iii**	**iv**
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	1.2850***	1.2767***	1.1982***	1.1950***
	(0.1221)	(0.0267)	(0.0515)	(0.0084)
Lag Y	0.8654***	0.8663***	0.9239***	0.9235***
	(0.0133)	(0.0028)	(0.0062)	(0.0009)

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**

Table 4.11 (continued): Results Sensitivity Analysis by Excluding Outliers of Difference between GMM and System GMM

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
DCPS	0.0282***	0.0299***	0.0448***	0.0443***
	(0.0081)	(0.0010)	(0.0052)	(0.0007)
M	0.0226**	0.0224***	0.0141*	0.0139***
	(0.0114)	(0.0009)	(0.0111)	(0.0015)
PG	0.0045**	0.0045***	0.0064***	0.0064***
	(0.0021)	(0.0002)	(0.0021)	(0.0002)
HC	0.0090***	0.0089***	0.0104**	0.0107***
	(0.0242)	(0.0042)	(0.0195)	(0.0025)
GE	0.0154***	0.0149***	0.0108**	0.0107***
	(0.0094)	(0.0008)	(0.0099)	(0.0008)
PI	0.0048***	0.0049***	0.0087***	0.0086***
	(0.0077)	(0.0005)	(0.0074)	(0.0006)
Sargan Test	25.3899	23.2516	23.7465	22.9436
	(0.3457)	(0.3214)	(0.2927)	(0.2439)
AR (1)	-	-1.4791	-	-1.5419
		(0.1391)		(0.1231)
AR (2)	-	0.1731	-	0.0047
		(0.8625)		(0.9962)
N		94		

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. .***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

As a final step, one alternative method for conducting a robustness test is to exclude specific years, notably 2020 and 2021, from the analysis. The COVID-19 pandemic was an unprecedented event that caused widespread disruptions to economies worldwide. By excluding the years 2020 and 2021, this research can focus on a period when economic conditions were more stable and representative of typical trends in developing countries. The pandemic may have led to data distortions, such as incomplete or inaccurate reporting due to disruptions in data collection processes. Excluding these years can help ensure the reliability and

consistency of data. These years experienced significant market upheaval due to the COVID-19 pandemic, resulting in evident economic depression. The results, excluding the effect of the COVID-19 pandemic, are reported in Table 4.12. They suggest that the impact of financial development, especially domestic credit to the private sector (DCPS), on economic growth in developing countries, remains unchanged.

Table 4.12: Sensitivity Analysis by exclude the Pandemic Covid 19 impact (2020 and 2021) of Difference between GMM and System GMM

	Difference GMM		**System GMM**	
	i	**ii**	**iii**	**iv**
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	1.2888***	1.2579***	1.0448**	1.0464***
	(0.1367)	(0.0276)	(0.0617)	(0.0088)
Lag Y	0.8651**	0.8680***	0.9929***	0.9928***
	(0.0149)	(0.0026)	(0.0064)	(0.0009)
DCPS	0.0353***	0.0352***	0.0240***	0.0234***
	(0.0096)	(0.0017)	(0.0073)	(0.0005)
M3	0.0243**	0.0241***	0.0157***	0.0172**
	(0.0134)	(0.0009)	(0.0153)	(0.0015)
PG	0.0089***	0.0086***	0.0107***	0.0116***
	(0.0028)	(0.0002)	(0.0028)	(0.0004)
HC	0.0060**	0.0054***	0.0062**	0.0062***
	(0.0248)	(0.0031)	(0.0211)	(0.0029)
GE	0.0093**	0.0086***	0.0109***	0.0108***
	(0.0117)	(0.0010)	(0.0106)	(0.0010)
PI	0.0034***	0.0034***	0.0053***	0.0052***
	(0.0093)	(0.0008)	(0.0087)	(0.0010)
Sargan Test	32.6754	31.8424	32.0684	29.8055
	(0.2385)	(0.3587)	(0.3622)	(0.3961)
AR (1)	-	-1.4756	-	-1.5449
		(0.1400)		(0.1224)
AR (2)	-	0.1892	-	0.2587
		(0.8499)		(0.7958)
N		96		

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. .***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

An empirical analysis was successfully conducted to examine the impact of financial development on economic growth in developing countries over the 2000 – 2022 period. The study employs both the difference Generalized Method of Moments (GMM) and the system GMM estimators to assess the impact of financial development (DCPS and M) on economic growth (GDP) in developing countries. Diagnostic tests reveal no first-order or second-order serial correlation, indicating the suitability of the Dynamic GMM as the preferred panel estimator. The finding of this study highlights the significant impact of financial development, particularly domestic credit to the private sector (DCPS), on economic growth in developing countries. The results show that both DCPS and broad money have a statistically significant and positive effect on GDP, with DCPS potentially exerting a more substantial influence. This underscores the importance of credit availability for investment and consumption in driving economic growth. Additionally, the study finds that population growth, human capital, government expenditure, and private investment also have a positive impact on GDP in developing countries. The results are consistent with past studies and suggest that improving and promoting these factors can further enhance economic growth.

Consequently, as a financial development plays a crucial role in driving economic growth. This outcome indicated that H1 is accepted.

H1: There is a significant impact of financial development indicators (such as domestic credit to the private sector and broad money supply) on economic growth in developing countries.

4.3 Role of employment in moderating financial development on economic growth in developing countries.

4.3.1 Introduction

This section discusses estimation results which examine the influence of financial development on employment through its influence on economic growth in developing countries. Financial development plays a crucial role in influencing employment rates across different regions. Studies in the MENA region (Raifi et al, 2023) and 19 emerging market countries (Raifu and Afolabi, 2023) highlight the significant negative impact of financial development on unemployment, especially among the working-age population and youths that shows as countries have a good financial development it will enhance employment in those countries. Additionally, a study by Ayadi et al. (2021) on 143 countries emphasized the positive relationship between financial institution efficiency and employment rates, with the effects varying based on the level of financial inclusion and institutional quality. Furthermore, a study focusing on Nigeria (Kananurak and Sirisankanan, 2020) reveals a positive and statistically significant impact of financial development on the employment rate, contradicting traditional economic theories. These findings collectively underscore the importance of sound financial development initiatives in reducing unemployment and fostering economic growth.

Thus, by focusing on developing countries based on data starting year 2000 till 2022, this section was conducted to examine hypothesis 2 (Financial development has a significant influence on employment through its impact on economic growth in developing countries). In order to test the hypothesis a few estimations test was conducted starting with descriptive analysis [see Table 4.13],

correlation analysis [see Table 4.14], multicollinearity test [see Table 4.12], panel unit root test [see Table 4.15], panel cointegration test [see Table 4.16 to Table 4.18], GMM estimation [see Table 4.22- Table 4.21] and robustness test [see Table 4.22 – Table 4.24].

4.3.2 Descriptive statistics

In order to test the hypothesis, the employment has been included in model estimation [see equation 3.2]. According to Hamijaya and Nadila (2022), Park (2022), Perez-Arce and Prados (2021) and Gross (2019) employment is measure using total labor force participation rate. This rate measures the proportion of the total population (including both the employed and the unemployed) that is either employed or actively seeking employment as it reflects the proportion of the population actively engaged in the labor market. The labor force participation rate is useful for understanding overall labor market dynamics, including changes in the size of the labor force and trends in labor force attachment among different demographic groups.

Table 4.13 tabulates the descriptive statistics involving mean, standard deviation, minimum, and maximum values for the preliminary analysis.

Table 4.13: Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
i	ii	iii	iv	v
Y	2.3463	0.0820	2.1612	2.5811
DCPS	0.3300	0.3521	-3.2312	0.8841
M3	0.4866	0.1965	-0.0785	2.1618
PG	0.3967	0.8089	-6.0789	2.6572

Table 4.13(continued): Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
i	ii	iii	iv	v
HC	0.5698	0.1613	-0.2404	2.3619
GE	0.1144	0.1723	-1.1675	0.7744
PI	0.2770	0.2056	-3.2155	2.4494
EMP	0.5769	0.0446	0.4453	0.6657
DCEMP	2.5306	0.9970	-5.0559	4.2877
M3EMP	2.9504	0.6453	-2.5081	15.8061

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, EMP= Employment; DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP= Interaction between Broad Money with Employment.

Given that employment (EMP) as new variable was employed in this section, the discussion for the initial variables (Y, DCPS, M, PG, HC, GE and PI) was identical to the previous section (see Section 4.2.2). In brief China experienced the largest GDP growth [see column (v) of Table 4.13], contrasting with Vanuatu, which had the lowest GDP growth in 2002 [see column (iv) of Table 4.13]. Hong Kong recorded the highest domestic credit to the private sector (DCPS) [see column (v) of Table 4.13], while the Democratic Republic of the Congo reported the lowest DCPS in 2004 [see column (iv) of Table 4.13]. Panama exhibited the highest broad money supply, [see column (v) of Table 4.13] with Cameroon reporting the lowest [see column(iv) of Table 4.14].

Population growth peaked in the Syrian Arab Republic in 2022 [see column (v) of Table 4.13] and hit its lowest point in Mauritius in 2020 [see column (iv) of Table 4.13. Regarding human capital, Panama ranked the highest [see column (v) of Table 4.14], while Niger ranked the lowest [see column (iv) of Table 4.13]. Timor-Leste allocated the most significant government spending in 2002 [see column (v) of Table 4.13], with Zimbabwe recording the lowest in 2008 [see column (iv) of Table 4.13]. Oman had the highest private investment [see

column (v) of Table 4.13], contrasting with Sierra Leone's lowest private investment in 2000 [see column (iv) of Table 4.13].

The mean value of employment was 0.5769 (standard deviation of 0.0446). Notably, the country with the lowest employment is Jordan in 2014 [see column (iv) of Table 4.13]. Meanwhile, Qatar recorded higher employment in 2022 [see column (v) of Table 4.13] . In order to answer the objective of this section, two interaction variables were developed. First is interaction between domestic credit to private sector and employment (DCEMP) and second interaction is M3EMP that interaction between broad money and employment. The DCEMP revealed that the minimum (-5.0559) and maximum (4.2877) values were produced by Sierra Leone (2001) and Hong Kong (2022), respectively. Likewise, the M3EMP demonstrated that Panama in 2022 and Sierra Leone in 2022 produce the maximum values 15.8061 and -2.5081, respectively.

4.3.3 Correlation analysis

Correlation analysis was then used to determine the relationship between the correlation variables (see Table 4.14). Given that employment (EMPL) and two interaction variables (DCEMP and M3EMP) as new variables was employed in this section, the discussion for the initial variables (Y, DCPS, M, PG, HC, GE and PI) was identical to the previous section (see Section 4.2.3). In brief, the correlation between DCPS and GDP is positive, which was consistent with the studies by HuiChen et al, (2023), Tuti et al, (2023) and Ismaila (2022). Positive correlation between M and GDP was consistent with Tamma et al., (2020) and Marwa et al, (2022). A negative correlation between PG and GDP is similar to a

Table 4.14: Correlation Matrix

	Y	**DCPS**	**M**	**PG**	**HC**	**GE**	**PI**	EMPL	DCEMP	M3EMP
Y	1.0000									
DCPS	0.3646	1.0000								
M3	0.3885	0.7235	1.0000							
PG	-0.1355	-0.3317	-0.3469	1.0000						
HC	0.0411	0.4752	0.6556	-0.3386	1.0000					
GE	-0.1364	0.1649	0.2052	-0.0718	0.2117	1.0000				
PI	0.1246	0.1790	0.2571	-0.0229	0.3754	0.1709	1.0000			
EMP	-0.0860	-0.0024	-0.1468	0.0302	-0.1194	0.0169	0.0654	1.0000		
DCEMP	0.3971	0.9268	0.7721	-0.3675	0.5248	0.1687	0.2165	0.1584	1.0000	
M3EMP	0.3272	0.5660	0.9113	-0.2944	0.6308	0.1930	0.3390	0.0939	0.6859	1.0000

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment.

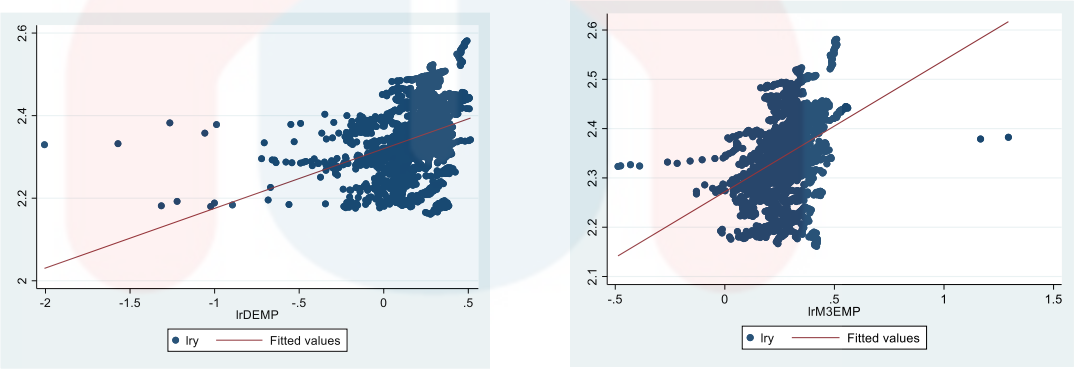
study by Kyaw (2019). A positive correlation between GDP and HC consistent with Yu (2022). A negative correlation between GDP and GE had shown by Mulugeta Emeru (2023) and Omitogun et al., (2022).

This section focuses on the variable EMPL and its interaction variables. The correlation between EMP and GDP is week negative. This negative correlation could be due to a variety of variables. First, Kamal et al. (2023) in Pakistan found that economic expansion does not necessarily result in the production of an acceptable number of jobs for the people, demonstrating a mismatch between GDP and employment levels. Second, there may be mismatches between available skills and job requirements, as demonstrated by Thioune and Kane (2018), who discovered that economic growth had a limited impact on the young employment ratio. Additionally, a study by Wang et al. (2017) on the linkage effects between economic growth and industry employment found that while the first industry employment has a weak negative effect on economic growth, the second industry employment has a strong negative effect on economic growth. Other factors such as limited access to finance, inadequate infrastructure, and unfavorable business environments may also contribute to high unemployment and slower economic growth.

The correlation between the interaction variables (DCEMP and M3EMP) demonstrates a medium positive relationship with GDP. This relationship indicates that financial development plays a crucial role in influencing employment to support economic growth in developing countries. Studies have shown that financial development has a significant impact on employment rates and economic growth. For example, research in countries such as Nigeria, WAEMU, China, and G7 countries has found a positive correlation between

financial development and employment rates (Xue et al., 2022; Ndubuaku et al., 2021; Ayivodji et al., 2020; Gunduz and Ozyıldırım, 2020).

Figure 4.3 depicts correlation plots demonstrating the correlations between GDP and two interaction variables: domestic credit to the private sector with employment (DCEMP) and broad money with employment (M3EMP) over the period 2000–2022. The graphic depicts a scatter of data points indicating GDP levels compared to their corresponding interaction variables. A best-fit line is drawn between the data points, which represents the linear regression model that was fitted to the data. The slope of this line represents the direction and strength of the link between GDP and the interaction factors.



a) GDP vs DCEMP b) GDP vs M3EMP

Figure 4.3: Scatter Plot for GDP vs. Financial development

In this scenario, the fitted line indicates a weakly positive association between GDP and both interaction factors. This means that when the values of domestic loans to the private sector and broad money with employment rise, so does GDP, albeit slowly. DCEMP and M3EMP have R-squared values of 0.3971 and 0.3272, respectively, indicating that these interaction factors account for about 39.71% and 32.72% of the GDP variance. This shows that, while there is a positive association, these variables alone do not account for a significant

percentage of GDP fluctuation, showing the presence of other factors impacting economic growth. This analysis implies that financial development, as represented by domestic credit to the private sector and broad money, influences employment, which can therefore have an impact on economic growth in developing countries. However, the observed associations are quite modest, emphasising the complexity of the processes determining economic results.

4.3.4 Panel Unit Root Tests

Table 4.15 presents results from Panel Unit Root Tests, specifically the Levin, Lin and Chu (LLC) test and the Im, Pesaran and Shin (IPS) test, which are used to determine if a series is stationary, a key consideration in time series analysis. The variables tested, such as Y, DCPS, and M, are listed in the first column. Four columns represent different model specifications: Level Intercept, Intercept + trend, First Difference Intercept, and Intercept + trend. Statistical significance is denoted by asterisks, with * indicating p< 0.1, ** indicating <.05, and *** indicating p<0.01.

The findings indicate that most variables show non-stationarity at the level (both intercept and intercept + trend) since the test statistics are significant. However, when taking the first difference of these variables, the results suggest stationarity for most of them, as shown by significant test statistics. This indicates that these variables are integrated of order one, I(1), after differencing. This suggests that the variables are integrated of order one, *I*(1). The LLC test generally shows stronger evidence of non-stationarity at the level compared to the IPS test. Therefore, in further analysis, it would be appropriate to use panel cointegration techniques to test the variables.

Table 4.15: Panel Unit Root Tests

Levin, Lin and Chu (LLC) test.				
	Level		**First Difference**	
Variable	**Intercept**	**Intercept +trend**	**Intercept**	**Intercept + trend**
Y	-7.9270***	-3.3383***	9.3028***	-7.6673***
DCPS	-5.8358***	-3.6315***	-9.3028***	-7.6673***
M3	-2.7341***	-5.5523***	-16.1457***	-11.5422***
EMP	-6.5956***	-3.1595***	-12.7950***	-9.3371
PG	-5.2233***	-9.7232***	-16.4180***	-16.8011***
HC	9.8637	3.6000	7.7004	3.8004
GE	-3.4231***	-4.9568	-16.5555***	-12.3249***
PI	7.6366	4.0000	1.2004	1.8004
DCEMP	-5.2033***	-3.5382***	-9.1502***	-7.1195***
M3EMP	-2.3981***	-4.8828***	-15.0689***	-10.7054***
Im, Pesaran and Shin (IPS) test.				
Y	2.7344	0.3833	-18.3711***	-20.9603***
DCPS	2.8944	-4.3602***	-20.5389***	-21.7102***
M3	-0.5893	-11.7976***	-24.9831***	-25.2575***
EMP	0.0757	-4.4551***	-19.1688***	-20.0073***
PG	8.8219	0.9949	-11.7182***	-13.2131***
HC	-6.5817***	-7.3349***	-25.1036***	-26.8436***
GE	-1.9987**	-6.9329***	-22.2924***	-22.8299***
PI	-3.4633***	-6.8445***	-22.6332***	-23.2785***
DCEMP	2.8558	-4.3054***	-20.4378***	-21.6028***
M3EMP	-0.4744	-11.0657***	-24.7965***	-25.0356***

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. All data are in logarithmic form.

4.3.5 Panel Cointegration Test

After establishing that each variable is integrated to order one (I(1)), panel cointegration analysis is performed using cointegration tests developed by Pedroni (1999, 2004), Kao and Chiang (1999), and the Westerlund test. These tests measure cointegration in panel data, although their techniques and assumptions differ. The Pedroni test employs an augmented Dickey-Fuller (ADF) statistic that accounts for both heterogeneous and homogeneous coefficients,

allowing for differences in individual impacts and trends across cross-sectional units. It is well-known for its ability to handle a variety of data patterns. The Kao and Chiang test, an extension of the ADF test for panel data, takes into account cross-sectional dependence by assuming that individual unit faults share a common factor structure and tests for cointegration using a group mean ADF statistic.

This test proves useful when there is potential for cross-sectional dependence in the data. Finally, the Westerlund Test finds cointegration in the presence of both individual and common variables, taking into account the likelihood of a structural break in the cointegrating vectors as well as variance in the adjustment coefficients. It is especially useful when the cointegrating relationship has shifted over time or between units. The Kao and Chiang tests, as well as the Westerlund test, all lend credence to the Pedroni test results. If all three tests find substantial evidence of cointegration among the variables, it strengthens the case for a cointegrating relationship in the panel.

Table 4.16 (Pedroni test) shows statistically significant test statistics for the Modified Phillips-Perron, Phillips-Perron, and Augmented Dickey-Fuller tests, indicating strong evidence of cointegration between variables.

Table 4.16: Results of Cointegration Test Based on Pedroni (1999, 2004)

Test Statistics	**Intercept**	**Intercept + Trend**
Modified Phillips–Perron t	9.8333***	11.8742***
Phillips–Perron t	1.0309	2.2787***
Augmented Dickey–Fuller t	1.9238**	3.1532***

Table 4.17 presents similar results from the Kao and Chiang tests, with high t-values and significant degrees pointing to strong cointegration. Table 4.19,

using the Westerlund test, also indicates substantial evidence of cointegration between variables, supported by high variance ratio test statistics and significance levels in all tests. The results from these tests suggest strong evidence of cointegration among the variables, indicating a cointegrating connection in the panel.

Table 4.17: Results of Cointegration Test based on Kao and Chiang (1999)

Test Statistics	**Coefficient**
Modified Dickey–Fuller t	-1.9161***
Dickey–Fuller t	-2.5004***
Augmented Dickey–Fuller t	-2.2686***
Unadjusted modified Dickey–Fuller t	-1.8348***
Unadjusted Dickey–Fuller t	-2.4511***

Table 4.18: Results of Cointegration Test based on Westerlund test.

Test Statistics	**Intercept**	**Intercept + Trend**
Variance ratio	8.0010***	6.0308***

4.3.6 Linear Estimation (Multicollinearity test)

As a necessary test for multicollinearity, the first step of our analysis is to estimate a simple linear model as shown in equation (3.16). Results are reported in Table 4.19 and Table 4.20. The results indicate that there is positive and significant of DCPS, M3, HC, PI, DCEMP and M3EMP on GDP in developing countries for a period 2000-2022. Whereas the other two examination variables (EMP, PG and GE) indicate negative coefficient value toward GDP growth in developing countries.

This result indicating a negative correlation between employment and economic growth implies that as economic growth increases, employment decreases, or vice versa. The positive and negative sign of variable estimation is

consistent with the correlation analysis as discussed in previous section [see section 4.3.3].

The model exhibits a substantial R-squared value of 0.8919, signifying that about 89.19% of the dependent variable's variance is elucidated by the model. The adjusted R-squared, standing at 0.8890, also remains high, indicating a strong fit even after considering the number of predictors. Furthermore, the p-value of 0.0000 is highly significant, demonstrating that the model's outcomes hold statistical significance at conventional levels.

Table 4.19: Linear Model

Variable	**Coefficient**	**s.e**	**t-stat**
DCPS	0.0359***	0.0131	2.7404
M3	0.0510*	0.0342	1.49
EMP	-0.0860***	0.0288	-2.98
PG	-0.0082***	0.0021	-4.10
HC	0.1711***	0.0135	12.62
GE	-0.1173***	0.0090	-12.93
PI	0.0080**	0.0035	2.24
DCEMP	0.0484***	0.0072	6.66
M3EMP	0.0132*	0.0090	12.93
Constant	2.3243***	0.0432	53.75
R^2		0.8919	
Adjusted R^2		0.8890	
Number of observations		2180	
p-value		0.0000	

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively, s.e = standard error and t-stat = t statistics. All data are in logarithmic form.

The next step is to look into multicollinearity, which occurs when the independent variables in a regression model are strongly linked, making it difficult to determine their individual impacts on the dependent. Detecting multicollinearity is critical since it might impact coefficient estimations and the interpretation of data. In multiple linear regression, the Variance Inflation Factor (VIF) and mean VIF (1/VIF) are frequently employed to detect multicollinearity. VIF calculates the inflation of the variance of an estimated regression coefficient due to multicollinearity. Typically, VIF values greater than 10 imply multicollinearity. Table 4.21 shows the VIF and 1/VIF values, suggesting that multicollinearity is not a major concern in the regression model. All VIF values are less than 10, and the average VIF is 1.81, indicating that the variables are not highly correlated and that the model contains no multicollinearity concerns. This improves the consistency of the regression coefficients and the overall interpretation of the model.

Table 4.20: Result for Variance Inflation Factor (VIF) and Mean Variance Inflation Factor (1/VIF)

Variable	vif	1/vif
DCPS	2.79	0.3584
M3	2.15	0.4651
EMPL	2.36	0.4237
PG	1.22	0.8176
HC	2.20	0.4552
GE	1.08	0.9246
PI	1.64	0.6097
DCEMP	1.04	0.9615
M3EMP	1.81	0.5524
Mean VIF	1.81	

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment

4.3.7 Generalized Method of Moments (GMM) Estimation Results

To analysis the objective of this section, Generalized Method of Moments (GMM) and the system GMM estimators are employed to investigate whether employment moderates the effect of financial development on economic growth in developing countries. (see Table 4.21).

Table 4.21: Results of Difference between GMM and System GMM

	Difference GMM		**System GMM**	
	i	**ii**	**iii**	**iv**
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	0.9730***	0.9628***	0.8841***	0.8493***
	(0.2263)	(0.0435)	(0.1332)	(0.0142)
Lag Y	0.8533***	0.8544***	0.9190***	0.9198***
	(0.0158)	(0.0031)	(0.0057)	(0.0012)
DCPS	0.0375***	0.0368***	0.0587***	0.0588***
	(0.0140)	(0.0020)	(0.0094)	(0.0013)
M3	0.0159	0.0163***	0.0240***	0.0251***
	(0.0140)	(0.0014)	(0.0681)	(0.0148)
EMPL	-0.1849	-0.1857	-0.1672	-0.1717
	(0.0941)	(0.0137)	(0.0700)	(0.0092)
DCEMP	0.1503*	0.1098***	0.1239***	0.1234***
	(0.0053)	(0.0009)	(0.0052)	(0.0008)
M3EMP	0.0960***	0.0962***	0.1182***	0.1223***
	(0.0068)	(0.0011)	(0.0263)	(0.0057)
PG	0.0040**	0.0041***	0.0086***	0.0086***
	(0.0019)	(0.0003)	(0.0018)	(0.0003)
HC	0.0698**	0.0679***	0.0239**	0.0224***
	(0.0235)	(0.0041)	(0.0122)	(0.0022)
GE	-0.0367***	-0.0358***	-0.0111	-0.0124***
	(0.0098)	(0.0010)	(0.0090)	(0.0011)
PI	0.0227***	0.0229***	0.0118*	0.0119***
	(0.0070)	(0.0009)	(0.0066)	(0.0010)
Number of groups	96			
Number of observations	1534			

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

Considering that the Sargan test was not rejected when the p-value was above 0.05, no evidence of first [AR (1)] or second-order serial [AR (2)] correlations was observed [see columns (i)–(iv)]. The coefficients for the lagged dependent variable in each model estimation were also significantly below unity, indicating the absence of explosive behaviour. Thus, selecting the system GMM as the preferred panel estimator was statistically justified (Baltagi et al., 2009). These estimations were also further assessed and highlighted in terms of how they corresponded to the relevant hypotheses. Thus, the discussion in this section only focused on column (iv) findings using the system-GMM for the two-step level.

The first indicator of financial development, DCPS shows a positive and significant on GDP in developing countries with β=0.0588 and significant at 1 percent significant level, indicating that on average, a 1% increase in domestic credit to the private sector leads to a 5.88 percent increase in GDP, holding other factors constant. The significance at the 1 percent level implies that this relationship is unlikely to have occurred by random chance. This finding aligns with theoretical expectations and empirical evidence suggesting that a well-functioning financial sector, characterized by adequate credit provision to the private sector, can stimulate economic growth which is consistent with Ozili et al., (2023). By providing businesses with the necessary funds to invest in new projects and expand operations, domestic credit can boost productivity, create jobs, and drive overall economic growth in developing countries.

The coefficient for broad money, serving as a proxy for financial development, indicates a positive impact on GDP (β=0.0251, sig=1%). This result aligns with economic theory, which posits that a robust financial system, characterised by an ample money supply, can stimulate economic activity and growth. Broad money encompasses currency in circulation and various types of

deposits, playing a crucial role in facilitating transactions, investments, and overall economic activity. Adequate availability of broad money enables businesses and individuals to access funds for investments, consumption, and other economic activities, thereby contributing to higher GDP growth in developing countries. Chindengwike (2022) also supports this notion, highlighting that money supply has a significant positive effect on economic expansion, with developing countries experiencing faster economic growth with increased money availability.

For employment, the result shows a negative coefficient of -0.1717, which is not significant at any level, on GDP in developing countries. This finding suggests that, in the context of the model, changes in employment levels do not have a statistically significant impact on GDP growth. Several factors could contribute to this result. First, it may indicate that in these developing countries, increases in employment are not directly translating to higher levels of economic output or growth. This could be due to various reasons, such as inefficiencies in the labor market, mismatches between skills and available jobs, or structural issues within the economy. Additionally, the lack of significance could also suggest that other factors not included in the model may be more influential in driving GDP growth.

These could include macroeconomic policies, political stability, access to credit, or external factors such as global economic conditions. It is important to note that while the coefficient is negative, indicating a potential inverse relationship between employment and GDP growth, the lack of significance means that this relationship is not robust or reliable in explaining variations in GDP growth across the developing countries studied.

According to the studies by Yerrabati (2022 and 2021), there is a U-shaped relationship between employment and economic growth in developing countries. This implies that initially, an increase in employment may not lead to economic growth, but beyond a certain threshold, it does.

Therefore, as the significance of employment in economic growth while emphasising the complexity of their relationship, especially in developing countries. It suggests that a deeper, more nuanced understanding is required to comprehend how employment dynamics affect GDP growth. To explore this further, the analysis includes an interaction term between employment and financial development, using domestic credit to the private sector (DCPS) and broad money (M3) as a proxy. The coefficient of the interaction term between employment and DCPS is positive (0.1234) and significant at the 1 percent level, indicating a meaningful relationship.

This result implies that the impact of employment on GDP growth is influenced by the level of financial development, specifically the availability of credit to the private sector. One possible interpretation is that in developing countries where financial systems are more developed and access to credit is easier, the positive effect of employment on GDP growth is magnified. This could be due to increased investment and consumption fueled by access to credit, leading to higher economic activity and growth.

The second interaction between financial development, as proxied by broad money (M3), and employment on GDP in developing countries, the coefficient of the interaction term is positive ($\beta = 0.1223$) and statistically significant ($\rho < 0.01$), meaning the result is highly significant. This finding suggests that the relationship between employment and GDP growth is influenced

by the level of broad money in the economy. In other words, in developing countries where there is a higher level of broad money (which includes currency in circulation and various types of deposits), the positive impact of employment on GDP growth is strengthened. This result aligns with economic theory, which posits that a well-functioning financial system, characterised by adequate money supply, can stimulate economic activity and contribute to higher GDP growth rates. In such environments, businesses and individuals have easier access to funds for investments and consumption, leading to increased economic output and growth.

As both coefficients indicate a positive influence of the interaction between financial development proxies (DCPS and M) and employment on GDP growth in developing countries, it suggests that both DCPS and M play crucial roles in enhancing the impact of employment on economic growth in these countries. This finding is in line with Ndubuaku et al.'s (2021) conclusion that financial development positively affects the employment rate in Nigeria. Financial development can influence economic growth by improving employment opportunities through operational changes in financial institutions. This underscores the importance of considering the broader economic context, including financial development, when analysing the relationship between employment and GDP growth. It implies that policies aimed at promoting employment and economic growth in developing countries should also consider the level of financial development to maximise their effectiveness.

The coefficient values of the control variable in this study were recorded for PG (β = 0.0086, ρ < 0.01), HC (β = 0.0224, ρ < 0.01), GE (β = -0.0124, ρ < 0.01), and PI (β = 0.0109; ρ < 0.01). The coefficient value of population growth (PG) appears to contradict previous estimations. While Table 4.14 (correlation

analysis) and Table 4.19 (linear estimation) both show a negative sign for PG, this discrepancy can be explained by the limitations of these analyses. Correlation and regression analyses offer a straightforward way to evaluate relationships between variables but may overlook confounding factors or endogeneity issues, leading to biased estimates. In contrast, system GMM estimation, commonly used for addressing endogeneity in panel data, can provide more reliable estimates by accounting for unobserved heterogeneity and endogeneity. This method might reveal a different relationship between population growth and GDP, potentially showing a positive and significant effect even when simpler analyses suggest a negative correlation. These divergent results underscore the importance of employing appropriate methods and considering potential biases and data issues in empirical analyses.

Several studies also supported these values, and similar values were recorded. For example, Population growth can have a positive impact on economic growth in developing countries, as evidenced by various studies. Kremer's theory suggests that population growth stimulates economic growth in both the short and long run (Azam et al., 2020). Conversely, some researchers advocate for lower population growth to enhance economic growth, especially in developing countries (Kyaw, 2029).

Additionally, a study on ASEAN countries found that population has a negative impact on economic growth individually but a significant positive effect collectively with other factors like exports and regulatory quality (Malida and Marselina, 2023). Furthermore, research comparing Singapore and Malaysia indicates a strong relationship between population growth and economic development, with population growth being dependent on economic growth (Kamarudin et al., 2019). Therefore, while the relationship between population

growth and economic growth in developing countries may vary, evidence suggests a potential positive effect in certain contexts.

Human capital is found to have positive effect on GDP. Human capital has a significant positive effect on economic growth in developing countries (Monila and Elena, 2023; Shahzad et al., 2022; Uddin et al, 2021; Sarwar et al, 2021; Gulcemal, 2020; Tahir et al., 2020). Studies show that investments in human development, such as education and health, contribute to economic growth by enhancing productivity and innovation. Additionally, the interaction between human capital and financial development further boosts economic growth in developing economies. The presence of a causal link between attributes of human capital, like innovative capacity and qualifications, and economic growth has been observed in the Visegrad (V4) countries. Overall, human capital, measured through variables like life expectancy and education expenditures, acts as an engine of growth and employment opportunities in developing countries.

Government expenditure shows a negative effect on GDP (-0.0124; $p < 0.01$). In developing countries, government expenditure can have a negative impact on economic growth (Chindengwike 2023 and Megbowon et al., 2022). However, Sidek and Asutay (2021) argued that government development expenditures can contribute positively to economic growth, especially when complemented by good institutional quality. The discrepancy in findings could be attributed to differences in the specific contexts, methodologies, and measures of government expenditure and economic growth and further research is needed to better understand the relationship between government expenditure and economic growth in developing countries.

Finally, the PI has a favourable and significant effect on GDP in developing countries. Private investment is critical to boosting economic growth in

developing countries. The positive and significant effect of private investment on GDP shows that more private sector investments result in higher economic production. This finding is consistent with economic theory, which holds that private investment is an important driver of economic growth because it increases aggregate demand, creates jobs, supports innovation, and boosts productivity. Government policies, the business environment, access to finance, and macroeconomic stability are all important elements that influence private investment. Policies that foster a positive business environment, protect property rights, and reduce regulatory burdens might stimulate more private investment. Furthermore, ensuring access to finance for businesses, particularly small and medium-sized enterprises, can help to stimulate private investment and economic growth.

In conclusion, in developing countries, financial development plays an important role in influencing employment to boost economic growth as the interaction term between employment and financial development shows a higher coefficient value than the other variables.

4.3.8 Robustness test

To make sure the estimation results are reliable and trustworthy, this study ran three key sensitivity tests as robustness checks. A time dummy variable was incorporated to ensure that time-related influences did not affect the result. Table 4.22 lists the GMM results for the difference and system GMMs, employing one-step and two-step levels. Even though time dummies were incorporated, the overall findings concerning the important role of financial development in

influencing employment on economic growth in developing countries remained unchanged.

Table 4.22: Results of Difference between GMM and System GMM: Sensitivity Analysis – Inclusion of Time Dummy

	Difference GMM		**System GMM**	
	i	**ii**	**iii**	**iv**
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	0.9499***	0.8461***	0.5057***	0.4761***
	(0.1617)	(0.0544)	(0.0675)	(0.0151)
Lag Y	0.8750***	0.8873***	0.9982***	0.9983***
	(0.0149)	(0.0051)	(0.0059)	(0.0013)
DCPS	0.0181**	0.0155***	0.0233***	0.0221**
	(0.0090)	(0.0013)	(0.0112)	(0.0012)
M3	0.0262***	0.0213***	0.0204**	0.0207***
	(0.0116)	(0.0029)	(0.0112)	(0.0012)
EMPL	-0.2775	-0.2564	-0.3203	-0.0345
	(0.1562)	(0.0259)	(0.0893)	(0.0150)
DCEMP	0.1000**	0.0910***	0.1140**	0.1960***
	(0.0053)	(0.0007)	(0.0050)	(0.0008)
M3EMP	0.0326**	0.0391***	0.0649**	0.0674***
	(0.0243)	(0.0011)	(0.0597)	(0.0079)
PG	0.0041**	0.0040***	0.0091***	0.0096***
	(0.0021)	(0.0003)	(0.0021)	(0.0004)
HC	0.0342**	0.0306***	0.0118**	0.0123**
	(0.0216)	(0.0045)	(0.0186)	(0.0053)
GE	-0.0252***	-0.0214***	-0.0121***	-0.0123***
	(0.0095)	(0.0017)	(0.0088)	(0.0015)
PI	0.0177***	0.0173***	0.0295***	0.0289***
	(0.0070)	(0.0009)	(0.0065)	(0.0012)
Tdum 8	-0.0061***	-0.0059***	0.0050***	0.0041***
	(0.0022)	(0.0003)	(0.0019)	(0.0003)
Tdum 10	0.0049***	0.0040***	0.0056***	0.0054***
	(0.0022)	(0.0004)	(0.0017)	(0.0002)
Tdum 11	0.0039***	0.0034***	0.0052***	0.0048***
	(0.0021)	(0.0003)	(0.0017)	(0.0003)
Tdum 12	0.0069***	0.0062***	0.0010***	0.0002***
	(0.0021)	(0.0003)	(0.0016)	(0.0004)
Tdum 13	0.0065***	0.0065***	0.0113***	0.0114***
	(0.0020)	(0.0003)	(0.0017)	(0.0006)
Tdum 15	-0.0073***	-0.0077***	-0.0002**	-0.0004***
	(0.0020)	(0.0004)	(0.0016)	(0.0003)
Tdum 16	0.0072***	0.0058***	0.0046***	0.0037***
	(0.0020)	(0.0004)	(0.0019)	(0.0004)
Tdum 18	0.0043***	0.0037***	0.0002**	0.0001**
	(0.0020)	(0.0003)	(0.0019)	(0.0002)

Table 4.22 (continued): Results of Difference between GMM and System GMM: Sensitivity Analysis – Inclusion of Time Dummy

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Sargan Test	25.9598	25.6074	32.4751	37.3964
	(0.3345)	(0.3568)	(0.4524)	(0.4822)
AR (1)	-	-1.5471	-	-1.4039
		(0.1218)		(0.1603)
AR (2)	-	-0.0593	-	0.0492
		(0.9527)		(0.9608)
Number of groups			1535	
Number of observations			96	

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

Subsequently, the outliers were assessed regarding their influence on previously obtained results following the methodology by Besley *et al*. (1980) using DFITS statistics. The test suggests that Panama and Oman are potential outliers in the estimation. Table 4.23 lists the GMM results, while Figure 4.4 presents a scatter plot depicting the outliers.

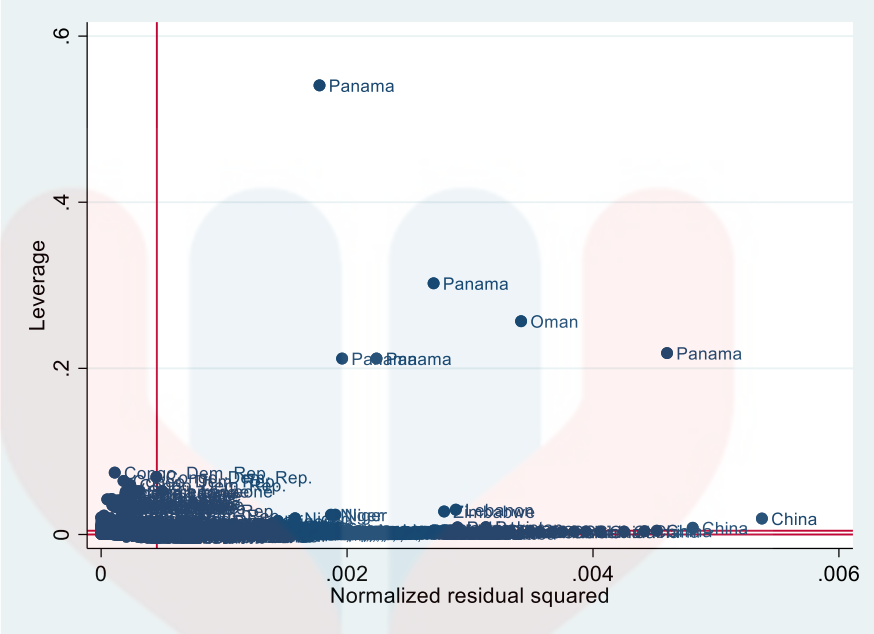


Figure 4.4: Scatter Plot Leverage vs. Residual Squared

The findings that exclude outlier observations are presented in Table 4.23. Selecting the system GMM as the preferred panel estimator was statistically justified by Baltagi et al., (2009) [see column (iv)]. The coefficient interaction DCEMP (β = 0.1254, ρ < 0.01) and M3EMP (β = 0.0626, ρ < 0.01) that show higher coefficient value than the other variables. Thus, the sensitivity assessments highlighted that the results were robust and were not influenced by simultaneity bias.

Table 4.23: Results Sensitivity Analysis by Excluding Outliers of Difference between GMM and System GMM

	Difference GMM		**System GMM**	
	i	**ii**	**iii**	**iv**
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	1.1376***	1.1336***	0.9752***	0.9762***
	(0.2401)	(0.0334)	(0.0983)	(0.0272)
Lag Y	0.8402***	0.8404***	0.9272***	0.9273***
	(0.0171)	(0.0021)	(0.0072)	(0.0012)

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**

Table 4.23 (continued): Results Sensitivity Analysis by Excluding Outliers of Difference between GMM and System GMM

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
DCPS	0.0314**	0.0319***	0.0332***	0.0333***
	(0.0133)	(0.0017)	(0.0103)	(0.0014)
M3	0.0213	0.0201***	0.0317*	0.0342***
	(0.0281)	(0.0026)	(0.0199)	(0.0024)
EMPL	-0.1585	-0.1624	-0.0223	-0.0225
	(0.0993)	(0.0137)	(0.0649)	(0.0112)
DCEMP	0.1005**	0.1006***	0.1254***	0.1254***
	(0.0054)	(0.0008)	(0.0060)	(0.0010)
M3EMP	0.0364***	0.0360***	0.0627***	0.0626***
	(0.0069)	(0.0012)	(0.0080)	(0.0012)
PG	0.0039**	0.0039***	0.0020***	0.0021***
	(0.0020)	(0.0005)	(0.0020)	(0.0002)
HC	0.1102***	0.1060***	0.0286***	0.02559***
	(0.0302)	(0.0049)	(0.0230)	(0.0035)
GE	-0.0394***	-0.0382***	-0.0036***	-0.0033***
	(0.0100)	(0.0012)	(0.0093)	(0.0007)
PI	0.0267***	0.0258***	0.0537***	0.0531***
	(0.0081)	(0.0011)	(0.0073)	(0.0006)
Sargan Test	29.2290	31.4543	29.5118	31.3830
	(0.1702)	(0.1714)	(0.1825)	(0.1901)
Number of groups		1410		
Number of observations		94		

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

To improve the robustness of this study, another estimation was made by omitting the influence of the COVID-19 pandemic and excluding particular

datasets (2020 and 2021). Excluding the impact of the COVID-19 pandemic from the research is critical for increasing the study's robustness, particularly when investigating the relationship between financial development and employment in poor countries. The pandemic brought about profound and unparalleled effects on economies worldwide, leading to disruptions in financial markets, shifts in consumer behavior, and significant alterations in employment trends. By excluding data from 2020 and 2021, which were substantially influenced by the pandemic, the analysis is able to focus on more common or normal economic conditions. This approach provides a deeper understanding of the long-term relationship between financial development and employment, removing the distortions induced by the pandemic's unusual circumstances.

Furthermore, removing the pandemic period from the research ensures that the findings are more generalizable and applicable to a broader set of economic settings. By focusing on data from non-pandemic times, the study can give policymakers and practitioners with more relevant insights into promoting long-term economic growth and employment in developing countries. Table 4.24 summarizes the modified GMM estimation results. The results added to the strength of the outcomes, ensuring that they were free of simultaneity bias. Referring to column (iv) of system GMM at two step estimations. The coefficient interaction DCEMP (β = 0.1964, ρ < 0.01) and M3EMP (β = 0.0696, ρ < 0.01) that show higher coefficient value than the other variables. The results highlighted that financial development significantly influences employment to boost economic growth in developing countries and remained robust.

Table 4.24: Sensitivity Analysis by exclude the Pandemic Covid 19 impact (2020 and 2021) of Difference between GMM and System GMM

	Difference GMM		System GMM	
	i	ii	iii	iv
Variable	**One-Step**	**Two-step**	**One-Step**	**Two-step**
Constant	1.0442***	0.9803***	0.9262***	0.9110***
	(0.2808)	(00746)	(0.1317)	(0.0239)
Lag Y	0.8347***	0.8434***	0.9057***	0.9066***
	(0.0195)	(0.0065)	(0.0081)	(0.0016)
DCPS	0.0266**	0.0240***	0.0206**	0.0295***
	(0.0133)	(0.0024)	(0.0113)	(0.0016)
M3	0.0532**	0.0528***	0.0326*	0.0378***
	(0.0275)	(0.0035)	(0.0266)	(0.0140)
EMPL	-0.0229	-0.0219	-0.0221	-0.0218
	(0.1172)	(0.0260)	(0.0771)	(0.0140)
DCEMP	0.1792***	0.1751***	0.1952***	0.1964***
	(0.0060)	(0.0015)	(0.0057)	(0.0008)
M3EMP	0.0465***	0.0452***	0.0692***	0.0696***
	(0.0078)	(0.0016)	(0.0081)	(0.0008)
PG	0.0043*	0.0047***	0.0072***	0.0070***
	(0.0026)	(0.0008)	(0.0027)	(0.0006)
HC	0.0453**	0.0439***	0.0463***	0.0462***
	(0.0267)	(0.0053)	(0.0249)	(0.0054)
GE	-0.0278***	-0.0273***	-0.0349***	-0.0337***
	(0.0123)	(0.0018)	(0.0129)	(0.0018)
PI	0.0353***	0.0322***	0.0576***	0.0577***
	(0.0100)	(0.0025	(0.0102)	(0.0019)
Sargan Test	28.0354	27.9778	29.6007	29.7399
	(0.2254)	(0.2061)	(0.2564)	(0.2577)
AR (1)	-	-1.3336	-	-1.3781
		(0.1823)		(0.1682)
AR (2)	-	0.6209	-	0.5720
		(0.5346)		(0.5673)
Number of groups		94		
Number of observations		1153		

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Value in paratheses is a standard error except for the Sargan test and AR (2) which are p-values. All data are in logarithmic form.

In conclusion, in developing countries, financial development plays an important role in influencing employment to boost economic growth. The first indicator of financial development, DCPS, shows a positive and significant effect on GDP in developing countries. This finding is consistent with theoretical expectations and empirical evidence, suggesting that a well-functioning financial sector can stimulate economic growth. Similarly, the coefficient for broad money, another proxy for financial development, indicates a positive impact on GDP, aligning with economic theory that a robust financial system can stimulate economic activity and growth. Regarding employment, the analysis suggests that changes in employment levels do not have a statistically significant impact on GDP growth in developing countries.

This finding underscores the complexity of the relationship between employment and economic growth, which may be influenced by various factors such as labor market inefficiencies or structural issues within the economy. To explore the relationship between employment and GDP growth further, an interaction term between employment and financial development was estimated.

The results show that both DCPS and broad money (M3) play crucial roles in enhancing the impact of employment on economic growth in developing countries. This finding is in line with previous research suggesting that financial development positively affects the employment rate and economic growth. This outcome indicated that H2 was accepted in this study (H2: financial development has a significant influence on employment through its impact on economic growth in developing countries).

This finding indicated that H2 is accepted. H2: Financial development has a significant influence on employment through its impact on economic growth in developing countries.

4.4 Role of minimum wage in moderating employment and the financial development nexus on economic growth in developing countries

4.4.1 Introduction

This section presents the findings of estimation results that explore the impact of minimum wage on moderating employment and financial development concerning economic growth. The analysis encompasses data from 96 selected developing countries spanning the period from 2000 to 2022, with results displayed in tables 4.25 to 4.42. Notably, estimations on different proxies of financial development, namely DCPS and M, are conducted separately.

Economic growth in developing countries is subject to various influences, including labor market conditions (Donovan et al., 2023), financial development (Okuyan, 2022; Ali et al, 2022 and Ekanayake and Thaver, 2021), and governmental policies (Daoui, 2023; Jungo et al., 2022; Islam et al., 2021). Minimum wage policies have a direct impact on employment levels by shaping labor demand and supply dynamics. An increase in minimum wages can lead to higher wages for workers but may also result in reduced employment opportunities as firms adjust to manage increased labor costs.

The financial sector plays a crucial role in driving economic growth by efficiently allocating capital and supporting business activities (Adeel-Farooq et al, 2020). Minimum wage policies intersect with financial development indicators such as access to credit, banking services, and investment opportunities. Thus, understanding the role of minimum wage in moderating the relationship between employment and financial development, and its subsequent impact on economic growth, is essential for policymakers. This understanding enables the design of

effective strategies aimed at promoting sustainable and inclusive growth in developing countries.

4.4.2 Descriptive statistics

Table 4.25 tabulates the descriptive statistics involving mean, standard deviation, minimum, and maximum values for the preliminary analysis. Given that only one new variable was employed (minimum wage (MW)), the discussion for the initial study was identical to the previous section (see Section 4.2.2 and 4.3.2). The data on minimum wage was collected from the Fraser Institute Annual Report 2023, which uses a scale ranging from 1 to 10. In this scale, countries with higher minimum wages receive lower ratings. The mean value of the minimum wage was calculated to be 5.8712, with a standard deviation of 1.9735. Notably, the country with the lowest minimum wage value among developing countries is Morocco, which had a minimum wage value of 1.1 from the year 2000 to 2015.This indicate

Table 4.25: Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
i	ii	iii	iv	v
Y	2.3463	0.0820	2.1612	2.5811
DCPS	0.3300	0.3521	-3.2312	0.8841
M3	0.4866	0.1965	-0.0785	2.1618
PG	0.3967	0.8089	-6.0789	2.6572
HC	0.5698	0.1613	-0.2404	2.3619
GE	0.1144	0.1723	-1.1675	0.7744
PI	0.2770	0.2056	-3.2155	2.4494
EMPL	0.5769	0.0446	0.4453	0.6657
DCEMP	2.5306	0.9970	-5.0559	4.2877
M3EMP	2.9504	0.6453	-2.5081	15.8061
MW	5.8712	1.9735	1.1	10

Notes: Y= GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, PG = population growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, EMP= Employment; DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP= Interaction between Broad Money with Employment; MW= minimum wage

that Morocco had one of the lowest minimum wages compared to other developing countries during that period [see column(iv) of Table 4.25]. On the other hand, Mauritius had the highest minimum wage rate from 2000 to 2012, with a value of 10. This means that Mauritius had one of the highest minimum wages among developing countries during that period [see column(v) of Table 4.25]. These findings highlight the significant variation in minimum wage levels among developing countries and underscore the importance of considering such differences in any analysis of the impact of minimum wages on economic outcomes.

4.4.3 Correlation analysis

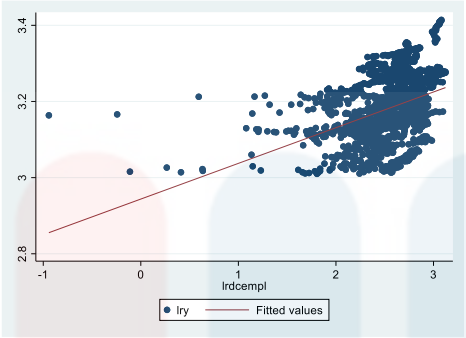
Table 4.26 provides the results of correlation analysis for all variables used in this analysis. Firstly, variables like domestic credit to the private sector (DCPS) and broad money (M3) exhibit medium positive correlations of 0.4307 and 0.4236, respectively, indicating a moderate positive relationship with economic growth. This suggests that higher levels of domestic credit and broad money are associated with increased economic growth in developing countries. On the other hand, population growth (PG) demonstrates a negative correlation of -0.1304 with GDP. Although this correlation is weak, it implies that higher population growth rates may exert a slight dampening effect on economic growth. Furthermore, human capital (HC) shows a medium positive correlation of 0.4404 with GDP, suggesting that investments in education and skill development positively influence economic growth.

In contrast, variables such as government expenditure (GE) and private investment (PI) exhibit weaker correlations with GDP. While government expenditure has a weak negative correlation (-0.1304), private investment shows a weak positive correlation (0.1611) with economic growth. Additionally, the interactions between domestic credit and broad money with employment (DCEMP and M3EMP, respectively) display moderate positive correlations with GDP. These findings imply that the interaction of financial factors with employment levels may have a more significant impact on economic growth than individual financial indicators alone. Interestingly, the correlation between minimum wage (MW) and GDP appears to be relatively weak, with a medium positive correlation coefficient of 0.2047. This suggests that the influence of minimum wage on economic growth may be less pronounced compared to other factors analysed in the study. Several variables exhibit significant correlations with economic growth, it is essential to conduct further analysis to understand the causal relationships and potential policy implications in developing countries. Figure 4.5 portrays the scatter plot between the independent variables and GDP.

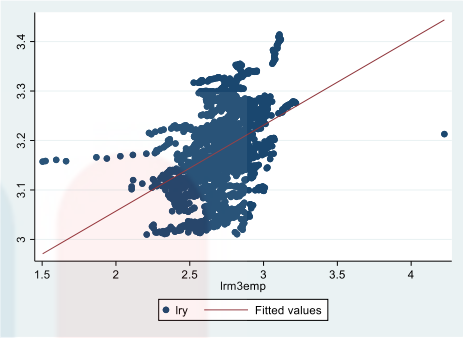
Table 4.26: Correlation Matrix

	Y	**DCPS**	**M**	**PG**	**HC**	**GE**	**PI**	EMPL	DCEMP	M3EMP	MW
Y	1.0000										
DCPS	0.4307	1.0000									
M3	0.4236	0.7938	1.0000								
PG	-0.1304	-0.3302	-0.3470	1.0000							
HC	0.4440	0.5405	0.6294	-0.3329	1.0000						
GE	-0.1304	0.1757	0.1974	-0.0808	0.2051	1.0000					
PI	0.1611	0.2117	0.2441	-0.0045	0.3520	0.1584	1.0000				
EMPL	-0.0875	-0.0109	0.0789	0.0380	-0.1227	0.0111	0.0598	1.0000			
DCEMP	0.4617	0.9307	0.8549	-0.3577	0.5658	0.173	0.2303	0.1549	1.0000		
M3EMP	0.4029	0.7210	0.9682	-0.3244	0.6184	0.1798	0.2832	0.0875	0.8052	1.0000	
MW	0.2047	0.2064	0.2785	-0.0768	0.2353	-0.0773	0.0079	0.1460	0.2553	0.2614	1.0000

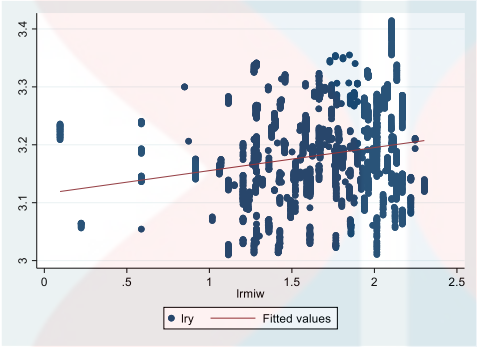
Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW=Minimum Wage



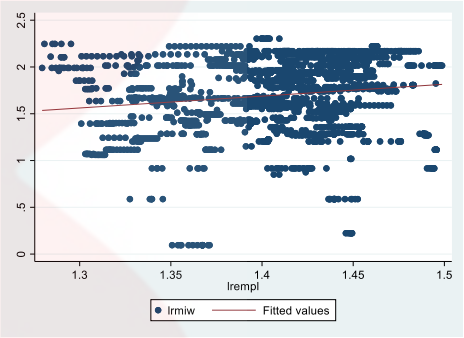
a) Y *vs.* DCEMP



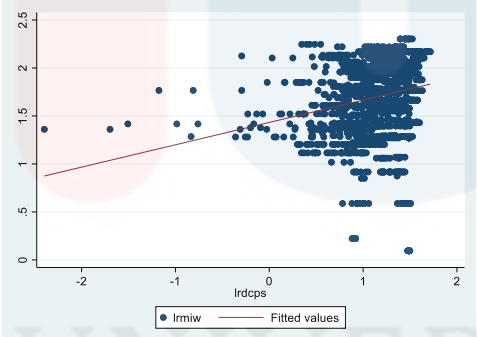
b) Y *vs.* M3EMP



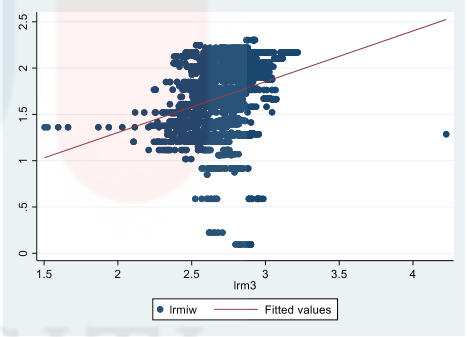
c) Y *vs.* MW



d) MW *vs.* EMPL



e) MW *vs.* DCPS



f) MW *vs.* M3

Figure 4.5: The Scatter Plots for Y vs. Interest Variables and for MW vs. Interest Variables

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, MW=Minimum Wage

4.4.4 Panel Unit Root Tests

The panel unit root tests presented in Table 4.27 aim to evaluate the unit root properties of various variables, which is necessary for cointegration analysis. The tests employed include the Levin, Lin, and Chu (LLC) test and the Im, Pesaran, and Shin (IPS) test. These tests assess whether the variables are stationary or non-stationary over time.

Starting with LLC test results, the test results for the level suggest that the variables Y, DCPS, M3, EMP, PG, HC, GE, PI, and MW all exhibit non-stationarity at the 1% significance level. However, after differencing the variables once (First Difference), the test findings show that all variables become stationary, as indicated by rejecting the null hypothesis of a unit root at the 1% significance level. Furthermore, when examining the Intercept + trend, the test results remain stationary for all variables, with the null hypothesis rejected at the 1% significance level.

Moving on to the results of the IPS test, similar to the LLC test, the results for the level indicate non-stationarity for all variables at the 1% significance level. However, after differencing the variables once (First Difference), all variables become stationary, as evidenced by rejecting the null hypothesis of a unit root at the 1% significance level. Furthermore, when the Intercept + trend is taken into account, the results remain consistent with stationarity for all variables, with the null hypothesis rejected at the 1% significance level. In summary, the panel unit root tests indicate that all variables are steady after differencing once, implying that they are integrated of order one, or $I(1)$.

This implies that the variables have a stable long-run relationship, which is required for undertaking additional cointegration analysis to investigate their relationships and dynamics across time.

Table 4.27: Panel Unit Root Tests

Levin, Lin and Chu (LLC) test.				
	Level		**First Difference**	
Variable	**Intercept**	**Intercept +trend**	**Intercept**	**Intercept + trend**
Y	-7.9270***	-3.3383***	9.3028***	-7.6673***
DCPS	-5.8358***	-3.6315***	-9.3028***	-7.6673***
M3	-2.7341***	-5.5523***	-16.1457***	-11.5422***
EMP	-6.5956***	-3.1595***	-12.7950***	-9.3371
PG	-5.2233***	-9.7232***	-16.4180***	-16.8011***
HC	9.8637	3.6000	7.7004	3.8004
GE	-3.4231***	-4.9568	-16.5555***	-12.3249***
PI	7.6366	4.0000	1.2004	1.8004
DCEMP	-5.2033***	-3.5382***	-9.1502***	-7.1195***
M3EMP	-2.3981***	-4.8828***	-15.0689***	-10.7054***
MW	1.8075	0.8400	-14.3951***	-8.4987***
Im, Pesaran and Shin (IPS) test.				
Y	2.7344	0.3833	-18.3711***	-20.9603***
DCPS	2.8944	-4.3602***	-20.5389***	-21.7102***
M3	-0.5893	-11.7976***	-24.9831***	-25.2575***
EMP	0.0757	-4.4551***	-19.1688***	-20.0073***
PG	8.8219	0.9949	-11.7182***	-13.2131***
HC	-6.5817***	-7.3349***	-25.1036***	-26.8436***
GE	-1.9987**	-6.9329***	-22.2924***	-22.8299***
PI	-3.4633***	-6.8445***	-22.6332***	-23.2785***
DCEMP	2.8558	-4.3054***	-20.4378***	-21.6028***
M3EMP	-0.4744	-11.0657***	-24.7965***	-25.0356***
MW	2.5810	1.0287	-13.2485***	-7.6691***

Notes: Y = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW= Minimum wage. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. All data are in logarithmic form.

4.4.5 Panel Cointegration Test

The panel cointegration tests, conducted subsequent to the panel unit root tests, aim to ascertain the presence of long-term relationships among the variables under consideration. Following the confirmation of stationarity or integration order of the variables, the cointegration analysis evaluates whether they move together over time in a stable manner. The results of the panel cointegration tests, employing various methodologies such as those proposed by Pedroni (1999, 2004) [see Table 4.28], Kao and Chiang (1999) [see Table 4.29] and Westerlund [see Table 4.30] indicate significant cointegration among the variables. Significant cointegration, denoted by asterisks (***) at various levels of significance, suggests the existence of stable, long-term relationships among the variables beyond mere random fluctuations. This implies that the variables considered exhibit equilibrium relationships, which are essential for understanding their interdependencies and dynamics over time. The significant cointegration results provide further support for subsequent analyses, such as vector error correction modeling, to delve deeper into the short-term dynamics of these relationships. Thus, the findings from the cointegration analysis contribute valuable insights into the long-term interactions among the variables and their implications for economic processes in the panel of developing countries under study.

Table 4.28: Results of Cointegration Test Based on Pedroni (1999, 2004)

Test Statistics	**Intercept**	**Intercept + Trend**
Modified Phillips–Perron t	5.7784***	8.2894***
Phillips–Perron t	2.6741*	3.5712***
Augmented Dickey–Fuller t	1.4365**	2.8752***

Table 4.29: Results of Cointegration Test based on Kao and Chiang (1999)

Test Statistics	Coefficient
Modified Dickey–Fuller t	-2.4057***
Dickey–Fuller t	-2.7013***
Augmented Dickey–Fuller t	-2.3619***
Unadjusted modified Dickey–Fuller t	-1.4468*
Unadjusted Dickey–Fuller t	-2.1343**

Table 4.30: Results of Cointegration Test based on Westerlund test.

Test Statistics	Intercept	Intercept + Trend
Variance ratio	5.2214***	4.6685***

4.4.6 Linear Estimation (Multicollinearity test)

The linear estimation, as presented in Table 4.31, aims to address multicollinearity issues through a simple regression analysis. The table reports the estimation results of the linear model. The coefficients represent the estimated impact of each independent variable on the dependent variable (Y), which is GDP in this case. The coefficient for financial development indicator DCPS (0.0424) is statistically significant at the 1% level, and M3 (0.0510) significant at 5% level, suggesting that an increase in domestic credit to the private sector and broad money is associated with an increase in GDP. Besides that, the coefficients for M, HC, PI, and DCEMP are statistically significant at various levels, suggesting positive relationships with GDP. Conversely, the coefficients for EMP and GE are statistically significant (-0.2643 and -0.1122, respectively) at the 1% level, indicating that higher levels of employment and government expenditure are associated with lower GDP. The R-squared value (0.7458) indicates that approximately 74.58% of the variation in GDP is explained by the independent

variables included in the model. This suggests that the model provides a reasonably good fit to the data.

Table 4.31: Linear Model

Variable	Coefficient	s.e	t-stat
DCPS	0.0424***	0.0129	3.27
M3	0.0510**	0.0375	1.35
EMP	-0.2643***	0.0372	-7.09
PG	0.0086***	0.0019	4.47
HC	0.1352***	0.01266	10.68
GE	-0.1122***	0.0086	-12.92
PI	0.0127	0.0080	1.57
DCEMP	0.0117***	0.0013	8.69
M3EMP	-0.0037*	0.0020	-1.83
MW	0.0093	0.0038	2.42
Constant	3.2482***	0.0867	37.45
R^2		0.7458	
Adjusted R^2		0.7425	
Number of observations		2039	
p-value		0.0000	
Mean VIF		1.432	

Notes: Dependent variable = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW = minimum wage.

Multicollinearity occurs when independent variables are highly correlated, leading to unreliable coefficient estimates. High VIF values suggest the presence of multicollinearity. Table 4.25 shows the result VIF and Mean VIF (1/VIF). The mean of 1.432, provided at the bottom of the table, is relatively low, indicating that multicollinearity is not a significant issue in this regression model. A mean VIF value close to 1 suggests that the independent variables are not highly correlated with each other. Therefore, the linear estimation results suggest that several independent variables, including domestic credit to the private sector, employment, government expenditure, and other factors, have significant impacts

on GDP in the model. Additionally, the low mean VIF indicates that multicollinearity is not a significant concern in this regression analysis.

Table 4.32: Result for Variance Inflation Factor (VIF) and Mean Variance Inflation Factor (1/VIF)

Variable	vif	1/vif
DCPS	2.49	0.4010
M3	1.1	0.9090
EMPL	1.42	0.7042
PG	1.17	0.8547
HC	2.03	0.4921
GE	1.4	0.7129
PI	1.25	0.8010
DCEMP	1.21	0.8266
M3EMP	1.16	0.8620
MW	1.09	0.9174
Mean VIF	1.432	

Notes: Dependent variable = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW = minimum wage.

4.4.7 Threshold Regression Analysis

Thus, by using threshold regression analysis, this study aims to determine at what level of minimum wage could be effect on financial development and employment nexus on economic growth in developing countries as show in equation (3.44).

4.4.7.1 Threshold estimation: Domestic Credit to Private Sector as a proxy of financial development

First of all, we fit the single-threshold model, with the null hypothesis H0: $\beta_1 = \beta_1$ (no threshold effect), and the alternative H1: $\beta_1 \neq \beta_2$ (threshold effect does exist). Figure 4.6 shows the plot of the concentrated likelihood ratio function of threshold estimate $LR(\gamma)$ with 95 per cent confidence intervals. The point estimates are the value of γ at which the likelihood ratio hits the zero axis as is in Figure 4.6.

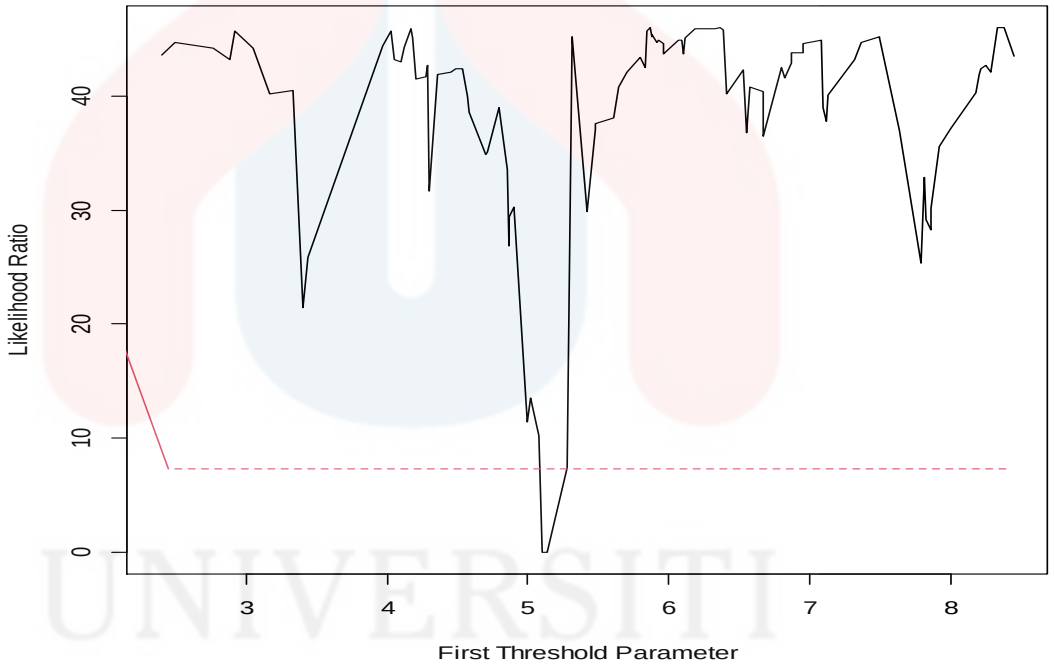


Figure 4.6: Plots of the Concentrated Likelihood Ratio

(Note: 95 per cent confidence intervals)

The results for single threshold regression analysis are reported in Table 4.33. As shown in Table 4.34 and Figure 4.6, the threshold estimate is 5.133. According to the Fraser Institute (source of MW data), MW data is between 1 to 10, with countries has higher minimum wages receive lower ratings. The minimum wage is indication of minimum wage regulation, countries that full enforcement of minimum wage regulation will receive lower rating [ratio of MW]. Thus, we can split the sample into two regimes according to the minimum wage regulation classification, which countries with a minimum wage ratio less than or equal to 5.133 as having full enforcement of minimum wage regulation and those with a ratio greater than 5.133 as having less enforcement.

By using 1000 bootstrap replications to test for a single threshold effect, the likelihood ratio threshold estimates of 9.7258 suggests that the model fits the data relatively well at the estimated threshold point of 5.133. It is significant with a bootstrap p-value of 0.0125. The LR threshold estimate is 9.6958 larger than critical value at 5% significance level (9.6512). Therefore, the null of linear model is rejected. In other words, the relationship between MW and DCEMP on economic growth is non-linear, and there is an existence of threshold effect.

Table 4.33: Threshold estimator in single threshold model

Estimation	**Value**
Single threshold estimate	5.133
LR Threshold estimate	9.6958
Number of Bootstrap replications	1000
Bootstrap p-value	0.0125
Critical value at 10%	8.1547
Critical value at 5%	9.6512
Critical value at 1%	10.070

To determine the number of thresholds, we sequentially estimate the model with one, two, and three thresholds. All three bootstrap tests use the same

number of replications (1000). Table 4.34 presents the threshold estimates for different models. The results indicate that the single-threshold test has an LR threshold estimate of 6.7258, exceeding its critical value of 6.5542 at a 5% significance level, rendering the single-threshold model significant with a bootstrap p-value of 0.0143. Similarly, the double-threshold model is significant with a bootstrap p-value of 0.009, where the LR threshold estimate of 5.7621 exceeds the critical value of 5.6133 at a 1% significance level. However, for the triple-threshold model, the LR threshold estimate is 5.6612, which is lower than the critical value of 5.7214 at a 10% significance level, resulting in a non-significant bootstrap p-value of 0.1158. Thus, the implication of the one, two, and three threshold estimations suggests the presence of two thresholds in the model.

Table 4.34: Results for threshold estimate in different threshold models

Model	**Threshold value**	**LR Threshold estimate**	**Bootstrap p-value**	**Critical value at 10%**	**Critical value at 5%**	**Critical value at 1%**
Single threshold	5.133	6.7258	0.0143	4.9027	6.5542	7.8087
Double Threshold	3.617 5.133	5.7621	0.0093	3.7596	4.3913	5.6133
Triple Threshold	3.4 3.617 5.099	5.6612	0.1158	5.7214	6.0189	7.5017

To determine the threshold value, we re-estimate the double-threshold model. Figure 4.7 shows the plot of the concentrated likelihood ratio function of threshold estimate $LR(\gamma)$ with 95 per cent confidence intervals. The results indicate the estimates of two thresholds as 3.617 and 5.133.

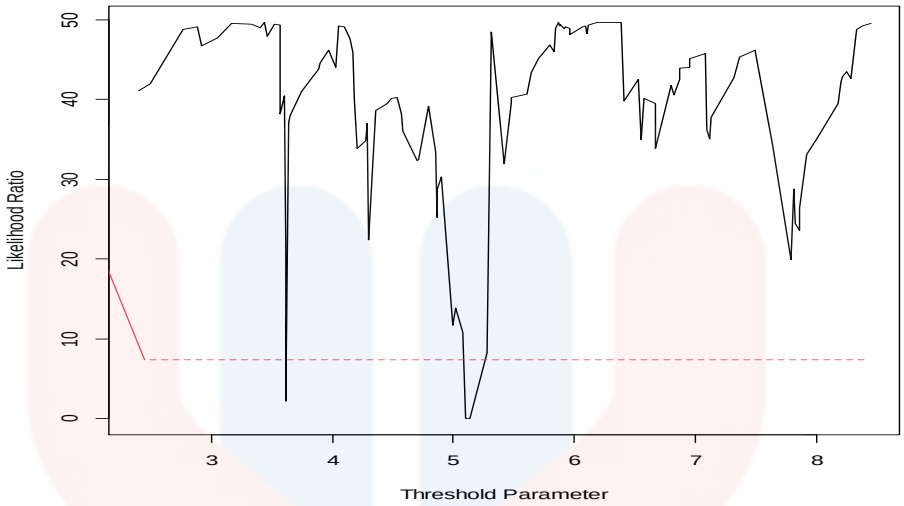


Figure 4.7: Plots of the Concentrated Likelihood Ratio of Double Threshold (Note: 95 per cent confidence intervals)

The results for threshold regression analysis are reported in table 4.35. As the double threshold, the findings will be discuss based on three regimes according to the ratio of minimum wage regulation. The first regime is for developing countries, where the ratio of minimum wage regulation is less than 3.617. The second regime is for countries with a minimum wage regulation between 3.617 and 5.133, and the third regime is for countries with minimum wage regulation greater than 5.133. The data of MW is from the Fraser Institute economic Freedom Report 2023 and the data ranges from 1 to 10, where according to this report countries with higher minimum wages receive lower ratings. Based on this, the three-regime classification using the double threshold is defined as follows.

Regime 1 - High Enforcement: Countries with high enforcement of minimum wage regulations, where the ratio of minimum wage regulation is less than 3.617. These countries are likely to have strong enforcement mechanisms and minimum wage levels that are relatively high compared to other countries.

Regime 2 - Moderate Enforcement: Countries with moderate enforcement of minimum wage regulations, where the ratio of minimum wage regulation is between 3.617 and 5.133. These countries likely have established minimum wage laws and enforcement mechanisms but may not fully comply with international standards or have room for improvement in enforcement.

Regime 3 - Low Enforcement: Countries with minimal enforcement of minimum wage regulations, where the ratio of minimum wage regulation is greater than 5.133. These countries may have weak enforcement mechanisms or low minimum wage levels relative to other countries.

Table 4.35: Result for Regression Estimate: Double Threshold Model

Variable	**Coefficient**	**s.e**	**t-stat**
DCPS	0.0006***	0.0091	0.0659
EMP	-0.0766	0.0288	-2.6597
PG	0.0758***	0.0258	2.9379
HC	0.1274***	0.1134	1.1234
GE	-0.0010**	0.0005	-2.0000
PI	0.2192***	0.1029	2.1302
DCEMP	0.0176***	0.0149	1.1812
MW ≤ 3.617	0.0227*	0.0039	5.8205
3.617 < MW ≤ 5.133	0.0663***	0.0034	19.5000
MW > 5.133	0.0382	0.0032	11.9375
Threshold estimate			
First regime		3.617	
Second Regime		5.133	
LR Threshold estimate		5.7621	
Bootstrap p-value		0.0093	
Number of Bootstrap replications		1000	

Notes: Dependent variable = GDP, DCPS= Domestic Credit to Private Sector, M3= Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW = minimum wage. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. s.e = standard error and t-stat = t statistics. All data are in logarithmic form.

Based on the result report in Table 4.35, the LR threshold estimate is 5.7621 and the bootstrap p-value is 0.0093, which support the existence of threshold effect at the 1% significant level. The estimation of DCPS shows a positive and significant effect on economic growth with $\beta = 0.0006$ with a 1% significant level. Employment indicates negative statistically insignificant effect on GDP. The interaction variable DCEMP indicate positive and significant at 1% level. The control variables (PG, HC and PI) indicate positive and significant and GE show negative (-0.0010) and significant effect on GDP.

The main interest of estimation is on the threshold coefficient value. When the MW is below than 3.617 for the first regime, the coefficient is positive ($\beta = 0.0227$) and significance at 10% significant level, implies that countries with high enforcement of minimum wage regulations had a positive effect, which indicating that MW able to moderating the effect of employment and the financial development nexus on economic growth in developing countries.

The second regime reveals significant insights: when the minimum wage (MW) falls between 3.617 and 5.133, the coefficient value stands at a positive 0.0663 and is highly significant at the 1% level. This finding suggests that in developing countries with moderate enforcement of minimum wage regulations, where the legal framework and enforcement mechanisms are established but not necessarily in full compliance with international standards, there exists a positive and noteworthy effect on GDP.

As highlighted by Yusof et al. (2021), the impact of stringent minimum wage regulations on employment and economic growth varies across countries. While developed countries may experience positive long-term effects, the situation differs in developing countries, as indicated by studies such as Paun et

al. (2021), which point to potential negative impacts on employment, particularly among vulnerable groups.

Hence, caution is advised in utilizing this policy tool to prevent adverse effects on economic growth. The positive and significant coefficient value observed in the second regime underscores the importance for developing countries to strike a balance in minimum wage implementation. It is suggested that for these countries to maximize the benefits of the minimum wage's effect on the nexus between financial development, employment, and economic growth, the approach should not be overly rigid nor excessively flexible. Overly flexible regulations may undermine the primary objectives of minimum wage enforcement, such as poverty reduction, inequality alleviation, and improvement of living standards. Therefore, achieving an optimal balance between flexibility and rigidity in regulations, while considering their impact on employment and economic growth, is crucial to attaining desired outcomes.

In the third regime, the coefficient value stands at 0.0382, signifying a positive but insignificant effect. These results suggest that in developing countries with low or minimal enforcement of minimum wage regulations, there is an inability to effectively stimulate economic growth, despite potential support from availability domestic credit and employment.

This finding underscores the intricate relationship between minimum wage regulations, economic growth, and enforcement mechanisms. While factors like the availability of domestic credit and employment contribute to the economic landscape, their influence may be overshadowed by the inadequacies in enforcing minimum wage regulations. In environments where enforcement is weak or minimal, the intended benefits of minimum wage policies, such as increased consumer spending power and reduced income inequality, may not materialize as

expected, leading to limited overall economic growth. In countries where enforcement is lacking or minimal, the intended benefits of minimum wage policies may not materialize fully, leading to limited impact on economic growth.

This observation aligns with the broader discourse on the effectiveness of minimum wage regulations in developing countries. Studies have highlighted the complex interplay between minimum wages, employment dynamics, and economic outcomes, with enforcement mechanisms playing a critical role in shaping these relationships. In contexts where enforcement is weak, the potential positive effects of minimum wages on financial development and employment may not translate into substantial economic growth.

Thus, these findings emphasize the importance of not only implementing minimum wage regulations but also ensuring effective enforcement mechanisms. Policymakers in developing countries need to consider the balance between regulation and enforcement to maximize the potential benefits of minimum wage policies on economic growth. Additionally, further research is warranted to explore the nuanced impact of enforcement levels on the effectiveness of minimum wage regulations and their implications for broader economic development strategies.

Thus, based on the above discussion and from the estimation from Table 4.35, conclusion can be made that the second regime, characterized by moderate enforcement of minimum wage regulations, is the most significant. It demonstrates a notable positive effect on GDP, highlighting the crucial role of balanced implementation and enforcement of minimum wage policies in driving economic growth. This regime underscores the importance of effective policy formulation and enforcement mechanisms to maximize the benefits of minimum wage regulations for inclusive economic development.

Several sensitivity tests are carried out to evaluate whether the previous finding is robust. First, we test the sensitivity of the p-value for testing the null of no threshold effect to different numbers of bootstrap replications and trimming percentages.

Table 4.36: Bootstrap p-value

Threshold Estimate: 3.617 and 5.1333 LR test of threshold: 5.7621	**Trimming Percentage**					
Bootstrap Replications	**5**	**10**	**15**	**20**	**25**	**30**
1000	0.0093	0.0167	0.0185	0.0193	0.0211	0.0228
5000	0.0069	0.0181	0.0192	0.0210	0.0218	0.0235
10000	0.0051	0.0196	0.0211	0.0232	0.0252	0.0285

Note: Bootstrap replication and trimming percentage obtain by using R statistical software.

The results are reported in Table 4.36. Based on the results presented in the table, we can conclude that at all of bootstrap replications that we examined (1000, 5000 and 10,000) and with 5%, 10%, 15%, 20%, 25% and 30% of trimming percentage, we can easily reject the null hypothesis of no threshold. This indicates that the existence of threshold effect with the role of minimum wage in moderating the effect of employment and DCPS nexus on economic growth is not driven by trimming percentages and number of bootstrap replications.

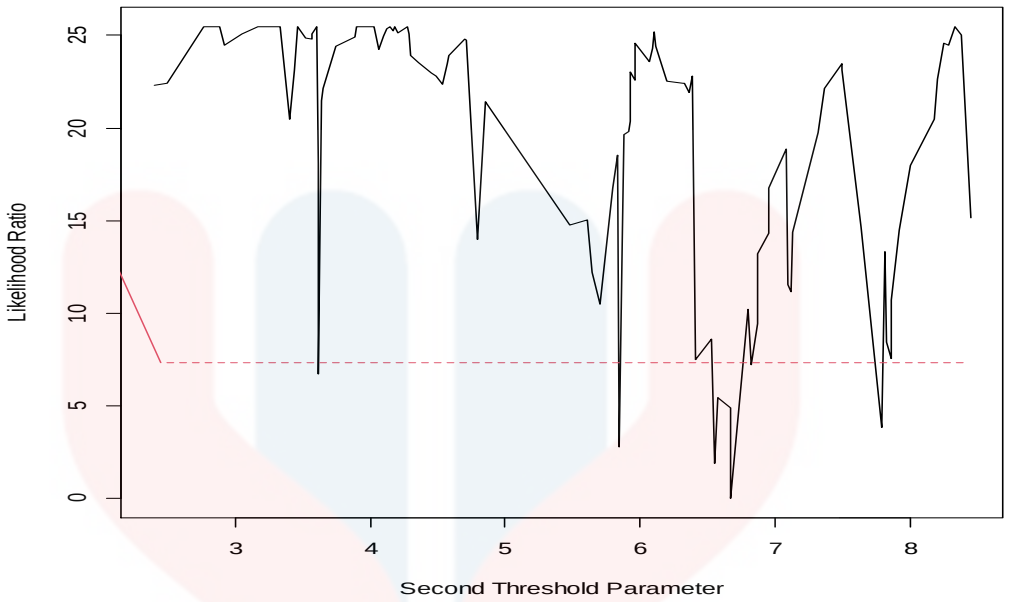


Figure 4.8: Plots of the Concentrated Likelihood Ratio of Double Threshold

(Note: 95 per cent confidence intervals)

Table 4.37: Result for Regression Estimate by Excluding Outliers: Double Threshold Model

Variable	**Coefficient**	**s.e**	**t-stat**
DCPS	0.0091***	0.0040	2.2750
EMP	-0.0264	0.0113	-2.3362
PG	0.0184***	0.0541	0.3401
HC	0.1054***	0.0985	1.0700
GE	-0.0009**	0.0001	-9.0000
PI	0.0980***	0.0345	2.8405
DCEMP	0.0257***	0.0040	6.4250
MW ≤ 5.0989	0.0290*	0.0035	8.2857
5.0989 < MW ≤ 6.675	0.0809***	0.0033	24.5151
MW > 6.675	0.0422	0.0036	11.7222
Threshold estimate			
First regime		5.0989	
Second Regime		6.675	
LR Threshold estimate		5.4885	
Bootstrap p-value		0.0050	
Number of Bootstrap replications		1000	

Notes: Dependent variable = GDP, DCPS= Domestic Credit to Private Sector, M3= Broad money, DCEMP= Interaction between Domestic Credit to Private Sector with Employment; EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW = minimum wage. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. s.e = standard error and t-stat = t statistics. All data are in logarithmic form.

The second robustness test involves excluding outliers from the analysis (Table 4.37). Four countries, namely Panama, Oman, Samoa, and Vanuatu, are identified as outliers and excluded from the dataset. The double-threshold model is then re-estimated using the remaining 92 developing countries, and the results are presented in Table 4.38. The new estimation indicates threshold values of 5.0989 and 6.675. The point estimates are the value of γ , at which the likelihood ratio hits the zero axis as in Figure 4.8.

The regression slopes estimated in the double-threshold model illustrate the effect of minimum wage (MW) in moderating the relationship between domestic credit to the private sector (DCPS) and employment on economic growth across three regimes. In the first regime, where MW is less than or equal to 5.0989, the coefficient is 0.0290, significant at the 10% level. In the second regime, where MW is between 5.0989 and 6.675, the coefficient is positive and significant at the 1% level (β=0.0809). However, in the third regime, where MW exceeds 6.675, the coefficient is 0.0422 but insignificant. These results support the previous estimation, indicating that in the second regime, MW plays a crucial role in moderating the impact of DCPS and employment on economic growth in developing countries. The findings are robust and not influenced by simultaneity bias.

4.4.7.2 Threshold estimation: Broad Money to Private Sector as a proxy of financial development

In this section, the second proxy of financial development (broad money) is examined. Based on the previous estimation [see section 4.4.7.1], the same procedures are followed. At first is to determine the number of thresholds for one

two and three. All three bootstrap tests use the same number of replications (1000). Table 4.38 present the threshold estimate for different models.

Table 4.38: Result for threshold estimate in different threshold model

				Critical value		
Model	**Threshold**	**LR Threshold estimate**	**Bootstrap p-value**	**10%**	**5%**	**1%**
Single threshold	5.133	9.0027	0.0152	7.0148	8.8521	9.2215
Double Threshold	5.133 8.4470	5.3955	0.0089	3.5812	4.9217	5.2812
Triple Threshold	3.6437 5.133 8.4470	5.3305	0.1214	5.3671	6.4751	8.2037

The results indicate that the single-threshold test has an LR threshold estimate of 9.0027, exceeding its critical value of 8.8521 at a 5% significance level, rendering the single-threshold model significant with a bootstrap p-value of 0.0152. Similarly, the double-threshold model is significant with a bootstrap p-value of 0.0089, where the LR threshold estimate of 5.3955 exceeds the critical value of 5.2812 at a 1% significance level. However, for the triple-threshold model, the LR threshold estimate is 5.3305, which is lower than the critical value of 5.3671 at a 10% significance level, resulting in a non-significant bootstrap p-value of 0.1214. Thus, the implication of the one, two, and three threshold estimations suggests the presence of two thresholds in the model.

The estimation of double threshold model is presented in Table 4.39. Figure 4.9 shows the plot of the concentrated likelihood ratio function of threshold estimate $LR(\gamma)$ with 95 per cent confidence intervals.

Table 4.39: Results for Regression Estimate: Double Threshold Model

Variable	Coefficient	s.e	t-stat
M3	0.0109***	0.0041	2.6585
EMP	-0.1244	0.0132	-9.4242
PG	0.0984**	0.0424	2.6207
HC	0.1085***	0.0587	1.8483
GE	-0.0098**	0.0015	-6.5333
PI	0.0838**	0.0352	2.3806
M3EMP	0.0109***	0.0041	2.6585
MW ≤ 5.133	0.0523*	0.0036	14.5277
5.133 < MW ≤ 8.4470	0.0762***	0.0038	20.0526
MW > 8.4470	0.0906	0.0046	19.6956
Threshold estimate			
First regime		5.1333	
Second Regime		8.4470	
LR Threshold estimate		5.3955	
Bootstrap p-value		0.0089	
Number of Bootstrap replications		1000	

Notes: Dependent variable = GDP, DCPS= Domestic Credit to Private Sector, M3 = Broad money, M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW = minimum wage. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. s.e = standard error and t-stat = t statistics. All data are in logarithmic form.

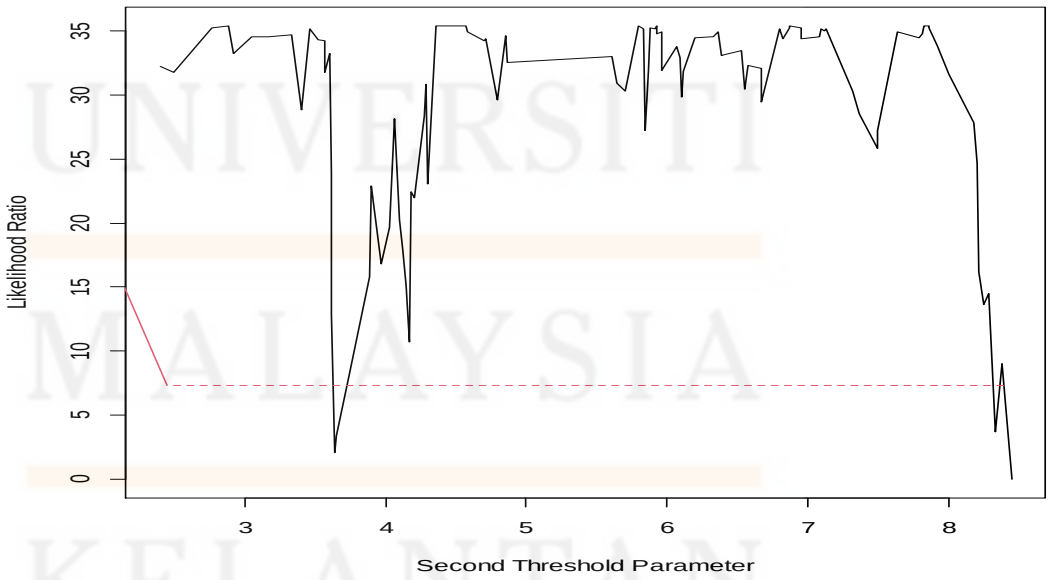


Figure 4.9: Plots of the Concentrated Likelihood Ratio of Double Threshold

(Note: 95 per cent confidence intervals)

The results indicate the estimates of two thresholds as 5.133 and 8.4470. The first regime is for developing countries with the ratio of minimum wage regulation is less than 5.133. The second regime is for countries minimum wage regulation between 5.133 and 8.4470 and the third regime is for countries with minimum wage regulation greater than 8.4470. The following discussion is based on the similar explanation of regime.

Regime 1 - High Enforcement: Countries with high enforcement of minimum wage regulations, where the ratio of minimum wage regulation is less than 5.133. These countries are likely to have strong enforcement mechanisms and minimum wage levels that are relatively high compared to other countries.

Regime 2 - Moderate Enforcement: Countries with moderate enforcement of minimum wage regulations, where the ratio of minimum wage regulation is between 5.133 and 8.4470. These countries likely have established minimum wage laws and enforcement mechanisms but may not fully comply with international standards or have room for improvement in enforcement.

Regime 3 - Low Enforcement: Countries with minimal enforcement of minimum wage regulations, where the ratio of minimum wage regulation is greater than 8.4470. These countries may have weak enforcement mechanisms or low minimum wage levels relative to other countries. The regression estimates from the Double Threshold Model, presented in Table 4.40, offer valuable insights into the dynamics between key variables and economic growth (GDP). Firstly, the positive and statistically significant coefficient

for M3 at 0.0109 indicates that an increase in broad money supply corresponds to higher GDP levels. Conversely, EMP demonstrates a negative coefficient of -0.1244, insignificant signifying employment does not affect economic growth. PG exhibits a positive coefficient of 0.0984, suggesting that higher population growth rates are associated with increased GDP. Moreover, HC investment is positively linked to economic growth, as evidenced by its coefficient of 0.1085. However, GE shows a negative coefficient (-0.0098), indicating a potentially adverse impact on GDP with higher government spending. Conversely, PI displays a positive and significant coefficient (0.0838), indicating its role in fostering economic growth.

Lastly, the interaction term between Broad Money and Employment (M3EMP) underscores the intricate relationship between these variables, with a positive coefficient (0.0109) and statistical significance at the 1% level. Overall, these findings highlight the multifaceted nature of factors influencing economic growth in developing countries, including monetary policy, population trends, human capital development, and government spending, each contributing to the complex interplay shaping a country's economic trajectory.

The primary focus of the estimation lies in the examination of minimum wage (MW) regimes and their impact on economic growth. In the analysis, the first regime, encompassing MW values less than or equal to 5.133, exhibits a positive coefficient of 0.0109, albeit significant at the 10% level. Contrastingly, the coefficient for the second regime is notably higher at 0.0523 and highly significant, indicating a stronger effect compared to the first regime. However, in

the third regime, characterized by MW values exceeding 8.4470, the coefficient is insignificant across all levels.

These findings suggest that, particularly in the second regime where MW ranges from 5.133 to 8.4470, there exists a significant role for MW in moderating the relationship between broad money and employment on economic growth in developing countries. This underscores the importance of MW policies within this range in shaping the economic landscape, with potential implications for policymakers aiming to foster sustainable growth and employment opportunities.

Two robustness tests have been conducted to assess the robustness of the previous findings. Firstly, the sensitivity of the p-value for testing the null hypothesis of no threshold effect was examined across different numbers of bootstrap replications and trimming percentages. The outcomes of these tests are presented in Table 4.40.

Table 4.40: Bootstrap p-value

Threshold Estimate: 5.1333 and 8.4470 LR test of threshold: 5.3955	**Trimming Percentage**					
Bootstrap Replications	**5**	**10**	**15**	**20**	**25**	**30**
1000	0.0089	0.0072	0.0095	0.0122	0.0187	0.0204
5000	0.0085	0.0089	0.0096	0.0154	0.0167	0.0211
10000	0.0251	0.0287	0.0296	0.0321	0.0387	0.0394

Note: Bootstrap replication and trimming percentage obtain by using R statistical software.

Analysis of the results provided in the table indicates that across all examined scenarios, including varying numbers of bootstrap replications (1000, 5000, and 10,000) and trimming percentages (10%, 15%, 20%, 25%, and 30%), the null hypothesis of no threshold can be confidently rejected. This suggests that

the presence of the threshold effect, with the minimum wage moderating the relationship between employment and M3 nexus on economic growth, remains consistent regardless of the trimming percentages and number of bootstrap replications.

The second approach to assess the robustness of the findings involves removing outliers from the dataset. Four countries, including Panama, Oman, Samoa, and Vanuatu, were identified as outliers and subsequently excluded from the analysis. Following this adjustment, the double-threshold model was recalculated using data from the remaining 92 developing countries. The outcomes of this re-estimation are detailed in Table 4.42, revealing threshold values of 5.1333 and 6.655. These threshold values represent the points where the likelihood ratio intersects the zero axis, as depicted in Figure 4.10.

Table 4.41: Result for Regression Estimate by Excluding Outliers: Double Threshold Model

Variable	**Coefficient**	**s.e**	**t-stat**
M3	0.01274***	0.0038	3.3526
EMP	-0.0202	0.0133	-1.5188
PG	0.1008**	0.0815	1.2368
HC	0.1257***	0.0784	1.6033
GE	-0.0007**	0.0001	-7.0000
PI	0.0340**	0.0333	1.0210
M3EMP	0.0212***	0.0038	5.5789
MW ≤ 5.1333	0.0807*	0.0055	14.6727
5.1333 < MW ≤ 6.55	0.1417***	0.0052	27.2500
MW > 6.55	0.0627	0.0054	11.6111
Threshold estimate			
First regime	5.1333		
Second Regime	6.55		

Table 4.41 (continued): Result for Regression Estimate by Excluding Outliers: Double Threshold Model

Variable	Coefficient	s.e	t-stat
LR Threshold estimate	2.2832		
Bootstrap p-value	0.0032		
Number of Bootstrap replications	1000		

Notes: Dependent variable = GDP, DCPS= Domestic Credit to Private Sector, M3= Broad money, M3EMP = Interaction between Broad Money with Employment, EMP= Employment; PG = Population Growth, HC = Human Capital, GE = Government Expenditure, PI = Private Investment, MW = minimum wage. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. s.e = standard error and t-stat = t statistics. All data are in logarithmic form.

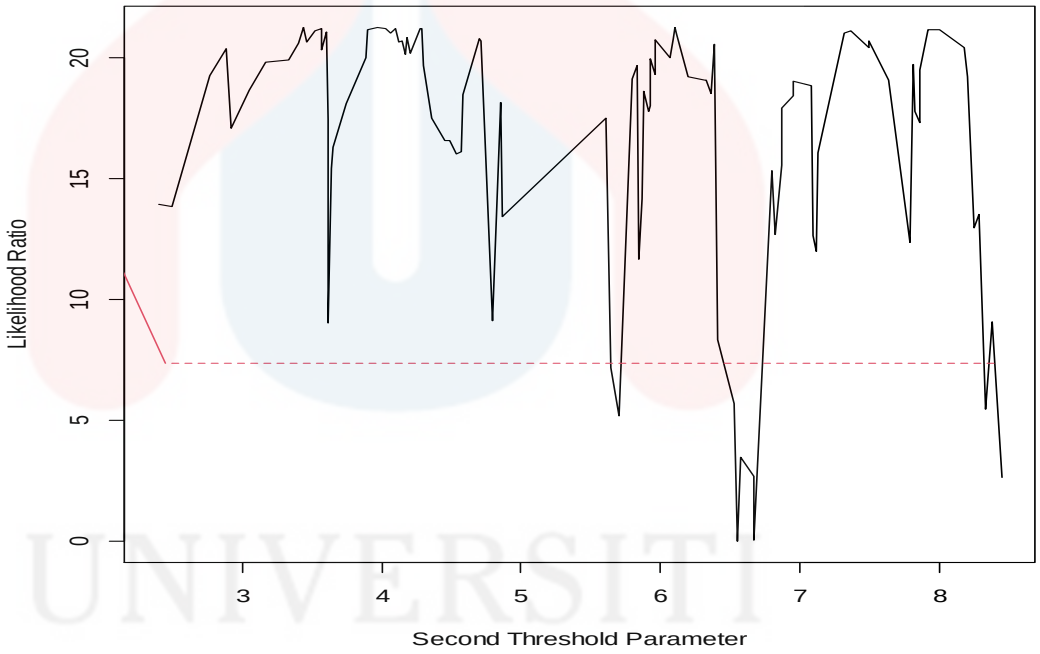


Figure 4.10: Plots of the Concentrated Likelihood Ratio of Double Threshold (Note: 95 per cent confidence intervals)

Examining the regression slopes estimated within the double-threshold model provides insights into the role of minimum wage (MW) in moderating the relationship between broad money (M3), employment, and economic growth across distinct regimes. In the first regime, characterized by MW values less than

or equal to 5.1333, the coefficient stands at 0.00807, significant at the 10% level. Transitioning to the second regime, where MW ranges between 5.1333 and 6.655, the coefficient assumes a positive and highly significant value at the 1% level (β=0.1417). However, in the third regime, where MW exceeds 6.655, the coefficient drops to 0.0627 and becomes statistically insignificant. These results reaffirm the previous findings, indicating that in the second regime, MW indeed plays a pivotal role in moderating the effects of M3 and employment on economic growth in developing countries. Importantly, these findings remain robust and are unaffected by simultaneity bias.

Based on the results of the threshold regression analysis and the classification into three regimes based on the ratio of minimum wage regulation, several key conclusions can be drawn regarding the relationship between minimum wage, financial development proxies (domestic credit to the private sector and broad

money supply), and economic growth in developing countries.

The presence of a threshold effect, supported by the LR threshold estimate and a bootstrap p-value of highly significance at 1% level, indicates that the impact of minimum wage on the relationship between financial development and economic growth is not uniform across all levels of minimum wage regulation. Among the three regimes defined based on the minimum wage regulation ratio, the second regime, characterized by moderate enforcement of minimum wage regulations, stands out as the most significant. This regime demonstrates a positive and highly significant effect on GDP. This finding suggests that countries with moderate enforcement of minimum wage regulations experience a more pronounced effect of financial development on economic growth compared to countries with higher or lower levels of enforcement. The results highlight the

importance of balanced implementation and enforcement of minimum wage policies. Overly rigid or lenient regulations may not effectively harness the potential benefits of financial development for economic growth.

In conclusion, the findings suggest that moderate enforcement of minimum wage regulations is crucial for maximizing the benefits of financial development on economic growth in developing countries. By adopting balanced minimum wage policies and strengthening enforcement mechanisms, policymakers can promote inclusive economic growth and sustainable development. Thus, based on this statement hypothesis 3 is accepted. (H3: The minimum wage moderates the effect of employment and the financial development nexus on economic growth in developing countries.)

4.5 Summary of Hypothesis results

The proposed hypotheses were answered based on a deeper study of the generated model utilizing a Generalized Method of Moment analysis and Threshold regression and the conclusion was critically tested using robustness analysis. Table 4.42 summarizes the research hypothesis and the conclusion reached.

Table 4.42: Summary hyphothesis

Hypothesis statement		**Conclusion**
H1	There is a significant impact of financial development indicators (such as domestic credit to the private sector and broad money supply) on economic growth in developing countries.	Accepted
H2	Financial development has a significant influence on employment through its impact on economic growth in developing countries.	Accepted
H3	The minimum wage moderates the effect of employment and the financial development nexus on economic growth in developing countries.	Accepted

4.6 Summary of Chapter

This chapter provides the results and discussion of the study into the impact of financial development on economic growth in developing countries and revealed several important conclusions. By employing Generalised Method of Moments estimators, the analysis revealed that financial development, particularly domestic credit directed towards the private sector from 2000 to 2022, significantly stimulated economic growth. Other contributing factors involved population increases, human capital, government expenditures, and private investments. Yet alterations in employment levels were determined to lack statistical significance regarding GDP growth; notwithstanding, financial development's beneficial impacts on job creation indirectly contributed to economic advancement. Additionally, heightened accessibility to financing encouraged more entrepreneurial endeavors and startup companies, generating new positions. Meanwhile, expanding credit to small businesses allowed these enterprises to broaden operations and hire additional personnel. Therefore, although fluctuations in employment itself did not strongly affect growth in overall production, financial development's stimulating impact on job creation served as an integral component of its positive link to a country's economic growth. Moreover, the study highlights the critical moderating role of minimum wage policies, particularly where moderate enforcement enhances the positive impact of financial development on economic growth.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATION

5.1 Overview

This section provides an in-depth evaluation of the study, including a summary of main findings, major recommendations, policy implications, and proposals for further research. The study's conclusions are significant for a wide range of stakeholders, including businesses, policymakers, relevant governmental agencies, and field scholars. Furthermore, the section provides extensive recommendations for future research activities, with the goal of guiding and inspiring further inquiry in the field.

5.2 Summary of research

The first chapter of this study examines a variety of topics, including the study's history, problem description, research aims, research questions, significance, and scope. It also includes defining crucial concepts and organising the study. The study investigates the relationship between financial development, employment, and economic growth in developing countries, with a particular emphasis on the influence of minimum wage policies. Financial development is critical to economic growth and job creation in these countries. Research has demonstrated that a well-developed financial sector can boost economic growth by better resource allocation and investment.

It can also increase employment by supporting small and medium-sized businesses (SMEs) and encouraging entrepreneurship. Minimum wage policies also play a significant role in shaping the relationship between financial development, employment, and economic growth. While minimum wages can increase the income of workers and reduce poverty, they can also have negative effects on employment, particularly for low-skilled workers. The study aims to examine how minimum wage policies moderate the relationship between employment and financial development in developing countries.

The research issues are on the impact of financial development on economic growth, how financial development affects employment through economic growth, and how minimum wage policies moderate the relationship between employment and financial development. The study's goals are to evaluate these links and make policy recommendations for promoting inclusive growth and finance sector development in developing countries.

The study will explore the unique challenges that developing countries will encounter in promoting long-term economic success. It will primarily focus on these countries' future experiences with financial development, employment, and minimum wage legislation. The study will aim to contribute to the existing literature by offering insights into the complex relationships among these factors and by providing practical recommendations.

Chapter Two provides an extensive literature review focusing on studies directly relevant to the current research. The review covers scholarly works, research articles, and publications relevant to the issue, aiming to gain a comprehensive overview of current knowledge, identify gaps, and apply past discoveries to improve the study. Empirical literature is also analyzed to better grasp previous discoveries. By synthesizing existing research, the chapter hopes

to discover knowledge gaps and make substantial contributions to the field. It methodically addresses these gaps and discusses how the current work bridges them, adding significant insights to the corpus of knowledge.

The chapter also presents the study framework as a schematic representation of the related constructs, demonstrating the interconnections and correlations between the variables under consideration. The conceptual framework clearly depicts the study's theoretical base and guiding ideas. The chapter delves deeply into the impact of finance and engineering on economic growth, thoroughly exploring the argument over the role of financial development on economic growth using numerous surveys and analyses of pertinent financial development indicators. The present literature supports the concept that financial development has a considerable impact on economic growth. However, past literature has raised doubts about the relationship between financial development and economic growth, suggesting that several factors can moderate this relationship. Therefore, the study proposes an estimation in the next section to investigate the moderating effect of employment and examine the role of minimum wage regulation.

Chapter Three explores the research methodology, detailing the procedures followed in the study. It primarily adopts a positivist research philosophy and employs a quantitative research design. The chapter begins by discussing the development of an engineering index, outlining its components and how it was constructed. The next section focuses on the three econometric models used in the study, providing a detailed explanation of each model. It then moves on to discuss the econometric analysis, with a specific focus on the use of GMM (Generalized Method of Moments) estimation techniques. Finally, this chapter presents the data used in the study, including its indicators and the sources from which the data was

obtained. This section ensures transparency and clarity regarding the data used for the analysis, enhancing the reliability and validity of the study's findings.

Chapter Four of the research focuses on presenting, analysing, interpreting, and discussing the results. It starts by elucidating the results of the descriptive analysis and correlation matrix, highlighting the characteristics and relationships among the variables under scrutiny. The chapter then delves into the results of the estimation using GMM (Generalized Method of Moments) for difference GMM and system GMM at one-step and two-step estimations, showcasing the empirical findings from the econometric analysis. Additionally, robustness and validity tests are conducted to validate the random effect estimates obtained in the study, ensuring the reliability and accuracy of the research outcomes. Furthermore, the chapter presents and explains the results of the moderating models, shedding light on how certain variables may moderate the relationship between financial development and employment on economic growth in developing countries. Hypotheses based on these results are tested to verify their significance. Thorough discussions of the major findings from the study provide insights into the implications and significance of the research outcomes.

In conclusion, Chapter Five provides a summary of the research, presenting the major findings and conclusions drawn from the study. It also discusses the policy implications of the research results, highlighting their potential impact on relevant stakeholders. Furthermore, the chapter offers suggestions for future studies, outlining potential avenues for further research in the field.

5.3 Summary of Findings

5.3.1 The impact of financial development on economic growth in developing countries.

The empirical analysis successfully investigates the relationship between financial development and economic growth in 96 selected developing countries from 2000 to 2022. Employing both the difference GMM and the system GMM estimators, the study examines the influence of financial development indicators, specifically DCPS and M3, on GDP in these nations. Diagnostic tests confirm the suitability of the Dynamic GMM as the preferred panel estimator due to the absence of first-order or second-order serial correlation. The findings underscore the significant impact of financial development on economic growth in developing countries, with DCPS particularly prominent. Both DCPS and broad money supply exhibit a statistically significant and positive effect on GDP, highlighting the crucial role of credit availability in driving economic growth.

Additionally, population growth, human capital, government expenditure, and private investment are identified as factors positively influencing GDP in developing countries, aligning with prior research. To leverage these findings, the study recommends that monetary policy in developing countries should priorities implementing expansionary policies to boost domestic funds available for investment. Lowering interest rates and reducing borrowing costs can stimulate economic growth by encouraging businesses to invest in new projects and consumers to increase spending, thereby enhancing economic activity and GDP growth. This approach can also boost investor confidence, supporting business expansion and investment.

Moreover, improving access to credit for private enterprises is crucial for stimulating economic growth by enabling them to invest in expansion, innovation, and productivity enhancements. Policies that promote an efficient and accessible credit market can amplify the positive impact of financial development on economic growth. Additionally, financial development can facilitate financing for the private sector and support investment activities, with a positive moderating effect on financial outward foreign direct investment (OFDI), ultimately creating a more conducive environment for economic growth and development.

Promoting financial inclusion is pivotal for economic growth, particularly in developing countries, as it enables underserved populations to access banking and financial services. Initiatives such as mobile banking, agent banking, and simplified account opening procedures can expand access to financial services, empowering individuals and businesses to manage finances effectively, save, and invest, thereby stimulating economic growth.

Furthermore, effective regulatory frameworks are critical for ensuring the financial system's stability and integrity, as well as building trust and confidence among investors and depositors. Transparent governance in financial institutions can boost investor confidence, minimize corruption, and spur economic growth. Investing in education, healthcare, and skill development is also critical for improving human capital, resulting in higher productivity, innovation, and economic growth while reducing poverty and inequality.

Overall, the study's findings confirm the notion that financial development indicators have a considerable impact on economic growth in developing nations, emphasizing the relevance of financial development policies in promoting economic growth and development, that is consistent with the new growth theory and recent studies (i.e. Geyikchi et al, (2023) in their studies show that financial

development plays a crucial role in driving economic growth in countries like China. It is found that banking-sector development is particularly influential in fostering economic growth. Financial development indirectly affects poverty levels through its impact on income inequality and economic growth (Guo et al, 2023)).

5.3.2 Role of employment in moderating financial development on economic growth in developing countries.

The second objective investigate the role of employment on financial development in influencing economic growth, an interaction variable was included in the model estimation. The interaction is between financial development (DCPS and M3) with employment. Based on the 96 selected developing countries with the time period covers from 2000 till 2022 and using GMM as main method for analysis. The results indicate that both DCPS and broad money play pivotal roles in enhancing the impact of employment on economic growth in developing countries, aligning with prior research suggesting that financial development positively influences the employment rate and economic growth.

This finding supports the acceptance of the hypothesis, indicating that financial development significantly influences employment through its impact on economic growth in developing countries. This finding is consistent with the recent studies. Financial systems that are well-developed can positively affect employment by fostering economic growth, especially in countries with high income per capita levels (Oncel et al, 2023).

Additionally, the development of financial markets, rather than institutions, can alleviate the adverse effects of income inequality on economic growth in under-developed countries, potentially leading to improved employment opportunities (Shoaib et al, 2020). Furthermore, the positive impact of financial development on economic growth can be enhanced by promoting the development of financial markets, which in turn can positively influence employment rates in developing nations (Ramirez-Rondan et al, 2020).

Therefore, it is recommended that policy strategies be tailored with financial development, governments can create a more conducive environment for economic growth, with a focus on improving employment opportunities and outcomes. Priority areas for policy recommendations include improving access to Access to Credit for Labor-Intensive Industries, Skills Development Funding, Entrepreneurship Financing, Informal Employment Formalisation, Gender Equality in Access to Finance, Social Protection Funding, Decent Work and Financial Security.

5.3.3 Role of minimum wage in moderating employment and the financial development nexus on economic growth in developing countries

The final objective of research is to investigate whether the minimum wage moderates the effect of employment and the financial development nexus on economic growth in developing countries. As found from the previous analysis, domestic credit and broad money supply play critical roles in stimulating economic growth by facilitating investment, consumption, and overall economic activity.

However, their impact can vary depending on various factors such as the regulatory environment, the efficiency of financial institutions and the overall economic conditions of the country. Thus, to answer the objectives, the analysis was conducted separately of financial development indicators (i) role of minimum wage regulation moderates the effect of domestic credit and employment the nexus on economic growth in developing countries, and (ii) role of minimum wage regulation moderates the effect of broad money and employment the nexus on economic growth in developing countries.

The results of the threshold regression analysis reveal insights into the impact of minimum wage regulations on economic growth in developing countries. The analysis classified countries into three regimes based on the enforcement of minimum wage regulations:

Regime 1: High Enforcement, with a minimum wage regulation ratio below threshold value, indicating strong enforcement mechanisms and relatively high minimum wage levels.

Regime 2: Moderate Enforcement, with a ratio between threshold values, suggesting established minimum wage laws but room for improvement in enforcement.

Regime 3: Low Enforcement, with a ratio greater than threshold value, indicating weak enforcement mechanisms or low minimum wage levels.

The classification into three regimes based on enforcement levels highlights the importance of balanced implementation and enforcement of minimum wage policies. The findings indicate that, in countries with high enforcement (Regime 1), the minimum wage has a positive effect on moderating the impact of employment and financial development on economic growth. In

Regime 2, characterized by moderate enforcement, there is a significant and positive effect of minimum wage on GDP. However, in countries with low enforcement (Regime 3), the impact of minimum wage on economic growth is positive but not significant.

The second regime, characterized by moderate enforcement of minimum wage regulations, emerges as the most significant among the three defined based on the minimum wage regulation ratio. This regime exhibits a notably positive and highly significant effect on GDP. These results imply that countries with moderate enforcement of minimum wage regulations experience a more pronounced impact of financial development on economic growth compared to those with higher or lower levels of enforcement. The findings underscore the importance of a balanced approach in implementing and enforcing minimum wage policies. Excessively rigid or lenient regulations may not fully exploit the potential benefits of financial development for economic growth. Ronconi (2019) discusses the importance of enforcing labor regulations, such as minimum wage requirements, to ensure that a higher number of employees receive mandated benefits. Therefore, moderate enforcement of minimum wage regulations, coupled with financial development, could potentially lead to enhanced economic growth in countries by promoting financial stability and ensuring fair labor practices.

Thus, in developing countries, policymakers should priorities strengthening enforcement mechanisms, especially in countries with moderate enforcement levels, to maximize the positive effects on economic growth. In conclusion, the findings suggest that moderate enforcement of minimum wage regulations is essential for optimizing the benefits of financial development on economic growth in developing countries. Sensitivity tests confirmed the

robustness of the findings, highlighting the crucial role of moderate enforcement of minimum wage regulations in driving economic growth in developing countries. These findings underscore the need for policymakers to carefully consider the enforcement of minimum wage regulations. Overly rigid or lenient regulations may not effectively harness the potential benefits of financial development for economic growth. By adopting balanced minimum wage policies and strengthening enforcement mechanisms, policymakers can promote inclusive economic growth and sustainable development in developing countries.

5.4 Contribution of Study

5.4.1 Theoretical Contribution

The contributions of this study lie in highlights the substantial theoretical contributions made by the study to the field of financial development, employment, minimum wage regulation and economic growth in developing countries. This section suggests some theoretical implication associated with the findings from all objectives tested that can guide policy and action.

Firstly, on the Neoclassical Growth Theory. Neoclassical growth theory emphasises the importance of factors such as capital accumulation, technological progress, and labor in driving economic growth. From the findings, research shows that financial development, including indicators like domestic credit and broad money supply, can be seen as contributing to capital accumulation. These factors facilitate investment, consumption, and overall economic activity, leading to increased GDP growth.

The impact of financial development on economic growth can vary depending on factors such as the regulatory environment, the efficiency of

financial institutions, and the overall economic conditions of the country. These variations highlight the need for nuanced analysis and policy considerations.

Employment, as per neoclassical growth theory, represents the labor factor and is closely intertwined with financial development and economic growth. Financial development can facilitate increased access to credit, thereby stimulating entrepreneurial activities and job creation, consequently contributing to economic growth. The study also highlights the moderating effect of minimum wage regulations on the relationship between employment, financial development, and economic growth. Countries are categorised into three regimes based on the enforcement of minimum wage regulations: high enforcement, moderate enforcement, and low enforcement. These categories reflect the varying levels of enforcement mechanisms and minimum wage levels across different countries. Countries with moderate enforcement of minimum wage regulations tend to experience a more significant impact on GDP growth, suggesting that a balanced approach to minimum wage policies is crucial. However, in countries with low enforcement, the impact of minimum wage on economic growth is positive but not significant, highlighting the importance of balanced enforcement.

Second is on the Labor Market Theory. Labor market theory focuses on how labor market's function, including factors such as wages, employment levels, and labor regulations. The discussion on minimum wage regulations and their impact on employment and economic growth aligns with this theory, as it considers how labor market dynamics can influence overall economic performance. Minimum wage regulations can influence the level of employment
in an economy. While higher minimum wages may lead to increased wages for workers, they could also potentially lead to reduced employment, especially in sectors with lower profit margins. The discussion underscores the importance of

a balanced approach to minimum wage policies, as excessively high or low minimum wages could have adverse effects on employment and economic growth.

Third is on the regulatory economics. Regulatory economics examines the impact of regulations on economic outcomes. The discussion on the enforcement of minimum wage regulations and their effects on economic growth and employment aligns with this perspective, as it considers how regulatory interventions can shape economic behaviour and outcomes. The findings suggest that countries with moderate enforcement of minimum wage regulations experience a more pronounced impact of financial development on economic growth compared to those with higher or lower enforcement levels. This underscores the importance of balanced implementation and enforcement of minimum wage policies.

Finally on development economics. Development economics focuses on the economic development of countries, particularly in the context of developing countries. The discussion on the role of minimum wage in moderating the relationship between employment, financial development, and economic growth is highly relevant to development economics, as it addresses key issues related to economic growth and policy interventions in developing countries. The findings suggest that moderate enforcement of minimum wage regulations is essential for optimising the benefits of financial development on economic growth in developing countries. Sensitivity tests confirmed the robustness of the findings and emphasises the importance of balanced policy approaches and regulatory frameworks. It suggests that moderate enforcement levels are most conducive to GDP growth, as they allow for a balanced approach that maximises the positive effects of financial development on economic growth. Policymakers should

prioritise strengthening enforcement mechanisms, especially in countries with moderate enforcement levels, to maximise the positive effects on economic growth. This highlights the need for careful consideration of minimum wage regulations to promote inclusive economic growth and sustainable development.

5.4.2 Policy Contribution

The first objective of this study was to explore the relationship between financial development and economic growth in developing countries. The findings indicate that financial development particularly measured through domestic credit to the private sector (DCPS) has a substantial positive effect on economic growth. Other influential factors identified include population growth, human capital development, government expenditure, and private investment. These results highlight the multifaceted drivers of growth and the critical role of financial development in mobilizing resources and fostering economic activity.

Based on these insights, it is recommended that developing countries adopt expansionary monetary policies to increase the availability of domestic funds for investment. Policies that lower interest rates can incentivize borrowing, stimulate business investments, and increase consumer spending, which collectively contribute to economic expansion. Improving access to credit, especially for private enterprises, is vital to supporting innovation, enhancing productivity, and fostering job creation. Thus, governments should prioritize financial sector reforms that promote accessible and efficient credit markets. By strengthening financial infrastructure and encouraging investment, policymakers can create a conducive environment for sustained economic development.

The second objective examined whether employment moderates the relationship between financial development and economic growth. The findings reveal that financial development, measured through indicators such as DCPS and broad money supply, has a statistically significant and positive effect on GDP. Interestingly, while employment levels alone do not significantly affect GDP growth, their interaction with financial development indicators shows a strong influence. This implies that financial development enhances the employment-growth nexus, suggesting that a robust financial system supports job creation and boosts economic performance.

In light of these findings, several policy recommendations emerge. Governments should improve access to credit for small and medium-sized enterprises (SMEs), strengthen financial institutions, and promote financial inclusion. Investing in human capital through education and skills training, encouraging private investment, and reinforcing institutional quality are also essential steps. These strategies can enhance labor productivity, create jobs, and support inclusive and sustainable economic growth in developing countries.

The third objective investigated the moderating role of minimum wage regulations on the relationship between employment, financial development, and economic growth using threshold regression analysis. The results demonstrate that the impact of minimum wage policies on this relationship is not uniform. A threshold effect is evident, with the second regime characterized by moderate enforcement of minimum wage regulations—exhibiting the strongest and most positive effect on GDP. This suggests that balanced and moderate enforcement of minimum wage laws enhances the benefits of financial development on growth. Accordingly, the study recommends that policymakers avoid extremes in wage regulation. Overly rigid or overly lenient enforcement may limit the positive

impacts of financial development. Governments should enhance enforcement mechanisms through regular inspections, payroll audits, penalties for non-compliance, and public awareness campaigns. Collaborative efforts with labor unions and employers' associations, coupled with the use of digital tools for monitoring, can significantly improve enforcement effectiveness. Strengthening labor inspectorates and ensuring they have adequate training and resources is also vital.

In addition to enforcement, setting optimal minimum wage levels is essential. These should be high enough to ensure a decent standard of living for workers, but not so high that they lead to job losses or harm business competitiveness. Governments should base wage levels on the cost of living, productivity, and prevailing economic conditions. Stakeholder engagement including dialogue with employers, workers, and economists is crucial in designing effective wage policies. A phased or gradual approach to implementing wage adjustments, along with regional considerations, can further enhance policy effectiveness.

The study also emphasizes the importance of financial development in stimulating economic growth by facilitating investment and consumption. Governments can foster financial development by reducing barriers to entry for financial institutions, simplifying regulations, and encouraging competition. Enhancing credit access for SMEs and marginalized groups through credit guarantees or microfinance programs can boost inclusive growth. Promoting financial literacy and digital financial services, especially in rural areas, ensures broader financial participation. Establishing a sound regulatory framework and investing in the capacity of financial institutions and regulators are equally critical to long-term financial stability and development.

Investing in education and workforce development is another cornerstone of sustainable growth. Governments should prioritize vocational training, apprenticeships, and basic skills programs that are aligned with labor market needs. Partnerships between the public and private sectors can help bridge skills gaps and ensure that training initiatives respond effectively to industry demands. These efforts not only increase employability but also raise individual productivity and support the broader goals of economic transformation.

Lastly, continuous monitoring and evaluation of minimum wage regulations are essential to ensure their effectiveness in achieving intended outcomes. Governments should regularly track employment trends, wage levels, and income inequality to assess the real-world impacts of minimum wage laws. Evaluations using robust methodologies, such as difference-in-differences or regression discontinuity designs, can uncover causal effects and identify unintended consequences. These insights are valuable for making data-driven policy adjustments. Transparency in sharing evaluation results and inclusive consultation with stakeholders can enhance policy credibility and accountability.

These policy recommendations align closely with the Sustainable Development Goals (SDGs). They support Goal 1 (No Poverty) by ensuring fair wages and reducing poverty, Goal 8 (Decent Work and Economic Growth) by promoting full and productive employment, and Goal 10 (Reduced Inequality) by reducing income disparities. By adopting a balanced approach to wage regulation, promoting financial development, and investing in education and skills, developing countries can harness these policy tools to accelerate inclusive and sustainable economic growth.

In conclusion, the research underscores the importance of an integrated policy approach that considers the interplay between financial development,

employment, and wage regulations. Through evidence-based reforms and targeted investments, governments can ensure that both workers and businesses benefit from economic progress, fostering a resilient and inclusive growth trajectory.

5.5 Recommendation for Future Study

Based on the findings of the three objectives outlined in your research, here are some recommendations for future research. Since the findings have made successful efforts to determine the nature and direction of the association between financial development, employment and economic growth in future study, the research could go further and explore the causal link between the given variables.

Utilizes several research methods and tools that combine the qualitative and quantitative paradigms to ensure that the analysis captures all the necessary variables and reflects the subject matter fully. Through interviews, it is possible to get first-hand information from policymakers and financial specialists since this research method offers exclusive access to decision-making procedures and concerns that underpin policymaking. Such interviews offer elaborate descriptions and are more revealing in the sense that they give a detailed account of the subject matter as practiced by the respondents, and the essence of these may at times be avoided in the statistical analysis of the results. It is also possible to find out new trends and predict further development when communicating with professionals in the subject, which adds to the depth of the study.

However, underpin the interviews and produce a more intricate assessment of the findings within socio-economic and political environments, undertake detailed case studies of selected countries. These are real-life examples of how

policies are implemented and how they affect society in general and specific populations in particular. By looking at several countries, it can learn the variances, see which practices are working, and find out the reasons why some policies are effective while others are not in a particular setting. Besides, it strengthens the credibility of our findings and guarantees that the suggested policies will be appropriate for different countries.

The combination of qualitative data and information obtained through interviews and case studies with quantitative data analysis helps to make more elaborate conclusions. Quantitative results give a general picture of the facts and figures constituting the studied objects and processes, whereas qualitative results unveil details and uniqueness. Such a dual approach is beneficial because it enables one to validate the results and ensures that the analytical information is based on real-life experiences. In conclusion, this approach allows to offer policy recommendations that are not only backed up by empirical data but also culturally sensitive and, thus, would contribute to an improved policy-making process and more efficient policy implementation.

The second suggestion for future research involves conducting sector-specific analysis to examine how financial development impacts different industries and sectors within an economy. This type of analysis can provide policymakers with valuable insights into the specific challenges and opportunities faced by different sectors, allowing them to tailor interventions to maximize the positive effects of financial development on each sector. By conducting sector-specific analysis, policymakers can gain a better understanding of how financial development impacts different parts of the economy and tailor their interventions accordingly. This can help maximize the positive effects of financial development on economic growth, employment, and poverty reduction.

Next, conducting comparative studies across countries or regions can provide valuable insights into how different institutional and policy environments affect the relationship between financial development, employment, and economic growth. This diversity will allow for a more robust analysis of the relationship between financial development, employment, and economic growth. By conducting comparative studies, policymakers can gain a better understanding of how different institutional and policy environments affect the relationship between financial development, employment, and economic growth. This can help inform the design of more effective financial development strategies that promote sustainable economic growth and job creation.

Besides that, exploring the impact of financial development on inclusive growth can provide valuable insights into how financial policies can be designed to promote more equitable economic development. Inclusive growth typically refers to economic growth that is broad-based across sectors and inclusive of all segments of society, leading to poverty reduction, reduced income inequality, and improved social welfare. By analyzing the impact of financial development on inclusive growth indicators such as income distribution, poverty alleviation, and social welfare, researchers can provide valuable insights for policymakers looking to design policies that promote more equitable economic development. This can help ensure that the benefits of economic growth are shared more broadly across society, leading to a more inclusive and sustainable economy.

Policy impact analysis is a crucial tool for evaluating the effectiveness of policy interventions aimed at promoting financial development and employment generation. This analysis involves several key steps, starting with the identification of specific policies related to financial development and employment generation

that have been implemented in developing countries. Data collection on key indicators such as access to credit, employment rates, and GDP growth is essential to assess the impact of these policies. The analysis itself involves comparing outcomes before and after policy implementation, as well as comparing outcomes with control groups or similar countries that did not implement the policies. By identifying the best practices and lessons learned from the analysis, policymakers can develop recommendations to improve the effectiveness of existing policies and introduce new interventions to address gaps in financial development and employment generation. Ultimately, policy impact analysis can provide valuable insights to policymakers, helping them allocate resources more effectively and promote sustainable economic growth and development.

Collaborating with experts from other disciplines such as sociology, political science, and environmental studies can provide valuable insights into the broader socio-political and environmental implications of financial development on economic growth and employment. Such cross-disciplinary research can be conducted by bringing together researchers from different fields to study the complex interactions between financial development, economic growth, and employment. Each discipline can contribute unique perspectives and methodologies, enriching the analysis. Data integration is key, as researchers can combine data from various disciplines to gain a more comprehensive understanding of how financial development impacts economic outcomes. This could include integrating social indicators, political institutions, and environmental factors into the analysis. By exploring the policy implications of the research findings from a multidisciplinary perspective, researchers can provide policymakers with a more nuanced understanding of how financial policies can affect social inequality, political stability, and environmental sustainability. Additionally, engaging with

stakeholders from government, business, and civil society can ensure that the research findings are relevant and actionable, bridging the gap between research and policy-making. Overall, collaborating with experts from other disciplines can lead to more informed policy decisions that consider the broader implications of financial policies on society, politics, and the environment.

5.6 Limitation of the Study

Though these study findings have enormous theoretical and methodological contributions as well as managerial implications, likewise other empirical research still this study also has several limitations that need to be addressed. These study limitations might be considered for the grounds of future research; however, current study findings need to be interpreted by taking into consideration the flaws of the study.

Firstly, because this study only covers the years 2000 to year 2022, the sample size can have a major impact on the generalizability and trustworthiness of the research findings. It's important for researchers to carefully consider the sample size and its potential limitations when designing a study. A larger sample size can help address many of these limitations and increase the study's reliability and validity.

Secondly, only developing countries are the subject of this study. Studying only developing countries can have numerous limits because they have different socioeconomic, cultural, and political histories. By excluding other countries, the study might unintentionally create biases, which could result in fragmented or biased conclusions. There may be major regional differences in aspects like

economic levels, educational attainment, and infrastructure within developing countries. Strictly concentrating on developing countries may miss crucial differences and dynamics across other regions.

Thirdly, a study's use of just two independent variables domestic private sector credit and broad money variables can significantly affect the precision and generalizability of its conclusions and limit its attention to the effects on economic growth. Data mining is still a valuable method for drawing significant conclusions and patterns from huge datasets. It is essential to be aware of these limitations and employ data mining tools judiciously while keeping in mind the potential repercussions and biases in the results. This analysis will only use the World Bank's indicator. This study considers only the impact of minimum wage on employment. Therefore, further research may incorporate other samples particularly in income equality, poverty reduction, inflation, regional disparities and others that will give a good opportunity to make comparison analysis.

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APPENDICES

DEVELOPING COUNTRIES	
Algeria	Kuwait
Argentina	Lao PDR
Bahamas, The	Lebanon
Bahrain	Lesotho
Bangladesh	Libya
Barbados	Madagascar
Belise	Malaysia
Benin	Mali
Bhutan	Mauritania
Bolivia	Mauritius
Botswana	Mexico
Brazil	Morocco
Brunei Darussalam	Namibia
Burkina Faso	Nepal
Burundi	Nicaragua
Cambodia	Niger
Cameroon	Oman
Central African Republic	Pakistan
Chad	Panama
Chile	Paraguay
China	Peru
Colombia	Philippines
Comoros	Qatar
Congo, Dem. Rep.	Rwanda
Congo, Rep.	Samoa
Costa Rica	Saudi Arabia
Dominican Republic	Senegal
Ecuador	Sierra Leone
Egypt, Arab Rep.	Singapore
El Salvador	Solomon Islands
Eswatini	South Africa
Fiji	Sri Lanka
Gabon	Sudan
Gambia	Suriname
Ghana	Syrian Arab Republic
Guatemala	Thailand
Guinea	TimorLeste
Guinea Bissau	Togo
Haiti	Tunisia
Honduras	Turkiye

DEVELOPING COUNTRIES (continued)	
Hong Kong SAR, China	Uganda
India	Ukraine
Indonesia	United Arab Emirates
Iran, Islamic Rep.	Uruguay
Israel	Vanuatu
Jamaica	Viet Nam
Jordan	Yemen, Rep.
Kenya	Zimbabwe