Impact of Financial Development on Output Volatility: A Case Study of South Asian Region

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Impact of Financial Development on Output Volatility: A Case Study of South Asian Region

Submitted in partial fulfillment of the requirements for the Master of Philosophy degree in Economics at School of Economics, Faculty of Social Sciences.Quaid-i-Azam University, Islamabad.

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"In the Name of ALLAH, the most beneficent, the most Merciful"

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

This thesis is dedicated to my parents' deepest gratitude whose love, & prayers have always been a source of strength for me.

CERTIFICATE

This is to certify that we accept the work contained in the dissertation titled **"Impact of Financial Development on Output Volatility: A Case Study of South Asian Region"** submitted by Alia Rafique, Registration number 02092113016 as a confirmation to the required standard for partial fulfillment of the degree of Master of Philosophy in Economics.

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This thesis is dedicated to my father Rafique Ahmed & mother Saleema bibi, whose support, encouragement, efforts, love and prayers mean a lot to me and make me able to complete my research work successfully on time.

AUTHOR'S DECLARATION

I Alia Rafique hereby state that my M.Phil. thesis titled "Impact of Financial Development on Output Volatility: A Case Study of South Asian Region" is my own original work. I have not presented and submitted any part of this work anywhere else for any other degree previously. At any time if my statement is found to be incorrect even after my graduation the university has the right to withdraw my M.Phil. degree.

ALIA RAFIQUE

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WDI   World Development Indicator

GDP   Gross Domestic Product

GDPPC   Gross Domestic Product, per capita

OLS   Ordinary Least Method

FE   Fixed Effect

RE   Random Effect

Abstract

The primary aim of the current investigation is to develop a more integrated and in-depth insight of the association amongst the fluctuations observed in output volatility and the financial development. To achieve this objective, a panel dataset encompassing eight South-Asian economies (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) is utilized, spanning a time period of 50 years from 1973 to 2022. The empirical analysis employs various statistical techniques such as pooled OLS, fixed effect estimation (FE), and random effect estimation (RE) to examine the data. In this study, the independent variable is financial development, which is quantified by assessing the domestic credit extended to the private sector. Similarly, the volatility of economic output is measured by calculating the three-year moving average of the standard deviation. Through the utilization of a panel dataset, the study determined that financial development has a significant positive impact on output volatility, highlighting that fluctuations in the financial sector can disrupt economic output. Furthermore, the research indicated that inflation and trade openness also contribute to the volatility observed in economic growth. The study revealed that a well-developed real sector has the potential to alleviate output volatility, while inflation tends to exacerbate it. Overall, the findings suggest that financial growth plays a role in reducing the output volatility. The study additionally presents policy implications, underscoring the importance of government actions in improving the management of financial instability. This can be accomplished by strengthening the capabilities of the financial system through the implementation of effective fiscal and monetary policies, ultimately fostering economic growth.

CHAPTER 1

INTRODUCTION

During the past several decades, the idea of the output volatility has been gaining prominence amongst policymakers along with analysts internationally. For most of the past fifty years, output volatility across emerging economies has consistently been substantially greater than in OECD nations. Economists are particularly concerned about high output volatility since a significant body of literature has indicated that excessive volatility encompasses a negative influence on the growth or is strongly correlated with the slower development **(Bruno & Easterly, 1995; Hnatkovska & Loayza, 2004; Aghion et al., 2004).**

Numerous studies have shown that high levels of volatility in the macroeconomic environment tend to reduce investing, promote advantages in the short term as well as lessen the growth in the economy **(Serven, 2002).** Lower investment in the human resources is associated with more unstable macroeconomic conditions, based on recent studies (Krebs et al., 2005). Increased crisis frequency, which is strongly tied to increased macroeconomic volatility, is a further contributor causing increased macro-financial exposure and vulnerability **(IMF 1999).** All countries have been shown to be particularly susceptible to financial along with monetary crises when their output volatility is larger **(Frankel & Rose, 1996; Calvo et al., 2004).**

There is rich proof suggesting that recurrent crises entail lasting impacts on growth as a result of irreversible losses of tangible, organizational, as well as human capital, along with to the output losses throughout them, resulting in significant loss of welfare **(Greenwald et al., 1990).** Furthermore, evidence suggests a strong

association between disparity and instability in the economy, with causation likely acting in both directions **(Halac & Schmukler, 2004).**

In a nutshell, significant output volatility and financial meltdowns are recurring features of global economies. Output volatility and financial crises seem to be severe development barriers because they are linked to high volatility of consumption, poor long-term expansion, wide disparities, along with elevated poverty.

Theory also shows that there may be a link connecting financial growth as well as output volatility, particularly in emerging nations **(Aghion et al., 1999).** In terms of finances advanced economies facilitate a better match amongst servers and shareholders while also aiding in absorbing the effects of external shocks in the real-world sector. Financial integration may additionally promote diversity, thereby lowering risk as well as minimizing cyclical oscillations. Furthermore, effective financial markets reduce information asymmetries as well as allow entrepreneurs to process understanding with greater efficiency, which leads to decrease the output volatility.

As a result, we learned that advancement of the financial industry plus the decrease of production volatility are significant goals of boosting the economy. The purpose of this research is to answer the question of whether the financial development of Southern nation economies experiences greater or lesser output volatility.

1.1 Background of the Study

The essential role of the financial development for the growth of the economy has drawn increasing attention in the academic literature that has already been published. The importance of the financial sector for the growth of the economy was a topic on which economists differed. According to **Bagehot Walter (1873)** and **John Hicks**

(1969), it was crucial in fostering industrialization in England by easing the flow of money. According to **Joseph Schumpeter (1912)**, a strong banking system fosters technological advancement since it aids in locating and recognizing business owners who may successfully introduce novel goods and production techniques.

On the opposing side, **John Robinson (1952)** asserts that "where entrepreneurship prospects, financing follows." Additionally, not all economists agree that the connection between finance along with growth is significant. According to **Robert Lucas (1988)**, economists grossly overstate the centrality of financial variables in the growth of the economy, whereas economists who specialize in development regularly voice their skepticisms regarding the contribution of the financial sector and so downplay its significance **(Anand Chandavarkar, 1992)**.

Regarding the impact of financial growth on the output volatility, the findings are not definitive. For instance, **Stiglitz (2000)** found that the financial growth and development increases output volatility. **Schmukler (2008)** finds that a short-term financial changes, whether favorable or unfavorable, have no other influence on production volatility. Others find either no association or even a negative connection amongst financial development as well as macroeconomic volatility when measuring financial growth by the stock market deregulation **(Easterly et al., 2001; Bekaert et al., 2002).**

The present research presents a theoretical framework of the relationship between finance and growth of the economy by employing existing theory in light of the aforementioned conflicting opinions before assessing the importance of the financial sector for economic growth and its effect on output volatility. Despite the need for caution, the research suggests that financial development as well as growth in

the economy are positively correlated. On the relationship between finance and output volatility, the verdict continues to be out.

1.2 Financial Development

The growing prominence of the financial services sector in growing economies and the developing regions is one of the development projects that aim to support growth in the economy and the eradication of the poverty **(Michael Thiel, 2001).** The financial sector is a collection of businesses, things, and markets. Additionally, it consists of the legal and administrative structure that facilitates credit extension as a means of conducting business.

The main goal of financial sector advancements is to lower costs sustained by the financial system's operations **(Kwan Wai Ko, 2008).** This process of reducing gathering information and the transaction cost of execution results in the creation of financial arrangements, agents, and marketplaces. Numerous marketplaces, intermediaries, as well as varieties of contracts have been driven by diverse types and the combinations of information, transactions, alongside enforcement expenses in many different nations over different times. The country's financial system serves five primary purposes:

- ➢ to generate data for future investments as well as capital allocation
- ➢ to carry out good corporate governance along with monitoring the financial backing of the investments.
- ➢ to enable the managing hazards and diversification
- ➢ to stimulate a savings account
- ➢ to facilitate the substitution of the products and services.

When financial instruments, financial markets, along with the intermediaries work together to reduce the expenditure of the data as well as interactions, the financial sector develops. When it is robust and operating efficiently, the banking and finance industry plays a significant role in stimulating the economy. As a consequence, local savings are generated, and those savings are subsequently profitably employed in the local enterprises. Efficient banks are additionally able to control private financial transactions across borders. The framework for increasing income and creating jobs is therefore provided by the financial industry.

Theoretical explanations provide a better understanding of many of the mechanisms through which the emergence of the financial instruments, markets, as well as institutions drives the development of the economy alongside in turn impacted by it. Financial development provides a big impact on production volatility along with to how it affects the growth of the economy. The creation of financial markets reduces the macroeconomic volatility, according to earlier studies **(Easterly et al., 2000; Denizer et al., 2002).**

1.3 Output Volatility

In the past few decades, the output volatility have been mostly viewed as a transient economic occurrence of the secondary importance to longer-term development objectives. However, these brief short- and long-term variations are now incorporated into a unified framework due to theoretical advancements, which have an impact on growth.

Prior to the collection and publication of contemporary macroeconomic metrics like GDP and the unemployment rate, economists were well aware that there were cyclical changes in the state of the economy. Because instability leads to the disruption,

unpredictability, as well as risk, every effort is taken in the economy to maintain equilibrium among the economic components. Volatility is what causes destabilization.

Economic actors are more capable of making wiser choices regarding their future actions while operating in a stable economy. As a result, it's necessary to achieve stability and eliminate production variations. For this, studies have been conducted that link output volatility with various factors, including financial sector developments, financial integration, discretionary fiscal policy volatility, monetary policy volatility, quality of economic and political institutions, oil price shocks, interest rate, terms of trade, imports and exports of goods and services, exchange rate flexibility, sectoral and foreign diversification remittances, among others.

Because the importance of the financial sector for growth along with the development is growing in light of the most recent financial crises that the world economies has experienced, we are concerned about the impact of financial development on output volatility for the South Asian region in this study.

1.4 Statement of Problem

Various factors of output volatility including consumer volatility, fiscal policy, remittances, FDI and oil prices have all been examined in the research literature. Financial development has been identified as one of the key causes of the growth volatility along with numerous additional variables, yet the literature in this area is scarce and produces conflicting findings.

The expansion of the financial industry has been shown to have a favorable effect on the economic development in recent research. Because a healthy financial market improves the connections among investors and savers, encourages diversification of

operations, lowers risks, mitigates the disparities in information, and enables individuals to take more wisely. This also helps stabilizing the economy along with minimize the output volatility (**Ramey and Ramey, 1995; Aghion et al., 1999**).

There is not a lot of research examining and proving any connection amongst the output volatility along with the financial development. Additionally, little investigation has been done on possible connections among financial development, economic growth and output volatility.

1.5 Contribution of the Study

The purpose of the study is to explain the relationship amongst financial development along with the output volatility. It examines whether financial development dampens the consequences of monetary as well as real instability or if it acts as a shock absorber. There has not been much academic research on the relationship between output volatility along with the financial growth in the South Asian nations, therefore this study contributes to the body of literature in this field. The study's main contributions are as follows:

- ➢ This study looks at the connection between output volatility and financial development in order to determine if financial advancements increase or decrease the output volatility.
- ➢ According to our expertise, this has been the first study to investigate the impact of financial development on the output volatility in eight South Asian nations.
- ➢ We conducted empirical analysis using several estimation approaches which included pooled OLS, fixed effect (FE) technique, as well as random effect (RE) technique.

1.6 Hypothesis of the Study

The present investigation employs the following hypotheses to emphasize the relationship underlying financial development along with the output volatility.

Hypothesis:

H_0 = There has been a positive relationship amongst financial developments along with the output volatility.

H_1 = There has been a negative relationship amongst financial developments along with the output volatility.

It would be crucial for addressing theoretically to determine whether the positive or a negative impact of the financial growth on the output volatility predominate. The theoretical connections involving financial evolution along with the output volatility showed both positive and negative implications. It's also possible that the financial situation has no impact on the growth volatility. In light of this, we shall attempt to investigate how financial development affects production volatility.

1.1 Organization of the Study

In the current study, the following pattern has been identified. The first chapter of the current investigation provides an introduction, while chapter two presents significant theoretical as well as the empirical research on the relationships among growth volatility as well as the financial growth. The analysis's econometric technique and framework are detailed in Chapter 3. In Chapter 4, the variables, sources, along with the descriptive analysis of the data are demonstrated, and in Chapter 5, the main empirical findings of the current study are discussed. However, the dissertation's last chapter discusses the study's conclusion, policy suggestions, as well as future directions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The current chapter of the dissertation offers a comprehensive evaluation of existing literature, with a particular emphasis on the interplay between finance and growth of the economy. Although there have been numerous research exploring relationships amongst finance and growth of the economy, there is a dearth of research that specifically investigates how financial development influences fluctuations in output. This is mainly due to the recent surge in interest regarding volatility, its determinants, and its effects.

Financial intermediaries and markets play a vital role in reducing the costs associated with obtaining information, enforcing contracts, and carrying out transactions. This, in turn, alters the incentives and constraints faced by economic agents by facilitating the production and dissemination of information, efficient allocation of capital, and effective monitoring of firms. Simultaneously, financial advancements contribute to risk reduction, accumulation of savings, and facilitation of exchange, thereby positively influencing the growth of the economy **(Greenwood & Jovanovic, 1990; Bencivenga and Smith, 1991; King and Levine, 1993a; Acemoglu and Zilibotti,1997).**

A growing body of research has investigated the influence of finance on the growth of the economy **(Levine & Zervos, 1998; Loayza & Beck, 2000; Beck & Levine, 2004).** These studies have consistently demonstrated that a well-functioning financial system portrays a pivotal function in stimulating growth in the economy. The banking system provides essential financial services that contribute to enhancing growth prospects within an economy. Furthermore, **Levine (2002)** underscores the

significance of financial systems in comprehending the underlying processes of economic growth. However, when it comes to establish a link among the financial development and the volatility of output, the existing literature is deficient in substantial evidence and remains relatively limited.

Volatility creates conditions that are typically precarious and should be avoided. In economics, every effort is made to stabilize economic variables due to the disruptive nature, uncertainty, and risk associated with instability. By operating within a stable economy, economic agents are better positioned to make informed decisions regarding their future activities.

To determine whether the volatility of an economic variable is advantageous or not, it is essential to examine its impact on overall growth and welfare. The welfare of a nation is typically evaluated based on the per capita GDP level. In the past, until the early 1980s, growth and growth volatility were regarded as separate phenomena and were studied independently through growth theory and business cycle theory. However, in recent times, the concept of the output volatility has obtained the considerable attention, leading to a surge in studies specifically focused on analyzing output   volatility.

The present chapter is organized into four sections. The first section, 2.1, provides an introduction to the topic. Section 2.2 delves into a detailed discussion on growth and output volatility. Section 2.3 focuses on the literature pertaining to financial development and output volatility. Finally, section 2.4 concludes the literature review.

2.2 Growth and Output Volatility

Before exploring the relationship between output volatility and other variables, as well as the potential causes of output volatility, it is crucial to address the question of

whether output volatility has any impact on the economy. The influential study conducted by **Ramey and Ramey (1995)** provided empirical evidence indicating that volatility exerts a detrimental impact on economic growth. Although a small amount of studies propose a positive association amongst growth and the volatility, the prevailing consensus tends to support an inverse association between these two variables.

The concept of creative destruction, as proposed by **Schumpeter (1942),** suggests that volatility may actually have a positive influence on growth. According to this idea, during periods of economic expansion, new firms and businesses emerge, which may not operate as efficiently as established firms. Despite their inefficiencies, these new firms can still remain profitable while the economy is growing. However, during times of economic stagnation, these less productive and inefficient firms struggle to survive and eventually face closure. In this sense, a recession can be seen as a period when the economy purges itself of less productive entities, paving the way for higher future growth.

On the contrary, the concept of irreversibility of investment proposed by **Pindyck (1991)** suggests that heightened fluctuations in economic activity can have a detrimental impact on growth. Once an investment is made, it is often difficult to reverse due to fixed costs, contractual obligations, and other commitments. In favorable economic conditions, firms may have the necessary resources to sustain their investments, such as higher interest payments on loans. However, during challenging economic circumstances, firms may struggle to maintain their investments and, in the worst-case scenario, face closure. In countries where volatility is higher than usual, firms may even choose to avoid investment altogether due to the uncertainty surrounding future conditions, which could negatively impact growth.

Increased levels of the output fluctuations can have detrimental effects on the growth of economy, poverty levels, and welfare, especially in emerging economies **(Ramey and Ramey, 1995).** Additionally, numerous studies have documented a decline in volatility in both industrialized and developing nations over the past few decades. Certain countries have experienced significant welfare losses as a result of episodes of extreme volatility, leading to substantial drops in output during the 1980s and 1990s. Hence, it is crucial to comprehend the factors driving output volatility.

Chun and Kim (2010) discovered a significant drop in volatility of GDP growth rates United States over the past decade, a phenomenon referred to as the "great moderation." This reduced volatility can be attributed to several factors, including the enhanced stability of GDP growth, improved monetary policy, and advancements in business practices such as inventory management, financial innovation, and even fortuitous occurrences involving fewer variable shocks. The findings suggest that the increased industry-specific productivity growth over the past decades has played more important part in reducing aggregate output volatility than the improved stability of industry-level total factor productivity (TFP) or input growth rates.

In a similar vein, **Stiglitz (1993)** explains the negative correlation between growth and output fluctuations by focusing on the impact of volatility on research and development (R&D). While acknowledging the positive effects of the Schumpeterian notion of creative destruction, Stiglitz emphasizes that the costs associated with volatility, stemming from its adverse effects on R&D, outweigh the benefits of creative destruction. According to Stiglitz, technological progress serves as the primary factor influencing long-term growth. Therefore, insufficient investments in new innovations can result in lower future growth rates.

2.3 Financial Development and Output Volatility

In the past few years, there has been a noticeable emphasis on the examining that how output volatility is influenced by the financial openness, financial institutions, financial integration, as well as monetary policy. Similarly, researchers have explored how financial volatility can affect real economic activity. However, the implications of the financial growth on output volatility vary across regions along with different situations. In order to obtain a more comprehensive understanding of the association amongst financial development along with the output volatility, it is crucial to review the existing literature that has aimed to explore this specific association between these two significant variables.

Despite a substantial amount of academic research exploring the impact of finance on economic growth, there is a notable absence of in-depth inquiries into the intricate relationship between financial development and the variations in economic output. **Mishkin (2009)** underscores the importance of maintaining stable economic growth within a range of macroeconomic policy objectives. However, at present, existing theories do not offer precise predictions regarding how financial development influences the fluctuations in economic growth. For example, **Bernanke and Gertler (1989)** offer a formal analysis that explores the role of the borrower's balance sheet in shaping the business cycle. They modify the real business cycle model by incorporating an information asymmetry between entrepreneurs and the savers who provide them with loans. The authors find that when there is an information asymmetry between borrowers and lenders, optimal financial arrangements can mitigate agency costs. Consequently, the cost of external funds is higher compared to internal funds. Therefore, periods of financial distress coincide with comparatively high agency costs in the investments, as well as the financial restrictions on

companies may significantly contribute to the propagation of the business cycle, leading to heightened oscillations.

In a similar vein, **Kearney and Daly (1997)** conducted a study to explore the impact of fluctuations in monetary volatility on real economy of macroeconomics. Their empirical model provides insights into the transmission mechanism through which changes in monetary volatility influence the volatility of inflation, financial asset prices as well as the real output. The authors specifically concentrate on understanding the relationship between financial volatility along with the real output volatility, with a particular focus on the pathway mediated by financial asset prices. To estimate their models, they employ the generalized least squares (GLS) method and complement it with common-to-specific assessment approach for further analysis.

The connections between financial asset prices and monetary instability accentuate the link between monetary fluctuations and shifts in real economic output. Importantly, both models indicate that the main channel through which monetary instability impacts real output is primarily through the stock market, rather than interest rates. For example, **Levine and Zervos (1998a)** investigated the linkages amongst economic growth along with the stock market development, productivity growth as well as the capital accumulation. They conducted their research for 42 economies over the time period from 1976 to 1993, and also utilized several stock market indicators for the assessment of this relationship. The findings of their research indicate a substantial and meaningful correlation between the starting level of stock market liquidity and the advancement of banking systems, which has subsequent effects on economic growth, capital accumulation, and productivity growth rates over an 18-year timeframe. Importantly, these significant outcomes persist even after considering various factors, including initial income, education, inflation, government

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spending, the premium associated with black market exchange rates, and political stability.

Acemoglu and Zilibotti (1997) have highlighted another crucial link between the growth of the financial sector and volatility. They emphasized the significance of diversity as a means of mitigating risk. Their argument centered on the notion that, due to the indivisibility of capital, diversification is not achievable during the early stages of development. However, as wealth accumulation commences, diversification becomes feasible, resulting in increased investment and consequently a reduction in investment volatility and risk. In a separate study, **Aghion et al. (2000)** placed considerable emphasis on the role of an open economy in explaining the connection between volatility and finance. They asserted that in economies with moderate levels of financial development, volatility increases in open economies.

Similarly, **Beck et al. (2000)** investigated the impact of legal origin on law, enforcement, and subsequent financial development. Since legal systems in most countries were established through employment as well as immigration, the variables related to authorized origin can be considered exogenous. The findings provide compelling evidence that supports a connection amongst the exogenous elements of financial intermediaries and development as well as long-term growth of the economy. Additionally, the study showcases that the robust correlation observed among the financial development along with the growth does not affect simultaneousness preconceptions. The calculated factor that will be accurately quantifies the influence of extraneous elements of the financial intermediation development on the growth.

However, **Bacchetta and Caminal (2000)** provide evidence that the overall impact of the financial development on the volatility depends on the several factors, including the occurrence of real or monetary shocks, the stage of financial development in a country (such as intermediate, early, or later stages), and credit supply or demand shocks. Their primary finding indicates that the presence of financial constraints can either magnify or stifle the output fluctuations, depending upon the nature of the initial shock.

By a similar means, **La Porta et al. (2002)** carried out an investigation that was intended to examine the prevalence of public ownership of banks on a global scale. The analysis presented in the study offers direct evidence to explore the relationship amongst the growth of the economy and the services providing by the financial arbitrators, taking into consideration the potential challenges faced by publicly owned banks in accessing information about firms and facilitating transactions efficiently. According to the study's outcomes, greater amounts of the bank ownership by the public are correlated with the lower levels of development in banks and, on the other hand, higher numbers of bank public possession are connected with the slower growth of the economy.

Acemoglu et al. (2003) proposed that countries that adopt distortionary macroeconomic policies, such as sustaining high inflation rates, maintaining large budget deficits, and having misaligned exchange rates, typically encounter higher levels of macroeconomic volatility and witness slower economic growth during the postwar period. This study highlights that countries with a colonial history marked by extractive institutions are more prone to volatility and economic crises. Drawing from the findings, it can be inferred that distortionary macroeconomic policies often act as indicators of fundamental institutional difficulties instead of being the primary drivers

of volatility of economy. Furthermore, the study emphasizes that the impact of institutional disparities on volatility is not predominantly mediated by traditional macroeconomic variables.

In a study by **Aghion et al. (2004),** a framework is introduced to analyze the significance of financial factors as a potential contributor to instability in small open economies. The outcomes demonstrate that countries in the midst of fiscal development may experience increased short-term instability. Similarly, full capital account liberalization can lead to economic destabilization in economies which are in the interim stages of the growth of finance, where periods of the development with the capital inflow were trailed by collapses with the capital outflow.

Likewise, **Li et al. (2009)** conducted an analysis to examine the volatility of output and macroeconomic variables in five East Asian economies. The study utilized quarterly data from both the periods preceded and Asian financial economic crisis, with the aim of investigating the influence of output along with the stock market price volatility in one East Asian economy on the other economies within the region. Additionally, the study explored the interdependence among these economies through cross-country and cross-variable correlation analysis. Overall, the findings suggest that the East Asian economies, as a collective, were able to maintain macroeconomic stability during the post-Asian financial crisis period. These economies remain interconnected and exert significant influence on each other and the Asian region as a whole. The study concludes that trade, consumption, and investment continue to foster close connections among the five East Asian economies.

Popov (2011) conducted a study to examine how financial openness influences the distribution of growth rates during the business cycle. The study utilized data from 53

countries over a period of 45 years (1963-2007) to explore the effects of the monetary liberalization on the output growth, volatility, and skewness. The findings strongly indicate a positive correlation between financial openness and higher output growth, as well as increased variability in output growth. The direct impact of financial openness on the asymmetry is partially mediated by the indirect effect through higher growth. Moreover, financial liberalization often has a more positive impact on nations with more established financial markets as well as more powerful institutions, and experiencing higher growth rates and a reduced likelihood of significant and infrequent contractions. However, it should be noted that while the evidence suggests that financial openness may elevate the probability of large, abrupt, and infrequent contractions in output at a disaggregated level, this relationship may not hold true when analyzing data at the aggregate level.

The existing empirical research on the relationship between finance and output volatility yields varied results. For example, **Denizer et al. (2002)** discover that enhanced financial systems reduce the oscillations in per capita output growth. Similarly, **Bekaert et al. (2006)** note that financial liberalization frequently leads to decreased volatility in consumption growth. Likewise, **Dynan et al. (2006)** evaluated the relationship amongst output volatility along with the financial innovations. The authors specifically investigated different types of innovation, such as advancements in lending practices, improvements in loan markets to facilitate borrowing for households and firms, along with the shifts in government policies. The study employed a range of empirical techniques to assess the connections between reduced the output volatility and the impact of economic innovations on the housing investment, consumer spending as well as business fixed investment. By considering both four-quarter rates and quarterly growth rates, the analysis demonstrated that

financial innovation played a role in stabilizing output volatility, particularly during the mid-1980s.

As well, **Jermann and Quadrini (2006)** argued that progressions in financial markets enhance financial flexibility, lower output fluctuations, yet concurrently increase the instability associated with the expansion of firms' financial elements.

However, **Beck et al. (2006)** carried out a study to explore the effects of the economic financial intermediaries on the volatility of output and explore the potential relationships between these variables. However, the findings do not conclusively establish a direct connection amongst the growth volatility with the financial development. They employed panel estimation regressions by employing a data set of 63 economies over a period of 38 years from 1960 to 1997. The inquiry is primarily focused on the determining whether the emergence of the financial intermediaries has an impact on the association amongst the volatility of trade along with volatility of inflation as well as the volatility of growth in the economy. Overall, the analysis highlights the minimal contribution of the financial sector to lowering the terms of trade volatility whilst revealing a robust association between the rise of output volatility and the financial intermediaries.

By a similar vein, **James B. Ang (2011)** carried out an investigation to check the influence of the financial repression on the volatility of private consumption in India. The study utilized annual time series data spanning from 1950 to 2005. Two summary indicators that take into consideration the various financial policies adopted by the Indian government both domestically as well as internationally were used to determine the degree of financial suppression. The implementation of the financial repressionist regulations with a decrease in the volatility of consumption were shown

to be significantly correlated, according to the study. Even after accounting for numerous macroeconomic shocks and factors, these conclusions held up well. The study also revealed that in order for financial changes to successfully lessen consumption volatility, a particular threshold must be reached. This shows that volatility in private spending can be reduced by a more transparent financial system.

Moreover, **Majeed and Noreen (2018)** provide support for the relationship between a less developed financial sector (characterized by higher volatility) and output volatility by employing the panel dataset for 79 economies over the time period throughout 1961 to 2012. Similarly, **Majeed and Mazhar (2019)** conducted a comprehensive analysis employing the data of 155 economies spanning the period from 1971 to 2017, which was further supported by the subsequent research conducted by **Majeed, Mazhar, and Sabir (2021).** Through rigorous empirical analyses utilizing the Pooled Ordinary Least-Squares as well as Random with Fixed Effects Patterns in consistent evidence emerged indicating that financial stability is linked to a reduction in output volatility. By facilitating a seamless flow of funds and providing reliable information, financial service providers like banks along with other financial organizations play a significant role in lessening the detrimental effects of production shocks. This is done via a variety of strategies, including domestic financing offered by the banks, credit from domestic private sector sources of information, as well as credit from the whole financial industry.

Meanwhile, **Moschovou and Giannopoulos (2021)** put forth an alternative viewpoint, suggesting a connection between economic crises leading to financial economic volatility and a decline in the output. Their study specifically examines prominent EU economies, including Greece, Spain, Italy, as well as Portugal over the period from 2005 to 2019. They find that financial crises during this time period have

led to output reductions in various economic sectors, particularly in the context of transportation freight.

Similarly, **Safi et al. (2021)** examined how financial instability, technological innovation, and exports affect output that is driven by consumption. Their findings suggest that when financial development experiences high volatility, it leads to a decline in output based on consumption.

In the latest era, **Anum et al. (2022)** investigated the impact of the financial sector expansion on the output volatility. Specifically, they aim to understand the relationship between financial sector development along with the output volatility, considering the presence of financial sector uncertainty. To conduct their analysis, they utilized panel dataset of 180 nations spanning the period from 1971 to 2020. The study employs various empirical techniques, including random as well as fixed effects models along with 2SLS, and GMM. The results of their investigation reveal a mixture of findings. On the one hand, they observe that instability in the economic finance industry contributes to an increase in output volatility. On the other hand, they discover that the financial development plays a crucial role in reducing the output volatility. Moreover, the study takes into account trade openness and inflation as controlled variables due to their impact on the output volatility. According to the findings, trade openness, similar financial stability, lowers the volatility of output. Inflation, on the contrary hand, tends to amplify production swings since it is a monetary phenomenon.

2.4 Conclusion

The aforementioned studies have provided valuable insights into the various factors influencing output volatility and the relation amongst output volatility along with the

financial development. We now understand that there are numerous determinants of output volatility, including financial sector development, financial integration, discretionary fiscal policy volatility, institutional quality, interest rates, terms of trade, imports and exports of goods and services, exchange rate flexibility, sectoral and foreign diversification, remittances, and foreign direct investment (FDI). These studies have explored output volatility from various perspectives, considering the aforementioned factors.

The association among financial development as well as output volatility has gained significant attention and has become a matter of concern, particularly in light of past financial crises. However, there has been relatively little focus on understanding the entire link amongst financial development with output volatility. The main aim of this study is to contribute to the existing knowledge by exploring the relationship among output volatility and financial development, with a particular focus on the South Asian region.

CHAPTER 3

THEORETICAL FRAMEWORK AND ESTIMATION METHODOLOGY

3.1 Introduction

In this section of our thesis, we have delved into the methodology of analyzing fluctuations in output, commonly referred to as output volatility. Our specific focus has been on examining the significance of the financial development at output volatility, using South-Asian economies as the context for our investigation. The current chapter is organized into five distinct sections. The first section, labeled as 3.1, serves as an introductory part that provides an overview of the topic. In section 3.2, we establish the theoretical framework that forms the foundation of our study. Moving forward, section 3.3 is dedicated to constructing empirical models that are customized to address our specific research objectives and in section 3.4, we outline the econometric techniques employed to analyze the impact of both dependent and independent variables. Subsequently, in section 3.5 and 3.6, we delve into the data sources and sample and time period selection respectively. Likewise, section 3.7 and 3.8 presents the descriptive and statistical analysis and diagnostics respectively of the conducted study.

3.2 Theoretical Framework for Present Study

The current study has developed a theoretical framework to examine the impact of financial development on output volatility. The main objective is to empirically investigate the relationship between dependent as well as independent variables, focusing specifically on the association amongst output volatility with financial development. Previous research has indicated that high output volatility in the past two decades has had minimal effects on welfare, poverty, and economic growth,

particularly in impoverished nations **(Ramey and Ramey, 1995).** However, some low-income countries faced significant welfare costs and substantial output declines during the 1980s and 1990s due to extreme volatility. Conversely, other studies have found a decrease in volatility over the last two decades in both developing and industrialized countries, attributed to factors like structural changes, favorable circumstances, and effective policies. Consequently, it is crucial to understand the factors influencing output volatility. In light of this, the present study aims to explore the role of financial development in shaping output volatility.

Prior studies have examined various factors that contribute to output volatility, including consumption volatility, oil prices, remittances, foreign direct investment, and fiscal policy. However, there is a research gap in understanding the specific impact of financial development on output volatility in the South Asian region. Thus, our study aims to fill this gap by investigating how financial development influences output volatility and whether it helps mitigate volatility. Among the factors being examined, GDP growth emerges as the most significant determinant of output volatility in a country. The literature commonly utilizes the standard deviation of GDP per capita as a benchmark for measuring output volatility **(Beck et al., 2000; Hakura, 2007; Ahamada and Coulibaly, 2011)**. Additionally, employing the logarithm of GDP is a common approach in empirical research for measuring growth and determining volatility **(Posch, 2011).** Therefore, we follow the established practice of using the logarithm of per capita GDP as a measure of growth to estimate volatility in our empirical study **(Posch, 2011; Beck et al., 2006; Majeed and Noreen, 2018).** Based on these considerations, we develop our output volatility model.

$$\textbf{LOV = f (LGDP)}$$

The objective of this study was to evaluate how financial development affects the volatility of economic growth in the Southern region. Additionally, it investigated two potential channels that could connect these variables. One channel focused on the real sector and utilized the standard deviation of terms of trade as an indicator of real shocks. The other channel examined the monetary sector and employed the standard deviation of inflation as a measure of monetary shocks **(Majeed & Noreen, 2018).** The study examined the influence of financial intermediaries' development on both real and monetary shocks, as well as investigated whether it mitigated or amplified output volatility through these channels. Taking these factors into consideration, the general form of the regression equation employed in our analysis is as follows:

LOV = f (LGDPPC, LagLOV, FD, VTO, VINF)

In accordance with these specifications, the regression model we employed adheres to the standard structure outlined below:

Log of Output Volatility = f (Log of GDP per capita, Log of Lag of Output Volatility, Financial Development, Volatility of Trade Openness, Volatility of Inflation)

3.3 Empirical Model Specification:

Based on the theoretical framework, the empirical model applied in this section focuses on investigating the relationship between the dependent variable, OV (output volatility), and the independent variable, FD (financial development). This association is formulated as a panel equation presented in the following form:

$$\textbf{LOV}_{it} = \beta_1(LGDPPC)_{it} + \beta_2(LagLOV)_{it} + \beta_3(FD)_{it} + \beta_4(VTO)_{it} + \beta_5(VINF)_{it} + \mu_{it} + \varepsilon_{it}$$

The provided equations consist of multiple variables. The variable 'LOV' represents the logarithm of output volatility, which serves as the primary dependent variable. 'LGDPPC' corresponds to the logarithm of GDP per capita, 'LagLOV' represents the lag term of the dependent variable, 'FD' denotes financial development, 'VTO' represents the volatility of trade openness, and 'VINF' indicates the volatility of inflation.

In the equation provided, β_1 denotes the effect of the log of per capita GDP on the log of growth volatility. β_2 represents the effect of the lagged of log of output volatility on the log of output volatility. Furthermore, β_3 captures the influence of financial development on the log of growth/output volatility, β_4 signifies the impact of trade openness volatility on the log of output volatility, and β_5 reflects the impact of inflation volatility on the log of output volatility. The variable **'i'** distinguishes between different countries, while **'t'** represents time.

3.4 Econometric Methodology

In our empirical analysis, we employed a range of techniques to examine the data. We chose panel data estimation as our analytical approach because it allows for the combination of cross-sectional and time series analysis, making it a widely used method.

For our analysis, we applied various econometric techniques to the dataset. Initially, we utilized the pooled ordinary least squares (OLS) method. Subsequently, we implemented the fixed effect (FE) method. Additionally, we also considered the random effect (RE) method. To determine the most appropriate model between fixed and random effects, we conducted the Hausman test.

These techniques were carefully selected to ensure a robust analysis that takes into account the specific characteristics of the dataset.

3.4.1 Panel Data Regression Models:
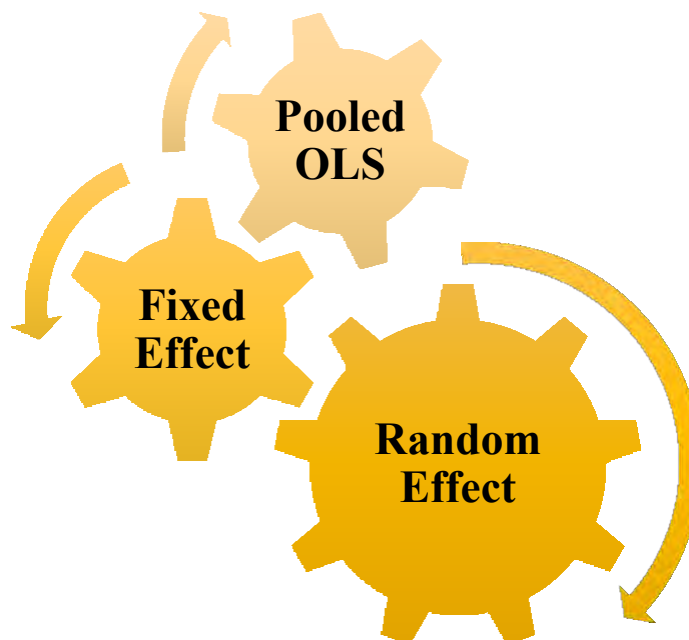
Figure: Panel Data Regression Techniques

3.4.1.1 Pooled OLS Method:

Panel data collection offers a higher level of freedom, allowing for the representation of intricate human interactions. Additionally, pooling the data in panel data analysis ensures more accurate results. The pooled ordinary least squares (OLS) method is utilized in regression analysis to estimate consistent coefficients and intercepts. In situations where the ideal model is properly projected or estimated however the explanatory variables do not demonstrate the correlation residuals, the method of ordinary least squares is applied to tackle this concern.

In our study, we examined implicit of finance growth development on the output volatility in eight South-Asian economies. The equations representing the estimation using the pooled OLS method are as follows:

$$\textbf{LOV}_{it} \quad = \quad \beta_1(\text{LGDPPC})_{it} + \beta_2(\text{LagLOV})_{it} + \beta_3(\text{FD})_{it} + \beta_4(\text{VTO})_{it} + \beta_5(\text{VINF})_{it} + \mu_{it} + \varepsilon_{it}$$

3.4.1.2 Fixed Effect Model

In OLS estimation, the intercept remains consistent across countries, and the coefficients remain unchanged across different cross sections. However, recognizing this limitation, we employ alternative estimation methods such as the fixed effects or random effects methods for our regression analysis. The equation representing the fixed effects method of output volatility is expressed as follows:

$$\textbf{LOV}_{it} \quad = \quad \beta_1(\text{LGDPPC})_{it} + \beta_2(\text{LagLOV})_{it} + \beta_3(\text{FD})_{it} + \beta_4(\text{VTO})_{it} + \beta_5(\text{VINF})_{it} + \mu_{it} + \varepsilon_{it}$$

3.4.1.3 Random Effect Model:

Given the large number of observations, the fixed effect method is susceptible to unknown parameters. To address this concern, we employ an alternative approach known as the random effect method. The equation representing the random effect method for analyzing output volatility is expressed as follows:

$$\textbf{LOV}_{it} \quad = \quad \beta_1(\text{LGDPPC})_{it} + \beta_2(\text{LagLOV})_{it} + \beta_3(\text{FD})_{it} + \beta_4(\text{VTO})_{it} + \beta_5(\text{VINF})_{it} + \mu_{it} + \varepsilon_{it}$$

3.5 Data and Data Sources

This section of our research provides a concise overview of the description, theory, and construction of the variables used in our ongoing study. Our main focus and dependent variable center around measuring the extent of output volatility.

3.5.1 Dependent Variable:

3.5.1.1 Output Volatility

Our study focuses on output volatility as the dependent variable, which acts as an indicator of the fluctuations in macroeconomic output. In economics, macroeconomic volatility is typically quantified by calculating standard deviations of real per capita GDP. For our research, we obtained data on GDP per capita, determined in constant 2015 US dollars, extract from the World Development Indicators (2023) for all South Asian countries. The dataset covers the time frame from 1973 to 2022. GDP represents the overall market value of all produced goods, including taxes and excluding subsidies, while accounting for asset depreciation and excluding natural resources. To evaluate output volatility, we utilize the three-year moving standard deviation (SD) of Gross Domestic Product in constant US dollars.

3.5.2 Focused (Independent) Variables

3.5.2.1 Financial Development

Promoting financial development is a means to enhance economic efficiency by facilitating seamless transactions, enabling portfolio diversification, easing household liquidity constraints, managing risks over time, and addressing issues of asymmetric information. As a result, financial mediators play a decisive role in maintaining the stability in economy. In our ongoing research, we employed domestic credit to the private sector as an indicator of the financial development. The data on domestic credit to the private sector was sourced from the World Development Indicators (2022), spanning the period from 1973 to 2022.

3.5.3 Control (Independent) Variables

As part of our empirical examination, we have integrated control variables to consider additional influential factors. These control variables encompass gross domestic product (GDP), trade openness, and inflation.

3.5.3.1 GDP per capita

In our study, GDP per capita serves as the primary control variable. GDP is the combined market value of all the goods and services produced within an economy, encompassing taxes on these products but excluding subsidies. The calculation considers asset depreciation and excludes natural resources. Our dataset for GDP per capita is determined in constant 2015 US dollars and is obtained from the World Development Indicators (2022). The data spans from 1973 to 2022 and includes all countries analyzed in our study.

3.5.3.2 Volatility of Trade Openness

In our study, trade openness is regarded as the primary control variable. It entails the elimination or reduction of obstacles that hinder the free flow of goods between nations. The diversification of products is vital for safeguarding the economy against global shocks and volatility, making trade openness instrumental in stabilizing output fluctuations. To construct the trade variables, we utilized trade data sourced from the World Development Indicators (2023), spanning from 1973 to 2022. Moreover, we compute the volatility of trade openness by employing the three-year moving standard deviation of trade openness.

3.5.3.3 Volatility of Inflation

In our study, we have incorporated inflation as the second control variable. Inflation represents the gradual escalation of prices for goods and services over time within an

economy. To gauge inflation, we utilized the consumer price index (CPI) as a proxy. The data for constructing the inflation variable was obtained from the World Development Indicators (2022) and encompasses the timeframe from 1973 to 2022. The volatility of inflation was assessed using the standard deviation of inflation across the relevant periods. Furthermore, the volatility of inflation was calculated by employing the three-year moving standard deviation of the consumer price index.

Summary of the Variables:

Below is a summary of all the variables incorporated in our empirical research.

Table 1 : Outline of Data Sources of Variables

Variables	Denoted by	Measured in	Sources
Dependent Variable			
Output Volatility	OV	Standard deviations of the per capita GDP, calculated by constant 2010 US dollars.	WDI (2023)
Focused Variables			
Financial Development	FD	The percentage of domestic credit allocated to the private sectors in relation to the country's GDP.	WDI (2023),
Control Variables			
GDP per capita	GDPPC	Constant 2015 US dollars	WDI (2023)
Trade Openness	TO	The combined worth of goods and services both imported and exported, presented as a proportion of the nation's Gross Domestic Product (GDP).	WDI (2023)
Inflation	INF	Consumer price index measured in 2010 = 100	WDI (2023)

3.6 Sample and the Time Period Selection:

To accomplish this, we have utilized a dataset consisting of countries from South Asia, including Pakistan, India, Bangladesh, Sri Lanka, Afghanistan, Bhutan, Maldives, and Nepal. The empirical data for our study has been obtained from the World Development Indicators (WDI) and covers the time period throughout from 1973 to 2022.

3.7 Descriptive and Statistical Analysis:

3.7.1 Summary Statistics

This section of our ongoing research showcases descriptive statistics, encompassing instruments of the central tendency such as mean and the median. Furthermore, we present information regarding the standard deviation, minimum, and maximum values for both the dependent and independent variables. Additionally, an overview of the overall observations is provided. The table below provides a summary of the descriptive analysis conducted on all the dependent, focal, and control variables, including output volatility, financial development, per capita GDP, volatility of trade openness, and the volatility of inflation.

Table 2 : Results of Summary Statistics of Independent along with Dependent Variables

Variables	Obs.	Mean	Median	Std. Dev.	Minimum	Maximum
Dependent Variable						
Log of Output Volatility	270	3.421356	3.389795	1.151672	0.750522	8.783631
Focused Variables						
Log of Financial Development	270	3.113083	3.186873	0.679384	0.961556	4.658472
Control Variables						
GDP per capita	270	1304.163	916.4061	1548.431	321.7880	10753.14
Log of lag of Output Volatility	270	92.38772	29.28694	439.4628	2.118105	6526.533
Volatility of Trade Openness	270	3.486288	2.179452	5.641629	0.067237	80.68443
Volatility of Inflation	270	6.410706	2.790338	16.68979	0.036574	144.2458

Table 3.7.1 expresses descriptive analysis of our research where log of output volatility is our main and dependent variable. We are using log of financial development as focused (independent) variable. Moreover, we have been using a lot of control (independent) variables in current research. Control variables which are used in our study are GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation.

Mean and the median values of log of the output volatility is 3.421356 and 3.389795 respectively. The standard deviation of the log of the output volatility is 1.151672.

Moreover, the minimum and the maximum values of log of the output volatility are 0.750522 and 8.783631 respectively. Total no. of observations of the log of the output volatility are 270.

Correspondingly, the mean value of log of financial development, GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation are 3.113083, 1304.163, 92.38772, 3.486288 and 6.410706 respectively. Similarly, median values of log of financial development, GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation are 3.186873, 916.4061, 29.28694, 2.179452 and 2.790338 respectively. Whereas, the standard deviation of log of financial development, GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation are 0.679384, 1548.431, 439.4628, 5.641629 and 16.68979 respectively. Moreover, minimum values of log of financial development, GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation are 0.961556, 321.7880, 2.118105, 0.067237 and 0.036574 respectively. While the maximum values of log of financial development, GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation are 4.658472, 10753.14, 6526.533, 80.68443 and 144.2458 respectively. Lastly, total no. of observations for all variables including log of financial development, GDP per capita, log of lag of output volatility, volatility of trade openness and volatility of inflation are same, and it is 270.

3.7.2. Correlation Matrix

The correlation matrix serves as a quantitative tool utilized to evaluate the magnitude and direction of relationships between variables. Its significance lies in identifying the presence of multicollinearity among the variables. In the subsequent table, we present

the correlation matrix, providing an overview of the interrelationships among all the dependent, independent as well as control variables.

Table 3 : Correlation Matrix Results

	Variables	1	2	3	4	5	6
1.	Log of Output Volatility	1.0000					
2.	GDP per capita	0.5747	1.0000				
3.	Lag of log of the Output Volatility	0.0753	0.1431	1.0000			
4.	Log of Financial Development	0.3272	0.2930	0.0203	1.0000		
5.	Volatility of Trade	0.4970	0.1395	0.2596	-0.0334	1.0000	
6.	Volatility of Inflation	0.2549	-0.0539	0.3529	-0.0380	0.3409	1.0000

The results presented in Table 3.7.2 demonstrate a positive correlation between the logarithm of output volatility and both the focal (independent) variable and the control (independent) variables. These control variables encompass the logarithm of financial development, GDP per capita, the logarithm of the lag of output volatility, volatility of trade openness, and volatility of inflation. Positive correlation coefficients indicate that as the logarithm of output volatility increases, the corresponding variables also exhibit an increasing trend. Conversely, negative correlation coefficients would indicate that as the logarithm of output volatility decreases, the associated variables would decrease as well. However, our research reveals a positive correlation among all the variables.

3.8 Diagnostics/ Test

In this specific section, we conducted pre-estimation testing to evaluate the functional form, address potential multicollinearity concerns, and identify any indications of heteroscedasticity within the estimated model.

3.8.1 Functional Form/ Model Specification Test

The link test plays a crucial role in evaluating the specification and functional form of models. In our study, we employed the link test to refine the specification of the linear regression model. The p-value associated with the square term was a key focus during this test as it carries substantial significance in determining the reliability of our findings. A p-value less than 5% indicates potential issues with the model's specification or estimation accuracy. Conversely, a p-value greater than 5% suggests that the model is properly estimated, aligning with the desired objectives of our research. We have summarized the outcomes of the link test, which validate the functional form of the estimated model, in the provided table.

Table 4 : Link Test Results of the Log of the Output Volatility as dependent variable

Link Test			
Model	**Coefficient**	**T- Stats**	**P- Value**
Log of Output Volatility (Dependent variable)			
Hat	1.674737	8.51	0.012
Hat- Square	-0.0722684	-3.54	0.060
Constant	-1.405625	-3.24	0.001

Table 3.8.1 presents the findings of the link test performed on the logarithm of output volatility. The observed probability value for the hat-square term exceeds 0.05, indicating that the null hypothesis can be rejected. Consequently, we can assert with

confidence that the functional form has been effectively estimated in our model, leading to a decisive and conclusive result.

3.8.2 Multicollinearity Test

In our study, we employed the variance inflation factor (VIF) to assess the presence of multicollinearity. The VIF measures the extent to which the variances of coefficients are inflated. If the average VIF value exceeds 10, it indicates a significant level of multicollinearity in our models, warranting careful consideration. Conversely, if the average VIF value is below 10, we can conclude that our model is correctly specified and does not exhibit any multicollinearity issues in the data or model. The table below presents the results of the multicollinearity analysis conducted on our estimated models.

Table 5 : Multicollinearity Test Results of the Log of Output Volatility as Dependent Variable

Independent Variables	VIF	1/VIF
GDP per capita	1.16	0.863203
Lag of the log of Output Volatility	1.20	0.834052
Log of Financial Development	1.10	0.908490
Volatility of Trade	1.19	0.838989
Volatility of Inflation	1.26	0.790881
Mean VIF	**1.18**	

The results of the variance inflation factor (VIF) analysis for the logarithm of output volatility are presented in Table 3.8.2. The findings reveal that the average VIF value for the model is 1.18, which is below the threshold of 10. This indicates that our estimated model does not exhibit any significant multicollinearity issues. As a result,

we can confidently assert that our model has been correctly estimated and is devoid of multicollinearity problems.

3.8.3 Heteroscedasticity

Based on the observed deviations in the relationship between the explanatory variables and the variance of the error term (Var(U iX i) = 2), it can be inferred that there is a possibility of heteroscedasticity in our estimated model. Homogeneity of variance refers to situations where the variability of the variable is not consistent across the entire range of the anticipated variable. To assess the presence of heteroscedasticity, we employed the Breusch-Pagan heteroscedasticity test. The results of this test are outlined below.

Table 6 : Heteroscedasticity Test Results of Foreign Direct Investment Inflows as Dependent Variable

Null: constant variance	
Chi2 (1)	6.32
Probability > chi2	0.1301

Table 3.8.3 displayed the findings related to heteroscedasticity in the estimated model of the logarithm of output volatility. The results suggest that there is no evidence of heteroscedasticity in our model. This conclusion is backed by the probability value of 0.1301, which surpasses the 5% threshold. Hence, we can deduce that our estimated model is devoid of any heteroscedasticity concerns.

CHAPTER 4
RESULTS AND DISCUSSIONS

Introduction

This section of the dissertation presents the findings and discussion related to the relationship between financial development and changes in output. The study utilized GDP per capita as a measure of how output fluctuates and domestic credit to private investment as an indicator of financial development. Additionally, three variables were included as control factors: GDP per capita, trade volatility, and inflation volatility. Various statistical methods were employed to assess how output fluctuates in South Asian economies. The regression analysis used panel data from several countries in South Asia, such as Pakistan, India, Bangladesh, Sri Lanka, Afghanistan, Bhutan, Maldives, and Nepal. The research applied pooled ordinary least squares regression estimation, fixed effects technique along with the random effects technique. The estimation covered a time period of 50 years, spanning from 1973 to 2022, and the analysis was conducted using Stata 15 and Eviews software packages. The data for the study was obtained from the World Development Indicators (WDI).

In this chapter, there are two sections. Section 4.1 elaborates on the findings derived from the pooled ordinary least square (OLS) method, while Section 4.2 demonstrates the implementation of the random effects method as well as fixed effects method.

4.1. Pooled Ordinary Least Squares (OLS)

Panel data collection offers a wide range of degrees of freedom, enabling it to effectively capture the intricate nature of human interactions. Pooling the panel data ensures accurate results. The regression analysis utilizes the assumption of a coherent factor along with the the intercepts to assess the pooled ordinary least squares. The ordinary least squares approach can be used to solve this problem if the predictive

model is appropriately estimated and when there is no connection amongst the independent variables along with the residuals. The estimation results associated with the pooled ordinary least-squares method shown in the following table.

Table 7 : Results of the Pooled ordinary least squares of the Log of Output Volatility as dependent variable

Variables	Log of the Output Volatility
GDP per capita	0.000368***
	(11.74)
Lag of log of the Output Volatility	0.000475***
	(4.24)
Log of the Financial Development	-0.352***
	(-5.07)
Volatility of Trade	0.0835***
	(9.58)
Volatility of Inflation	-0.0148***
	(-4.87)
R-Square	0.5963
F-Statistics	77.98
F-Probability	0.0000
No of observations	270

*Note: t-values are given in parenthesis. *, **, *** corresponds to significance at 10%, 5% and 1% respectively.*

Table 4.1 contains the findings of the pooled ordinary least squares regression analysis that was performed in Chapter 3. The results show a link amongst output fluctuations together with the per capita GDP that is positive. More specifically, a rise in GDP per capita of 1% results in an increase in the output volatility of 11.74 units. In this study, a panel dataset has been used to take output volatility's long-term effects into consideration. Greater production volatility often results from higher GDP levels. In the GDP structure, this rise in production volatility may be seen as a reinforcement

mechanism since it influences output swings and is unexpected. The study also looked at the latency of the log of the output volatility, and it was discovered that this factor significantly improved the log of the production volatility. Volatility of output increases by 4.24 units for every 1% increase in the latency of the log of the output volatility. These results are consistent with the study done by **Shoaib et al., (2022).**

A macroeconomic model with micro foundations developed by **Aghion et al. (1999)** predicts that less developed financial systems, characterized by low credit to the private sector, tend to be more volatile. The authors demonstrate that low financial development creates a separation between savers and investors, leading to macroeconomic fluctuations where the economy cycles around its steady-state growth path. In contrast, in the presence of financial development and higher credit to the private sector, the economy converges on a stable growth path where fluctuations are primarily caused by exogenous shocks. The authors conclude that in less developed financial sectors, the supply and demand for credit are more cyclical. Therefore, investors are more likely to be excluded from credit markets during economic downturns and rush back in when the economy experiences positive shocks. The results of this research reveal significant impact of the economic financial developments on the output volatility. The coefficients associated with the coefficient of financial development indicate that a 1% increase in the log of the financial development leads to a reduction of 5.07 units in output volatility. These findings support the anticipated outcomes and are in line with the studies conducted by **Majeed and Noreen (2018)** and **Shoaib et al. (2022).**

In a similar vein the anticipated outcomes demonstrate that the log of output variability is positively and statistically significantly impacted by the trade volatility.

The results imply that genuine sector disturbances and meddling lead to higher production volatility. According to **Hadded et al., (2013),** a greater degree of trade openness in a nation's economy increases volatility because countries that rely on trade to gauge their economic performance are more vulnerable to shocks from outside sources. The findings show that a greater logarithm of production volatility is caused by an upsurge in the magnitude of the trade openness volatility. These findings are consistent with those of **Majeed and Noreen (2019)** and **Shoaib et al., (2022) studies.**

On the contrary side, inflation is a sign of monetary sector uncertainty. The results indicate that the production volatility is negatively yet significantly impacted by the rate of inflation volatility. The findings imply that disruptions and involvement in the monetary system cause a decrease in production volatility. As noted by **Majeed and Noreen (2018)** and **Shoaib et al., (2022),** it is hypothesized that inflation as well as output volatility followed opposite pathways, with the lower inflation leading to the less volatility in development and vice versa.

Finally, the result shows that the value of R-squared is 0.5963, indicating that 59% of the variation in FDI can be explained by the independent variables. The F-stat value is 77.98, with a probability value of 0.0000, indicating the overall significance of the regression model. The empirical analysis utilized 270 observations for the study.

4.2. Random Effects and Fixed Effects Results

When using OLS estimation, the intercept remains constant for all countries, and the coefficients remain the same when examining different cross sections. Due to this restriction, we explore alternative estimation methods such as fixed effect or random effect techniques for empirics. The table below showcases the estimated values

obtained through fixed effect and random effect approaches. Let's begin by examining the outcomes of the fixed effect methodology, which are presented in column (1) of the table.

The primary findings indicate a consistent and significant influence of output volatility. According to the findings, there is a correlation amongst per capita GDP along with the output volatility that is positive, with each 1% rise in per capita GDP transforming into a 5.63 units improvement in the log of the output volatility. We conducted a study using a panel dataset to look at long-term consequences. Due to its unpredictable nature and influence on production volatility, higher GDP is frequently linked to increased output volatility, functioning as an amplifier for GDP.

In the present research we conducted, the lag of the log of production volatility was also taken into account since it had a large and favorable impact on the log of the output volatility. The log of the output volatility specifically increased by 3.94 units for every 1% increase in the latency of the log of production volatility. These findings align with the research conducted by **Shoaib et al. (2022).**

Aghion et al., (1999) has been developed into a macro-economic model with micro foundations, which predicts that less developed financial systems with limited credit to the private sector tend to exhibit greater volatility. They demonstrate that under such conditions, a gap between savers and investors arises, leading to macroeconomic fluctuations centered around the steady-state growth path. Conversely, in the presence of financial development and increased credit to the private sector, the economy stabilizes on a growth path where fluctuations are solely driven by external shocks. The authors conclude that in less developed financial systems, the supply and demand for credit are more cyclical, causing investors to be excluded from credit markets

during economic downturns and rush back in during periods of economic upturn. Our findings confirm a significant impact of financial development on the output volatility. The coefficients of the log of financial development indicate that a 1% increase in log of financial development corresponds to a 4.82 unit decrease in the log of output volatility. These results align with the findings **of Majeed & Norren (2018)** and **Shoaib et al. (2022).**

Similarly, our estimated results indicate a positive and significant effect of the trade volatility on the log of the output volatility. The findings suggest that disruptions and interference in real sectors caused by trade-related factors contribute to increased output volatility. **Hadded et al. (2013)** argue that trade openness leads to higher volatility as economies reliant on trade for economic activity are more exposed to external shocks, resulting in heightened volatility. Our results suggests that increasing intensities of the openness to trade volatility leads to a higher log of output volatility. These findings are in line with the studies conducted by **Majeed & Noreen (2019)** and **Shoaib et al. (2022).**

But inflation shows that the financial system is unstable. Our research shows that the log of the output volatility is negatively yet significantly impacted on the inflation volatility. This shows that deteriorations along with the intervention in the monetary sectors cause a decline in the output volatility. It is hypothesized that inflation as well as output volatility pursue different trajectories, with the lower inflation resulting in a decrease in the growth volatility & vice versa. These findings align with the research of **Majeed & Noreen (2018)** and **Shoaib et al. (2022).**

Finally, the results indicate an R-squared value of 0.5871, indicating that the independent variables account for 58% of the variation in the log of the output

volatility. The F-statistic value is 64.91, with a probability value of 0.0000. The empirical study is based on a total of 270 observations.

Table 8 : Results of Fixed Effects and Random Effects of Log of the Output Volatility

Variables	(1)	(2)
	Fixed Effect Model	**Random Effect Model**
Log of Output Volatility		
GDP per capita	0.000464***	0.000359***
	(5.63)	(6.83)
Lag of log of the Output Volatility	0.000386***	0.000397***
	(3.94)	(4.05)
Log of Financial Development	-0.386***	-0.444***
	(-4.82)	(-6.33)
Volatility of Trade	0.0783***	0.0764***
	(9.97)	(9.87)
Volatility of Inflation	-0.0152***	-0.0156***
	(-5.67)	(-5.87)
R-Square	0.5871	0.5918
Chi2(5)	------	344.75
Prob > Chi2	------	0.0000
F-Statistics	64.91	------
F-Probability	0.0000	------
No of Observations	270	270

*Note: Standard errors are given in parenthesis. *, **, *** corresponds to significance at 10%, 5% and 1% respectively.*

After assessing the outcomes of the fixed effect analysis, the results obtained from the random effects method estimation are presented in column (2). The fixed effect method can be influenced by unknown parameters, particularly when dealing with a large number of observations. To overcome this issue, we have adopted the random effect method as an alternative approach.

The results suggest a confirmed association amongst per capita GDP along with the fluctuations in output. In particular, a 1% increase in the per capita GDP corresponds to a 6.83-unit rise in the logarithm of output volatility. To address the persistent nature of output volatility, we employed a panel in the data set in our study. Greater GDP levels tend to amplify the output volatility, serving as a mechanism that enhances the impact of GDP while also introducing significant unpredictability and influencing output volatility. Additionally, we examined the impact of the lagged of log of output volatility in our analysis, which demonstrated a noteworthy beneficial implicit on the output volatility. More precisely, a 1% increase in the lagged logarithm of output volatility led to a 4.05-unit rise in the logarithm of the output volatility. These findings are consistent with the outcomes reported by **Shoaib et al. in 2022.**

A macroeconomic model incorporating microeconomic principles was constructed by **Aghion et al. (1999),** proposing that financial systems with limited development and low private sector credit tend to exhibit higher levels of volatility. The authors demonstrate that this lack of financial development leads to a separation between savers and investors, resulting in macroeconomic fluctuations and an economy that fluctuates around its steady-state growth path. Conversely, in economies with advanced financial development and higher private sector credit, the growth path becomes more stable, with fluctuations primarily driven by external shocks. The authors conclude that in less developed financial sectors, the supply of and demand for credit becomes more cyclical. Consequently, investors are more likely to face restricted access to credit markets during economic downturns and rush back in when positive shocks occur. The findings indicate a substantial impact of financial development on output volatility. The coefficients derived from the logarithm of financial development suggest that a 1% increase in the logarithm of financial

development leads to a 6.33-unit decrease in the logarithm of output volatility. These results are consistent with and support the findings of **Majeed & Noreen (2018)** and **Shoaib et al. (2022).**

Furthermore, our analysis findings indicate a significant and positive relationship between trade volatility and the logarithm of output volatility. The coefficients associated with trade volatility suggest that a 1% increase in trade volatility corresponds to 9.87 units increase in the log of the output volatility. On the contrary, the volatility of inflation exhibits instability within the monetary sector. Our results demonstrate a significant and negative impact of inflation volatility on the logarithm of output volatility. Specifically, a 1% increase in inflation volatility results in 5.87 units decrease in the log of output volatility. These results are consistent with the findings reported by **Majeed & Noreen (2018)** and **Shoaib et al. (2022).**

Moreover, the R-squared value of 0.5918 suggests that approximately 59% of the variation in the logarithm of output volatility can be explained by our estimated model. Additionally, the chi-square value of 344.75, with a probability of 0.0000, confirms the statistical significance of the estimated model. Our analysis is based on a dataset comprising 270 observations.

To determine the appropriate model choice between fixed effect and random effect models for our empirical analysis, we conducted the Hausman test. The results of the Hausman test can be found in the following table.

Table 9 : Results of Hasuman Test

Hausman Test		
Variable	**Chi (5)**	**P-Value > Chi 2**
Output Volatility	5.52	0.3562

The table presented above illustrates the outcomes of the Hausman test conducted on the logarithm of output volatility. Upon analyzing the results, it becomes apparent that the probability value exceeds 0.10, which suggests a strong preference for the random effect model. In comparison to the fixed effect model, the random effect model is considered more appropriate and suitable for our analysis.

CHAPTER 5

CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

Strong consistent and predictable financial development reduces the influence on the output volatility. Financial intermediaries continue to be essential to business along with the investment undertakings. As a result, with an established financial system, we may reduce the impediment of the information asymmetry, increasing the quantity of cash available from various funding sources as well as projects. Given that the financial sector is so important to growth and output, it is claimed that any act that causes volatility in the financial industry disrupts the flow of capital along with the investment for projects and output. Current study examined the effects of the financial developments on the output volatility of eight Southern Asian regions throughout the time period from 1973 to 2022.

Existing literature demonstrates that how the financial growth triggers the growth disruptions. The evidence presented in literature about association amongst the output volatility with the financial development is also supported by the results of empirical research. To discover the empirical evidence regarding the relationship within the two variables, pooled OLS, Radom, and Fixed Effect test analyses were used. Financial development is our independent variable in conducting research and we measure this by domestic credit to private sector and demonstrates substantial positive effect on the dependency variable which is growth/ output volatility. According to this, output is disturbed by the financial sector's instability. Additionally, inflation and the trade openness exert pressure on the growth volatility. A developing real sector drops the output volatility, however inflation leads to amplify the growth volatility. Overall, our findings show that financial growth helps to reduce the production volatility, though the evidence is still mixed in some

circumstances. We find that stability in the financial development has a larger role in reducing the output volatility, since the negative link is more prominent in the results we obtained. Overall, the negative sign of the financial development indicator indicates that financial development helps to mitigate the output volatility.

The aforementioned portion of the dissertation is divided into three parts. Section 6.1 demonstrates the main result, while Section 6.2 discusses the research's policy implications. Finally, section 6.3 discusses the study's future objectives as well as its limits.

5.2. Policy Implications:

The origins of economic instability can be attributed to unsustainable macroeconomic policies, fragile financial systems, institutional shortcomings, and structural flaws in both domestic and global financial markets. Consequently, addressing this issue takes on significant importance in the realm of policymaking, particularly for governments and monetary authorities. Their objective is to fortify their control over financial stability by aligning it with the economy's capacity through the effective use of monetary and fiscal policies, ultimately promoting economic growth.

To boost economic expansion, various measures can be implemented. These include facilitating migrants' access to both domestic and foreign financial institutions, streamlining the remittance flow, and introducing household-centric retail payment systems, all of which contribute to stabilizing the financial landscape. Additionally, creating a conducive investment environment through the maintenance of political and macroeconomic stability holds the potential to stimulate capital formation and government expenditure, thereby propelling long-term economic growth.

5.3. Limitations and the Future Directions of the Study

With the availability of time, opportunities, as well as resources that were available, we made every effort to successfully complete this investigation. However, there are still a few areas that may use improvement. First off, generalizing from only two proxies for real along with the monetary shocks is improper. Therefore, future study might examine additional ways that financial intermediaries influence production volatility. Second, our study concentrated on one specific indicator of financial development—domestic loans to the private sector. Therefore, future study will also make use of other proxies for financial development, such as the money supply to GDP ratio as well as stock market capitalization. Thirdly, the analysis in the current study is limited to South Asia, but it might be expanded to include other areas as well.

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