INTERNAL AND EXTERNAL SOURCES OF FINANCIAL GROWTH LEADING TO ECONOMIC DEVELOPMENT OF PAKISTAN: DYNAMIC ANALYSIS OF SELECTED ISLAMIC COUNTRIES

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Candidate of **Master of Philosophy** at the National University of Modern Languages do hereby declare that the thesis **Internal and External Sources of Financial Growth Leading to Economic Development of Pakistan: Dynamic Analysis of Selected Islamic Countries** submitted by me in partial fulfillment of M.Phil. degree, is my original work, and has not been submitted or published earlier. I also solemnly declare that it shall not, in future, be submitted by me for obtaining any other degree from this or any other university or institution.

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Parents

Dr. Muhammad Ayub Siddiqui

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List of Abbreviations

ARDL	Autoregressive Distributed Lag model
ASEAN	Association of South East Asian Nations
BAN	Bangladesh
BD	Bank Deposits
BDG	Bank Deposits Growth
DC	Domestic Credit to private sector
DCG	Domestic Credit to private sector Growth
EAC	The East African Community
EG	Economic Growth
FDIG	Foreign Direct Investment Growth
FTA	Free Trade Agreement
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GATT	The General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
IBRD	International Bank for Reconstruction and Development
IFS	International Financial Statistics
IMF	International Monetary Fund
IND	Indonesia
KSA	Kingdom of Saudi Arabia
KWT	Kuwait
MAL	Malaysia
NAFTA	North American Free Trade Agreement
NFA	Net Financial Assets

NFAG	Net Financial Assets Growth
OIC	Organization of Islamic Cooperation
PAK	Pakistan
PAK-EG	Pakistan Economic Growth
QAT	Qatar
Q1 - Q4	Quarter1 - Quarter4
TUK	Türkiye
UAE	United Arab Emirates
UECM	Unrestricted Error Correction Model
WTO	World Trade Organization

ABSTRACT

Many countries, these days are financially and economically integrated. Indeed, financial indicators are linked with the economic growth of an economy. Local and global financial and macroeconomic factors, in addition to the capital flows from the Islamic Countries have historically played a significant role in the economic growth and development of Pakistan. Different countries are trying to realign their interest while pursuing their long term political and economic objectives. Statistical analysis of data reveals that financial and capital flows, in terms of FDIs, from one economic and regional block to various Islamic Economies have shown a trade-off which means increasing flow of FDIs to one Islamic country is observed at the cost of decreasing FDIs in some other country. There are various empirical methods to research such type of relationships between financial flows and economic growth. This study has been conducted with the objective of finding such relationship between financial sector growth and economic growth of in connection with Bangladesh, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Türkiye, UAE, for the period of 2002Q1-2020Q4 using dynamic econometric models. The issue of causality between financial sector growth and economic growth had remained inconclusive. Pre-dominantly literature reveals significant role of financial system as one of the essential fundamentals of economic growth and development of an economy. This study initially applies Granger Causality Test, in order to examine financial and economic connectivity of Pakistan with the other Islamic countries. The study uses Autoregressive Distributed Lag (ARDL) approach to cointegration to examine the long run relationship between economic growth and financial sector growth,. This study employs the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) models to examine the impact of financial sector growth and its volatility on economic growth volatility. These models have clear provision for the inclusion of internal and external variables not only in the mean equation but also in the variance equation enabling us to test effectiveness of external (from Islamic countries) and domestic financial volatility on the economic growth of Pakistan. The study finds unequivocal direction of relationship from financial sector growth towards Economic Growth of Pakistan. There is a great potential of financial integration between Pakistan and the selected Islamic countries. This study also finds that any volatility occurring in terms of Foreign Direct Investment, Bank Deposits, Domestic Credit to Private sector, and Net Financial Assets, creeps into fluctuation of Pakistan's Economic Growth. The results shows economic growth volatility of Pakistan is affected by financial sector growth and its volatility.

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CHAPTER 1
INTRODUCTION

This section describes the area of research contemplated for the study, its context based on summary findings of the literature review. Additionally, objectives and research questions, problem statement, significance of the study have also been discussed.

1.1 Theoretical Background and Empirical Evidence

Economic growth of countries is observed to have been significantly related with the financial system of not only their internal economies but it also takes effect from the changing financial activities of their trading partners. With equivocal direction of relationship of financial development with economic growth, flourishing financial sector is essential for economic growth because this is the only source of channelizing saving for capital formation in the country as investment (Schumpeter, 1934). A mentionable amount of literature consider financial sector development as leading source of economic growth (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015).

Context and Background

Review of leading studies reveal very important findings regarding the relationship of economic growth and financial sector development inside and outside the economic boundaries of the country. There are recommendations of these studies to understand impact of changing conditions of internal and external financial sectors. Financial integration among the countries provides opportunities for them, and diversifies risk, improves efficient allocation of resources and leads to higher growth. Contrary to this, international connectivity of a country exposes it to macroeconomic shocks, spillover effects and transfer of crisis leading to greater volatility in growth and output.

Studies related to the financial integration have identified various factors which are common across participating economies (Stavarek, Repkova, & Gajdosova, 2012). Financial integration among the countries is independent of the financial structures of the member countries. Functioning of all financial institutions of the integrating countries vary in terms of scale and magnitude. Financial integration does not necessarily mean free flow of funds on account of difficulty level to access capital across regions and the countries. Additionally, financial integration deals with

investment opportunities in the event of supply-demand gap (Baele, Ferrando, Hordahl, Krylova & Monnet, 2004).

Schumpeter (1934) and Goldsmith (1969) have examined the leading role of financial sector development in the enhancement of economic efficiency for different economies. Studies (Tajgardoon, Behname, & Noormohamadi, 2013; Zarrouk et al., 2017) with empirical evidence find significant linkage between economic growth and financial sector development with the recommendation of viewing importance of regional financial integration for economic development and growth. Most of the previous studies related to the developed economies have focused economic growth, financial integration. The developing economies like Pakistan, on account of deficient finances created by saving investment gap, are dependent on local savings. That is the economies like Pakistan depend upon financial sources through internal and external borrowings such as international financial sources. The relationship is examined both in the short run and also long run by using the dynamic econometric models such as distributed lagged models, ARCH and GARCH models.

Justification for the Scope of this Study

Different strategies and policy measures have been employed by the managers of Pakistan Economy enabling their financial system to meet the challenges of the global development scenario at the least, if not being able to catch up the developed world. For this purpose, 1970s was the period of Islamization of Pakistani Financial sector assuming the better virtues of interest-free economic and financial products. Pakistan has also considered development of financial sector with special emphasis on Islamic principles in 1979 (Anwar, 1992). Given this as a common background, the present study considers financial sector development of selected Islamic counties as external factors affecting economic growth of Pakistan.

More specifically this study targets to find relationship of financial sector growth in Bangladesh, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Türkiye and UAE with the economic growth of Pakistan. The objective of this study is to empirically examine the role of local financial sector development in the economic growth of Pakistan at the first place. Secondly, objective of the study is also find the significance and connectivity of financial sector development in the selected Islamic Countries for the economic growth of Pakistan Economy for the period of 2002Q1-2020Q4. This study considers industrial production index but preferred to employ changing output of manufacturing sector as a proxy to represent economic growth of Pakistan. Other leading variables considered in this study include Foreign Direct Investment (FDI), Domestic Credit to Private sector (DC), Bank Deposits (BD), Net Financial Assets (NFA) from the local economy and the selected Islamic countries as

proxy for financial sector growth. The relationship is examined both in the short run and also long run by using the dynamic econometric models such as test of co-integration, Granger Causality test, distributed lagged models, ARCH and GARCH models using the data for the period of 2002Q1- 2020Q4. Studies have revealed financial sector growth as an essential factor of economic growth (Goldsmith, 1969; King & Levine, 1993; McKinnon & Money, 1973; Schumpeter, 1934; Shaw, 1973). According to Schumpeter (1982), prudential management of the financial indicators in terms of savings mobilization, assessment of projects, rationalizing the risk and supervising securities lead the economic system towards economic growth.

1.2 Research Gap

This research gap has been built from the critical review of literature, the detail of which is given in the literature review in this document.

An enormous amount of literature reveals mixed results in terms of direction of causal relationship between financial development and economic growth of economies. Nevertheless, these studies have ignored significance of the financial sector development in the friendly countries. Additionally, this study tests bi-directional relationship using Granger Causality Test to examine the relationship of internal and external financial development and economic growth of Pakistan.

Short-term relationship of financial sector growth and economic growth has been the focus of previous studies (Abduh & Chowdhury, 2012; Gudarzi Farahani & Dastan, 2013; Tabash & Dhankar, 2014; Zarrouk et al., 2017). This study is an attempt to consider relationship of financial growth and economic growth by employing more variables than the ones employed by the previous studies. Additionally, it tests short-term and long-term relationship of the two imperative sides of the economy. Previous studies considered Gross fixed capital formation (GFCF), GDP, trade and total Islamic bank's financing (Gudarzi Farahani & Dastan, 2013) without considering long term relationship of economic growth and financial sector growth in Pakistan. The previous studies have also not considered the significance of financial sector growth of the selected Islamic countries for the economic growth of Pakistan which are ideologically connected to each other. Generally, financial crises and volatility of the financial variables of various economies take up the volatility spill-over effect from one another. But this perspective has not been considered by the previous studies in general and for Pakistan in particular relation with the selected Islamic Countries.

1.3 Problem Identification

Relationship of financial sector growth and Economic Growth is summed up in three statements of research gap:

- Direction of relationship between financial sector growth and economic growth is not established for the economy of Pakistan with respect to financial sector growth of the selected Islamic countries.

- The scope of relationship can be extended over long term using various econometric models which is need of the time when regional economies are realigning their financial, economic, social and other interests.

- Financial crises, volatility and uncertainty or oscillation of the financial indicators from within Pakistan as well as Islamic countries have been the sources of variation in the economic growth of Pakistan, the extent of which needs to be tested.

1.4 Research Questions

- What is the direction of relationship between financial sector growth of selected Islamic countries and economic growth of Pakistan?

- Does the relationship between of selected Islamic countries and economic growth of Pakistan, persists in the long run?

- How is the financial sector growth and its volatility of Bangladesh, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Türkiye and UAE related to the economic growth of Pakistan?

1.5 Research Objectives

Objective of the study is:

- To examine interdependence between financial sector growth of selected Islamic countries and economic growth of Pakistan.

- To examine the long-run relationship between financial sector growth and economic growth of Pakistan.

- To empirically test as to how far the economic growth of Pakistan is affected by the financial sector growth and its volatility of Bangladesh, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Türkiye and UAE?

1.6 Significance of the Study

Economic growth of countries is observed to have been significantly related with the financial system of not only their internal economies but it also takes effect from the changing financial activities of their trading partners. With equivocal direction of relationship of financial development with economic growth, flourishing financial sector is essential for economic growth. Internal and external sources of finance support in the capital formation through investment in a country.

The present study considers financial sector development of selected Islamic counties as external factors affecting economic growth of Pakistan. More specifically this study targets to find relationship of financial sector growth in Bangladesh, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Türkiye and UAE with the economic growth of Pakistan. Findings of the study makes contribution in the academic literature related to the financial sector and its significance for the economic growth of Pakistan.

Understanding the dynamics of financial and economic fundamentals of Pakistan, would provide guidance to policy makers and regulators about the true significance of financial system of Pakistan and selected Islamic countries and for the economic growth of Pakistan, not only in short run but also in long run consistency of financial sector growth and economic growth relationship for Pakistan. Further, the issue of causality between financial sector growth and economic growth would motivate policy makers in terms of framing long term planning and decision making for Pakistan by developing and strengthening economic and financial ties with the Islamic Economies.

Understanding how financial sector growth and its volatility affects economic growth volatility is necessary for designing and evaluating economic policies and economic decision making. By incorporating leading variables of economic growth and financial sector growth, this study would give clear, precise and applicable picture in respect of financial institutions and economic growth of the country to stakeholders. Moreover, the study would contribute to the betterment of economy of Pakistan by highlighting important factors affecting the economy of Pakistan with special emphasizing on the need for promoting savings and requirement of their channelizing.

1.7 Structure of the Study

This thesis is structured as follows.

Chapter 1: Introduction. This chapter explains the outline of this study. It discusses the context and background, research gap, problem identification, research questions and research objectives. It also highlights the significance and theoretical contribution.

Chapter 2: Literature Review. This part of the document has been developed from the review of theoretical and empirical literature in the field of financial sector growth and its relation with economic growth. It consists of six sub-sections; a) Financial Growth and Economic Development, b) Financial and Economic Integration: A Historical Perspective, c) Sequential Economic Integration, d) The Theories of International Trade, e) Economic & Financial Integration, and Business cycles and Financial Variables.

Chapter 3: Methodological Framework and Data. This chapter explains methodology and model specifications to investigate the causal relationship between financial sector growth and economic growth, Long run Relationship between Economic Growth and Financial Sector Growth, Impact of Financial Sector Growth and Its Volatility on Economic Growth Volatility.

Chapter 4: Empirical Results and Analysis. This chapter share findings from the estimation of models described and elaborate in chapter 3. The results in this are organized as descriptive statistics for the general understanding of data set. Results of the econometric models have also been shared and explained using the appropriate diagnostic tests.

Chapter 5: Conclusion. The last chapter of the study gives summary of findings and policy recommendations.

CHAPTER 2
LITERATURE REVIEW

This part of the document has been developed from the review of theoretical and empirical literature in the field of financial sector growth and its relation with economic growth. Though significant amount of literature addresses the relationship between financial growth and economic growth but no consensus has been viewed in the direction of causality between the two. Predominant literature indicates financial growth as source of economic growth. In the current era of regional integration, Islamic countries have always played significant role in supporting the economy of Pakistan.

2.1 Financial Growth and Economic Growth

A coordinated system of monetary and real sectors of an economy always play a role in the economic development and growth of the economy. Financial sector development is one of the major sources of supply of funds for the real sector. Banking sectors deposits mobilization through interest rate reduction and money supply creates credits for the manufacturing sector of the country. Main hypothesis of this study encompasses the role of financial flows playing as an impetus for the large scale manufacturing sector which ultimately provide sustainable base and foundation for the development and economic growth. Such a direction of relationship is covered in the supply-side economics.

Many studies (Christopoulos & Tsionas, 2004; Demirgüç-Kunt & Maksimovic, 1998; Jordaan & Eita, 2007; King & Levine, 1993; Rioja & Valev, 2004) have shown growth in financial sector significantly affecting growth of an economy. On the contrary studies (Al-Malkawi, Marashdeh, & Abdullah, 2012; De Gregorio & Guidotti, 1995; Hermes & Lensink, 2007; Samargandi, Fidrmuc, & Ghosh, 2013) have also highlighted significant negative impact of financial growth on the growth and development of an economy.

Patrick and Reimer (1966) test the three diverse hypotheses including financial growth affecting economic growth which represents the (supply-side view). As a second hypothesis they test economic growth affecting financial growth which represents demand side. They also test the hypothesis of bidirectional causal relationship between economic growth and financial growth. Ndako (2017) estimated association of economic growth and financial growth in Nigeria for the period of 1960-2014 using VAR and Johansen cointegration tests. The study finds financial sector growth leading to economic growth in the long run. This study employs investment as the moderator in this relationship by employing limited number of variables which do not represent

the entire financial sector of the country. In another study, Assefa and Mollick (2017) test the same relationship for African stock and find financial sector growth having an impact on economic growth of the country ignoring the long term association of the two. Faisal, Muhammad, and Tursoy (2017) employ ARDL model to show if the relationship of the two dimensions is unidirectional in the short run or not. This particular study and, Cojocaru, Falaris, Hoffman, and Miller (2016) focus on competitiveness and efficiency of the financial market playing developmental role for economic growth of selected European countries. The efficiency was the main focus of the studies with less emphasis on the causality. Problem with the ARDL is that dependent variable builds relationship with the power of the coefficients included in the model. These coefficients cumulate their value with time and do not give efficient measure of relationship of the variables.

Omri, Daly, Rault, and Chaibi (2015) contemplate economic growth and its relationship with financial growth in North Africa and the Middle East for 1990-2011 and find through panel data models effect of financial growth on economic growth. The study however, does not explain the diagnostic tests of the panel data models in terms of cross-sectional heteroscedasticity.

Some of the leading studies Ductor and Grechyna (2015) have revealed negative effect of financial growth on economic growth and these studies incorporated the data set of 101 developing and developed countries for the period of 1970-2010. Another set of studies such as Marashdeh and Al-Malkawi (2014) relating the same variables depict positive relationship of the financial sector growth and economic growth. Most of these studies have employed ordinary least squares models and ARDL methods. Nevertheless, Grassa and Gazdar (2014) employed the panel data for GCC countries for the period of 1996-2011 and revealed that Islamic financial system could enhance the investment, savings whereby making a long term relationship with economic growth. Gudarzi Farahani and Dastan (2013) applied panel cointegration approach and revealed Islamic bank's total financing having a strong positive relation with economic growth in the short run and the long run.

Considering findings of the previous studies (Hossain, Biswas, Hossain, and Poddar (2017), (Spiegel, 2012); (Oh, Lau, Puah, & Mansor, 2010), (Bayoumi & Bui, 2012) and (Bai & Zhang, 2012), it can be concluded as testable hypothesis that financial growth and economic growth are related to each other irrespective of the direction of their relationship.

Hussein, Mohieldin, and Rostom (2017) employed VECM on Egyptian Economy using the sample from 1991 to 2010 to find the relationship between economic growth and financial development. This study has highlighted the importance of increasing private savings in financial development which ultimately lead to the economic growth and development.

A comparative study of China and USA has been conducted by Lu, Guo, Dong, and Wang (2017) to examine role of financial sector in the economic development. The study employs Pairwise Dumitrescu Hurlin Panel Causality Test in VAR model for the sample of 1991-2014 and finds significant role of financial development in influencing economic growth of both USA and China. Nevertheless, China being in the phase of rapid industrialization with different economic dynamics is still to develop its financial system as per financial regulations of IFRS. Another study of Nyasha, Gwenhure, and Odhiambo (2017) examines a two-way causal relationship between economic growth and financial development for Ethiopia including the sample of 1980-2014. This study employs Pairwise Dumitrescu Hurlin Panel Causality Test and error-correction and ARDL models. Findings of the study reveal short term two-way causal relationship while in the long run, financial development, of not only local economy but also from the international financial flows set economic growth on a momentum. Shahbaz, Van Hoang, Mahalik, and Roubaud (2017) also reveal similar findings for India based on their data for the period of 1960 to 2015 using the ARDL model. The study also finds bad news creating significant shocks in the financial sector and thus adversely affecting the economic growth. All of these studies have signified the role of financial variables such as interest, savings, banking sector deposits mobilization and expansionary monetary policies in the expansion of real sector of the economies. A constant expansion of the real sector of the economy ultimately becomes the source of economic growth through a leading growth of large scale manufacturing sector.

Some of the studies have included inflation (price index) adversely affecting real value of the financial assets which temporarily restrict economic growth. These studies have been conducted on the economies of Hong Kong, Türkiye, and Romania for the sample of 1990-2017. Ho and Njindan Iyke (2017) investigated the role of banking sector assets and liabilities with the endogenous role of inflation in the determination of economic growth of Hong Kong for the period of 1990 to 2014. This study finds the direct effect of financial variables on economic growth of Hong Kong. Durusu-Ciftci, Ispir, and Yetkiner (2017) studied and revealed adverse effect of price instability and a positive relationship between economic growth and financial development of 40 countries for the period of 1989 to 2011. The study employed the Augmented Mean Group and Common-Correlated Effects and reveal long term effect of financial development on economic growth. Similar findings have been revealed by Aydin and Odabasioglu (2017) for Romania using the sample of 2002-2015, and Türkiye with the sample of 1999-2015. These two studies have employed as threshold, autoregressive model. These studies have also recommended to explore the importance of foreign direct investment, exchange rate and other financial flows for economic growth and development.

A study published in 2017 related to one of the African countries, Nigeria, employed VAR and Johansen Co-integration models for the period of 1960-2014. This study

finds the moderating role of investment between the relationship of financial development leading to economic growth in the long run. Another study of Assefa and Mollick (2017) also finds investigates the similar relationship for the African stock markets using the sample for the period of 1995 to 2010. The study reveals significant role of endogenous stocks as an indicator of financial development which leads to African economic growth.

Jung (2017) finds long term significant effect of financial development through banking stocks, deposits and credit creation on economic development of South Korea using the sample from 1961 to 2013. The study employs the Pairwise Dumitrescu Hurlin Panel Causality Test based on Vector Autorgression model, cointegration analysis and unit root tests.

Some of the studies tested the role of financial indicators through saving mobilization which improves the competitiveness of financial markets and thus lead to the economic growth measured by industrial output. These studies include Faisal et al. (2017) Cojocaru et al. (2016) related to the selected European countries; Lipovina-Božović and SMOLOVIĆ (2016), Muhammad, Islam, and Marashdeh (2016) related to the GCC countries for the period of 1975-2012. These studies employed Pooled OLS, GMM and dynamic panel data models.

2.2 Financial and Economic Integration: A Historical Perspective

Economic and financial integration dates back to the industrial revolution which made a shift from agrarian economies to mechanized and then highly mechanized ones through the international trade. The industrialization was not possible without increased supply of raw materials to support growth of mass production and mechanization. The 18th century colonization spread over the early years of the 19th century as well. This was the period when industrialization in the currently advanced countries arranged to bring resources and products from colonies. Studies have shown an unequal exchange of goods (Dragusanu, Giovannucci & Nunn, 2014). The world learnt the lesson from the War and trade barriers were gradually removed after the great depression of 1930s. Consequently, international institutions such as GATT-later on WTO came into being in addition to the creation of IMF and IBRD.

The General Agreement on Tariffs and Trade (GATT) helped the member countries rationalize import duties, customs and tariffs through successive rounds of negotiations. Gradually, the member countries moved towards liberalization and the world entered into a new phase of World Trade Organization (WTO) in 1995. The platform of WTO ever since its creation played the role of making new agreements, settling down trade

disputes and resolving the legal issues that might arise. The development under the umbrella of WTO ensures a smooth multilateral global trade system and international financial transactions. This body includes around 180 member countries of the world (WTO, 2020) after meeting certain economic and policy conditions.

According to the regulations of WTO, all the regional trade agreements and multi-country trading blocs have to be ratified by the WTO. More than 291 regional trading areas including free trade areas and preferential trade agreements are listed in the WTO record by the year 2019. Increasing number of free trade areas and regional trading agreements clearly speak of recognition of interdependence and interconnectedness of various countries in the world and these agreements have played a significant role in the economic growth and financial developments of the member countries. Economic growth and development of a country cannot be decided from a unilateral perspective, rather it requires a broader view. Formal and informal economic and financial integration at least reduces trade barriers through recognition of interdependence of monetary and fiscal policies. Keeping this historical perspective and the development of WTO, the present study explores dependence of Pakistan's economic growth on not only local financial sector development but also recognizes the role of financial flows associated with the selected Islamic countries. The financial flows of different countries being interdependent reduce costs for consumers and the large scale manufacturing industries and help promote trading opportunities among the participating countries (Naeem & Naz, 2005). We explore these opportunities and measure the dependence of Pakistan's economic growth, in terms of changing industrial output, on the financial variables from Pakistan and the selected Islamic Countries.

2.3 Sequential Economic Integration

Economic integration in the world is observed to have followed a sequence from autarky, preferential trading arrangements, free trade area, common market and economic union and then to common currency. In the current economic era, consumers, businesses and the government of any one country hardly function independent of other countries. Objective of this study is to explore interconnectedness of Pakistan Economic growth with selected Islamic Economies in terms of financial indicators. Complete economic and financial integration is a long journey to travel among the Islamic countries. This study is an attempt to explore as to the extent of Pakistan economic growth linked with financial sector of Pakistan and financial development of

the selected Islamic countries. We believe that theoretically, sequential stages of integration exist, yet practical progression through these stages is hard to follow.

It is essential to study the extent of integration between the Pakistan and the selected Islamic Countries. Based on findings from this study we are able to recommend as to the pursuit of sequential order of further steps of economic integration. There are many more examples of free trade agreements. NAFTA is among USA, Canada and Mexico; The ASEAN Free Trade Area of Singapore, Brunei, Vietnam, Bhutan, Brunei, Cambodia, Indonesia, Malaysia, Thailand and the Philippines. The Gulf Cooperation Council (GCC) includes Saudi Arabia, United Arab Emirates, Oman, Qatar, Bahrain and Kuwait. The East African Community (EAC) includes Burundi, Kenya, Tanzania, South Sudan, Uganda and Rwanda. Pakistan being highly dependent on flows from Islamic countries does not have any free trade with any country. Still its economic growth remains dependent on financial development of these Islamic countries.

2.4 The Theories of International Trade

The international trade theories have gone through various approaches with respect to the levels of economic integration. During the late 1700s, the theory of absolute advantages by Adam Smith (Myint, 1982) has been a useful tool for understanding free bilateral trade. Smith in his 'Wealth of Nations' emphasizes on the division of labor and specialization to explain how a country can specialize in the goods which it makes at a cheaper cost and import goods which the trading partner has got absolute advantages by producing at the least cost. David Ricardo in the early 1800s, realizing the limitations of Absolute Advantages, extended the concept of free trade to a comparative efficiency which allows each country to minimize comparative costs of production and specialize in only in the one product. Both of these classical theories of free trade are not a zero-sum game. Rather, overall productivity of the trading partners expands on account of efcient allocation of resources.

2.4.1 An Appraisal of Free Trade and Classical Theories

Developed countries have benefited more from the free trade as compared to the less developed countries. Some of the less developed countries could increase their output by employing more labor resources (Myint, 1982). Technical advancement and financial sector development changed the dynamics of the international trade, economic growth and financial development. The development of financial institutions helped

mobilize savings through the direction of financial flows from one country to another by financial integration.

Development of the Heckcher and Ohlin models from Germany in the early 1900s introduced differential in the factor prices and factor abundance as bases for trade integration of different countries (Greenaway & Milner, 1990; Myint, 1982; Schor, 2016). Comparative advantages were redefined, while recognizing more than one factors of production and factor proportions. Reallocation of factors changed the income distribution of factors to support comparative advantages and international trade among the countries. This is redistribution of factors income was further illustrated with the help of Stolper-Samuelson effect (Schor, 2016). In the early 19th century, practical experience of such theories was observed in the countries like Indonesia, China and India when they shifted their labor from subsistence farming to mining and large-scale plantations. Due to short supply of local labor, switching labor within the country moved to the industries, which lead to income redistribution and maximum gains from trade (Myint, 1982).

The current industrialized and developed countries achieved their current level of mounting growth by initially following international trade policies of protectionism strategies (Rodrik, 2001). Existing developing economies need to recognize the need for strengthening financial institutions to be able to benefit from connectivity of financial institutions in a sustained manner. Developing countries (like Pakistan) have to be dependent on financial flows from their friendly countries due to small savings, rising consumption expenditures and mounting twin deficits (Greenaway & Milner, 1990).

2.4.2 Proponents of Free Trade

The ever rising growth of the Asian economies during the mid-60s and then the early 90s represented by per capita GDP can be attributed to opening up of these economies to trade and financial integration, in addition to many other factors such as improving productivity of labor and capital, and stable governance (Dumrongrittikul, Anderson, Vahid, 2019). The openness to trade and financial interdependence allowed these countries reallocation of resources towards productive sectors of the economy which are termed as main driver behind growth.

Financial integration of the countries may help reduce the trade and non-tariff barriers (Boudreaux & Ghei, 2018). For poorer economies, opening up trade and financial integration creates multiple learning and production activities in making affordable goods and services, thus helping reduce poverty (World Bank, 2018). The World Bank reports during the last three years reveal that poorer countries may not be able to take full advantage of the beneficial results of direct trade. These poor countries lack

infrastructure, both in terms of transport and logistics, and also in terms of communication and information technology. The World Bank have expressed their plan to address these issues through financial integration of the countries.

International trade and financial linkage leads to a systematic flow of benefits which are at a slow yet steady pace. Financial sector connectivity of the countries might be a source of flow of knowledge from one country to another which allows innovation to take fruit as a result (Grossman & Helpman, 2015).

The benefits of trade are not always seen in terms of growth. The economies may be linked through financial indicators to realize welfare effects which may be separate from the growth effects of trade and finance (Woolan, 2016). Yet financial growth in the countries eventually, lead to create traditional growth effects in terms of increased consumption and production.

2.5 Business cycles and Financial Variables

2.5.1 Stages of a Business Cycle:

An inconsistent growth of the gross domestic product (GDP), or output measured in terms of market value represents a natural occurrence of business cycle in an economy over a specific time period. In other words, a natural progression of rise and fall is termed as a business cycle. A business cycle passes through four sequential stages of expansion, peak, contraction and trough in the economic activity (Amadeo, 2018). The IMF organizes its data bank around economic activity with different indicators. Industrial production index, change in manufacturing output are the two leading indicators of cycles measured on quarterly basis for all the member countries of the IMF. This study considers these two variables as proxy for economic growth of Pakistan for the period of 2002Q1 to 2020Q4.

GDP, IPI and manufacturing output can be used to determine which phase the economy is in at a specific time. An improvement in these indicators continues, growth reaches all-time high, and then starts entering into contraction phase. During the peaked phase, all types of prices reach the higher levels, create an asset bubble through overvaluation and then fall. During the period of fall, the economy slows down, and growth in incomes and production is bound to fall creating huge unemployment, reflecting a bearish stock market and losing the investors' confidence. This contraction leads to recession, and if persists it leads to the trough. A long-term-persistent recession is a sign of decrease in demand which ultimately is likely to turn into economic depression. Resultantly, wages, income, employment all decrease. If the poor countries stuck into

it, they cannot recover without the external financial aid and financial reforms. The rising demand for goods and services play significant role in the recovery phase.

Studies mainly use GDP growth, but there are studies which use employment levels (Mejía-Reyes, Rendón-Rojas, Vergara-González & Aroca, 2018), firms output and sales growth, and government activities in terms of expansionary and contractionary monetary and fiscal policies (Ductor & Leiva-Leon, 2016) to manage the adverse effects of business cycles. The adverse effects of fiscal indiscipline are most of the times rationalized through monetary policy tools including interest rates, deposit mobilization, money supply, and management of monetary assets in addition to international financial inflows to the economy. Given this as a background, this study aims to explore the role of financial flows of the selected Islamic countries in the performance of Pakistan economic growth using the manufacturing growth and the Industrial Production Index as proxy for economic growth of the country.

2.5.2 Evidence regarding Business Cycles and their Synchronicity

The literature has addressed possibilities of business cycle of different countries to move together. This is one of the major objectives of the current study to relate Pakistan's economic growth with financial sector of the not Pakistan but also the financial indicators of the selected Islamic countries for better understanding of co-movement. Historically, global economies have connected and any financial changes occurring in one country do affect the economic performance of the other countries (Zarnowitz, 1984). Despite different source of economic fluctuations, there have always been certain common factors causing fluctuation in the output of an economy. These co-movements of different economies are a reflection of long term development and growth trends in the economy and across the economies (Frankel & Rose, 1998, Zarnowitz, 1992). The economic indicators of co-movement include aggregate production and aggregate sales, private investment and consumer spending, wages, salaries, and dividends, interest rates and savings which are also major contributory factors of the business cycles and which also make pro-cyclical or counter-cyclical.

During the declining phase of a business cycle, employment, output and real income and other financial indicators fall reflecting the early signs of a recession, with falling investment, capital expenditure and financial securities. Business cycles have an international aspect and represent synchronicity of different countries (Cooke, Kose, Otrok & Owyang, 2015). The country specific shocks may spread over the other areas through integration financial capital and financial flows leading to symmetrical business cycles (Mejía-Reyes, Rendón-Rojas, Vergara-González & Aroca, 2018).

2.5.3 Facts Providing Theoretical Base

Generally, theories of international trade offer a basis for the study of globalization as a source of synchronized business cycles of various countries and the regions. Nevertheless, literature has singled out facts, which provide the basis for the business cycle and financial integration and synchronization.

The business cycles and financial developments are interrelated movements in terms of numerous economic variables (Kufenko & Geiger, 2017). Different approaches in economics have followed each other in the history of economics. Post-Keynesian approach was followed by Monetarist and Neo-Classical approaches, and later the Neo-Keynesian approach over the decades since the Second World War ended (Zarnowitz, 1984). No cohesive theory of business cycles exists today. However, empirical evidences, econometric models and statistical approaches focus on showing the financial integration of various countries and the regions. The momentum and trends in economic and financial variables have tendency to recur frequently across various countries time and again. This study focuses on such trends of the financial variables among selected Islamic countries and Pakistan. Such key integrating financial variables of Pakistan and the Islamic countries may not have their way into theory yet, but they do form a basis for structured stylized facts (Kaldor, 1957).

Out of many studies, three of them can be considered as the leading ones which deeply addressed movements through aggregate output with their integration of the financial indicators (Kufenko & Geiger, 2017). These studies include Lucas (1997), Zarnowitz (1992) and Ryan (2002), which address the pro-cyclical changes and counter-cyclical changes in the financial and economic indicators. These research studies primarily focus on the relationships of multiple economic and financial variables across the countries and the regions at different levels. The empirical studies following the three seminal research reveal that the economies move in sync and changes in a few countries do affect the economic and financial variables of the other countries. Duration of cycles related to the financial and economic indicators from various countries and the regions show is also consistent and in conformity with each other. The empirical studies have also calculated and forecast cycle durations lasting five to eight years (Kufenko & Geiger, 2017; Romer, 2008 and Zarnowitz, 1992).

These empirical facts and evidences have mostly based on data from the US economy being the leading economic and financial giant economy of the world. There is need for conducting similar studies in the various regions. The present study aims to focus on the financial and economic integration with a view to empirical test the economic and financial sync of these Islamic countries with the economy of Pakistan.

2.6 Economic & Financial Integration

Financial integration among the countries varies across economies of different sizes, depths and openness. Several positive results change the attitude of policy makers, financial managers to take initiatives towards financially integration. At the same time there are risks associated with financial linkages.

Financial integration leads the economies to relaxing the restrictions on financial flowsand connects financial markets of different economies (Lane & Milesi-Ferretti, 2003). Looking at the benefits of financial integration, countries commit to create and economic environment amenable to capital inflows through various reforms related to the capital and financial markets and try to attract foreign direct investment (Agenor, 2001). Financial inflows to the developing economies like Pakistan, bridge the demand-supply gap of funds for investment (Obstfeld, 1994). Financial integration of the countries promote specialization and enables them for efficient capital allocation and promotes economic growth (Edison, Levine, Ricci & Sløk, 2002).

Portfolio flows most commonly includes investments in shares/equities, bonds and certificates of deposits; and technological advancements have allowed such flows relatively easier to materialize (Agenor, 2001).

Financial flows among the countries with different portfolio include investments in shares, equities, bonds and saving certificates, banking deposits and debentures which have been greatly supported by improved financial technologies (Agenor, 2001). China has set up new model of financial flows with the understanding of financial volatility (Agenor, 2001). Now financial flows, foreign direct investment (FDI) are observed towards developing economies instead of bi-directional flows. Higher rates of return from investments are the major reason for diversified investments. These returns adequately serve hedging against risk of losses. Financial integration helps countries to absorb shocks which are brought about by financial crises (Ductor, Lorenzo, Leiva-Leon & Danilo, 2016).

Different countries respond differently to external shock and there is need to incorporate such a shock-based volatility and realize the need for financial integration which may help reduce business cycle (Cesa-Bianchi, Imbs & Saleheen, 2018). Apart from trade being a big main source of cyclical effects, financial crises, create business cycles in the financially integrated areas and the economies.

Uncertainty and volatility in the financial variables do not directly affect the economic growth rather it is affected through variance equation by volatility of financial variables. This perspective has not been covered by the previous studies. To cover the financial

integration of Pakistan and the Islamic countries this study incorporates financial indicators of Islamic countries in the variance equation of the GARCH models. Following the recommendations of some of the previous studies (Meller & Metiu, 2017).

2.6.1 Theoretical fundamentals of financial integration

Financial integration among the countries provides opportunities for them, and diversifies risk, improves efficient allocation of resources and leads to higher growth. Contrary to this, international connectivity of a country exposes it to macroeconomic shocks, spillover effects and transfer of crisis leading to greater volatility in growth and output.

Studies related to the financial integration have identified various factors which are common across participating economies (Stavarek, Repkova, & Gajdosova, 2012). Financial integration among the countries is independent of the financial structures of the member countries. Functioning of all financial institutions of the integrating countries vary in terms of scale and magnitude. Financial integration does not necessarily mean free flow of funds on account of difficulty level to access capital across regions and the countries. Additionally, financial integration deals with investment opportunities in the event of supply-demand gap (Baele, Ferrando, Hordahl, Krylova & Monnet, 2004).

Countries can move towards integration only when cross-border financial services are available in terms of financial markets, capital markets, equity and banking services. This is covered in the current study. Foreign banks working in the local markets play important role in developing the financial integration of various countries even if there is no formal agreement among the countries for financial integration (Stavarek, Repkova, & Gajdosova, 2012). Historically, monetary unions, common currency and dollarization passed through this informal financial coordination (Liebscher, Christl, Peter & Ritzberger-Grünwald, 2006). Another format of the financial integration has been observed in terms of free access to capital accounts, listing of equity, bond, securities on foreign stock exchanges under certain policies. This study is exploring the effect of financial indicators of Pakistan and the Islamic countries on the economic growth of Pakistan through mean and variance equations which is a pre-condition to understand efficiency of the markets of these countries. Statistically significant results will highlight the possible integration of these Islamic countries with the economy of Pakistan as per findings of the studies (Stavarek, Repkova, & Gajdosova, 2012).

VAR models have not been considered in this study on account of their being lag-sensitive. Most of the previous studies have employed OLS in different formats including VAR as a-theoretic model, ARDL and other single equation based models. The linear regression models do not estimate the variance equations which are the main source of measuring volatility and conditional variance. Nonetheless, studies have not employed GARCH models which intuitively estimate mean and the variance equations. We consider in this study the significance of financial development for economic growth of Pakistan Economy both from the local as well as selected Islamic Countries. Integrated effect of financial growth on the economy of Pakistan can be measured through the mean and the variance equations using the GARCH models.

Economic Requirements for the Free Trade Area (FTA)

In order to reach FTA, the member countries have to have Long-term common political and economic interests like European Free Trade Area (EFTA) and European Union (EU), Latin American Free Trade Area (LAFTA) and other regional trade and economic coordination. In the pursuit of free trade are, the member countries have go through Custom union, Trade creation, Trade Diversion, in the short-run. Then common economic policies, institutions of common interest for the long-run sustainability of economic ties in the changing circumstance.

Understanding of the financial ties among Pakistan and Islamic countries can be a step towards FTA and other achievements. FDI has been a source of job creation and building productive capacity in Pakistan Economy. China, Hong Kong, USA, UK, Netherland, and UAE provided Pakistan with 77% of the total net FDI during 2020-21. GCC members have their own agenda of economic coordination and Pakistan does not bear an economic weight in this regional coordination of the GCC. Except UAE, FDI from GCC stand nowhere during the last 10 years. Share of the FDI from six leading countries is as:

- China $1.847 billion (41%).
- Hong Kong 8.5%
- USA 8.4%
- UK 7.7%
- Netherlands 5.8%
- UAE 5.5%.

Historically, Western countries have been the major trading partners. There is need to explore the possible integration of financial sector of Pakistan and selected Islamic countries with the economic growth of Pakistan.

Pakistan's Current Trade Relations with GCC Members

An analysis of trade ties with the GCC-members during 2009-2020 is presented in Tables 1 & 2. Important findings from this data are shared as the following points:

- Pakistani total exports to all GCC never exceeded 15%
- Maximum average Pakistani exports to a GCC member has been 2.16% of total, in 2012.
- UAE is on the top to buy Pakistan Exports (8.54%), that too declined over the years.
- Maximum average Pakistani imports from GCC is 2.16% of total imports at the most
- Pakistani total imports from all GCC never exceeded 38.63%.
- Most of the Pakistani current imports are from UAE ($4.48b), KSA ($1.89b), and Qatar ($1.48b).
- In terms of current ranking of importers UAE is the 2nd, KSA and Qatar are the 5th and 6th largest importers from Pakistan in the GCC.
- In terms of current ranking of Pakistani exports, none of the GCC-members is listed in the top ten buyers from Pakistan.

The volume of trade with GCC is not so significant. Certain conclusions can be drawn based on the findings listed above. Pakistan has comparatively more advantages in strengthening trade ties with the neighboring countries. For FTA with the GCC, Pakistan will have to go for 'trade creation' and 'trade diversion' policies. Financial integration can play an important role towards economic integration of Pakistan and the Islamic countries. Ministry of trade and commerce will have to explore lines of products with comparative advantages for trading with the GCC. Until and unless Pakistan economy expands in terms of cost-efficient production, and exportable industries, FTA will not accrues benefits. Cost-efficiency requires member countries to integrate and bridge the gap between supply and demand for funds created due to skewed distribution of savings in these Islamic countries.

Table 1: Pakistan's Exports to GCC as Percent of Total Exports

Year	Bahrain	Iraq	Kuwait	Oman	Qatar	KSA	UAE	Total	Average
2009	0.37%	0.51%	0.47%	0.78%	0.84%	2.43%	8.43%	13.84%	1.98%
2010	0.35%	0.60%	0.43%	0.65%	0.52%	1.90%	8.54%	12.99%	1.86%
2011	0.30%	0.24%	0.36%	0.73%	0.45%	1.65%	7.55%	11.29%	1.61%
2012	0.28%	0.17%	0.33%	0.60%	0.32%	1.84%	11.59%	15.13%	2.16%
2013	0.37%	0.10%	0.38%	0.75%	0.31%	1.96%	7.05%	10.94%	1.56%
2014	0.33%	0.19%	0.40%	0.75%	0.30%	2.06%	5.35%	9.39%	1.34%

Year	Bahrain	Iraq	Kuwait	Oman	Qatar	KSA	UAE	Total	Average
2015	0.31%	0.14%	0.45%	0.77%	0.29%	1.95%	4.06%	7.97%	1.14%
2016	0.31%	0.09%	0.48%	0.49%	0.30%	1.85%	3.82%	7.34%	1.05%
2017	0.19%	0.10%	0.39%	0.54%	0.30%	1.53%	3.87%	6.92%	0.99%
2018	0.24%	0.10%	0.42%	0.59%	0.44%	1.28%	4.00%	7.06%	1.01%
2019	0.30%	0.15%	0.44%	0.69%	0.50%	1.71%	4.74%	8.53%	1.22%
2020	0.30%	0.12%	0.50%	0.67%	0.66%	1.94%	4.93%	9.13%	1.30%

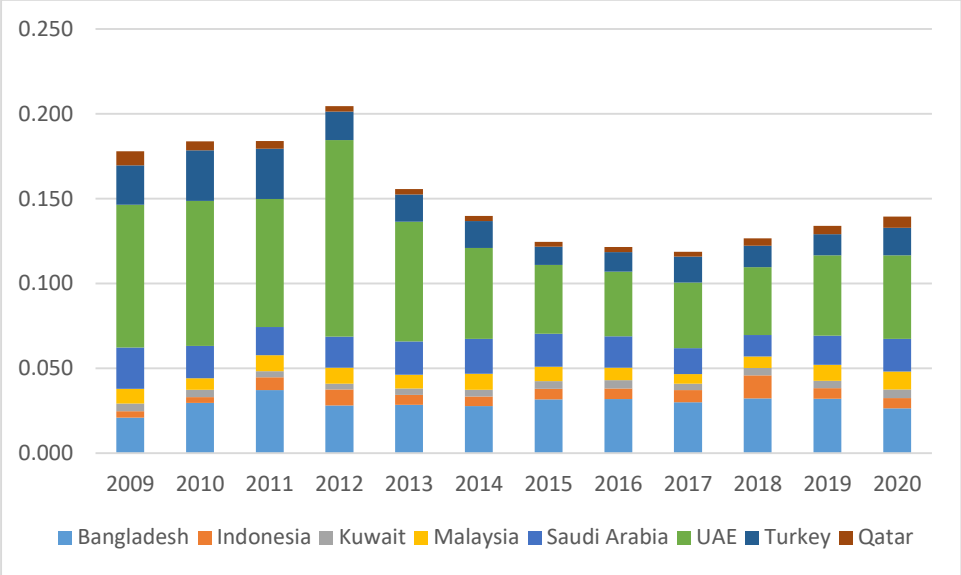
Table 2: Pakistani Imports from GCC as Percent of Total Imports

Year	Bahrain	Iraq	Kuwait	Oman	Qatar	KSA	UAE	Total	Average
2009	0.42%	0.08%	5.68%	0.84%	0.53%	11.02%	10.92%	29.49%	4.21%
2010	0.78%	0.00%	6.95%	0.42%	0.41%	10.22%	13.98%	32.75%	4.68%
2011	0.59%	0.01%	8.93%	0.58%	0.58%	10.71%	15.65%	37.04%	5.29%
2012	0.32%	0.01%	9.61%	1.66%	0.79%	9.78%	16.46%	38.62%	**5.52%**
2013	0.16%	0.01%	9.02%	2.57%	0.38%	8.79%	17.71%	**38.63%**	5.52%
2014	0.24%	0.04%	6.22%	2.38%	0.38%	9.29%	14.89%	33.43%	4.78%
2015	0.06%	0.03%	3.89%	1.40%	0.73%	6.84%	13.04%	25.98%	3.71%
2016	0.18%	0.04%	2.71%	0.54%	1.65%	3.92%	13.20%	22.24%	3.18%
2017	0.17%	0.12%	2.56%	1.15%	2.81%	4.76%	13.15%	24.72%	3.53%
2018	0.16%	0.09%	2.35%	1.43%	3.93%	5.32%	14.41%	27.69%	3.96%
2019	0.08%	0.04%	2.51%	1.22%	4.38%	4.90%	12.63%	25.75%	3.68%
2020	0.11%	0.09%	2.45%	1.34%	3.24%	4.14%	9.79%	21.16%	3.02%

Pakistan's Trade Relations with Islamic Countries

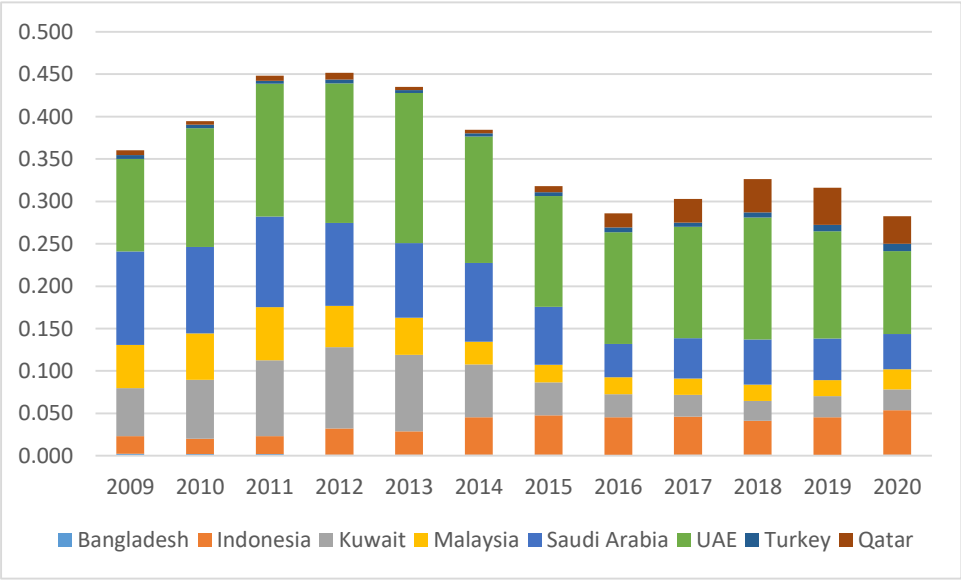
The bar chart clearly indicates share of Pakistani exports to different Islamic Countries considered in this study. This share is the highest with KSA and UAE indicating the rising importance and requirements for the growth of trade and finance relationship with the Islamic countries. There is great potential for trade with Bangladesh, Türkiye and Malaysia. The trade figures show in the graph span over the period of the last 12 years for the perusal of readers.

Figure 1: Share of Pakistani Exports with Islamic Countries



Over the last 12 years our overall exports to these Islamic countries have been on the decline which is something to worry about for the policy makers of Pakistan.

Figure 2: Share of Pakistani Imports with Islamic Countries



When we look through the charts given in figure 2, it is evident from the graph that KSA, UAE, Malaysia, Kuwait, have been significantly important for Pakistan. These are the major countries selling their products to Pakistan. One thing is common in these figures that is declining trade relationship of Pakistan with the Islamic countries during the last 12 years in general and during the last four years in particular. However, imports from Qatar and Indonesia to Pakistan have slightly improved during the last 4 years. Pakistan needs to improve its diplomatic and trade relations with the Islamic countries. Diplomatic ties help to improve trade, economic and financial relations with the Islamic countries.

There is need to launch trade talks between Pakistani concerned ministries with their Islamic countries counter parts. Identify and mutually exchange the lines of products with comparative advantages between Pakistan and the Islamic countries. Preferably start exploring FTA with the neighboring Islamic countries.

CHAPTER 3
METHODOLOGICAL FRAMEWORK AND DATA

To examine the relationship between economic growth and financial sector growth, this chapter presents model specifications, estimation methods and data descriptions.

3.1 Model Specifications and Methodological Framework

The method specifications and framework of this research study is as follows:

3.1.1 Interdependencies between Economic Growth and Financial Sector Growth

To examine the interdependencies between economic growth and financial sector growth, causal relationship between them is investigated. For this purpose Granger causality test is used. A general specification of the Granger causality test in the context of two variables is expressed as follows:

$$EG_t = \alpha_0 + \alpha_1 EG_{t-1} + \alpha_2 EG_{t-2} + \dots\dots\dots \alpha_i EG_{t-i} + \beta_1 FG_{t-1} + \beta_2 FG_{t-2} + \dots\dots\dots + \beta_i FG_{t-i} + \varepsilon_{1t} \quad (1)$$

$$FG_t = \alpha_0 + \alpha_1 FG_{t-1} + \alpha_2 FG_{t-2} + \dots\dots\dots \alpha_i FG_{t-i} + \beta_1 EG_{t-1} + \beta_2 EG_{t-2} + \dots\dots\dots \beta_i EG_{t-i} + \varepsilon_{2t} \quad (2)$$

where, EG_t is economic growth of Pakistan at time *t* and FG_t is financial sector growth. The ε_{it} is the error term at time *t*.

The Granger causality test tests the null hypotheses that the FG does not Granger-cause EG and the EG does not Granger-cause FG. The F values are estimated for Granger causality.

3.1.2 Long run Relationship between Economic Growth and Financial Sector Growth

To examine the long run relationship between economic growth and financial sector growth, Autoregressive Distributed Lag (ARDL) approach to cointegration is used. The ARDL model for economic growth is specified as follow

$$EG_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_{2,k} FDI_{k,t-1} + \alpha_{3,k} BD_{k,t-1} + \alpha_{4,k} DC_{k,t-1} + \alpha_{5,k} NFA_{k,t-1} + \sum_{l=0}^{P=l} \beta_{1,k} FDIG_{k,t-i} + \sum_{l=0}^{P=l} \beta_{2,k} BDG_{t-i} + \sum_{l=0}^{P=l} \beta_{3,k} DCG_{t-i} \sum_{l=0}^{P=l} \beta_{4,k} NFG_{t-i} + \varepsilon_{1t} \quad (3)$$

where EG_t is economic growth of Pakistan at time t, $FDIG_{k,t-i}$ is foreign direct investment growth at time *t-i* of each country *k*, $BDG_{k,t-1}$ is bank deposits growth at time *t-i* of each country *k*, $DCG_{k,t-i}$ is private domestic credit growth at time *t-i* of each country *k*, $NFAG_{k,t-i}$ is net foreign assets growth at time *t-i* of each country *k*.

For the estimation of ARDL model (2), residual augmented least squares (RALS) method is used. The Akaike Information Criteria (AIC) and Schwarz Bayesian Criteria (SBC) are used for lags selection. The bound test method is used to see if there are any long-run relationships between variables. The F-test is used to do bound testing. The F-test sets the hypothesis of no cointegration among the variables against the hypothesis of cointegration among the variables, which is denoted as:

Ho: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$

i.e., there is no cointegration among the variables.

H_1: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$

i.e., there is cointegration among the variables.

The ARDL bound test is based on the Wald-test (F-statistic). Pesaran et al. (2001) provides two critical values for the cointegration test. The lower critical bound implies that all variables are I(0), implying that the variables under consideration have no cointegration relationship. The upper bound implies that all variables are I(1), implying that the variables are cointegrated. The H_0 is rejected when the estimated F-statistic is greater than the upper bound critical value (the variables are cointegrated). The H_0 cannot be rejected if the F-statistic is less than the lower bound critical value (there is no cointegration among the variables). The results are inconclusive when the estimated F-statistics lie between the lower and upper bounds.

Then, the unrestricted error correction (UECM) model is specified. The long-run elasticities are calculated using the unrestricted error correction model by dividing the coefficient of the one lagged explanatory variable (multiplied with a negative sign) by the coefficient of the one lagged dependent variable.

$$EG_t = \theta_0 + \gamma EC_{t-1} + \sum_{I=0}^{P=l} \theta_{1,k} EG_{k,t-i} + \sum_{I=0}^{P=l} \theta_{1,k} FDIG_{k,t-i} + \sum_{I=0}^{P=l} \theta_{2,k} BDG_{k,t-i} + \sum_{I=0}^{P=l} \theta_{3,k} DCG_{k,t-i} \sum_{I=0}^{P=l} \theta_{4,k} NFG_{k,t-i} + \varepsilon_{2t} \quad (4)$$

where, EC_{t-1} is the error correction term.

3.1.3 Impact of Financial Sector Growth and Its Volatility on Economic Growth Volatility

In order to examine the impact of financial sector growth and its volatility on economic growth volatility, Generalized Autoregressive Conditional Heteroscedasticity (GARCH) models are used. These models are able to capture the three common stylized facts in economic growth series which are fat tails, skewness and volatility clustering.

To examine the impact of financial sector growth on economic growth volatility, ARMA (p, q) – GARCH (p, q) model and EGARCH (p, q) are specified as follows:

$$\mathrm{EG}_t = c_i + \sum_{l=1}^{p} \delta_l \mathrm{EG}_{t-l} + \sum_{m=1}^{q} \varphi_m \varepsilon_{t-m} + \varepsilon_t \quad (5)$$

GARCH (p,q)

$$h_t = \omega_0 + \sum_{l=1}^{q} \alpha_l \varepsilon_{t-l}^2 + \sum_{m=1}^{p} \beta_m h_{t-m} + \gamma_{k,1} FDIG_{k,t} + \gamma_{k,2} BDG_{k,t} + \gamma_{k,3} DCG_{k,t} + \gamma_{k,4} NFAG_{k,t} \quad (6)$$

EGARCH (p,q)

$$ln\, h_t = \omega_0 + \sum_{l=1}^{q} \alpha_l \left[\pi_{1,l} \frac{\varepsilon_{t-l}}{\sqrt{h_{t-l}}} + \pi_{2,l} \left\{ \frac{|\varepsilon_{t-l}|}{\sqrt{h_{,t-l}}} - E\left(\frac{|\varepsilon_{t-l}|}{\sqrt{h_{t-l}}} \right) \right\} \right] + \sum_{m=1}^{p} \beta_m h_{t-m} + \gamma_{k,1} FDIG_{k,t} + \gamma_{k,2} BDG_{k,t} + \gamma_{k,3} DCG_{k,t} + \gamma_{k,4} NFAG_{k,t} \quad (7)$$

where EG_t is economic growth of Pakistan at time *t*, h_t is conditional variance which denotes economic growth volatility, $FDIG_{i,t}$ is foreign direct investment growth at time *t* of each country *k*, $BDG_{i,t}$ is bank deposits growth at time *t* of each country *k*, $DCG_{i,t}$ is private domestic credit growth at time *t* of each country *k*, $NFAG_{i,t}$ is net foreign assets growth at time *t* of each country *k*.

To examine the impact of financial sector growth volatility on economic growth volatility, ARMA (p, q) – GARCH (p, q) model and EGARCH (p, q) are specified as follows:

$$EG_t = c_i + \sum_{l=1}^{p} \delta_l EG_{t-l} + \sum_{m=1}^{q} \varphi_m \varepsilon_{t-m} + \varepsilon_t \quad (7)$$

GARCH (p,q)

$$h_t = \omega_0 + \sum_{l=1}^{q} \alpha_l \varepsilon_{t-l}^2 + \sum_{m=1}^{p} \beta_m h_{t-m} + \gamma_{k,1} VFDIG_{k,t} + \gamma_{i,2} VBDG_{k,t} + \gamma_{k,3} VDCG_{k,t} + \gamma_{k,4} VNFAG_{k,t} \quad (8)$$

EGARCH (p,q)

$$ln\, h_t = \omega_0 + \sum_{l=1}^{q} \alpha_l \left[\pi_{1,l} \frac{\varepsilon_{t-l}}{\sqrt{h_{t-l}}} + \pi_{2,l} \left\{ \frac{|\varepsilon_{t-l}|}{\sqrt{h_{,t-l}}} - E\left(\frac{|\varepsilon_{t-l}|}{\sqrt{h_{t-l}}} \right) \right\} \right] + \sum_{m=1}^{p} \beta_m h_{t-m} + \gamma_{k,1} VFDIG_{k,t} + \gamma_{k,2} VBDG_{k,t} + \gamma_{k,3} VDCG_{k,t} + \gamma_{k,4} VNFAG_{k,t} \quad (9)$$

where EG_t is economic growth of Pakistan at time *t*, h_t is conditional variance which denotes economic growth volatility, $VFDIG_{k,t}$ is foreign direct investment growth

volatility at time *t* of each country *k*, $VBDG_{k,t}$ is bank deposits growth volatility at time *t* of each country *k*,, $VDCG_{k,t}$ is private domestic credit growth volatility at time *t* of each country *k*, $VNFAG_{k,t}$ is net foreign assets growth volatility at time *t* of each country *k*.

In this study, GARCH (1,1) and EGARCH(1,1) are used to model volatility. The conditional variance equation is employed with various ARMA (p,q) model specifications for the mean equation simultaneously. The GARCH (1,1) and EGARCH (1,1) models were chosen because they appropriately reflect the volatility dynamics and perform better in diagnostic testing. The Maximum Likelihood Estimation (MLE) approach is used to compute the estimations' covariance matrix (outer-product of gradients). The ML estimates of the parameters are obtained using the Broyden–Fletcher–Goldfarb–Shanno (BFGS) numerical optimization procedure. In addition, the error term's conditional distribution is calculated using the normal and t distributions. Diagnostic tests are used as a model selection criterion for GARCH models. These are SIC (Schwartz Information Criteria), AIC (Akaike Information Criteria, log-likelihood values, Box-Pierce Q, and Q2 statistics, and LM ARCH test. The model with the lowest AIC, SIC, or maximum log likelihood values and that satisfies the Q-test, the LM ARCH test, is chosen in the case of model selection under the normal distribution.

3.2 Data

The data sources and data description with variable definitions are given below.

3.2.1 Data Sources

The data are obtained from International Financial Statistics (IFS).

3.2.2 Data Description

The quarterly data from period 2002Q1 - 2020Q4 are used to analyze the relationship between economic growth and financial sector growth. The data for nine

Islamic countries Pakistan, Bangladesh, Kuwait, Indonesia, Malaysia, Saudi Arabia, Türkiye, Qatar and United Arab Emirate are used for empirical analysis. These countries are selected on the basis on their trade relations with Pakistan.

The economic growth is measured by percentage change in manufacturing production index. For financial sector growth is measured by percentage changes in foreign direct investment, bank deposit, domestic credit to private sector, and net financial assets. The details of variables related to economic growth and financial sector growth are given in Table 3.1.

Table 3.1: Variables, Variables Definition and Construction, and Data Sources

Variables	Variables Definition and Construction	Data Sources
Economic Growth		
Economic Growth	Manufacturing Production Index in percentage.	Constructed using IFS data.
Economic Growth Volatility	Variance of Economic Growth Calculated from GARCH Model	Constructed using IFS data.
Financial Sector Variables		
Bank Deposits	Broad Money Liabilities, Transferable Deposits (refers to the Depository Corporations), Domestic Currency. Transferable deposits comprise all deposits that are (a) exchangeable on demand at par, without penalty or restriction; (b) freely transferable by cheque and (c) otherwise commonly used to make payments.	IFS
Bank Deposits Growth	Percentage change in Bank Deposits.	Constructed using IFS data.
Bank Deposits Growth Volatility	Absolute Percentage change in Bank Deposits.	Constructed using IFS data.
Domestic Credit to Private Sector	Claims on Private Sector in Domestic Currency and then converted to USD using the relevant Exchange Rate.	IFS

Domestic Credit to Private Sector Growth	Percentage change in Claims on Private sector.	Constructed using IFS data.
Domestic Credit to Private Sector Growth Volatility	Absolute Percentage change in Claims on Private sector.	Constructed using IFS data.
Net Financial Assets	Net Foreign Assets in Domestic Currency, converted to the USD using relevant exchange rate. NFA refers to the value of overseas assets owned by a nation, minus the value of its domestic assets that are owned by foreigners, adjusted for changes in valuation and Exchange Rates.	IFS
Net Financial Assets Growth	Percentage change in Net Financial Assets.	Constructed using IFS data.
Net Financial Assets Growth Volatility	Absolute Percentage change in Net Financial Assets.	Constructed using IFS data.
Foreign Direct Investment	Foreign Direct Investment in Domestic Currency, converted to the USD using relevant Exchange Rate. The amount in US Dollar invested in the country along with management control in the business enterprise by the foreign investors	IFS
Foreign Direct Investment Growth	Percentage change in Foreign Direct Investment.	Constructed using IFS data.
Foreign Direct Investment Growth Volatility	Absolute Percentage change in Foreign Direct Investment.	Constructed using IFS data.

CHAPTER 4
EMPIRICAL RESULTS

This chapter share findings from the estimation of models described and elaborated in chapter 3. The results in this chapter are organized as descriptive statistics for the general understanding of data set. Keeping in view the basic features of the data necessary mathematical transformation on the variables have been applied for better results of the econometric models. Results of the econometric models have also been shared and explained using the appropriate diagnostic tests.

4.1 Preliminary Findings

4.1.1 Descriptive Statistics

The descriptive statistics of the data exhibit information about PAK-Economic Growth and Financial Sector Growth. These financial sector growth indicators are represented by foreign direct investment growth (FDIG), banking sectors deposits growth (BDG), domestic credit to private sector growth (DCG) and net financial assets growth (NFAG). The distribution of PAK-Economic Growth and other Financial Sector variables exhibit the features of skewness as leptokurtosis and volatility.

The table 4.1 reports descriptive statistics for the quarterly time series of Economic Growth of Pakistan, Foreign Direct Investment Growth, Bank Deposits Growth, Private Domestic Credit Growth and Net Financial Assets Growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar. The average of most of the quarterly financial sector growth variables is positive reflecting growth of those variables over time. The skewness measures asymmetry of distribution and kurtosis measures the peak or height of distribution of quarterly financial sector growth variables respectively which should ideally lie between zero and three in normal distribution.

The mean of the dependent variable-DV (PAK-Economic Growth) is positive and 3.6%, which means it increases over time. The variability in PAK-Economic Growth is observed as measured by standard deviation, which is 7.6%. The value of skewness is positive in PAK-Economic Growth and the value of kurtosis is greater than 3 for PAK-Economic Growth which indicates a heavy tailed and have leptokurtic distribution. The Jarque-Bera test statistic is positive and it is statistically significant for PAK-Economic Growth which shows prevalence of non-normality in the distribution. With reference to the financial economics, leptokurtic distribution is the reflection of risk taking attitude of the investors in the country. For the developing country like Pakistan risk taking in the manufacturing may be due to the principle of 'higher the risk the higher the return'. Financial sector of Pakistan and the Islamic countries may be encouraged to take risk of undertaking investment in Pakistan for a better return.

The mean of FDI growth of Pakistan, Bangladesh, Indonesia, Kuwait, Saudi Arabia, UAE, Türkiye and Qatar are 1.6%, 3.9%, 3.3%, 2.1%, 4.5%, 2.6%, 1.5% and 4.5% respectively. The mean values of FDI growth of these countries indicates that FDI growth of these countries increases over time. However, the mean value of Malaysia is -0.36%, which shows that FDI growth of Malaysia decreases over time. The standard deviation of FDI growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar are 61.7%, 49.2%, 56.8%, 10.4%, 71.8%, 17.4%, 12.3%, 63.2% and 16.9% respectively. It shows variability in the FDI growth of these countries.

It is observed that mean of FDI growth of Saudi Arabia and Qatar is the highest when compared to other countries. The FDI growth of Malaysia is the lowest and negative as compared to other countries. The standard deviation of FDI growth of Malaysia is the highest and Kuwait is the lowest among other countries. The higher standard deviation represents a relatively higher degree of volatility and uncertainty associated with the FDI growth. Thus, economic growth of Pakistan may not depend much on the volatility of Malaysian FDI growth. However, Kuwait's FDI growth can be possibly a source to consider for economic growth of Pakistan.

The mean of Bank Deposits growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar are 2.80%, 2.85%, 2.52%, 2.82%, 2.36%, 3.87%, 4.22%, 4.16% and 4.03% respectively. The mean of Bank Deposits growth of these countries indicate that Bank Deposits growth of these countries increases over time. The standard deviation of Bank Deposits growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar are 8.5%, 7.5%, 6.0%, 6.7%, 4.3%, 11.0%, 7.5%, 13.7% and 8.8% respectively. It shows variability and degree of uncertainty in the Bank Deposits growth of these countries.

It is observed that mean of Bank Deposits growth of UAE is the highest as compared to other countries, whereas, Bank Deposits growth of Malaysia is the lowest as compared to the other countries. The standard deviation of Bank Deposits growth of Türkiye is the highest whereas that of Malaysia is the lowest among other countries.

The mean of Private Domestic Credit growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar are 1.4%, 3.2%, 3.3%, 2.7%, 1.7%, 3.0%, 3.2%, 3.8% and 4.5% respectively. The mean values of Private Domestic Credit growth of these countries indicates that Private Domestic Credit growth of these countries increases over time. The standard deviation of Private Domestic Credit growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar are 5.0%, 1.9%, 4.4%, 2.7%, 2.9%, 2.8%, 6.0%, 8.1% and 4.7% respectively. It shows variability in the Private Domestic Credit growth of these countries.

It is observed that mean of Private Domestic Credit growth of Qatar is highest as compared to other countries, whereas, Private Domestic Credit growth of Pakistan is the lowest as compared to other countries. The standard deviation of Private Domestic Credit growth of Türkiye is the highest and Bangladesh is the lowest among other countries. Pakistan has very good trade relations with Qatar, as shown in the chapter 2. Increasing domestic credit and bank deposits in the other countries have great potential of financial flows to other Islamic countries including Pakistan. The average growth of bank deposits in the Islamic countries ranging around 4% in general cannot be considered as a very strong source of capital formation and industrial

development in any individual Islamic countries. These countries jointly have great potential to pool their financial resources for the purpose of economic growth.

The mean of Net Financial Assets growth of Pakistan, Bangladesh, Malaysia, Saudi Arabia, UAE and Türkiye are 12.58%, 5.14%, 1.55%, 3.34%, 3.00% and 3.61% respectively. The mean values of Net Financial Assets growth of these countries indicates that Net Financial Assets growth of these countries increases over time. However, the mean values of Indonesia, Kuwait and Qatar are -1.85%, -0.00% and

-3.32% respectively, which shows that Net Financial Assets growth of these countries decreases over time.

The standard deviation of Net Financial Assets growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE, Türkiye and Qatar are 53.9%, 7.5%, 29.5%, 7.4%, 5.9%, 5.6%, 15.1%, 48.2% and 11.2% respectively. It shows variability in the Private Domestic Credit growth of these countries.

It is observed that mean of Net Financial Assets growth of Pakistan is highest as compared to other countries, whereas, the mean value of Net Financial Assets growth of Qatar is the lowest and negative as compared to other countries. The standard deviation of Net Financial Assets growth of Pakistan is the highest and Saudi Arabia is the lowest among other countries.

Higher values of the standard deviation in almost all the countries speaks of the rising volatility and uncertainty in the Islamic countries in general which should be taken seriously care of. Though financial growth in Pakistan is significantly a large number, but Pakistan could not capitalize this rising growth of financial assets. Consolidated investment planning in the country is required and policy makers should look into it.

The value of skewness is positive in FDI growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia and Qatar, and negative in FDI growth of UAE and Türkiye. The value of skewness is positive in Bank Deposits growth of Pakistan, Bangladesh, Kuwait, Malaysia, Saudi Arabia, Türkiye and Qatar, and negative in FDI growth of Indonesia and UAE. The value of skewness is positive in

Private Domestic Credit growth of Pakistan, Kuwait, Saudi Arabia, UAE and Qatar, and negative in Private Domestic Credit growth of Bangladesh, Indonesia, Malaysia and Türkiye. The value of skewness is positive in NFA growth of Bangladesh, Indonesia and Saudi Arabia, and negative in NFA growth of Pakistan, Kuwait, Malaysia, UAE, Türkiye and Qatar.

The value of kurtosis is greater than 3 for FDI growth in Bangladesh, Kuwait, Saudi Arabia and Türkiye; Bank Deposits growth in Pakistan and Türkiye; NFA growth in Indonesia, Kuwait, UAE, Türkiye and Pakistan; which indicates they are heavy tailed and have leptokurtic distribution while value of kurtosis is less than 3 for FDI growth in Pakistan, Indonesia, Malaysia, UAE and Qatar; Bank Deposits growth in Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE and Qatar; Private Domestic Credit growth in all the countries; NFA growth in Bangladesh, Malaysia, Saudi Arabia, Qatar. The value of skewness and excess kurtosis show non-normality. The Jarque-Bera test statistics are positive and statistically significant for each of variable series showing non-normality in distributions.

Table 4.1: Descriptive Statistics of Economic Growth and Financial Sector Growth Variables

Variables	Obs	Min	Max	Mean	Standard Deviation	Skew-ness	Excess Kurtosis	Jarque-Bera
PAK-Economic Growth	76	-16.3150	34.7640	3.6435	7.6770	0.8163 [0.0049] ***	4.2503 [0.0000] ***	58.7390 [0.0000] ***
PAK-Foreign Direct Investment Growth	76	-174.3300	175.8400	1.6016	61.7170	0.1388 [0.6330]	0.5971 [0.2981]	1.2287 [0.5409]
PAK-Bank Deposits Growth	76	-20.3530	56.4160	2.8035	8.5603	2.8508 [0.0000] ***	17.7130 [0.0000] ***	981.0700 [0.0000] ***
PAK- Private Domestic Credit Growth	76	-7.9358	13.9010	1.4322	5.0005	0.5661 [0.0515] *	-0.0187 [0.9739]	3.6336 [0.1625]
PAK- Net Financial Assets Growth	76	-363.2800	218.7200	0.1258	53.9000	-0.6080 [0.0362] **	4.5295 [0.0000] ***	62.3300 [0.0000] ***
BAN-Foreign Direct Investment Growth	76	-150.3000	243.8700	3.9551	49.2660	0.7959 [0.0061] ***	3.0860 [0.0000] ***	34.1630 [0.0000] ***

BAN-Bank Deposits Growth	76	-10.6720	18.9670	2.8531	7.5190Z	0.0241 [0.9337]	-1.0398 [0.0700] *	3.0697 [0.2154]
BAN-Private Domestic Credit Growth	76	-2.6116	7.6182	3.2662	1.9228	-0.0361 [0.9010]	0.5240 [0.3612]	0.7929 [0.6726]
BAN-Net Financial Assets Growth	76	-11.4840	28.6080	5.1424	7.5720	0.7358 [0.0113] **	0.5529 [0.3353]	7.0034 [0.0301] **
IND-Foreign Direct Investment Growth	76	-152.1500	161.8800	3.3012	56.8490	0.2847 [0.3275]	0.8734 [0.1280]	3.0802 [0.2143]
IND-Bank Deposits Growth	76	-14.4210	14.8570	2.5284	6.0146	-0.1800 [0.5357]	0.3417 [0.5516]	0.6983 [0.7052]
IND-Private Domestic Credit Growth	76	-13.4250	13.2190	3.3112	4.4239	-0.7378 [0.0111] **	2.0418 [0.0003] ***	17.9830 [0.0001] ***
IND-Net Financial Assets Growth	76	-136.9300	136.6000	-1.8583	29.5200	0.2466 [0.3962]	9.8829 [0.0000] ***	277.4300 [0.0000] ***
KUT-Foreign Direct Investment Growth	76	-16.7960	53.1260	2.1044	10.4470	1.7698 [0.0000] ***	5.5653 [0.0000] ***	123.2500 [0.0000] ***
KUT-Bank Deposits Growth	68	-9.9544	21.9350	2.8207	6.7521	0.6570 [0.0238]**	-0.0645 [0.9104]	4.9041 [0.0861]*
KUT-Private Domestic Credit Growth	68	-4.3704	10.6430	2.7115	2.7947	0.6062 [0.0370]**	0.6718 [0.2418]	5.4436 [0.0657]*
KUT-Net Financial Assets Growth	68	-46.2180	10.5450	-0.0050	7.4922	-3.2565 [0.0000] ***	18.7750 [0.0000] ***	1118.9000 [0.0000] ***
MAL-Foreign Direct Investment Growth	76	-224.7700	196.3400	-0.3696	71.8730	0.0151 [0.9584]	2.3508 [0.0000] ***	15.6600 [0.0003] ***
MAL-Bank Deposits Growth	76	-8.9397	13.7650	2.3681	4.3484	0.1351 [0.6421]	-0.2473 [0.6665]	0.3802 [0.8268]
MAL-Private Domestic Credit Growth	76	-8.0003	6.9650	1.7955	2.9392	-1.0322 [0.0003] ***	1.1472 [0.0456] **	15.8030 [0.0003] ***
MAL-Net Financial Assets Growth	76	-18.8090	17.5280	1.5573	5.9451	-0.3735 [0.1989]	0.8736 [0.1280]	3.7438 [0.1538]
KSA-Foreign Direct Investment Growth	76	-17.6480	142.2500	4.5848	17.4620	6.0842 [0.0000] ***	42.7700 [0.0000] ***	5602.400 [0.0000] ***
KSA-Bank Deposits Growth	71	-18.2270	37.5240	3.8731	11.0290	0.7673 [0.0083] ***	0.7543 [0.1888]	8.2854 [0.0158]**
KSA-Private Domestic Credit Growth	71	-2.0935	10.1650	3.0953	2.8733	0.5115 [0.0785]*	0.0298 [0.9585]	2.9677 [0.2267]
KSA-Net Financial Assets Growth	71	-8.5770	16.7400	3.3430	5.6245	0.0360 [0.9012]	-0.6534 [0.2549]	1.2247 [0.5420]

UAE-Foreign Direct Investment Growth	76	-34.4900	46.5010	2.6229	12.3990	-0.2669 [0.3585]	2.2505 [0.0000] ***	15.1570 [0.0005] ***
UAE-Bank Deposits Growth	76	-26.0860	27.5630	4.2200	7.5535	-0.3257 [0.2626]	2.3753 [0.0000] ***	17.1880 [0.0001] ***
UAE-Private Domestic Credit Growth	76	-10.2540	23.8740	3.2147	6.0318	0.4031 [0.1656]	0.8794 [0.1254]	4.0330 [0.1331]
UAE-Net Financial Assets Growth	76	-59.1760	51.9160	3.0029	15.1250	-0.8222 [0.0046] ***	3.3700 [0.0000] ***	39.8390 [0.0000] ***
TUK-Foreign Direct Investment Growth	76	-297.4300	196.3900	1.5947	63.2900	-1.1630 [0.0000] ***	6.3762 [0.0000] ***	130.52 [0.0000] ***
TUK-Bank Deposits Growth	76	-22.8640	87.9930	4.1699	13.7570	3.4481 [0.0000] ***	17.7960 [0.0000] ***	1032.0000 [0.0000] ***
TUK-Private Domestic Credit Growth	76	-24.1700	35.2110	3.8589	8.1206	-0.0462 [0.8735]	2.9798 [0.0000] ***	25.1810 [0.0000] ***
TUK-Net Financial Assets Growth	76	-250.5300	245.2700	3.6150	48.2410	-0.0881 [0.7618]	15.0220 [0.0000] ***	639.4500 [0.0000] ***
QAT-Foreign Direct Investment Growth	76	-44.6630	58.8500	4.5156	16.9870	0.3128 [0.2820]	1.5528 [0.0068] ***	7.9409 [0.0188]**
QAT-Bank Deposits Growth	76	-17.4410	35.9160	4.0311	8.8545	0.9416 [0.0012] ***	1.9524 [0.0006] ***	20.8510 [0.0000] ***
QAT-Private Domestic Credit Growth	76	-12.1670	22.6650	4.5884	4.7226	0.3785 [0.1930]	2.9434 [0.0000] ***	26.1710 [0.0000] ***
QAT-Net Financial Assets Growth	76	-78.7570	8.5559	-3.3231	11.2790	-0.4116 [0.1568]	0.9107 [0.1126]	4.2702 [0.1182]

Note: *** indicates 1% significance level, ** indicates 5% significance level, and * indicates 10% significance level

4.1.2 Unit Root Test

Economic and financial time series are naturally non-stationary. In case of testing for the ordinary least squared models for non-stationary variables, the results turn out to be spurious. Such results are usually unreliable and cannot be used for the purpose of forecasting.

Researchers employ different methods for testing and improving the non-stationarity of the financial and economic time-series. The Augmented Dickey-Fuller (ADF) test is used to determine whether a time series is stationary. ADF statistics test the null hypothesis that the series is non-stationary. With constant term, the ADF test is employed. The Schwarz Information Criteria (SIC) and Akaike Information Criteria are used to determine the length of the lag (AIC). The unit root results in table 4.2 reveal that all of the variables are integrated of order zero i.e I(0) which implies all variables are stationary.

Table 4.2: Unit Root Test

Variables	ADF Statistics	
	With Constant	**Results**
PAK-Economic Growth	4.4139 (2)	Stationary
PAK-Foreign Direct Investment Growth	6.7954 (2)	Stationary
PAK-Bank Deposits Growth	4.6631 (2)	Stationary
PAK-Private Domestic Credit Growth	4.2617 (2)	Stationary
PAK-Net Financial Assets Growth	2.7778 (1)	Stationary
BAN-Foreign Direct Investment Growth	5.2921 (2)	Stationary
BAN-Bank Deposits Growth	5.1955 (2)	Stationary
BAN-Private Domestic Credit Growth	4.1842 (2)	Stationary
BAN-Net Financial Assets Growth	4.5127 (2)	Stationary
IND- Foreign Direct Investment Growth	6.3575 (2)	Stationary
IND-Bank Deposits Growth	4.9272 (2)	Stationary
IND- Private Domestic Credit Growth	4.2303 (2)	Stationary
IND-Net Financial Assets Growth	5.2778 (2)	Stationary
KUT-Foreign Direct Investment Growth	4.7344 (2)	Stationary
KUT-Bank Deposits Growth	5.7609 (2)	Stationary
KUT-Private Domestic Credit Growth	2.3848 (1)	Stationary
KUT-Net Financial Assets Growth	3.7419 (1)	Stationary
MAL- Foreign Direct Investment Growth	5.7609 (2)	Stationary

MAL-Bank Deposits Growth	4.0209 (2)	Stationary
MAL-Private Domestic Credit Growth	4.0463 (2)	Stationary
MAL-Net Financial Assets Growth	4.2656 (2)	Stationary
KSA-Foreign Direct Investment Growth	3.5839 (2)	Stationary
KSA-Bank Deposits Growth	3.9091 (1)	Stationary
KSA-Private Domestic Credit Growth	3.6700 (1)	Stationary
KSA-Net Financial Assets Growth	2.8197 (1)	Stationary
UAE-Foreign Direct Investment Growth	4.2326 (2)	Stationary
UAE-Bank Deposits Growth	4.0240 (2)	Stationary
UAE-Private Domestic Credit Growth	3.8804 (1)	Stationary
UAE-Net Financial Assets Growth	4.5576 (2)	Stationary
TUK- Foreign Direct Investment Growth	5.6085 (2)	Stationary
TUK-Bank Deposits Growth	4.3044 (2)	Stationary
TUK-Private Domestic Credit Growth	4.3741 (1)	Stationary
TUK-Net Financial Assets Growth	4.4869 (2)	Stationary
QAT- Foreign Direct Investment Growth	5.5453 (2)	Stationary
QAT-Bank Deposits Growth	4.9914 (2)	Stationary
QAT-Private Domestic Credit Growth	4.2439 (1)	Stationary
QAT-Net Financial Assets Growth	4.5742 (2)	Stationary
Critical Values (ADF Test)		

	1%	5%	10%
No Trend	3.4323	2.8622	2.5672

Note: Lags values in parentheses

4.1.3 ARCH Test

The clustered volatility, wherein low volatility follows low volatility and higher volatility follows higher volatility, is based upon the information index. In other words, heteroscedasticity is conditional upon past values of the information index and the lagged values of the variable itself.

For testing the conditional heteroscedasticity, Lagrange Multiplier (LM) test and Ljung-Box (LB) test are used on PAK-Economic Growth time series from 2002Q1 to 2020Q4. LB Q-statistic is used for the detection of higher order serial correlation. The LB Q^2-statistic is used for assessing the volatility clustering. The ARCH-LM test is also used to determine whether the ARCH effect exists. The F-test is used to determine whether the ARCH effect exists.

The table 4.3 represents the LB Q-statistic and Q^2-statistic and ARCH LM test. The LB Q-statistic is highly significant at lags 5, 10, 20 and 50 indicating that residuals and squared residuals have a serial correlation. The LB Q^2- statistic indicate existence of ARCH effect. The LM-test also confirms strong evidence of ARCH-effect in squared residuals.

Table 4.3: ARCH Test

	Lags	**PAK-Economic Growth**
Q-Statistic	5	58.0176 [0.0000]***
	10	76.6083 [0.0000]***
	20	92.0983 [0.0000]***
	50	206.5820 [0.0000]***
		25.7280

Q^2-Statistic	5	[0.0001]***
	10	26.2167 [0.0034]**
	20	28.1938 [0.1048]
	50	46.8271 [0.6014]
ARCH LM test **(F-Statistic)**	ARCH 1-2	14.1850 [0.0000]***
	ARCH 1-5	10.2200 [0.0000]***
	ARCH 1-10	5.7473 [0.0000]***

Note: p-values in parentheses *** indicates 1% significance level, and ** indicates 5% significance level

The non-stationarity and clustered volatility justify for the ARCH and GARCH models. The descriptive statistics and the unit root tests pave the way for the estimation of ARCH and GARCH models. These results support the estimation of a conditional heteroscedasticity model for PAK-Economic Growth.

The GARCH models estimate mean and variance equations simultaneously. Given this property of the GARCH model, there is possibility of incorporating financial variables of Islamic countries in the mean equation for the evaluation of direct effect on the economic growth of Pakistan at the first place. Studies have shared their findings in terms of research gap as to the measurement of effect of financial growth through the stochastic variable. Measurement of effect of internal and external financial growth variables on the economic growth of Pakistan in this study is done through both the mean as well as variance equations for better understanding of the relationship of financial growth and economic growth. This is one of the empirical contributions of this study.

4.4 Empirical Results

4.4.1 Interdependencies between Economic Growth and Financial Sector Growth

Review of literature presented in chapter 2, identifies sufficient evidence in support of bi-directional relationship between economic growth and financial growth. To examine the interdependencies between economic growth and financial sector growth, causal relationship between them is investigated in this study. For this purpose, Granger causality test is used. The Granger Causality test tests the null hypothesis that the economic growth does not "Granger cause" the financial sector growth and the financial sector growth does not "Granger cause" economic growth.

Most of results in table 4.4 shows null hypothesis that the variable does not Granger Cause the other variable is not rejected, since the estimated F-value is insignificant. The independence is suggested between variables.

The results in table 4.4 show that in case of Pakistan, Bangladesh, Kuwait, Malaysia and Saudi Arabia, there is no relationship between FDIG and PAK-EG. However, in the case of Pakistan and Türkiye, there is unidirectional causality from PAK-EG to DCG, since the estimated F-value is significant at 10% and 5% level of significance respectively. On the other hand, there is no "reverse causation" from DCG to PAK-EG, because the estimated F-value is statistically insignificant. Furthermore, the estimated F-values show that there is no causality between BDG and PAK-EG in Pakistan, Indonesia, Malaysia, Saudi Arabia, UAE and Qatar and NFAG and PAK-EG in Pakistan, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE and Qatar. In the case of Bangladesh and Kuwait, there is unidirectional causality from BDG to PAK-EG, since the estimated F-value is significant at 5% level of significance, and PAK-EG to NFAG as the estimated F-value is significant at 1% level of significance. On the other hand, there is no "reverse causation" from PAK-EG to BDG and NFAG to PAK-EG, because the estimated F-value is statistically insignificant.

However, in Bangladesh and Indonesia, there is interdependence between DCG and PAK-EG and the estimated results show bidirectional relationship between DCG and PAK-EG. The estimated results shows that there is unidirectional causality from FDIG to PAK-EG in Indonesia and UAE as the estimated F-value is significant at 5% level of significance. There is no "reverse causation" from PAK-EG to FDIG and PAK-EG to FDIG in Türkiye and Qatar as the estimated F-value is significant at 10% and 5% level of significance respectively. There is no "reverse causation" from FDIG to PAK-EG. The estimated results of Kuwait, Malaysia, Saudi Arabia, UAE and Qatar shows that there is no interdependence between DCG and PAK-EG. There is unidirectional causality from PAK-EG to BDG because, the estimated F-value is significant at 1% level of significance. On the other hand, there is no "reverse causation" from BDG to PAK-EG in Türkiye.

Concluding the above discussion and pre-dominant findings of the Granger causality test it can be safely stated that internal and external financial sector growth leads to the economic growth of Pakistan for the sample from 2002Q1 to 2020Q4. These tests have been run in accordance with the first objective of this study. Therefore, answer to our first research question is received in the sense that financial growth leads to economic growth in case of Pakistan, pre-dominantly.

Table 4.4: Pairwise Granger Causality Tests

	Null Hypothesis	Obs.	F-Stats	Prob.	Decision
Pakistan					
FDIG	FDIG does not Granger Cause PAK-EG	74	0.42104	0.6580	Do not reject
	PAK-EG does not Granger Cause FDIG		0.84080	0.4357	Do not reject
BDG	BDG does not Granger Cause PAK-EG	74	0.55087	0.5790	Do not reject
	PAK- EG does not Granger Cause BDG		0.91037	0.4072	Do not reject
DCG	DCG does not Granger Cause PAK-EG	74	0.57170	0.5672	Do not reject
	PAK-EG does not Granger Cause DCG		2.91043	0.0612	Reject
NFAG	NFAG does not Granger Cause PAK-EG	74	0.12381	0.8837	Do not reject
	PAK-EG does not Granger Cause NFAG		0.02059	0.9796	Do not reject
Bangladesh					
FDIG	FDIG does not Granger Cause PAK-EG	74	0.16046	0.8521	Do not reject
	PAK-EG does not Granger Cause FDIG		0.83408	0.4386	Do not reject

BDG	BDG does not Granger Cause PAK-EG	74	3.84926	0.0260	Reject
	PAK- EG does not Granger Cause BDG		1.81933	0.1698	Do not reject
DCG	DCG does not Granger Cause PAK-EG	74	4.18945	0.0192	Reject
	PAK-EG does not Granger Cause DCG		3.57912	0.0332	Reject
NFAG	NFAG does not Granger Cause PAK-EG	74	1.49541	0.2313	Do not reject
	PAK-EG does not Granger Cause NFAG		6.81860	0.0020	Reject
Indonesia					
FDIG	FDIG does not Granger Cause PAK-EG	74	3.30929	0.0424	Reject
	PAK-EG does not Granger Cause FDIG		0.46080	0.6327	Do not reject
BDG	BDG does not Granger Cause PAK-EG	74	0.75372	0.4744	Do not reject
	PAK- EG does not Granger Cause BDG		0.25169	0.7782	Do not reject
DCG	DCG does not Granger Cause PAK-EG	74	4.18945	0.0192	Reject
	PAK-EG does not Granger Cause DCG		3.57912	0.0332	Reject
NFAG	NFAG does not Granger Cause PAK-EG	74	0.00770	0.9923	Do not reject
	PAK-EG does not Granger Cause NFAG		0.22371	0.8001	Do not reject
Kuwait					
FDIG	FDIG does not Granger Cause PAK-EG	74	1.09071	0.3417	Do not reject
	PAK-EG does not Granger Cause FDIG		0.36070	0.6985	Do not reject
BDG	BDG does not Granger Cause PAK-EG	66	3.54248	0.0350	Reject
	PAK- EG does not Granger Cause BDG		2.32636	0.1063	Do not reject
DCG	DCG does not Granger Cause PAK-EG	66	0.80599	0.4513	Do not reject
	PAK-EG does not Granger Cause DCG		1.20888	0.3056	Do not reject
NFAG	NFAG does not Granger Cause PAK-EG	66	0.48741	0.6166	Do not reject
	PAK-EG does not Granger Cause NFAG		0.18498	0.8316	Do not reject
Malaysia					
FDIG	FDIG does not Granger Cause PAK-EG	74	1.51321	0.2274	Do not reject
	PAK-EG does not Granger Cause FDIG		0.37238	0.6905	Do not reject
BDG	BDG does not Granger Cause PAK-EG	74	1.65213	0.1991	Do not reject
	PAK- EG does not Granger Cause BDG		1.60062	0.2092	Do not reject
DCG	DCG does not Granger Cause PAK-EG	74	0.50563	0.6053	Do not reject
	PAK-EG does not Granger Cause DCG		0.88360	0.4179	Do not reject
NFAG	NFAG does not Granger Cause PAK-EG	74	0.56685	0.5699	Do not reject
	PAK-EG does not Granger Cause NFAG		0.43294	0.6503	Do not reject
Saudi Arabia					
FDIG	FDIG does not Granger Cause PAK-EG	74	0.91270	0.4062	Do not reject
	PAK-EG does not Granger Cause FDIG		1.99368	0.1440	Do not reject
BDG	BDG does not Granger Cause PAK-EG	69	0.34923	0.7066	Do not reject
	PAK- EG does not Granger Cause BDG		2.00719	0.1427	Do not reject

DCG	DCG does not Granger Cause PAK-EG	69	0.75784	0.4728	Do not reject
	PAK-EG does not Granger Cause DCG		0.39798	0.6733	Do not reject
NFAG	NFAG does not Granger Cause PAK-EG	69	2.28029	0.1105	Do not reject
	PAK-EG does not Granger Cause NFAG		2.13992	0.1260	Do not reject
UAE					
FDIG	FDIG does not Granger Cause PAK-EG	74	4.04846	0.0218	Reject
	PAK-EG does not Granger Cause FDIG		0.59507	0.5543	Do not reject
BDG	BDG does not Granger Cause PAK-EG	74	0.33104	0.7193	Do not reject
	PAK- EG does not Granger Cause BDG		0.15548	0.8563	Do not reject
DCG	DCG does not Granger Cause PAK-EG	74	0.90512	0.4092	Do not reject
	PAK-EG does not Granger Cause DCG		0.59069	0.5567	Do not reject
NFAG	NFAG does not Granger Cause PAK-EG	74	2.77766	0.0691	Reject
	PAK-EG does not Granger Cause NFAG		0.43877	0.6466	Do not reject
Türkiye					
FDIG	FDIG does not Granger Cause PAK-EG	74	1.12478	0.3306	Do not reject
	PAK-EG does not Granger Cause FDIG		2.67251	0.0762	Reject
BDG	BDG does not Granger Cause PAK-EG	74	0.05257	0.9488	Do not reject
	PAK- EG does not Granger Cause BDG		9.44773	0.0002	Reject
DCG	DCG does not Granger Cause PAK-EG	74	0.67373	0.5131	Do not reject
	PAK-EG does not Granger Cause DCG		4.63146	0.0130	Reject
NFAG	NFAG does not Granger Cause PAK-EG	74	0.05257	0.9488	Do not reject
	PAK-EG does not Granger Cause NFAG		2.67251	0.0762	Reject
Qatar					
FDIG	FDIG does not Granger Cause PAK-EG	74	0.67330	0.5133	Do not reject
	PAK-EG does not Granger Cause FDIG		3.29608	0.0429	Reject
BDG	BDG does not Granger Cause PAK-EG	74	0.07248	0.9302	Do not reject
	PAK- EG does not Granger Cause BDG		0.17057	0.8435	Do not reject
DCG	DCG does not Granger Cause PAK-EG	74	1.80585	0.1720	Do not reject
	PAK-EG does not Granger Cause DCG		1.80110	0.1728	Do not reject
NFAG	NFAG does not Granger Cause PAK-EG	74	0.02617	0.9742	Do not reject
	PAK-EG does not Granger Cause NFAG		0.03468	0.9659	Do not reject

Note: EG = Economic Growth

FDIG = Foreign Direct Investment Growth

BDG = Bank Deposit Growth

DCG = Domestic Private Credit

NFAG = Net Financial Assets

4.4.2 Long Run Relationship between Economic Growth and Financial Sector Growth

Different econometric and statistical methods are used to test the long run relationship of the economic and financial variables. To examine the long run relationship between economic growth and financial sector growth, Autoregressive Distributed Lag (ARDL) approach to cointegration is used in this study.

In table 4.5A, ARDL model for long run relationship between PAK-economic growth and PAK-financial sector growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. According to table 4.5A, FDI elasticity is 0.0288 and significant while DC elasticity is 0.3879 and significant. The BD elasticity is 0.0075 and insignificant. NFA elasticity is 0.0070 and insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth for Pakistan.

Table 4.5A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

It can be concluded from the results discussed so far, that FDI and domestic credit to private sector plays significant role in the determination of economic growth of Pakistan. Both the FDI and DC are the main sources of capital formation which is essential for the growth of manufacturing sectors of the economies in general. Recent declining FDI and increasing government borrowings have adversely affected capital formation in Pakistan. That is why economic growth during the last 3-4 years has reflected slowly down.

Table 4.5A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and PAK-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	0.1255	0.1304	0.9630	0.3431
FDI (-1)	0.0288	0.0074	3.8900	0.0005***
BD(-1)	0.0075	0.0509	0.1490	0.8824
DC(-1)	0.3879	0.2007	1.9300	0.0628*
NFA(-1)	0.0070	0.0124	0.5670	0.5748
EG (-3)	-0.1556	0.1100	-1.4100	0.1675
EG (-4)	-0.3233	0.1051	-3.0800	0.0044***
EG (-5)	-0.5360	0.1184	-4.5300	0.0001***
EG (-6)	0.2034	0.1197	1.7000	0.0996*
EG (-7)	-0.1229	0.0975	-1.2600	0.2173
EG (-8)	-0.2776	0.0929	-2.9900	0.0055***
FDIG (-2)	0.0072	0.0043	1.6600	0.1067
FDIG (-5)	0.0219	0.0081	2.6900	0.0115**
FDIG (-6)	0.0253	0.0110	2.2900	0.0291**
FDIG (-7)	0.0409	0.0110	3.6900	0.0009***
FDIG (-8)	0.0258	0.0077	3.3100	0.0024***
BDG (-2)	-0.0526	0.0439	-1.2000	0.2405
BDG (-3)	-0.0872	0.0406	-2.1400	0.0402**
BDG (-6)	0.0417	0.0371	1.1200	0.2708
BDG (-8)	0.0419	0.0388	1.0800	0.2893
DCG (0)	0.2170	0.1509	1.4400	0.1607
DCG (-1)	-0.3279	0.2165	-1.5100	0.1403
DCG (-2)	-0.8172	0.2052	-3.9800	0.0004***
DCG (-3)	-0.8394	0.2297	-3.6500	0.0010***
DCG (-4)	-0.8118	0.2383	-3.4100	0.0019***
DCG (-5)	-0.6640	0.2080	-3.1900	0.0033***
DCG (-6)	-0.3418	0.1936	-1.7700	0.0877*
DCG (-7)	-0.2331	0.1452	-1.6100	0.1189
NFAG (0)	0.0161	0.0078	2.0500	0.0494**
NFAG (-2)	0.0194	0.0074	2.5900	0.0146**
NFAG (-3)	0.0439	0.0125	3.5000	0.0015***
NFAG (-4)	0.0542	0.0171	3.1600	0.0036***
NFAG (-5)	0.0922	0.0258	3.5700	0.0012***
NFAG (-6)	0.1148	0.0333	3.4500	0.0017***
NFAG (-7)	-0.1576	0.0464	-3.4000	0.0019
Diagnostic Tests				

LM ARCH 1-4 test	F-statistic	1.6850 [0.1655]
LM ARCH 1-10 test	F-statistic	0.7788 [0.6484]
Normality test	Chi-Square statistic	3.6955 [0.1576]
Durbin-Watson test	DW statistic	1.8655
Cointegration test	F-statistic	4.1994 [0.0052]***

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Error correction results are required to understand the adjustment through changes of one variable to another while moving from short run to long run. Such tests are essential in finding answer to our second research question. In table 4.5B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration. The absolute value of the coefficient of the error-correction term indicates that about 76 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter. For a developing country like Pakistan, such a quantum adjustment in quarter speaks of potential of economic growth of the country through financial variables included in this study. Though all the financial variables in the ARDL are not found significant, yet there is tendency in these financial variables to determine long-term equilibrium in the economic growth.

Table 4.5B: EC Model for Long Run Relationship Between PAK-Economic Growth and PAK-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	-0.7620	0.1705	4.4700	0.0001***
EG (-1)	0.6559	0.0547	12.0000	0.0000***
EG (-4)	-0.3425	0.0448	-7.6400	0.0000***
EG (-6)	0.0762	0.0518	1.4700	0.1491
FDIG (-1)	0.0097	0.0061	1.5900	0.1199

FDIG (-5)	0.0171	0.0074	2.2900	0.0274**
FDIG (-7)	0.0289	0.0069	4.1900	0.0002***
BDG (-0)	-0.0583	0.0321	-1.8200	0.0767*
BDG (-3)	-0.1183	0.0391	-3.0200	0.0043***
BDG (-4)	0.0627	0.0392	1.6000	0.1176
DCG (-2)	-0.3445	0.1163	-2.9600	0.0051***
DCG (-3)	-0.3342	0.1094	-3.0600	0.0040***
DCG (-6)	0.1795	0.0955	1.8800	0.0674*
DCG (-7)	0.2219	0.1147	1.9300	0.0602*
DCG (-8)	0.3879	0.0877	4.4200	0.0001***
NFAG (0)	-0.3445	0.1163	-2.9600	0.0051***
NFAG (-2)	-0.3342	0.1094	-3.0600	0.0040***
NFAG (-3)	0.1795	0.0955	1.8800	0.0674*
NFAG (-4)	0.2219	0.1147	1.9300	0.0602*
NFAG (-5)	0.3879	0.0877	4.4200	0.0001***
NFAG (-6)	-0.3445	0.1163	-2.9600	0.0051***
NFAG (-7)	-0.3342	0.1094	-3.0600	0.0040***
NFAG (-8)	0.1795	0.0955	1.8800	0.0674*

Diagnostic Tests

LM ARCH 1-4 test	F- statistic	1.0567 [0.3864]
LM ARCH 1-10 test	F-statistic	0.7793 [0.6479]
Normality test	Chi-Square statistic	2.7702 [0.2503]
Durbin-Watson test	DW statistic	2.3596

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.6A, ARDL model for long run relationship between PAK-economic growth and BAN-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. According to table 4.6A, FDI elasticity is -0.0523 and BD elasticity is -0.8783 and significant. The DC elasticity is 0.7056 and significant, while NFA elasticity is 0.0189 and insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth. These results further reiterate what has been explained above.

Table 4.6A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution. These results support researcher to report results with confidence in this study.

Table 4.6A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and BAN-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	0.1837	0.1228	1.5000	0.1438
FDI (-1)	-0.0523	0.0253	-2.0700	0.0466**
BD(-1)	-0.8783	0.2270	-3.8700	0.0005***
DC(-1)	0.7056	0.1957	3.6100	0.0010***
NFA(-1)	0.0189	0.0687	0.2760	0.7841
EG (-2)	0.1424	0.1249	1.1400	0.2623
EG (-4)	-0.4678	0.1214	-3.8500	0.0005***
EG (-6)	0.2510	0.1197	2.1000	0.0434**
EG (-8)	-0.5378	0.1298	-4.1400	0.0002***
FDIG (0)	-0.0094	0.0096	-0.9800	0.3341
FDIG (-1)	0.0196	0.0130	1.5100	0.1403
FDIG (-3)	-0.0135	0.0092	-1.4700	0.1499
BDG (0)	-0.3075	0.1081	-2.8400	0.0075***
BDG (-1)	0.3833	0.1141	3.3600	0.0019***
BDG (-4)	0.3933	0.1369	2.8700	0.0069***
BDG (-5)	0.4998	0.1672	2.9900	0.0052***
BDG (-6)	0.4605	0.1565	2.9400	0.0058***
BDG (-7)	0.3716	0.1080	3.4400	0.0015***
DCG (-1)	-1.1223	0.2901	-3.8700	0.0005***
DCG (-2)	-0.8269	0.3047	-2.7100	0.0103**
DCG (-3)	-1.2573	0.2882	-4.3600	0.0001***
DCG (-4)	-1.1255	0.3525	-3.1900	0.0030***
DCG (-5)	-0.7100	0.2631	-2.7000	0.0107**
DCG (-8)	0.9170	0.1965	4.6700	0.0000***
NFAG (-3)	0.3652	0.0843	4.3300	0.0001***
NFAG (-4)	0.2106	0.0768	2.7400	0.0097***
NFAG (-5)	0.1083	0.0791	1.3700	0.1798
NFAG (-6)	0.2431	0.0857	2.8400	0.0077***
NFAG (-8)	0.1147	0.0651	1.7600	0.0871*

Diagnostic Tests		
LM ARCH 1-4 test	F-statistic	0.6359 [0.6389]
LM ARCH 1-10 test	F-statistic	1.2294 [0.2990]
Normality test	Chi-Square statistic	0.9055 [0.6359]
Durbin-Watson test	DW statistic	2.1904
Cointegration test	F-statistic	4.0564 [0.0054]**

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.6B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 once again shows an indication of cointegration and the great possibility of model to determine equilibrium in the economic growth of Pakistan through adjustment of financial indicators. The absolute value of the coefficient of the error-correction term indicates that about 0.59 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter. Here in this case the speed of adjustment is quite ignorable. Such an extremely slow speed of adjustment in each quarter may be due to weakening trade and financial relationship of Pakistan with Bangladesh.

Table 4.6B: EC Model for Long Run Relationship Between PAK-Economic Growth and BAN-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	-0.0059	0.1226	-0.0488	0.9613
EG (-4)	-0.3934	0.1071	-3.6700	0.0007***
EG (-6)	0.1614	0.0987	1.6300	0.1094
EG (-8)	-0.3235	0.0976	-3.3100	0.0019***
FDIG (-8)	0.0135	0.0071	1.8900	0.0657*
BDG (-2)	-0.2346	0.0700	-3.3500	0.0017***
BDG (-3)	-0.3483	0.0878	-3.9600	0.0003***
BDG (-4)	-0.1086	0.0683	-1.5900	0.1195

BDG (-7)	0.2153	0.0560	3.8400	0.0004***
DCG (-1)	-0.4837	0.2183	-2.2200	0.0320**
DCG (-2)	-0.6199	0.2713	-2.2800	0.0273**
DCG (-3)	-0.8934	0.2446	-3.6500	0.0007***
DCG (-4)	-0.9086	0.2435	-3.7300	0.0006***
DCG (-5)	-0.6953	0.2004	-3.4700	0.0012***
DCG (-8)	0.8600	0.1752	4.9100	0.0000***
NFAG (-3)	0.2341	0.0685	3.4200	0.0014***
NFAG (-4)	0.1078	0.0603	1.7900	0.0809*
NFAG (-6)	0.1251	0.0705	1.7700	0.0830*
Diagnostic Tests				
LM ARCH 1-4 test	F-statistics		0.2874 [0.8849]	
LM ARCH 1-10 test	F-statistics		0.2845 [0.9813]	
Normality test	Chi-Square statistic		2.4802 [0.2894]	
Durbin-Watson test	DW statistic		1.80365	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.7A, ARDL model for long run relationship between PAK-economic growth and IND-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. As per guidelines from the econometricians, the lower the value of information criteria, the better the model. The system, among other criteria, declares AIC as the best one. According to table 4.7A, FDI elasticity is -0.0211 and NFA elasticity is -0.0298 and significant. The BD elasticity is -0.0571 and DC elasticity is 0.0431 and insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth.

Table 4.7A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

Surprisingly, Indonesia has a great potential to having financial implications for Pakistan. The descriptive statistics and share of trade with Indonesia also support

this finding. The population structure, political and socio-economic conditions of the two countries have been historically almost similar.

Table 4.7A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and IND-Financial Sector Growth

Variables	Coefficient	Std. Error	t-value	p-value
Y (-1)	0.7191	0.0740	9.7100	0.0000***
FDI (-1)	-0.0211	0.0101	-2.0800	0.0460**
BD(-1)	-0.0571	0.0468	-1.2200	0.2322
DC(-1)	0.0431	0.0373	1.1600	0.2574
NFA(-1)	-0.0298	0.0054	-5.5200	0.0000***
EG (-4)	-0.3606	0.0634	-5.6900	0.0000***
EG (-6)	0.1073	0.0683	1.5700	0.1272
EG (-8)	-0.1310	0.0512	-2.5600	0.0160**
FDIG (-2)	0.0217	0.0083	2.6100	0.0141**
FDIG (-5)	0.0209	0.0073	2.8500	0.0079***
FDIG (-6)	0.0177	0.0069	2.5400	0.0167**
FDIG (-7)	0.0394	0.0084	4.6500	0.0001***
FDIG (0)	0.1286	0.0623	2.0700	0.0479**
BDG (-3)	-0.2725	0.0719	-3.7900	0.0007***
BDG (-4)	0.2124	0.0651	3.2600	0.0028***
BDG (-5)	-0.3425	0.0954	-3.5900	0.0012***
BDG (-6)	0.3593	0.0813	4.4200	0.0001***
BDG (-7)	-0.2273	0.0725	-3.1300	0.0039***
DCG (0)	-0.4114	0.1076	-3.8300	0.0006***
DCG (-1)	-0.2059	0.0714	-2.8800	0.0074***
DCG (-3)	0.3903	0.0924	4.2200	0.0002***
DCG (-5)	0.4031	0.1116	3.6100	0.0011***
DCG (-6)	-0.2880	0.1002	-2.8800	0.0075***
DCG (-7)	0.3000	0.1059	2.8300	0.0083***
NFAG (0)	-0.0199	0.0109	-1.8300	0.0773*
NFAG (-1)	0.0783	0.0106	7.3900	0.0000***
NFAG (-3)	0.0419	0.0110	3.8000	0.0007***
NFAG (-4)	-0.0471	0.0122	-3.8400	0.0006***
NFAG (-5)	-0.0334	0.0139	-2.4000	0.0230**
NFAG (-6)	0.0543	0.0142	3.8000	0.0007***
NFAG (-7)	-0.0381	0.0144	-2.6400	0.0132**
NFAG (-8)	0.0710	0.0128	5.5200	0.0000***
Diagnostic Tests				

LM ARCH 1-4 test	F-statistic	0.8544 [0.4971]
LM ARCH 1-10 test	F-statistic	1.0991 [0.3845]
Normality test	Chi-Square statistic	0.1450 [0.9301]
Durbin-Watson test	DW statistic	2.5489
Cointegration test	F-statistic	66.9090 [0.0000]**

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.7B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted.. A negative and significant coefficient of ECt-1 shows an indication of cointegration which is essential for the determination of long run equilibrium in the economic growth which is the dependent variable of Pakistan. The absolute value of the coefficient of the error-correction term indicates that about 103 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter. Though the coefficient of adjustment is so big but it highlights the possibility of increasing relationship between Indonesia and Pakistan provided that the trade and economic ties are enhanced between the two countries.

Table 4.7B: EC Model for Long Run Relationship Between PAK-Economic Growth and IND-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	-1.0312	0.2150	-4.8000	0.0001***
EG (-1)	1.4906	0.0954	15.6000	0.0000***
EG (-2)	-0.6030	0.0990	-6.0900	0.0000***
EG (-5)	0.2104	0.0687	3.0600	0.0055***
EG (-7)	-0.3109	0.1145	-2.7200	0.0123**
EG (-8)	0.3025	0.0799	3.7800	0.0010***
FDIG (0)	-0.0254	0.0095	-2.6700	0.0136**
FDIG (-1)	0.0105	0.0084	1.2500	0.2253
FDIG (-2)	-0.0379	0.0095	-3.9600	0.0006***

FDIG (-5)	0.0273	0.0088	3.1000	0.0051***
FDIG (-6)	0.0124	0.0083	1.5000	0.1484
FDIG (-7)	0.0183	0.0091	1.9900	0.0582*
FDIG (-8)	-0.0304	0.0099	-3.0700	0.0054***
BDG (-0)	0.3657	0.0740	4.9400	0.0001***
BDG (-3)	-0.2989	0.0779	-3.8300	0.0009***
BDG (-4)	-0.1713	0.0792	-2.1600	0.0413**
BDG (-5)	-0.2498	0.0747	-3.3400	0.0028***
DCG (0)	0.1327	0.0767	1.7300	0.0971*
DCG (-1)	-0.4725	0.0915	-5.1600	0.0000***
DCG (-2)	0.6085	0.1045	5.8200	0.0000***
DCG (-3)	-0.4932	0.0893	-5.5200	0.0000***
DCG (-4)	0.3043	0.0772	3.9400	0.0007***
DCG (-6)	-0.6336	0.1109	-5.7100	0.0000***
DCG (-7)	0.3707	0.1406	2.6400	0.0147**
NFAG (0)	0.2677	0.1406	1.9000	0.0694*
NFAG (-1)	0.3495	0.1273	2.7500	0.0115**
NFAG (-2)	0.4831	0.1135	4.2600	0.0003***
NFAG (-4)	-0.4467	0.1484	-3.0100	0.0062***
NFAG (-5)	0.3805	0.1278	2.9800	0.0067***
NFAG (-6)	-0.5941	0.1263	-4.7000	0.0001***
NFAG (-7)	0.0492	0.0124	3.9600	0.0006***
NFAG (-8)	-0.0367	0.0118	-3.1000	0.0050***
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		2.6197 [0.0451]**	
LM ARCH 1-10 test	F- statistic		1.2769 [0.2750]	
Normality test	Chi-Square statistic		0.7959 [0.6717]	
Durbin-Watson test	DW statistic		2.4215	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.8A, ARDL model for long run relationship between PAK-economic growth and KWT-Financial Sector Growth is estimated. Out of the many other information criterial, Akaike's information criterion (AIC) is employed by the system while estimating and selecting the lag length on each first differenced variable. According to table 4.8A, DC elasticity is 0.1316 and significant. The FDI elasticity is -0.0008, BD

elasticity is -0.0337 and NFA elasticity is -0.0236 and are insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth.

Table 4.8A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

Most of the lagged financial variables of Kuwait significantly affect Pakistan's economic growth. Again error correction coefficient speaks of the potential relationship of financial growth of Kuwait and economic growth of Pakistan in the determination of long run equilibrium.

Table 4.8A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and KWT-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	0.2901	0.1364	2.1300	0.0412**
FDI (-1)	-0.0008	0.0438	-0.0204	0.9839
BD(-1)	-0.0337	0.0677	-0.4980	0.6220
DC(-1)	0.1316	0.0746	1.7700	0.0870*
NFA(-1)	-0.0236	0.0214	-1.1000	0.2783
EG (-2)	0.3196	0.1275	2.5100	0.0175**
EG (-4)	-0.3170	0.1254	-2.5300	0.0166**
EG (-5)	-0.0982	0.1322	-0.7430	0.4628
EG (-7)	-0.2107	0.1032	-2.0400	0.0495**
FDIG (0)	0.0985	0.0475	2.0700	0.0466**
FDIG (-3)	0.1183	0.0378	3.1300	0.0037***
FDIG (-5)	0.0950	0.0437	2.1700	0.0376**
FDIG (-7)	-0.1003	0.0436	-2.3000	0.0280**
FDIG (-8)	-0.1172	0.0409	-2.8600	0.0074***
BDG (0)	-0.2572	0.1010	-2.5500	0.0159**
BDG (-4)	0.4005	0.0951	4.2100	0.0002***
BDG (-5)	0.0773	0.0781	0.9900	0.3296
BDG (-7)	0.2283	0.0684	3.3400	0.0022**
DCG (-0)	0.3374	0.2347	1.4400	0.1602
DCG (-3)	0.6387	0.2211	2.8900	0.0069***
DCG (-6)	-0.7218	0.2659	-2.7100	0.0106**
DCG (-7)	0.4611	0.2361	1.9500	0.0596*
DCG (-8)	0.6755	0.2564	2.6400	0.0129**
NFAG (-6)	0.0958	0.0604	1.5900	0.1224
NFAG (-7)	0.1797	0.0670	2.6800	0.0115**

Diagnostic Tests		
LM ARCH 1-4 test	F-statistic	0.1282 [0.9715]
LM ARCH 1-10 test	F-statistic	0.2362 [0.9905]
Normality test	Chi-Square statistic	9.3283 [0.0094]***
Durbin-Watson test	DW statistic	2.1644
Cointegration test	F-statistic	5.7684 [0.0007]***

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.8B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration and the potential for the long run equilibrium relationship of financial growth taking place in Kuwait and economic growth of Pakistan. The absolute value of the coefficient of the error-correction term indicates that about 3.4 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter.

Table 4.8B: EC Model for Long Run Relationship Between PAK-Economic Growth and KWT-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	-0.0349	0.2360	-0.1480	0.8833
EG (-1)	1.1518	0.1787	6.4500	0.0000***
EG (-2)	-0.4111	0.1731	-2.3800	0.0235**
EG (-4)	-0.3967	0.1388	-2.8600	0.0073***
EG (-5)	0.2843	0.1122	2.5300	0.0162**
EG (-8)	-0.1912	0.0518	-3.6900	0.0008***
FDIG (-4)	0.0831	0.0388	2.1400	0.0396**
FDIG (-6)	0.1488	0.0422	3.5300	0.0013***
FDIG (-7)	-0.1226	0.0369	-3.3200	0.0022***
FDIG (-8)	0.0769	0.0329	2.3400	0.0256**
BDG (-1)	-0.2638	0.0881	-2.9900	0.0052***
BDG (-2)	0.2414	0.0804	3.0000	0.0051***

BDG (-3)	-0.2227	0.0852	-2.6100	0.0134**
BDG (-7)	0.2607	0.0787	3.3100	0.0023***
DCG (-1)	-0.7113	0.2170	-3.2800	0.0025***
DCG (-2)	0.5803	0.2823	2.0600	0.0478**
DCG (-3)	0.5776	0.2806	2.0600	0.0475**
DCG (-5)	-0.7045	0.2504	-2.8100	0.0082***
DCG (-6)	0.6846	0.2361	2.9000	0.0066***
NFAG (-3)	-0.1043	0.0481	-2.1700	0.0375**
NFAG (-6)	0.1026	0.0530	1.9400	0.0614*
NFAG (-8)	-0.1304	0.0535	-2.4300	0.0205**
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		0.4031 [0.8055]	
LM ARCH 1-10 test	F- statistic		0.2882 [0.9798]	
Normality test	Chi-Square statistic		3.9323 [0.1400]	
Durbin-Watson test	DW statistic		2.2323	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Malaysia and Pakistan have relatively better trade relationship as we have discussed above and shown share of imports and exports. In table 4.9A, ARDL model for long run relationship between PAK-economic growth and MAL-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. According to table 4.9A, BD elasticity is -1.1665, DC elasticity is 1.10524 and NFA elasticity is 0.5526 and are significant. The FDI elasticity is 0.0044 insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth. Most of the lagged financial variables have significant impact on the economic growth of Pakistan. Significance of distant lags reveal slow moving effect of Malaysian financial sector growth on the economy of Pakistan. Again it can be concluded that there is potential of financial integration of Malaysia with the economy of Pakistan.

Table 4.9A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

Table 4.9A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and MAL-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	0.1891	0.0764	2.4700	0.0225**
FDI (-1)	0.0044	0.0067	0.6630	0.5150
BD(-1)	-1.1665	0.1689	-6.9100	0.0000***
DC(-1)	1.10524	0.1886	5.8600	0.0000***
NFA(-1)	0.5526	0.0652	8.4700	0.0000***
EG (-4)	-0.6810	0.0689	-9.8800	0.0000***
EG (-8)	-0.3300	0.0532	-6.1900	0.0000***
FDIG (0)	-0.0119	0.0060	-1.9700	0.0624*
FDIG (-1)	-0.0249	0.0096	-2.5900	0.0176**
FDIG (-2)	-0.0157	0.0077	-2.0300	0.0554*
FDIG (-5)	-0.0319	0.0082	-3.8500	0.0010***
FDIG (-6)	-0.0544	0.0088	-6.1800	0.0000***
FDIG (-7)	-0.0536	0.0089	-6.0200	0.0000***
FDIG (-8)	-0.0303	0.0077	-3.9000	0.0009***
BDG (0)	0.1650	0.1094	1.5100	0.1470
BDG (-1)	0.7753	0.2015	3.8500	0.0010***
BDG (-2)	0.4911	0.1766	2.7800	0.0115**
BDG (-3)	0.6754	0.1799	3.7500	0.0012***
BDG (-4)	0.558884	0.1557	3.59	0.0018***
BDG (-5)	0.572052	0.1491	3.84	0.0010***
BDG (-6)	0.381132	0.1492	2.55	0.0189**
DCG (-1)	-1.05177	0.2484	-4.23	0.0004***
DCG (-2)	-1.01219	0.2245	-4.51	0.0002***
DCG (-3)	-0.699309	0.2215	-3.16	0.0050***
DCG (-4)	-0.747076	0.2149	-3.48	0.0024***
DCG (-5)	-0.405696	0.208	-1.95	0.0653*
DCG (-6)	-0.79562	0.208	-3.82	0.0011***
DCG (-7)	0.277983	0.1654	1.68	0.1085
NFAG (0)	0.221278	0.0779	2.84	0.0101**
NFAG (-1)	-0.27218	0.06665	-4.08	0.0006***
NFAG (-2)	-0.109521	0.07953	-1.38	0.1837
NFAG (-3)	-0.30411	0.06844	-4.44	0.0002***

NFAG (-4)	-0.166973	0.06821	-2.45	0.0237**
NFAG (-5)	-0.0923479	0.06187	-1.49	0.1512
NFAG (-7)	-0.207151	0.05633	-3.68	0.0015***
Diagnostic Tests				
LM ARCH 1-4 test	F-statistic		0.5720 [0.6842]	
LM ARCH 1-10 test	F-statistic		0.4500 [0.9109]	
Normality test	Chi-Square statistic		0.5288 [0.7677]	
Durbin-Watson test	DW statistic		2.7962	
Cointegration test	F-statistic		57.2820 [0.0000]***	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.9B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration. The absolute value of the coefficient of the error-correction term indicates that about 123 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter.

Table 4.9B: EC Model for Long Run Relationship Between PAK-Economic Growth and MAL-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	-1.2363	0.2596	-4.7600	0.0001***
EG (-1)	0.6376	0.1174	5.4300	0.0000***
EG (-2)	-0.2215	0.1289	-1.7200	0.0998*
EG (-3)	0.2133	0.1201	1.7800	0.0896*
EG (-4)	-0.5064	0.0979	-5.1700	0.0000***
EG (-8)	-0.1700	0.0906	-1.8800	0.0739*
FDIG (0)	-0.0174	0.0059	-2.9600	0.0073***
FDIG (-1)	-0.0281	0.0085	-3.2800	0.0034***
FDIG (-2)	-0.0217	0.0068	-3.1700	0.0045***

FDIG (-5)	-0.0385	0.0075	-5.1200	0.0000***
FDIG (-6)	-0.0635	0.0113	-5.6000	0.0000***
FDIG (-7)	-0.0558	0.0110	-5.0500	0.0000***
FDIG (-8)	-0.0287	0.0070	-4.0600	0.0005***
BDG (-0)	0.5263	0.1117	4.7100	0.0001***
BDG (-3)	0.4065	0.1288	3.1600	0.0046***
BDG (-4)	0.4548	0.1694	2.6800	0.0135**
BDG (-5)	0.3955	0.1175	3.3700	0.0028***
DCG (0)	-0.7130	0.1939	-3.6800	0.0013***
DCG (-1)	-0.3735	0.1469	-2.5400	0.0185**
DCG (-2)	-0.5697	0.1489	-3.8300	0.0009***
DCG (-3)	-0.2751	0.1714	-1.6000	0.1228
DCG (-4)	-0.5785	0.1866	-3.1000	0.0052***
DCG (-6)	-0.6120	0.1900	-3.2200	0.0039***
DCG (-7)	0.5356	0.1701	3.1500	0.0047***
NFAG (0)	0.3772	0.0857	4.4000	0.0002***
NFAG (-1)	0.3028	0.0772	3.9200	0.0007***
NFAG (-2)	0.3041	0.0692	4.3900	0.0002***
NFAG (-4)	0.1978	0.0668	2.9600	0.0072***
NFAG (-5)	0.1720	0.0716	2.4000	0.0253**
NFAG (-6)	0.2378	0.0741	3.2100	0.0040***
NFAG (-7)	-0.1919	0.0758	-2.5300	0.0191**
NFAG (-8)	0.1185	0.0539	2.2000	0.0389**
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		0.3984 [0.8088]	
LM ARCH 1-10 test	F- statistic		1.2712 [0.2827]	
Normality test	Chi-Square statistic		3.6288 [0.1629]	
Durbin-Watson test	DW statistic		1.8843	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

KSA has always been an unconditional support to the economy of Pakistan except a few most recent occasions. Our trading share with KSA is much better than any other Islamic country considered in this study. In table 4.10A, ARDL model for long run relationship between PAK-economic growth and KSA-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length

on each first differenced variable is employed. According to table 4.10A, the FDI elasticity is 0.2324, DC elasticity is 0.4226 and NFA elasticity is -0.6971 and are significant. The BD elasticity is 0.0770 insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth. Table 4.10A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

Table 4.10A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and KSA-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	-0.6150	0.1508	-4.0800	0.0015***
FDI (-1)	0.2324	0.0271	8.5700	0.0000***
BD(-1)	0.0770	0.0474	1.6300	0.1300
DC(-1)	0.4226	0.0573	7.3700	0.0000***
NFA(-1)	-0.6971	0.0997	-6.9900	0.0000***
EG (-2)	-0.5323	0.1167	-4.5600	0.0007***
EG (-3)	0.2808	0.0942	2.9800	0.0115**
EG (-4)	-0.6894	0.1018	-6.7700	0.0000***
EG (-5)	0.1950	0.0950	2.0500	0.0627*
EG (-6)	-0.6544	0.0830	-7.8800	0.0000***
EG (-8)	-0.5520	0.0705	-7.8200	0.0000***
FDIG (-1)	-0.2787	0.0340	-8.2000	0.0000***
FDIG (-2)	-0.3780	0.0435	-8.6800	0.0000***
FDIG (-3)	-0.2924	0.0470	-6.2100	0.0000***
FDIG (-4)	-0.0387	0.0275	-1.4100	0.1845
FDIG (-5)	-0.0984	0.0216	-4.5400	0.0007***
BDG (0)	0.3838	0.0643	5.9600	0.0001***
BDG (-1)	-0.1852	0.0661	-2.8000	0.0161**
BDG (-2)	-0.1254	0.0783	-1.6000	0.1353
BDG (-3)	-0.3912	0.0768	-5.0900	0.0003***
BDG (-4)	-0.4762	0.1080	-4.4100	0.0008***
BDG (-5)	-0.5986	0.0934	-6.4000	0.0000***
BDG (-6)	-0.6807	0.1259	-5.4100	0.0002***
BDG (-7)	-0.6617	0.0824	-8.0300	0.0000***
BDG (-8)	-0.2493	0.0940	-2.6500	0.0211**
DCG (0)	0.6311	0.1632	3.8700	0.0022***
DCG (-1)	-1.0739	0.1501	-7.1600	0.0000***
DCG (-3)	-1.0635	0.2140	-4.9700	0.0003***

DCG (-4)	1.2413	0.2881	4.3100	0.0010***
DCG (-5)	-1.6524	0.3624	-4.5600	0.0007***
DCG (-6)	2.2510	0.4132	5.4500	0.0001***
DCG (-7)	-0.6676	0.2925	-2.2800	0.0415**
DCG (-8)	1.1922	0.2717	4.3900	0.0009***
NFAG (0)	0.5002	0.1137	4.4000	0.0009***
NFAG (-1)	1.2004	0.1864	6.4400	0.0000***
NFAG (-2)	1.8939	0.2408	7.8700	0.0000***
NFAG (-3)	0.8277	0.1582	5.2300	0.0002***
NFAG (-4)	1.2244	0.1689	7.2500	0.0000***
NFAG (-5)	0.3388	0.1229	2.7600	0.0174**
NFAG (-6)	1.2339	0.1596	7.7300	0.0000***
NFAG (-7)	0.2762	0.1226	2.2500	0.0438**
NFAG (-8)	0.3269	0.1211	2.7000	0.0193**
Diagnostic Tests				
LM ARCH 1-4 test	F-statistic		0.6511 [0.5860]	
LM ARCH 1-10 test	F-statistic		0.7617 [0.6634]	
Normality test	Chi-Square statistic		1.1559 [0.5611]	
Durbin-Watson test	DW statistic		2.6654	
Cointegration test	F-statistic		68.326 [0.0000]***	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.10B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration. The absolute value of the coefficient of the error-correction term indicates that about 233 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter.

Table 4.10B: EC Model for Long Run Relationship Between PAK-Economic Growth and KSA-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	-2.3392	0.3413	-6.8500	0.0000***
EG (-1)	0.6088	0.0698	8.7200	0.0000***
EG (-3)	0.1917	0.0748	2.5600	0.0178**
EG (-4)	-0.2490	0.0680	-3.6600	0.0014***
EG (-7)	-0.2659	0.0628	-4.2300	0.0003***
EG (-8)	0.2516	0.0599	4.2000	0.0004***
FDIG (0)	-0.0399	0.0134	-2.9700	0.0071***
FDIG (-1)	-0.1149	0.0166	-6.9000	0.0000***
FDIG (-2)	-0.0409	0.0159	-2.5600	0.0178**
FDIG (-3)	-0.0619	0.0273	-2.2600	0.0339**
FDIG (-4)	0.1042	0.0132	7.8500	0.0000***
FDIG (-7)	-0.0593	0.0139	-4.2600	0.0003***
FDIG (-8)	0.0260	0.0155	1.6800	0.1070
BDG (-1)	0.0634	0.0488	1.3000	0.2072
BDG (-3)	-0.2307	0.0344	-6.7000	0.0000***
BDG (-5)	-0.2565	0.0448	-5.7200	0.0000***
BDG (-6)	-0.0720	0.0487	-1.4800	0.1533
BDG (-7)	-0.2204	0.0547	-4.03OO	0.0006***
BDG (-8)	0.2490	0.0500	4.9800	0.0001***
DCG (0)	1.2885	0.1533	8.4100	0.0000***
DCG (-1)	-1.8221	0.2281	-7.9900	0.0000***
DCG (-2)	0.8263	0.2532	3.2600	0.0036***
DCG (-3)	-0.9986	0.2236	-4.4700	0.0002***
DCG (-4)	0.9560	0.1258	7.6000	0.0000***
DCG (-6)	0.8583	0.1401	6.1200	0.0000***
DCG (-8)	0.2535	0.1526	1.6600	0.1107
NFAG (0)	0.7302	0.0677	10.8000	0.0000***
NFAG (-2)	0.2967	0.1097	2.7000	0.0129**
NFAG (-3)	-0.3066	0.0898	-3.4100	0.0025***
NFAG (-6)	0.2924	0.0801	3.6500	0.0014***
NFAG (-8)	-0.2719	0.0784	-3.4700	0.0022***
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		0.4199 [0.7935]	
LM ARCH 1-10 test	F- statistic		0.9490 [0.5027]	

Normality test	Chi-Square statistic	1.5099 [0.4700]
Durbin-Watson test	DW statistic	2.3208

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.11A, ARDL model for long run relationship between PAK-economic growth and UAE-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. According to table 4.11A, the FDI elasticity is -0.1298, BD elasticity is -0.1650, DC elasticity is 0.0469 and NFA elasticity is 0.2491 and are significant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth.

Table 4.11A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

UAE and KSA both have been on the forefront in their support to Pakistan in terms of financial flows, diplomatic relations at the international forum and in any difficult times. The significant results speak of this very fact and highlight great potential of the financial integration of these countries with Pakistan Economy.

Table 4.11A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and UAE-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	1.1849	0.1333	8.8900	0.0000***
FDI (-1)	-0.1298	0.0642	-2.0200	0.0532*
BD(-1)	-0.1650	0.0394	-4.1800	0.0003***
DC(-1)	0.0469	0.0249	1.8800	0.0710*
NFA(-1)	0.2491	0.0821	3.0300	0.0053***
EG (-2)	-0.3708	0.2168	-1.7100	0.0986*
EG (-3)	-0.3280	0.2721	-1.2100	0.2384
EG (-4)	-0.4170	0.2451	-1.7000	0.1003
EG (-5)	0.5768	0.1573	3.6700	0.0011***
EG (-7)	-0.3809	0.0965	-3.9400	0.0005***
FDIG (-1)	-0.4495	0.1269	-3.5400	0.0015***
FDIG (-4)	0.3023	0.1097	2.7600	0.0103**
FDIG (-5)	-0.1479	0.0516	-2.8600	0.0080***
FDIG (-6)	0.2636	0.1007	2.6200	0.0143**

BDG (-2)	0.1073	0.0805	1.3300	0.1933
BDG (-3)	0.1163	0.0889	1.3100	0.2019
BDG (-5)	0.3645	0.1047	3.4800	0.0017***
BDG (-6)	-0.1323	0.0767	-1.7300	0.0959*
DCG (-1)	-0.3841	0.1057	-3.6300	0.0012***
DCG (-3)	-0.1680	0.1091	-1.5400	0.1352
DCG (-8)	-0.1108	0.0781	-1.4200	0.1673
NFAG (0)	-0.0495	0.0354	-1.4000	0.1733
NFAG (-1)	0.2720	0.1176	2.3100	0.0286**
NFAG (-4)	-0.4435	0.1143	-3.8800	0.0006***
NFAG (-6)	-0.1494	0.1063	-1.4100	0.1712
NFAG (-8)	-0.0636	0.0410	-1.5500	0.1325
Diagnostic Tests				
LM ARCH 1-4 test	F-statistic		0.9023 [0.4703]	
LM ARCH 1-10 test	F-statistic		1.1970 [0.3262]	
Normality test	Chi-Square statistic		0.2245 [0.8938]	
Durbin-Watson test	DW statistic		2.2479	
Cointegration test	F-statistic		21.9910 [0.0000]***	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.11B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration. The absolute value of the coefficient of the error-correction term indicates that about 81 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter.

Table 4.11B: EC Model for Long Run Relationship Between PAK-Economic Growth and UAE-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
EC (-1)	0.8140	0.3625	2.2500	0.0362**

EG (-1)	-0.3136	0.1846	-1.7000	0.1049
EG (-2)	0.6609	0.1487	4.4400	0.0002***
EG (-3)	0.3141	0.1636	1.9200	0.0692*
EG (-4)	-1.0700	0.1777	-6.0200	0.0000***
EG (-7)	0.3067	0.1591	1.9300	0.0681*
EG (-8)	-0.5489	0.1314	-4.1800	0.0005***
FDIG (-2)	-0.4065	0.1412	-2.8800	0.0093***
FDIG (-3)	0.3423	0.1208	2.8300	0.0103**
FDIG (-4)	0.5026	0.1333	3.7700	0.0012***
FDIG (-5)	0.4191	0.1281	3.2700	0.0038***
FDIG (-8)	-0.3654	0.0927	-3.9400	0.0008***
BDG (0)	0.2832	0.0928	3.0500	0.0063***
BDG (-1)	0.3431	0.1101	3.1200	0.0054***
BDG (-3)	0.4404	0.1066	4.1300	0.0005***
BDG (-4)	-0.1579	0.1067	-1.4800	0.1541
BDG (-7)	-0.2867	0.1117	-2.5700	0.0184**
BDG (-8)	-0.3294	0.1128	-2.9200	0.0084***
DCG (0)	-0.3779	0.1241	-3.0500	0.0064***
DCG (-1)	-0.4534	0.1085	-4.1800	0.0005***
DCG (-2)	-0.2375	0.0978	-2.4300	0.0247**
DCG (-4)	0.6046	0.1065	5.6800	0.0000***
DCG (-5)	0.2208	0.0905	2.4400	0.0242**
DCG (-6)	0.4062	0.1039	3.9100	0.0009***
DCG (-7)	0.2943	0.0976	3.0100	0.0069***
NFAG (-2)	0.2404	0.1155	2.0800	0.0504*
NFAG (-3)	-0.1803	0.1178	-1.5300	0.1415
NFAG (-4)	-0.4783	0.1269	-3.7700	0.0012***
NFAG (-5)	-0.4351	0.1149	-3.7900	0.0012***
NFAG (-6)	-0.0960	0.0362	-2.6500	0.0154**
NFAG (-7)	0.0982	0.0399	2.4600	0.0230**
NFAG (-8)	0.3764	0.0786	4.7900	0.0001***
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		0.8999 [0.4718]	
LM ARCH 1-10 test	F- statistic		0.3978 [0.9384]	
Normality test	Chi-Square statistic		3.7139 [0.1561]	
Durbin-Watson test	DW statistic		1.9783	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.12A, ARDL model for long run relationship between PAK-economic growth and TUK-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. According to table 4.11A, the FDI elasticity is 0.1877, DC elasticity is 0.3378 and NFA elasticity is -0.4501 and are significant. However, the BD elasticity is 0.0389 and insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth.

Table 4.12A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

Table 4.12A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and TUK-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	p-value
Y (-1)	0.5278	0.0924	5.7100	0.0000***
FDI (-1)	0.1877	0.0175	10.7000	0.0000***
BD(-1)	0.0389	0.0725	0.5370	0.5987
DC(-1)	0.3378	0.0753	4.4900	0.0004***
NFA(-1)	-0.4501	0.0595	-7.5600	0.0000***
EG (-2)	-0.4255	0.1193	-3.5700	0.0026***
EG (-3)	0.2091	0.1201	1.7400	0.1008
EG (-4)	-0.5141	0.0899	-5.7200	0.0000***
FDIG (-1)	-0.1723	0.0181	-9.4700	0.0000***
FDIG (-2)	-0.1930	0.0189	-10.2000	0.0000***
FDIG (-3)	-0.1479	0.0152	-9.6800	0.0000***
FDIG (-4)	-0.1711	0.0167	-10.2000	0.0000***
FDIG (-5)	-0.1255	0.0115	-10.9000	0.0000***
FDIG (-6)	-0.1206	0.0126	-9.5700	0.0000***
FDIG (-7)	-0.0615	0.0076	-8.0700	0.0000***
FDIG (-8)	-0.0370	0.0075	-4.8800	0.0002***
BDG (0)	-0.2905	0.0737	-3.9400	0.0012***
BDG (-1)	-0.4782	0.0683	-7.0000	0.0000***
BDG (-2)	-0.3500	0.0641	-5.4600	0.0001***
BDG (-3)	-0.5084	0.0668	-7.6000	0.0000***
BDG (-5)	-0.3379	0.0549	-6.1600	0.0000***

BDG (-6)	-0.1384	0.0539	-2.5700	0.0207**
BDG (-7)	-0.2175	0.0514	-4.2300	0.0006***
DCG (0)	0.1579	0.0556	2.8400	0.0119**
DCG (-2)	-0.3995	0.0552	-7.2300	0.0000***
DCG (-4)	-0.6659	0.0721	-9.2300	0.0000***
DCG (-6)	-0.4605	0.0774	-5.9400	0.0000***
DCG (-7)	0.3198	0.0623	5.1300	0.0001***
DCG (-8)	-0.1740	0.0681	-2.5500	0.0212**
NFAG (-1)	0.4184	0.0582	7.1900	0.0000***
NFAG (-2)	0.5089	0.0692	7.3500	0.0000***
NFAG (-3)	0.4199	0.0557	7.5300	0.0000***
NFAG (-4)	0.2936	0.0532	5.5100	0.0000***
NFAG (-5)	0.2448	0.0495	4.9400	0.0001***
NFAG (-6)	0.3242	0.0481	6.7300	0.0000***
NFAG (-8)	0.2595	0.0385	6.7200	0.0000***

Diagnostic Tests

LM ARCH 1-4 test	F-statistic	0.8287 [0.5138]
LM ARCH 1-10 test	F-statistic	0.9056 [0.5387]
Normality test	Chi-Square statistic	0.2860 [0.8667]
Durbin-Watson test	DW statistic	2.6322
Cointegration test	F-statistic	71.616 [0.0000]***

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.12B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration. The absolute value of the coefficient of the error-correction term indicates that about 124 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter.

Table 4.12B: EC Model for Long Run Relationship Between PAK-Economic Growth and TUK-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	P-value
EC (-1)	-1.2410	0.2817	-4.4100	0.0002***
EG (-1)	0.8530	0.0551	15.5000	0.0000***
EG (-3)	-0.2724	0.0865	-3.1500	0.0045***
EG (-4)	-0.2450	0.0883	-2.7700	0.0108**
EG (-6)	0.2200	0.0672	3.2700	0.0034***
EG (-7)	-0.1902	0.0793	-2.4000	0.0250**
EG (-8)	-0.1400	0.0663	-2.1100	0.0457**
FDIG (0)	-0.0151	0.0106	-1.4300	0.1672
FDIG (-1)	0.0245	0.0086	2.8300	0.0096***
FDIG (-2)	-0.0368	0.0076	-4.8400	0.0001***
FDIG (-4)	-0.0309	0.0057	-5.4000	0.0000***
FDIG (-5)	-0.0216	0.0080	-2.6900	0.0131**
FDIG (-6)	-0.0409	0.0063	-6.4400	0.0000***
BDG (-1)	0.1145	0.0536	2.1300	0.0438**
BDG (-2)	0.2303	0.0682	3.3700	0.0026***
BDG (-4)	0.3425	0.0597	5.7300	0.0000***
BDG (-8)	0.1549	0.0327	4.7300	0.0001***
DCG (0)	-0.0824	0.0328	-2.5100	0.0194**
DCG (-2)	-0.3253	0.0694	-4.6900	0.0001***
DCG (-3)	0.2615	0.0388	6.7300	0.0000***
DCG (-4)	-0.3516	0.0641	-5.4800	0.0000***
DCG (-5)	0.1538	0.0464	3.320	0.0030***
DCG (-6)	-0.1362	0.0447	-3.0400	0.0058***
DCG (-7)	0.4866	0.0494	9.8500	0.0000***
NFAG (-1)	-0.1221	0.0442	-2.7600	0.0111**
NFAG (-6)	0.1688	0.0331	5.0900	0.0000***
NFAG (-7)	-0.1584	0.0366	-4.3300	0.0002***
NFAG (-8)	0.1131	0.0279	4.0500	0.0005***
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		0.4200 [0.7927]	
LM ARCH 1-10 test	F- statistic		0.5165 [0.8660]	
Normality test	Chi-Square statistic		0.2079 [0.9013]	
Durbin-Watson test	DW statistic		2.20143	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.13A, ARDL model for long run relationship between PAK-economic growth and QAT-Financial Sector Growth is estimated. Akaike's information criterion (AIC) in selecting the lag length on each first differenced variable is employed. According to table 4.13A, the FDI elasticity is 0.1613 and BD elasticity is -0.2391 and are significant. The DC elasticity is -0.0025 and NFA elasticity is -0.0102 and are insignificant. The cointegration results show that F-statistic is significant, indicating that there is cointegration between economic growth and financial sector growth.

Table 4.13A also presents diagnostic test for estimated ARDL model. The diagnostic test shows that there is no autocorrelation and ARCH effect. Normality test shows normal distribution.

Table 4.13A: ARDL Model for Long Run Relationship Between PAK-Economic Growth and QAT-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	P-value
Y (-1)	0.3811	0.14360	2.6500	0.0199**
FDI (-1)	0.1613	0.0344	4.6900	0.0004***
BD(-1)	-0.2391	0.0676	-3.5400	0.0036***
DC(-1)	-0.0025	0.0416	-0.0621	0.9514
NFA(-1)	-0.0102	0.0426	-0.2400	0.8141
EG (-1)	0.3811	0.1436	2.6500	0.0199**
EG (-2)	0.4031	0.2186	1.8400	0.0881*
EG (-3)	-0.8014	0.2226	-3.6000	0.0032***
EG (-4)	-0.6426	0.1663	-3.8600	0.0020***
EG (-5)	0.3258	0.1662	1.9600	0.0717*
EG (-6)	0.1472	0.1091	1.3500	0.2002
EG (-8)	-0.3398	0.0748	-4.5400	0.0006***
FDIG (0)	0.1119	0.0214	5.2300	0.0002***
FDIG (-2)	0.1447	0.0397	3.6400	0.0030***
FDIG (-3)	0.1301	0.0293	4.4400	0.0007***
FDIG (-4)	-0.0577	0.0391	-1.4800	0.1636
FDIG (-6)	-0.2116	0.0383	-5.5100	0.0001***
FDIG (-7)	-0.1635	0.0330	-4.9500	0.0003***
BDG (0)	-0.5250	0.0978	-5.3600	0.0001***
BDG (-1)	-0.4315	0.0888	-4.8600	0.0003***
BDG (-2)	-0.2942	0.0791	-3.7200	0.0026***
BDG (-3)	-0.2547	0.0768	-3.3200	0.0056***
BDG (-5)	0.1383	0.0842	1.6400	0.1246

BDG (-6)	-0.1038	0.0703	-1.4800	0.1635
BDG (-7)	0.1568	0.0696	2.2500	0.0422**
BDG (-8)	0.4195	0.0734	5.7100	0.0001***
DCG (-1)	-0.3034	0.1591	-1.9100	0.0788*
DCG (-2)	0.9453	0.1736	5.4400	0.0001***
DCG (-4)	0.6058	0.1419	4.2700	0.0009***
DCG (-5)	0.6881	0.2425	2.8400	0.0140**
DCG (-7)	0.3925	0.1762	2.2300	0.0441**
DCG (-8)	-0.9217	0.2283	-4.0400	0.0014***
NFAG (-2)	0.4503	0.1343	3.3500	0.0052***
NFAG (-3)	0.2714	0.1006	2.7000	0.0182**
NFAG (-4)	0.2252	0.1173	1.9200	0.0770*
NFAG (-5)	-0.2699	0.1319	-2.0500	0.0615*
NFAG (-6)	-1.0043	0.1162	-8.6400	0.0000***
NFAG (-7)	-0.7647	0.1482	-5.1600	0.0002***
NFAG (-8)	-0.3744	0.1036	-3.6100	0.0031***
Diagnostic Tests				
LM ARCH 1-4 test	F-statistic		1.3943 [0.2562]	
LM ARCH 1-10 test	F-statistic		1.0337 [0.4380]	
Normality test	Chi-Square statistic		1.0569 [0.5895]	
Durbin-Watson test	DW statistic		2.7488	
Cointegration test	F-statistic		11.2030 [0.0002]***	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

In table 4.13B, error correction model is estimated to capture the short-run dynamics. Shocks in any of the variables can cause deviations from the long-run equilibrium in the short term. In the ARDL model, it reports the coefficient estimates of all lagged first differenced variables (short-run coefficient estimates). All of these show how all variables are dynamically adjusted. A negative and significant coefficient of ECt-1 shows an indication of cointegration. The absolute value of the coefficient of the error-correction term indicates that about 120 percent of the disequilibrium in Economic Growth is offset by short-run adjustment in each quarter.

Table 4.13B: EC Model for Long Run Relationship Between PAK-Economic Growth and QAT-Financial Sector Growth

Variable	Coefficient	Std. Error	t-value	P-value
EC (-1)	-1.2043	0.2905	-4.1500	0.0003***
EG (-1)	0.6372	0.0575	11.1000	0.0000***
EG (-3)	-0.4275	0.0513	-8.3200	0.0000***
EG (-8)	-0.2043	0.0505	-4.0400	0.0004***
FDIG (0)	0.0710	0.0148	4.8000	0.0000***
FDIG (-2)	0.1078	0.0181	5.9500	0.0000***
FDIG (-4)	0.0369	0.0166	2.2200	0.0344**
FDIG (-6)	-0.0478	0.0144	-3.3200	0.0025***
FDIG (-7)	-0.0674	0.0147	-4.5800	0.0001***
FDIG (-8)	0.0707	0.0159	4.4400	0.0001***
BDG (0)	-0.1581	0.0366	-4.3100	0.0002***
BDG (-1)	-0.1090	0.0299	-3.6400	0.0011***
BDG (-3)	-0.2146	0.0307	-6.9900	0.0000***
BDG (-7)	0.2804	0.0360	7.7800	0.0000***
BDG (-8)	0.1736	0.0334	5.1900	0.0000***
DCG (0)	-0.4831	0.1026	-4.7100	0.0001***
DCG (-2)	0.4705	0.0848	5.5500	0.0000***
DCG (-4)	0.7286	0.0953	7.6500	0.0000***
DCG (-7)	-0.3544	0.0998	-3.5500	0.0014***
NFAG (-2)	0.1602	0.0419	3.8200	0.0007***
NFAG (-6)	-0.4626	0.0577	-8.0100	0.0000***
NFAG (-7)	-0.1888	0.0576	-3.2700	0.0028***
Diagnostic Tests				
LM ARCH 1-4 test	F- statistic		0.2755 [0.8922]	
LM ARCH 1-10 test	F-statistic		0.5576 [0.8353]	
Normality test	Chi-Square statistic		0.7518 [0.6867]	
Durbin-Watson test	DW statistic		1.9948	

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

4.1.1. Impact of Financial Sector Growth and Its Volatility on Economic Growth Volatility

This study examines the impact of financial sector growth and its volatility on economic growth volatility.

4.1.1.1. Impact of Financial Sector Growth on Economic Growth Volatility

To examine the impact of financial sector growth on economic growth volatility, ARMA (p, q) – GARCH (1, 1) and EGARCH (1, 1) models are estimated in table 4.14A and 4.15A. The significant results in mean equation shows that Pak economic growth is affected by its own lags. These results reveal the volatility clustering phenomenon. Any improvement in the past continues to prevail for some time in the subsequent period.

The results in variance equations shows that the Pak FDIG, Kuwait FDIG and Saudi Arabia FDIG have significant negative effect on Pak economic growth volatility which is consistent with studies (Schumpeter, 1934) in terms of integration of various economies. A mentionable amount of literature consider financial sector development as leading source of economic growth (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015). However, Malaysia FDIG has significant positive effect on Pak economic growth volatility which is consistent with studies (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015) and also follows Schumpeter (1912). Bangladesh FDIG has insignificant negative while Indonesia FDIG, UAE FDIG, Türkiye FDIG and Qatar FDIG has insignificant positive effect on Pak economic growth volatility.

Reasons for such an integration can be interdependence of the international financial structure linked with economic growth of the nations. The Pak BDG and Kuwait BDG have significant positive effect on Pak economic growth volatility which is consistent with studies as mentioned above. However, Indonesia BDG and Türkiye BDG has significant negative effect on Pak economic growth volatility which is

consistent with studies as mentioned earlier. Bangladesh BDG has insignificant negative while Malaysia BDG, Saudi Arabia BDG, UAE BDG and Qatar BDG has insignificant positive effect on Pak economic growth volatility.

Volatility in the financial sector of some of the islamic countries creeps into the other economies through trade and financial transactions. That is why changes occurring in terms of financial variables affect Pakistan's economic growth through variance equation.

The DCG of Pakistan, Kuwait, Malaysia and UAE have shown significant negative effect on Pak economic growth volatility which are again consistent with studies of (Schumpeter, 1934) at the theoretical level and consistent with the empirical studies. A mentionable amount of literature consider financial sector development as leading source of economic growth (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015). The Indonesia DCG has significant positive effect on Pak economic growth volatility. The DCG of Bangladesh and Türkiye has insignificant positive while Saudi Arabia and Qatar has insignificant negative effect on Pak economic growth volatility.

The NFA of Pakistan, Saudi Arabia and Türkiye has significant positive effect on Pak economic growth volatility which is consistent with empirical studies (Stavarek, Repkova, & Gajdosova, 2012). Historically, monetary unions, common currency and dollarization passed through this informal financial coordination as revealed by some of the precious studies (Liebscher, Christl, Peter & Ritzberger-Grünwald, 2006). The Indonesia NFA and Malaysia NFA has significant negative effect on Pak economic growth volatility. The NFA of Bangladesh has insignificant negative while Kuwait, UAE and Qatar has insignificant positive effect on Pak economic growth volatility.

Table 4.14B and 4.15B present diagnostic tests of estimated GARCH (1,1) models for Kuwait, Malaysia, Saudi Arabia, Türkiye, Qatar and EGARCH (1,1) models for Pakistan, Bangladesh, Indonesia and UAE. These models show that Pakistan, Bangladesh, Kuwait, Malaysia, have no significant skewness and kurtosis, while UAE and Qatar have significant skewness but insignificant kurtosis. The

diagnostic test results for Indonesia shows significant negative skewness and positive kurtosis. The standardized residuals are normally distributed, according to Jarque-Bera statistic. Furthermore, there are no ARCH effects, according to LM-ARCH test. There is no evidence of serial autocorrelation in the standardized residuals, according to the Q-statistic. There is no evidence of serial autocorrelation in squared standardized residuals according to the Q^2 - statistic.

Table 4.14A: GARCH Models for Impact of Financial Sector Growth on Economic Growth Volatility

Parameters	Pakistan EGARCH (1,1) ARMA(1,0)	Bangladesh EGARCH (1,1) ARMA(2,0)	Indonesia EGARCH (1,1) ARMA(1,0)	Kuwait GARCH (1,1) ARMA(1,0)	Malaysia GARCH (1,1) ARMA(2,0)
Mean Equation					
c (constant)	1.1996 [0.5606]	2.2299 [0.0020]***	2.3387 [0.1776]	1.4378 [0.2682]	1.1911 [0.1683]
AR (1)	0.9480 [0.0000]***	0.5577 [0.0000]***	0.8554 [0.0000]***	0.6606 [0.0000]***	0.6609 [0.0000]***
AR (2)	---	-0.1400 [0.0613]*	---	---	-0.1688 [0.0948]*
Variance Equation					
c (constant)	2.2795 [0.0000]***	2.1268 [0.0571]*	1.8175 [0.0000]***	4.2753 [0.1185]	4.3957 [0.0118]**
FDIG	-0.0063 [0.0067]***	-0.0056 [0.2304]	0.0043 [0.2991]	-0.2030 [0.0002]***	0.0315 [0.0085]***
BDG	0.1129 [0.0002]***	-0.0036 [0.9208]	-0.0744 [0.0751]*	0.4770 [0.0148]**	1.0036 [0.1330]
DCG	-0.0917 [0.0471]**	0.1486 [0.3972]	0.2373 [0.0001]***	-0.6645 [0.0774]*	-0.6500 [0.0854]*
NFAG	0.0113 [0.0000]***	-0.0340 [0.3202]	-0.0318 [0.0002]***	0.2053 [0.3472]	-0.6858 [0.0082]***
ARCH(Alpha1)	-2.6384 [0.0001]***	-0.5340 [0.3202]	1.5647 [0.0025]***	0.1430 [0.0876]*	0.2161 [0.0941]*
GARCH(Beta1)	0.2554 [0.0114]**	0.9558 [0.0000]***	-0.2963 [0.2783]	0.6086 [0.0001]***	0.4240 [0.0014]***
EGARCH (Theta1)	0.3873 [0.0012]***	0.0518 [0.8626]	-0.1165 [0.3138]	---	---
EGARCH (Theta2)	0.9954 [0.0001]***	0.9560 [0.0154]**	0.7827 [0.0064]***	---	---

Alpha[1]+Beta[1]	---	---	---	0.7517	0.6401
AIC	5.5672	5.4580	5.5775	5.6931	5.5201
SIC	5.9046	5.8260	5.9149	5.9869	5.8465
Log Likelihood	-200.5570	-195.4060	-200.9480	-184.5670	-177.6840

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Table 4.14B: Diagnostic Tests

	Lags	**Pakistan**	**Bangladesh**	**Indonesia**	**Kuwait**	**Malaysia**
			Normality Tests			
Skewness		-0.2106 [0.4447]	-0.1835 [0.5053]	-0.6221 [0.0239]**	-0.1786 [0.5389]	-0.3143 [0.2796]
Excess Kurtosis		0.0806 [0.8823]	0.6126 [0.2608]	1.0847 [0.0464]**	0.8348 [0.1458]	-0.1247 [0.8279]
Jarque-Bera		0.5826 [0.7472]	1.6153 [0.4459]	8.6291 [0.0133]**	2.3364 [0.3109]	1.1639 [0.5588]
			Residual Tests			
Q-Statistics on Standardized Residuals	5	4.1146 [0.3907]	8.9236 [0.0303]**	6.8269 [0.1453]	9.4955 [0.0498]**	10.3913 [0.0155]**
	10	8.6632 [0.4689]	13.7197 [0.0893]*	15.3520 [0.0817]*	15.7457 [0.0723]*	14.5070 [0.0694]*
	20	22.6754 [0.2519]	35.5286 [0.0081]***	26.9837 [0.1050]	40.8710 [0.0025]***	60.6818 [0.1034]
	50	53.5301 [0.3046]	59.3427 [0.1262]	60.1311 [0.1323]	68.8583 [0.0321]**	4.7000 [0.1951]
Q-Statistics on Squared Standardized Residuals	5	4.8327 [0.1844]	1.3452 [0.7184]	4.6181 [0.2019]	3.8460 [0.2785]	4.7000 [0.1951]
	10	6.4860 [0.5929]	3.1546 [0.9242]	8.7625 [0.3627]	6.8429 [0.5536]	7.1221 [0.5235]
	20	10.0156 [0.9313]	14.5632 [0.6917]	17.1789 [0.5108]	12.7328 [0.8071]	13.3161 [0.7724]
	50	28.7905 [0.9873]	43.0587 [0.6750]	53.7251 [0.2643]	46.6407 [0.5286]	33.8068 [0.9397]
ARCH LM test (F-Statistics)	ARCH 1-2	1.6542 [0.1987]	0.4558 [0.6358]	0.2527 [0.7774]	0.9952 [0.3756]	0.2407 [0.7868]
	ARCH 1-5	0.6954 [0.6289]	0.2828 [0.9208]	0.9321 [0.4663]	0.8156 [0.5437]	0.7672 [0.5774]
	ARCH 1-10	0.4347 [0.9228]	0.2401 [0.9905]	1.0223 [0.4378]	1.0262 [0.4375]	0.5710 [0.8286]

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Table 4.15A: GARCH Models for Impact of Financial Sector Growth on Economic Growth Volatility

	Saudi Arabia	**UAE**	**Türkiye**	**Qatar**
Parameter	**GARCH (1,1)** ARMA(2,0)	**EGARCH (1,1)** ARMA(1,0)	**GARCH (1,1)** ARMA(2,0)	**GARCH (1,1)** ARMA(1,0)
		Mean Equation		
c (constant)	2.9737 [0.0016]***	6.8497 [0.0030]***	3.4917 [0.0030]***	3.6559 [0.0000]***
AR (1)	0.5536 [0.0000]***	0.8105 [0.0000]***	0.3075 [0.0998]*	0.7220 [0.0000]***
AR (2)	-0.0342 [0.7648]	---	0.2230 [0.2512]	---
		Variance Equation		
c (constant)	5.1465 [0.0459]**	2.5302 [0.0000]***	4.6466 [0.0903]*	1.6041 [0.5843]
FDIG	-0.1091 [0.0084]***	0.0306 [0.5787]	0.0295 [0.2611]	0.1295 [0.3838]
BDG	0.1062 [0.6435]	0.0462 [0.2531]	-0.2937 [0.0003]***	0.0650 [0.8831]
DCG	-0.8195 [0.1126]	-0.0717 [0.0688]*	0.2775 [0.3175]	-0.0484 [0.9193]
NFA	0.6509 [0.0208]**	0.0208 [0.6758]	0.0374 [0.0300]**	0.0406 [0.5331]
ARCH(Alpha1)	0.1901 [0.0572]*	0.2736 [0.3998]	0.2565 [0.0534]*	0.2763 [0.4471]
GARCH(Beta1)	0.4447 [0.0412]**	0.0697 [0.8104]	0.4800 [0.0213]**	0.7033 [0.0001]***
EGARCH (Theta1)	---	0.4070 [0.0847]*	---	---
EGARCH (Theta2)	---	0.9999 [0.0045]***	---	---
Alpha[1]+Beta[1]	0.6349	---	0.7365	0.9796
AIC	5.3489	5.5530	5.5002	5.2691
SIC	5.6676	5.8904	5.8069	5.5757
Log Likelihood	-179.8880	-200.0170	-199.0110	-190.2260

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Table 4.15B: Diagnostic Tests

	Lags	Saudi Arabia	UAE	Türkiye	Qatar
Normality Tests					
Skewness		-0.5030 [0.0773]*	-0.2616 [0.3424]	-0.5570 [0.0432]**	-0.1248 [0.6505]
Excess Kurtosis		0.3279 [0.5598]	1.2078 [0.0266]**	0.7553 [0.1656]	2.5517 [0.0000]***
Jarque-Bera		3.3127 [0.1908]	5.4865 [0.0643]*	5.7377 [0.0567]*	20.816 [0.0000]***
Residual Tests					
Q-Statistics on Standardized Residuals	5	16.4414 [0.0009]***	10.7902 [0.0290]**	35.2788 [0.0000]***	10.6645 [0.0306]**
	10	23.7537 [0.0025]***	14.2394 [0.1140]	41.6461 [0.0000]***	15.1619 [0.0865]*
	20	58.8651 [0.0000]***	36.5274 [0.0090]***	69.8306 [0.0000]***	38.0823 [0.0057]***
	50	84.9059 [0.0008]***	71.7376 [0.0187]**	95.9704 [0.0000]***	70.843 [0.0222]**
Q-Statistics on Squared Standardized Residuals	5	2.9933 [0.3926]	4.7430 [0.1916]	7.9265 [0.0475]**	6.2861 [0.0984]*
	10	3.9489 [0.8616]	6.2892 [0.6148]	9.2448 [0.3220]	8.3254 [0.4023]
	20	16.9378 [0.5273]	18.8244 [0.4027]	21.3234 [0.2634]	12.7892 [0.8039]
	50	32.0991 [0.9622]	56.1545 [0.1958]	41.4653 [0.7359]	53.3059 [0.2775]
ARCH LM test (F-Statistics)	ARCH 1-2	0.5841 [0.5605]	0.0487 [0.9525]	1.2984 [0.2795]	3.5229 [0.0349]**
	ARCH 1-5	0.4342 [0.8228]	0.9289 [0.4684]	1.4981 [0.2032]	1.4173 [0.2303]
	ARCH 1-10	0.2112 [0.9942]	0.6373 [0.7752]	0.9946 [0.4598]	1.4687 [0.1774]

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

4.4.3 Impact of Financial Sector Volatility on Economic Growth Volatility

To examine the impact of financial sector volatility on economic growth volatility, ARMA (p, q) – GARCH (1, 1) and EGARCH (1, 1) models are estimated in table 4.16A and 4.17A. The results in variance equations shows that the Pak-VFDIG, Bangladesh VFDIG, Indonesia VFDIG, Malaysia VFDIG and Qatar VFDIG has significant negative effect on Pak economic growth volatility which is consistent with the previous studies of financial integration (Stavarek, Repkova, & Gajdosova, 2012) and studies related to the informal financial coordination (Liebscher, Christl, Peter & Ritzberger-Grünwald, 2006). This study is exploring the effect of financial indicators of Pakistan and the Islamic countries on the economic growth of Pakistan through mean and variance equations which is a pre-condition to understand efficiency of the markets of these countries. Statistically significant results highlight the possible integration of these Islamic countries with the economy of Pakistan as per findings of the studies (Stavarek, Repkova, & Gajdosova, 2012).

However, Türkiye VFDIG has significant positive effect on Pak economic growth volatility. Kuwait VFDIG and UAE VFDIG have insignificant negative while Saudi Arabia VFDIG has insignificant positive effect on Pak economic growth volatility.

The Pak VBDG has significant positive effect on Pak economic growth volatility which is consistent with studies as mentioned above. However, UAE VBDG has significant negative effect on Pak economic growth volatility which is consistent with studies mentioned above. The VBDG of Bangladesh, Kuwait and Saudi Arabia has insignificant negative while Indonesia VBDG, Malaysia VBDG, Türkiye VBDG and Qatar VBDG has insignificant positive effect on Pak-economic growth volatility.

The VDCG of Indonesia has significant positive effect on Pak economic growth volatility which is consistent with studies as mentioned above. The VDCG of Bangladesh, Kuwait, Malaysia, Saudi Arabia, UAE and Türkiye have insignificant

positive while Pakistan and Qatar have insignificant negative effect on Pak economic growth volatility.

The VNFA of Pakistan, Indonesia and Türkiye has significant negative effect on Pak economic growth volatility which is consistent with studies mentioned above. The VNFA of Bangladesh, Kuwait, Malaysia, Saudi Arabia, Qatar has insignificant negative while UAE has insignificant positive effect on Pak economic growth volatility.

Table 4.14B and 4.15B present diagnostic tests of estimated GARCH (1,1) models for Kuwait, Malaysia, Saudi Arabia, Türkiye, Qatar and EGARCH (1,1) models for Pakistan, Bangladesh, Indonesia and UAE. These models show that Pakistan, Bangladesh, Kuwait, Malaysia, have no significant skewness and kurtosis, while UAE and Qatar have significant skewness but insignificant kurtosis. The diagnostic test results for Indonesia shows significant negative skewness and positive kurtosis. The standardized residuals are normally distributed, according to Jarque-Bera statistic. Furthermore, there are no ARCH effects, according to LM-ARCH test. There is no evidence of serial autocorrelation in the standardized residuals, according to the Q-statistic. There is no evidence of serial autocorrelation in squared standardized residuals according to the Q^2 – statistic

Table 4.16A: GARCH Models for Impact of Financial Sector Volatility on Economic Growth Volatility

	Pakistan	**Bangladesh**	**Indonesia**	**Kuwait**	**Malaysia**
Parameter	**GARCH (1,1) ARMA (3,0)**	**EGARCH (1,1) ARMA (2,0)**	**GARCH (1,1) ARMA (3,0)**	**GARCH (1,1) ARMA (2,0)**	**GARCH (1,1) ARMA (3,0)**
Mean Equation					
c (constant)	1.4113 [0.2293]	2.1935 [0.0000]***	2.5982 [0.0004]***	3.1185 [0.0035]***	4.0553 [0.0041]***
AR (1)	0.3463 [0.0292]**	0.4421 [0.0000]***	0.8587 [0.0000]***	0.8636 [0.0000]***	0.8131 [0.0000]***
AR (2)	0.2088 [0.2261]	-0.0169 [0.7062]	-0.0727 [0.6261]	-0.1804 [0.0960]*	0.1774 [0.2375]
AR(3)	-0.0734 [0.6219]	--	-0.1112 [0.3700]	--	-0.2524 [0.0434]**

Variance Equation					
c (constant)	4.8198 [0.1507]	3.1963 [0.0031]***	1.4010 [0.0593]*	2.8806 [0.4938]	0.0000 [1.0000]
VFDIG	-0.0562 [0.0518]*	-0.0174 [0.0227]**	-0.0659 [0.0001]***	-0.2254 [0.3669]	-0.0275 [0.0044]***
VBDG	0.7115 [0.0211]**	-0.0585 [0.2319]	0.1167 [0.6770]	-0.1212 [0.8191]	0.3932 [0.4744]
VDCG	-0.7203 [0.1149]	0.0717 [0.5240]	0.8445 [0.0041]***	0.6024 [0.5528]	1.3889 [0.1223]
VNFAG	-0.0140 [0.0521]*	-0.0395 [0.3514]	-0.0684 [0.0006]***	-0.0114 [0.9842]	-0.1973 [0.4512]
ARCH(Alpha1)	0.2830 [0.0503]*	-0.5517 [0.0705]*	0.0409 [0.4656]	0.3083 [0.3680]	0.1565 [0.2625]
GARCH(Beta1)	0.6013 [0.0000]***	0.9580 [0.0000]***	0.7514 [0.0000]***	0.5888 [0.0511]*	0.5439 [0.0008]***
EGARCH(Theta1)	--	0.0915 [0.7286]	--		--
EGARCH(Theta2)	--	0.9691 [0.9691]	--		--
Alpha[1]+Beta[1]	0.88440		0.7924	0.8972	0.70051
AIC	5.5782	5.4001	5.1085	5.5080	5.2355
SBC	5.9155	5.7681	5.4458	5.8671	5.5860
Log Likelihood	-200.973	-193.204	-183.123	-176.275	-174.862

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Table 4.16B: Diagnostic Tests

	Lags	Pakistan	Bangladesh	Indonesia	Kuwait	Malaysia
Normality Tests						
Skewness		-1.4792 [8.0251]	-0.2656 [0.3352]	-0.2996 [0.2769]	-1.0727 [0.0002]***	-0.0848 [0.7656]
Excess Kurtosis		3.9289 [5.5286]	0.1794 [0.7418]	0.6520 [0.2313]	2.6577 [3.6534]	1.5581 [0.0056]***
Jarque-Bera		76.598 [2.3276]	0.9956 [0.6078]	2.4836 [0.2888]	33.054 [6.6453]	7.2671 [0.0264]**
Residual Tests						

Q-Statistics on Standardized Residuals	5	15.1142 [0.0005]***	10.8675 [0.0124]**	8.8306 [0.0120]**	4.1964 [0.2410]	8.1569 [0.0169]**
	10	16.5782 [0.0203]**	14.2137 [0.0763]*	11.2005 [0.1301]	9.6119 [0.2933]	12.5715 [0.0832]
	20	44.6172 [0.0002]***	37.5378 [0.0044]***	25.8842 [0.0765]*	21.4124 [0.2591]	29.4682 [0.0304]**
	50	71.8191 [0.0113]**	59.1383 [0.1300]	53.0464 [0.2524]	47.7205 [0.4842]	50.7055 [0.3296]
Q-Statistics on Squared Standardized Residuals	5	1.7816 [0.6189]	3.2680 [0.3521]	2.4005 [0.4935]	2.9754 [0.3954]	10.9365 [0.0120]**
	10	5.7411 [0.6761]	4.7824 [0.7805]	9.2011 [0.3256]	3.9480 [0.8617]	13.8997 [0.0844]*
	20	19.2731 [0.3751]	15.8181 [0.6052]	26.9536 [0.0798]*	8.8579 [0.9629]	34.7165 [0.0102]**
	50	28.1775 [0.9899]	41.0012 [0.7528]	47.4274 [0.4962]	49.2464 [0.4230]	45.8082 [0.5630]
ARCH LM test (F-Statistics)	ARCH 1-2	0.4236 [0.6564]	0.6985 [0.5008]	0.4895 [0.6150]	0.14875 [0.8621]	0.5683 [0.5693]
	ARCH 1-5	0.2891 [0.9173]	0.6613 [0.6541]	0.4007 [0.8465]	0.89320 [0.4921]	1.7506 [0.1376]
	ARCH 1-10	0.3277 [0.9699]	0.4702 [0.9018]	0.7739 [0.6529]	1.2613 [0.2806]	1.2390 [0.2914]

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Table 4.17A: GARCH Models for Impact of Financial Sector Volatility on Economic Growth Volatility

	Saudi Arabia	**UAE**	**Türkiye**	**Qatar**
Parameter	**EGARCH (1,1)** ARMA (1,0)	**EGARCH (1,1)** ARMA (2,0)	**EGARCH (1,1)** ARMA (2,0)	**GARCH (1,1)** ARMA (2,0)
Mean Equation				
c (constant)	5.8708 [0.0232]**	1.7139 [0.0293]**	2.6539 [0.0000]***	1.6560 [0.0888]*
AR (1)	0.8418 [0.0000]***	0.6696 [0.0000]***	0.3633 [0.0000]***	0.6129 [0.0000]***
AR (2)	--	-0.2012 [0.0187]**	--	-0.0982 [0.2938]
Variance Equation				
c (constant)	19.8550 [0.5347]	2.4483 [0.0007]***	2.5107 [0.0000]***	5.7686 [0.1235]

VFDIG	0.0036 [0.9618]	-0.0794 [0.3449]	0.0100 [0.0894]*	-0.1407 [0.0389]**
VBDG	-0.0196 [0.5722]	-0.1554 [0.0479]**	0.0152 [0.7489]	0.0363 [0.8638]
VDCG	0.1162 [0.5421]	0.1411 [0.1869]	0.0056 [0.9010]	-0.0714 [0.8315]
VNFAG	-0.1512 [0.2234]	0.0872 [0.2440]	-0.0254 [0.0502]*	-0.2788 [-0.2788]
ARCH(Alpha1)	-0.5969 [0.0166]**	-0.4436 [0.3204]	1.4836 [0.0005]***	0.2861 [0.0444]**
GARCH(Beta1)	0.9159 [0.0000]***	0.8886 [0.0000]***	-0.2709 [0.2215]	0.5144 [0.0001]***
EGARCH(Theta1)	0.3892 [0.1426]	-0.1376 [0.5666]	-0.4100 [0.0001]***	--
EGARCH(Theta2)	1.0000 [0.0050]***	0.9999 [0.0236]**	0.9790 [0.0083]***	--
Alpha[1]+Beta[1]		--	--	0.8006
AIC	5.6416	5.4654	5.7165	5.4481
SBC	6.0240	5.8478	6.0671	5.7667
Log Likelihood	-188.277	-182.023	-191.938	-183.408

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Table 4.17B: Diagnostic Tests

	Lags	**Saudi Arabia**	**UAE**	**Türkiye**	**Qatar**
Normality Tests					
Skewness		-0.2683 [0.3460]	-0.5617 [0.0485]**	-0.4078 [0.1521]	-0.3899 [0.1709]
Excess Kurtosis		1.6819 [0.0027]***	0.0707 [0.8999]	0.0300 [0.9574]	0.2637 [0.6392]
Jarque-Bera		9.2204 [0.0099]***	3.7491 [0.1534]	1.9712 [0.3732]	2.0053 [0.3669]
Residual Tests					
Q-Statistics on Standardized Residuals	5	10.0251 [0.0400]**	9.5542 [0.0227]**	24.5041 [0.0000]***	9.7433 [0.0208]**
	10	14.7378 [0.0983]*	15.8120 [0.0451]**	30.3081 [0.0003]***	15.8255 [0.0449]**
	20	42.9378 [0.0013]***	30.2626 [0.0349]**	66.5487 [0.0000]***	33.9007 [0.0129]**

	50	80.4528 [0.0030]***	58.0868 [0.1510]	88.2257 [0.0005]***	55.3394 [0.2173]
Q-Statistics on Squared Standardized Residuals	5	2.2482 [0.5225]	1.3102 [0.7267]	11.0244 [0.0115]**	2.1287 [0.5461]
	10	5.3857 [0.7156]	1.8569 [0.9850]	16.1268 [0.0406]**	2.8337 [0.9443]
	20	14.2974 [0.7095]	7.3360 [0.9869]	38.1666 [0.0036]***	15.3828 [0.6355]
	50	47.4336 [0.4959]	29.1591 [0.9855]	66.4342 [0.0401]**	36.7276 [0.8821]
ARCH LM test **(F-Statistics)**	ARCH 1-2	0.4351 [0.6491]	0.1206 [0.8865]	0.0152 [0.9848]	0.1237 [0.8838]
	ARCH 1-5	0.6005 [0.6997]	0.4242 [0.8299]	1.9908 [0.0935]*	0.3195 [0.8993]
	ARCH 1-10	0.6034 [0.8030]	0.8421 [0.5913]	2.1003 [0.0429]**	0.2618 [0.9866]

Note: p-values in parentheses *** indicates 1% significance level, ** indicates 5% significance level and * indicates 10% significance level

Discussion of Results

The information about PAK-Economic Growth and Financial Sector Growth is explained by descriptive statistics of the data. These financial sector growth indicators are represented by foreign direct investment growth (FDIG), banking sectors deposits growth (BDG), domestic credit to private sector growth (DCG) and net financial assets growth (NFAG). The distribution of PAK-Economic Growth and other Financial Sector variables exhibit the features of skewness as leptokurtosis and volatility.

The average of most of the quarterly financial sector growth variables is positive reflecting growth of those variables over time. The skewness measures asymmetry of distribution and kurtosis measures the peak or height of distribution of quarterly financial sector growth variables respectively which should ideally lie between zero and three in normal distribution.

The mean of the dependent variable-DV (PAK-Economic Growth) is positive and 3.6%, which means it increases over time. The variability in PAK-Economic Growth

is observed as measured by standard deviation, which is 7.6%. The value of skewness is positive in PAK-Economic Growth and the value of kurtosis is greater than 3 for PAK-Economic Growth which indicates a heavy tailed and have leptokurtic distribution. The Jarque-Bera test statistic is positive and it is statistically significant for PAK-Economic Growth which shows prevalence of non-normality in the distribution. With reference to the financial economics, leptokurtic distribution is the reflection of risk taking attitude of the investors in the country. For the developing country like Pakistan risk taking in the manufacturing may be due to the principle of 'higher the risk the higher the return'. Financial sector of Pakistan and the Islamic countries may be encouraged to take risk of undertaking investment in Pakistan for a better return.

The mean values of FDI growth of the selected countries except Malaysia indicates that FDI growth of these countries increases over time. However, the mean value of Malaysia is -0.36%, which shows that FDI growth of Malaysia decreases over time. The standard deviation of FDI growth of all the selected Islamic countries shows variability in the FDI growth of these countries. The mean of FDI growth of Saudi Arabia and Qatar is the highest when compared to other countries. The FDI growth of Malaysia is the lowest and negative as compared to other countries. The standard deviation of FDI growth of Malaysia is the highest and Kuwait is the lowest among other countries. The higher standard deviation represents a relatively higher degree of volatility and uncertainty associated with the FDI growth.

Thus, economic growth of Pakistan may not depend much on the volatility of Malaysian FDI growth. However, Kuwait's FDI growth can be possibly a source to consider for economic growth of Pakistan.

It is observed that mean of Bank Deposits growth of UAE is the highest as compared to other countries, whereas, Bank Deposits growth of Malaysia is the lowest as compared to the other countries. The standard deviation of Bank Deposits growth of Türkiye is the highest whereas that of Malaysia is the lowest among other countries. The mean of Private Domestic Credit growth of Qatar is highest as compared to other countries, whereas, Private Domestic Credit growth of Pakistan is the lowest as

compared to other countries. The standard deviation of Private Domestic Credit growth of Türkiye is the highest and Bangladesh is the lowest among other countries.

Pakistan has very good trade relations with Qatar, as shown in the chapter 2. Increasing domestic credit and bank deposits in the other countries have great potential of financial flows to other Islamic countries including Pakistan. The average growth of bank deposits in the Islamic countries ranging around 4% in general cannot be considered as a very strong source of capital formation and industrial development in any individual Islamic countries. These countries jointly have great potential to pool their financial resources for the purpose of economic growth.

The mean of Net Financial Assets growth of Pakistan is highest as compared to other countries, whereas, the mean value of Net Financial Assets growth of Qatar is the lowest and negative as compared to other countries. The standard deviation of Net Financial Assets growth of Pakistan is the highest and Saudi Arabia is the lowest among other countries.

Higher values of the standard deviation in almost all the countries speaks of the rising volatility and uncertainty in the Islamic countries in general which should be taken seriously care of. Though financial growth in Pakistan is significantly a large number, but Pakistan could not capitalize this rising growth of financial assets. Consolidated investment planning in the country is required and policy makers should look into it.

The value of skewness is positive in FDI growth of Pakistan, Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia and Qatar, and negative in FDI growth of UAE and Türkiye. The value of skewness is positive in Bank Deposits growth of Pakistan, Bangladesh, Kuwait, Malaysia, Saudi Arabia, Türkiye and Qatar, and negative in FDI growth of Indonesia and UAE. The value of skewness is positive in Private Domestic Credit growth of Pakistan, Kuwait, Saudi Arabia, UAE and Qatar, and negative in Private Domestic Credit growth of Bangladesh, Indonesia, Malaysia and Türkiye. The value of skewness is positive in NFA growth of Bangladesh, Indonesia and Saudi Arabia, and negative in NFA growth of Pakistan, Kuwait, Malaysia, UAE, Türkiye and Qatar.

The value of kurtosis is greater than 3 for FDI growth in Bangladesh, Kuwait, Saudi Arabia and Türkiye; Bank Deposits growth in Pakistan and Türkiye; NFA growth in Indonesia, Kuwait, UAE, Türkiye and Pakistan; which indicates they are heavy tailed and have leptokurtic distribution while value of kurtosis is less than 3 for FDI growth in Pakistan, Indonesia, Malaysia, UAE and Qatar; Bank Deposits growth in Bangladesh, Indonesia, Kuwait, Malaysia, Saudi Arabia, UAE and Qatar; Private Domestic Credit growth in all the countries; NFA growth in Bangladesh, Malaysia, Saudi Arabia, Qatar.

The value of skewness and excess kurtosis show non-normality. The Jarque-Bera test statistics are positive and statistically significant for each of variable series showing non-normality in distributions.

ARMA (p, q) – GARCH (1, 1) and EGARCH (1, 1) models are estimated in table 4.14A and 4.15A to examine the impact of financial sector growth on economic growth volatility. The significant results in mean equation shows that Pak economic growth is affected by its own lags. These results reveal the volatility clustering phenomenon. Any improvement in the past continues to prevail for some time in the subsequent period. The results in variance equations shows that the Pak FDIG, Kuwait FDIG and Saudi Arabia FDIG have significant negative effect on Pak economic growth volatility which is consistent with studies (Schumpeter, 1934) in terms of integration of various economies. A mentionable amount of literature consider financial sector development as leading source of economic growth (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015). However, Malaysia FDIG has significant positive effect on Pak economic growth volatility which is consistent with studies (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015) and also follows Schumpeter (1912). Bangladesh FDIG has insignificant negative while Indonesia FDIG, UAE FDIG, Türkiye FDIG and Qatar FDIG has insignificant positive effect on Pak economic growth volatility.

Reasons for such an integration can be interdependence of the international financial structure linked with economic growth of the nations. The Pak BDG and Kuwait BDG have significant positive effect on Pak economic growth volatility which is consistent with studies as mentioned above. However, Indonesia BDG and Türkiye

BDG has significant negative effect on Pak economic growth volatility which is consistent with studies as mentioned earlier. Bangladesh BDG has insignificant negative while Malaysia BDG, Saudi Arabia BDG, UAE BDG and Qatar BDG has insignificant positive effect on Pak economic growth volatility.

Volatility in the financial sector of some of the Islamic countries creeps into the other economies through trade and financial transactions. That is why changes occurring in terms of financial variables affect Pakistan's economic growth through variance equation.

The DCG of Pakistan, Kuwait, Malaysia and UAE have shown significant negative effect on Pak economic growth volatility which are again consistent with studies of (Schumpeter, 1934) at the theoretical level and consistent with the empirical studies. A mentionable amount of literature consider financial sector development as leading source of economic growth (Ahmed (2005); Lucas (1988); (Schuster & Uhrig-Homburg, 2015). The Indonesia DCG has significant positive effect on Pak economic growth volatility. The DCG of Bangladesh and Türkiye has insignificant positive while Saudi Arabia and Qatar has insignificant negative effect on Pak economic growth volatility.

The NFA of Pakistan, Saudi Arabia and Türkiye has significant positive effect on Pak economic growth volatility which is consistent with empirical studies (Stavarek, Repkova, & Gajdosova, 2012). Historically, monetary unions, common currency and dollarization passed through this informal financial coordination as revealed by some of the precious studies (Liebscher, Christl, Peter & Ritzberger-Grünwald, 2006). The Indonesia NFA and Malaysia NFA has significant negative effect on Pak economic growth volatility. The NFA of Bangladesh has insignificant negative while Kuwait, UAE and Qatar has insignificant positive effect on Pak economic growth volatility.

Table 4.14B and 4.15B present diagnostic tests of estimated GARCH (1,1) models for Kuwait, Malaysia, Saudi Arabia, Türkiye, Qatar and EGARCH (1,1) models for Pakistan, Bangladesh, Indonesia and UAE. These models show that Pakistan, Bangladesh, Kuwait, Malaysia, have no significant skewness and kurtosis, while UAE and Qatar have significant skewness but insignificant kurtosis. The diagnostic test

results for Indonesia shows significant negative skewness and positive kurtosis. The standardized residuals are normally distributed, according to Jarque-Bera statistic. Furthermore, there are no ARCH effects, according to LM-ARCH test. There is no evidence of serial autocorrelation in the standardized residuals, according to the Q-statistic. There is no evidence of serial autocorrelation in squared standardized residuals according to the Q^2 - statistic.

To examine the impact of financial sector volatility on economic growth volatility, ARMA (p, q) – GARCH (1, 1) and EGARCH (1, 1) models are estimated in table 4.16A and 4.17A. The results in variance equations shows that the Pak-VFDIG, Bangladesh VFDIG, Indonesia VFDIG, Malaysia VFDIG and Qatar VFDIG has significant negative effect on Pak economic growth volatility which is consistent with the previous studies of financial integration (Stavarek, Repkova, & Gajdosova, 2012) and studies related to the informal financial coordination (Liebscher, Christl, Peter & Ritzberger-Grünwald, 2006). This study is exploring the effect of financial indicators of Pakistan and the Islamic countries on the economic growth of Pakistan through mean and variance equations which is a pre-condition to understand efficiency of the markets of these countries. Statistically significant results highlight the possible integration of these Islamic countries with the economy of Pakistan as per findings of the studies (Stavarek, Repkova, & Gajdosova, 2012). However, Türkiye VFDIG has significant positive effect on Pak economic growth volatility. Kuwait VFDIG and UAE VFDIG have insignificant negative while Saudi Arabia VFDIG has insignificant positive effect on Pak economic growth volatility. The Pak VBDG has significant positive effect on Pak economic growth volatility which is consistent with studies as mentioned above. However, UAE VBDG has significant negative effect on Pak economic growth volatility which is consistent with studies mentioned above. The VBDG of Bangladesh, Kuwait and Saudi Arabia has insignificant negative while Indonesia VBDG, Malaysia VBDG, Türkiye VBDG and Qatar VBDG has insignificant positive effect on Pak-economic growth volatility. The VDCG of Indonesia has significant positive effect on Pak economic growth volatility which is consistent with studies as mentioned above. The VDCG of Bangladesh, Kuwait, Malaysia, Saudi Arabia, Türkiye and UAE have insignificant positive while Pakistan and Qatar have insignificant negative effect on

Pak economic growth volatility. The VNFA of Pakistan, Indonesia and Türkiye has significant negative effect on Pak economic growth volatility which is consistent with studies mentioned above. The VNFA of Bangladesh, Kuwait, Malaysia, Qatar and Saudi Arabia, has insignificant negative while UAE has insignificant positive effect on Pak economic growth volatility.

CHAPTER 5
CONCLUSION

Economic Growth of a country is dependent not only on the internal financial indicators but also financial changes occurring in the world around. This study has been conducted following Shumpeter (1934) and some important empirical evidences, Ahmed (2005); Lucas (1988) and Schuster and Uhring-Homburg (2015).

We employed advanced statistical and econometric methods like Pairwise Granger Causality test, GARCH models, ARDL and VECM, in order to find out empirical relation between Pakistan's Economic Growth, its financial indicators and Financial sector growth in the Islamic countries.

In different methods, findings are different. However, our overall results provide answers to research questions. The study finds unequivocal direction of relationship from financial sector growth towards Economic Growth of Pakistan at the first place. There is a great potential of finanacial integration between Pakistan and the selected Islamic countries.

Our results show that any volatility occurring in terms of-Foreign Direct Investment, Bank Deposits, Domestic Credit to Private sector and Net Financial Assets, creeps into fluctuation of Pakistan's Economic Growth. As per our hypothesis, Economic Growth of Pakistan is not necessarily directly affected by financial sector growth. Rather Economic Growth is effected by the financial variables through variance equation. That is why this study employs GARCH models with the features of mean and variance equation. Results of this study answers all the three research questions. The results are compatible with the previous studies such as Morana (2009), Cheung and Lai (2009) and Grydaki and Fountas (2009) while insignificance and negative effect is confirmed by Chipili (2010). The results area generalizable because, diagnostic tests prove robustness of these results.

5.1 Recommendations and Future Research Directions

Based on findings from the estimation of different models, following recommendations can be made for policy makers:

1. Financial sector should be disciplined, developed, supported from different sources of savings.
2. Financial sector growth is the backbone of capital formation in the economy. However, policy makers should take measures towards financial discipline through management of monetary policy variables.
3. Pakistan has lost its significant trade and financial relations with the Islamic countries. Our results find out potential for trade and financial integration with Islamic countries. Policy makers should take a serious notice of declining integration and capitalise great potential of financial integration for sustainable Economic Growth.
4. In the future research studies we can further test the extent of financial integration with non-Islamic countries and how much part we can convert from those and how can we generate our part from their volume of transactions by improving our economy through implementation of sound macroeconomic framework in the light of new financial sector development.
5. Each country is an economic entity. In the future, a funded research should be conducted on behalf of OIC, on all these Islamic countries separately so that we can get the detailed findings of each country. On the basis of those findings, OIC can

make further structure and framework to increase more financial integration between Islamic Countries.

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