Global Trade Potential and the Analysis of Facilitation Indicators for Pakistan

By

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School of Economics
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Islamabad
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This is to certify that the research work presented in this thesis, entitled "***Global Trade Potential and the Analysis of Facilitation Indicators for Pakistan***" was conducted by **Ms. Nazia Gul** under the supervision of **Dr. Javed Iqbal, Associate Professor of Economics.**

No part of this thesis has been submitted anywhere else for any other degree. This thesis is submitted to the School of Economics, Quaid-i-Azam University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the field of Economics, School of Economics, Quaid-i-Azam University, Islamabad.

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Dedicated to

My Dear Parents: For their endless love, support, and encouragement.

Especially, in the loving memory of my Father,

who could not live to see this day

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ABSTRACT

Traditionally the economy of Pakistan is characterized by a narrow trade base and chronic trade deficit. Trade diversification is one of the challenging issues that the country is supposed to cope with. The lack of diversification by products and markets and higher concentration in relatively low value-added products has posed a significant risk for export earnings. Another important obstacle to improving trade/export performance is higher trade cost due to a lack of international connectivity and trade facilitation. Trade Facilitation is one of the major policy tools which can effectively reduce cost and time through simplification, modernization, and harmonization of trade processes hence can increase trade flows. It may also contribute to an increase in export diversification. Considering the significance of diversification and facilitation for trade expansion, the present study has comprehensively examined the trade/export potential in goods and services by countries and regions for Pakistan as well as assessed the effects of trade facilitation. To perform the analysis, the gravity model has been estimated through OLS and PPML estimation methods, however, the PPML method is a preferred method as it estimates the model in multiplicative form thus dealing with zero trade flows and also providing consistent estimates in the presence of heterogeneity. The study has also used Access Market Additional Frontier (AMAF) to identify the product groups with higher trade potential. The study has used panel data across 101 trading partners to compute the trade/export potential in goods and services, while 97 countries were included to evaluate the impact of LPI on trade/exports. Findings suggest that Pakistan has tremendous potential to exhaust by diversifying its trade both in goods and services towards new destinations, particularly towards non-traditional trading partners. According to the regional distribution of trade/export potential in goods maximum potential lies within Latin America followed by Africa, SAARC, NAFTA, Transition Economies, EU-EEA, CAR, Middle East, ASEAN, and ECO. Product-wise potential on the basis of the AMAF approach has been identified in manufactures goods, misc. manufactured articles, food and live animals, and chemicals. The trade/export potential in services has been indicated within ECO followed by the Middle East, Africa, SAARC, Transition economies, EU-EEA, Latin America, and ASEAN. With regard to logistics, we found a considerably positive effect of the overall LPI of Pakistan and its partner countries on exports relative to overall trade. Amongst various sub-components, we found that ease of arranging competitively priced shipments both in Pakistan and its partner country, ability to track and trace consignment in Pakistan and quality of trade and transport logistic in partner country may have a significant impact on exports. Overall Present study has reaffirmed

that there is substantial potential for trade/export expansion both in goods and services. However, there are certain chronic as well as contemporary issues which require to be addressed. In order to enhance export growth, Pakistan is required to improve competitiveness and level of diversification in the export base. The findings of the study reveal that improvement in LPI (a proxy for trade facilitation) is fundamental for improving the country's export competitiveness and foreign market expansion. Pakistan has initiated several types of trade policies from import substitution to export-led strategy and now following STPF, but instead of focusing on effective implementation of these policies by addressing the structural issues, the country has focused on short-term export stimuli. Therefore, the main focus should be on the effective implementation of long-term trade policies. The present study has determined various important factors which can play a crucial role in stimulating trade/exports of goods and services. The government should give due attention to these factors while formulating trade policies.

CHAPTER 1: INTRODUCTION

1.1. Importance of International Trade

International trade plays a vital role in maximizing the wealth of countries. It also increases the division of labour and specialization which in turn helps the countries to achieve a higher level of growth and productivity (Sezer, 2018). As a key source of openness, international trade has significantly influenced the economic growth of countries (Sun & Heshmati, 2010). Countries that are more open to trade are supposed to make more productive use of their resources by specializing in the production of the goods and services that they can produce more competitively (WTO, 2018). However, a high level of trade openness and specialization is not without challenges as it could intensify external vulnerability through instability in terms of trade and foreign demand (McIntyre "et al", 2018). The vulnerability of a country to external economic shocks is embedded in a country's dependence on its export, as export earnings fund imports as well as directly add to investment and development (UNDP, 2015). Since the effect of an economic shock is realized by a decline in export earnings, however, the size of the effect relies on the composition and concentration of the country's exports (UNDP, 2015). Nevertheless, diversification policies both in terms of markets and products can help countries to build their resilience against any type of external shock. For this purpose, a highly competitive and sustainable structure of production and exports is very important (Erkan, 2014). The key obstacles, however, are the fierce competition in improving the quality of product and technological sophistication in the international market (Santhi & Setyari, 2019).

In addition to the above, international trade cannot be disconnected from different barrier i.e tariff and non-tariff barriers. In tariff barriers, taxes imposed on goods that cross national borders. On the other hand, regulations, policies, prohibitions, provisions, and private sector market practices are referred to as non-tariff barriers as they are obstacles to products entering a country's borders (Forzley, 2007). The implementation of non-tariff barriers is allowed under specific conditions; however, it can create various concerns for the exporters in case of unnecessary barriers. It not only influences 15-30 percent of the traded goods but can also have severe implications for export competitiveness (Santhi & Setyari, 2019). In view of this, the role of trade facilitation is very important, which can reduce the negative effect of non-tariff barriers that in turn leads to improve export performance. Particularly, as now the world is moving towards a more competitive global trade regime, the importance of trade facilitation has increased manifold in view of integrating into the global value chain.

International trade can be broadly characterized by trade in goods (merchandise) and services. A significant part of international trade is comprised of physical goods, whereas there is a much lower contribution of services despite its significant rise in absolute term over the past few years (UNCTAD, 2018). According to UNCTAD stat, the last decade has witnessed a sharp rise in global trade in goods from $ 10 trillion in 2005 to more than $17.5 trillion in 2017. Similarly, trade in services has also recorded a significant rise from $2.5 trillion in 2005 to more than $5 trillion in 2017. Global trade, in particular, growth in merchandise exports witnessed more than 10 percent growth on average between 2000 and 2008. However, it fell sharply in 2009 due to the financial crisis of 2008 and plunged to a level of 22 per cent in 2009, the largest decline over the past 20 years (WDI, 2019). In contrast, services exports registered a growth of 11.3 percent on average between 2000 and 2008, while they declined by 11 percent in 2009 (WDI, 2019). It indicates that international trade in services remained less volatile as compared to merchandise trade hence reflecting more resilience to global macroeconomic disruption (WTO, 2015).

The trade in services differs from the trade in goods in two ways as indicated by Copeland & Mattoo (2008). First, in the case of goods trade, the shipment of products from one country to another is important, while it is not the most important means of performing international dealings in the context of services trade. Second, services inclined to be highly regulated or are provided by the public sector. Similarly, there are many services like electricity, water and telecommunications that are produced and provided by the regulated monopolies. The hurdles in services trade emerge from domestic regulations which often serve the twin objective of reacting to market failures (e.g., medical practitioners ' quality standards) and protecting local providers from international competition. The “General Agreement on Trade in Services (GATS)” has taken an exceptionally comprehensive view of trade, which is categorised into four modes of supply (Mattoo & Stern, 2008) and (WTO, 2015). According to which, Mode 1 “Cross border” comprises services supplied from the territory of one country to another (call centre services, provision of software services through email), Mode 2 “Consumption abroad” includes services supplied in the territory of one country to the consumers of another (international tourism or education services), Mode 3 “Commercial presence” contains services supplied through an international company establishing subsidiaries or branches to offer services in another country (such as a bank establishing a branch abroad or insurance company owned by citizens of one country set up a branch through foreign direct investment (FDI) in another country) and Mode 4 “Presence of natural persons”

consists of services provided by the individuals travelling from their own country to another (doctor or a consultant travelling abroad to provide his services through his physical presence) (Mattoo & Stern, 2008) and (WTO, 2015).

The importance of the services sector can be recognized by the fact that it offers vital assistance through finance, transportation, communication, wholesale and other business services to various economic and industrial sectors. In addition to its significant contribution to various sectors of the economy, a rise in trade in services and the accessibility of different sub-services can lift the economic growth by enhancing the efficiency of other industries. In recent years, the expansion of telecommunications and information and communications technology (ICT) services have become an important tradeable service for developing countries. Furthermore, proficient services act as a facilitator for the expansion of regional and global value chains (UNCTAD, 2017). Most importantly, the services economy and trade have substantial potential to encourage structural transformation with regard to the 2030 Agenda for Sustainable Development. Particularly, services activities in health, finance, energy, transport and telecommunications are very important for achieving the Sustainable Development Goals (UNCTAD, 2017). Overall, international trade in goods and services assumes an imperative part in shaping the economic and social environment along with promoting peace and stability by reinforcing ties between the nations. It not only enables the countries to get benefits through resource allocation and increased capacity utilization, but it also facilitates the developing countries to accomplish the goals of sustainable economic development and reducing poverty. However, for the realization of these goals, developing nations need to raise their contribution to global exports.

1.2. Pakistan's Scenario

It is a well-established fact that for the sustainable economic growth of a country, exports play a vital role. However, most of the emerging economies are constantly facing a balance of payments problem owing to lack of enhancement or failure to grow their exports relative to imports. Pakistan is not an exception as both external and internal factors posed significant challenges to manage its external sector performance (Mahmood, 2015). A brief historical review reveals that merchandise exports posted a compound annual growth rate (CAGR) of 5.72 percent to reach $21.5 billion in 2017 against $ 2.6 billion in 1980. However, year on year growth performance is not promising as the export's earnings posted high growth in one year followed by paltry rise next year. The instability in exports is more visible in the

post-crisis (2008) period. The volatility reflects the inconsistency in our trade policies, and that Pakistan's exports have always been, and still are, very much resource-based; the availability of key commodities (like cotton and rice) largely determines the magnitude of exportable surplus in a certain year (SBP, 2015). Contrary to exports, merchandise imports registered a compound annual growth of 6.41 percent to stand at $57.2 billion during 2017 from $5.4 billion in 1980. There are three major items which attributed to heavy import bill for Pakistan over the years i.e., fuel, petroleum and manufactures products. According to the COMTRADE data, on average, the share of these three products is more than 90 percent of total imports. Like products, destinations are also limited to Pakistani products. Despite having many trading partners spread across the world, still, on average more than 50 percent of exports from 1980 to 2017 are concentrated in eleven trading partners of Pakistan. The USA has the highest share in Pakistan's exports followed by the UK, UAE, Germany, Japan, Hong Kong, China, Saudi Arabia, Italy, France and Spain. (COMTRADE, 2019).

With regard to services, it has contributed to more than 50 percent in GDP since 2000 and during 2017 it reached around 60 percent of GDP (SBP, 2015) and (Pakistan Economic Survey, 2018-19). Unfortunately, despite a growing share of services in Pakistan's economy, its contribution to global exports is very negligible. In addition, its share in Pakistan's overall trade is also not substantial (Gulzar: 2011). This is evidenced by the fact that since 1980, the total trade in services increased by 6.5 percent (CAGR) to reach $16.6 billion in 2017 from $1.5 billion in 1980 (WDI,2019). Like growth in merchandise trade, services trade growth has also remained unstable. Within total services trade, exports in services grew by 5.7 percent (CAGR) to stand at $5.7 billion in 2017 against $ 0.7 billion witnessed in 1980. On the contrary, services imports improved from $ 0.9 billion in 1980 to $ 10.8 billion during 2017 posting a CAGR of 6.8 percent. Pakistan's contribution to world trade of services is 0.16 percent during 2017, while exports are contributing 0.10 percent in global services exports (WDI, 2019). This implies that even with the rising share of services in the economy of Pakistan, its maximum potential has not been exploited with regard to its contribution towards the external side i.e. trade. Pakistan's trade performance in general and exports, in particular, has been facing multifaceted challenges. Particularly, the lack of diversification by products and markets and higher concentration in relatively low value-added products has posed a significant risk for export earnings (Mahmood, 2017). Moreover, Pakistan's prospects for trade/export expansion opportunities are very limited as current export markets have slow growth in import. Mahmood (2017) is of the view that only a considerable change in the export base can stimulate export

growth. However, one of the main hurdles in improving trade/export performance is higher trade cost due to a lack of international connectivity and trade facilitation. Trade Facilitation has become a major policy tool in recent years that can effectively reduce cost and time through "simplification", "modernization" and "harmonization" of trade processes, hence, can increase trade flows and the world GDP growth. Furthermore, it may contribute to an increase in export diversification. Broadly, trade facilitation involves such reforms that strengthen the chain of administrative and physical procedures which are required for "cross-border" transport of goods and services (Ikenson, 2008), however, in narrow terms, it deals with the logistics of moving goods through ports or border customs (Weerahewa, 2009). The importance of logistics for trade can be assessed from the fact that an effective and consistent logistics network together with a transparent and reliable facilitation mechanism for cross-border trade is fundamental for the country's export competitiveness and foreign market expansion for indigenous goods. In addition, efficient logistics give a boost to investment particularly FDI and in turn, it stimulates the country's trade (MoC, 2019).

1.3. Rationale of Study

The brief analysis unveils the fact that both exports and imports (goods and services) are heavily concentrated in terms of products/subcategories of services and markets, particularly, a heavy concentration of exports in a narrow range of products/subcategories of services has not only created volatility in exports earning but it has also added further pressure on export growth in confluence with other factors. Pakistan is striving hard to improve its trade balance by focusing on merchandise trade through various policy initiatives, particularly diversification by products and destination. In addition, various preferential and free trade agreements are also in progress. However, we are of the view that by exploiting the services trade, Pakistan can successfully increase its share in global international trade. In addition, its various components can be supportive in increasing Pakistan's overall exports. Also, it will pave the way to transform the economy into an innovative economy. Therefore, besides focusing on increasing market access for merchandise trade/exports by product and market diversification, it is equally important to examine the potential of trade in services.

Pakistan is following a mid-term trade policy Strategic Trade Policy Framework which needs to enhance yearly exports to above $ 30 billion, develop "export competitiveness", switch from "factor-driven" economy to "efficiency-driven" and "innovation-driven" economy and to improve share in regional trade. As part of this strategy, Pakistan is required to enhance

the role of "services trade" along with "merchandise trade". In addition, the trade policy is focused on enhancing export competitiveness. In this regard trade facilitation is an important pillar aimed at decreasing the cost of doing business, standardizing and taking regulatory measures. In view of the above, the present study focuses on three main aspects. Pakistan needs to diversify its exports in order to make the country's trade more secured against external shocks. For this purpose, we will first evaluate the trade/exports potential of Pakistan in goods through Gravity Model and Additional Market Access Frontier (AMAF) to examine whether Pakistan has increased the level of export diversification by destination and product. The analysis would be helpful in identifying new potential markets and products for Pakistan. Secondly, the study would also identify the markets in which Pakistan can expand its trade/exports in services. Thirdly, the study will measure the effect of "trade facilitation" on trade/export flows. It will provide a deep insight into the significance of trade facilitation indicators as an important policy tool that can effectively reduce cost and time through simplification, modernization and harmonization of trade processes. As an outcome, it can increase Pakistan's trade and hence its share in global trade. Most importantly, it may lead to an increase in export diversification.

1.4. Research Gap

There are numerous studies around the world including Pakistan in which the researchers have used different techniques to identify overall as well as sector level trade/export potential like the gravity model, trade potential index, RCA, Additional Market Access Frontier (AMAF) and speed of convergence [Waugh & Ravikumar (2016), Geda & Seid (2015), Nurseiit (2014), Kaur & Nanda (2011) and Mukherji (2014) etc]. However, the gravity model of trade has been used widely to find out the overall and sectoral trade/export potential. As for Pakistan is concerned, it has been observed that the gravity model has been used with a limited scope. Generally, the model has been used to find out the important factors and potential of trade/exports/imports in goods [Irshad "et al" (2018), Mohmand "et al" (2015) , Sultan & Munir (2015) etc]. Similarly, to estimate the model, conventional estimation technique i.e. OLS has been used widely [Sultan & Munir (2015), Ahmad & Garcia (2012) and Kaur & Nanda (2011) etc]. On the other hand, there are very few studies in which other methods like PPML, Tobit or GMM has been used such as Irshad "et al" (2018) has estimated the gravity model through PPML, GMM, Tobit, REM and EGLS. While he has used the coefficient estimated through GMM to predict the bilateral trade potential between Pakistan and China. Similarly, Mohamand "et al" (2015) has used the PMLE method to estimate the export potential of

Pakistan for 142 countries for the period between 1995-2011. Butt (2008) used the PPML estimation technique to estimate the gravity model at the sectoral level. His study was based on cross-sectional data for the year 2002-03. From the brief review of existing literature on Pakistan, we come to know that a large number of studies are available which have computed the trade/export potential in goods while the services side has been ignored. Similarly, work on trade facilitation is also very limited. In view of the above, the current study is an attempt to bridge this gap by carrying out a broad-based analysis of Pakistan's trade/export potential both in "goods" and "services". Besides, the study will also measure the effect of trade facilitation on bilateral trade flows between Pakistan and its trading partners.

Therefore, the current study adds in a variety of ways to the existing literature. We will first estimate the important economic and geographical determinants of trade/export of Pakistan in goods through the standard gravity model. The analysis would ensure the widest possible coverage by including 101 countries for the time period from 1980 - 2017. The coefficients will then be used to evaluate the trade/export potential. Besides estimating trade potential at the country level, we will assess the regional distribution of trade/export potential while focusing on Africa, ASEAN, Central Asian Republics (CAR), ECO, EU-EEA, Latin America, Middle East, NAFTA, SAARC and Transition economies. The inclusion of a significant number of countries and regions (Appendix-I) in the analysis would be highly supportive of policy implications as this will enable us to explore new markets. Unlike previous studies, that estimated trade potential for Pakistan at the bilateral level, we estimate Pakistan's trade potential at product/industry by using a disaggregated level approach (AMAF) in order to get deep insights about future trade prospects and existing trade potential. Estimating the gravity model at sectoral level is a cumbersome job as it needs to have a sector-specific production data instead of aggregate GDP variable. It is very difficult to get this data for developing countries, therefore, to avoid this issue we will use AMAF to explore products with maximum potential in different countries/regions. Another significant contribution of this study is that it augments the gravity model by using political risk (a proxy for institutional performance variable).

Existing literature on the trade/export potential of services is very limited. The main focus of these studies is on estimating the key factors that determine the trade in services [Grünfeld & Moxnes (2003), Kimura & Lee (2004), Shepherd & Marel (2010) & Pham "et al" (2014) etc] and services growth [Ajmair & Ahmed (2011) & Mujahid & Alam (2014)]. The current study, however, will contribute in several ways to the existing literature with regard to

trade in services. At the outset, we will estimate the key economic and geographical determinants of trade/export potential in services while using the gravity model for 101 countries for the period between 2007 and 2017. On the basis of estimated coefficients, we will calculate the trade/export potential of total services. The study will also estimate the determinants of various components of services. Unlike the previous studies in which determinants of services trade/exports and services growth have been analysed [Grünfeld & Moxnes (2003) Walsh (2006) Pham "et al" (2014) and Mujahid & Alam (2014)], this study will use various important economic factors to explore the major factors of trade/exports in services in addition to traditional gravity variables.

This study will use the "Poisson Pseudo Maximum Likelihood (PPML)" estimation method to estimate the trade/export potential of Pakistan with a large number of countries in addition to the ordinary least squares (OLS) method. PPML technique is robust in the presence of heteroscedasticity and is a much- preferred method to take into account the issue of missing or zero trade values (Agnosteva, "et al" (2019). Contrary to this, the OLS method simply omits such observations because the logarithm of zero is undefined. Therefore, to obtain consistent and unbiased estimates, the PPML estimation method would be used.

As for trade facilitation is concerned, internationally, there are different measures introduced by various international organizations to measure the impact of trade facilitation on trade/exports and used by a number of studies, however, most of the studies have used "logistic performance index (LPI)" developed by the "World Bank" [Skender, & Zaninović(2019), Ghani (2017), Seetanah, "et al", (2016) and Puertas "et al" (2014) etc]. Nevertheless, in Pakistan like services, this area has also been left unexplored. It is evidenced by the fact that we have not found any specific study which has examined the impact of facilitation on bilateral trade/exports of Pakistan. Taimur, "et al", (2016) examined the effect of trade facilitation on sectoral export of the SAARC region. They have used "number of documents", "number of days" and "cost to export per standard container" as a proxy to measure the trade facilitation. Saeed (2014) analysed the effect of the Trade Facilitation Agreement (TFA) on Pakistan's trade policy. Therefore, to fill the gap, the current study would investigate the effect of trade facilitation on merchandise trade/exports. For this purpose, we will use the "logistic performance Index (LPI)" as a proxy for trade facilitation. The gravity model will be estimated through the PPML estimation method for the period between 2007 and 2017. Hence, this study would offer a more comprehensive analysis of Pakistan's trade in terms of evaluating the trade/export potential and the impact of trade facilitation on trade/exports.

1.5. Objective of the Study

The main objective of the present study is to analyse the trade/export potential of Pakistan in goods and services against its traditional and non-traditional trading partners through the gravity model.

Primary goals of the study are:

1. To assess the effect of geographical and economic factors on bilateral merchandise trade/export of Pakistan on the basis of the gravity model. The gravity model will be estimated through OLS and PPML estimation method
    a) To assess the trade/export potential by country and region on the basis of coefficients obtained through the PPML method
    b) To assess product-wise trade potential while using the Additional Market Access Frontier approach
    c) To analyse the effect of Political stability on Pakistan's trade
    d) To quantify the asymmetric effect of "bilateral exchange rate" using the partial sum decomposition method
2. To estimate the geographical and economic factors affecting bilateral trade/exports in services of Pakistan through the "gravity model"
    a. To estimate the determinants of various components of services trade
    b. To calculate the trade/export potential in total services by country and region based on the coefficients obtained through the PPML method
3. To measure the impact of trade facilitation on merchandise trade/exports while using a gravity model. "Logistic Performance Index (LPI)" will be used as a proxy for "trade facilitation"
    a. To explore the impact of overall LPI and its subcomponents on trade/exports
    b. To evaluate the impact of overall LPI and its subcomponents on trade/exports between Pakistan and its high- income trading partners
    c. To assess the effect of overall LPI and its sub-components on trade/exports between Pakistan and its low- income trading partners

1.6. Outline of the Study

The study is organized as follows. "Chapter 2" offers a general overview of the existing studies on trade/export potential, "trade facilitation" and "theoretical foundation of the gravity model". The review of the literature shows that there is more than one type of methods to

estimate foreign trade potential i.e gravity model, trade potential index, AMAF and speed convergence. Although, every method has its own advantages and disadvantages, however, extensive literature is available in which trade potential is estimated through the gravity model. The chapter has also revealed that the gravity model can be applied both at the aggregate or sectoral level, while methods based on trade indices allow trade potential to be calculated only at the level of commodities. Similarly, the chapter has included some of the important studies on trade in services. In literature, there is a wide range of empirical studies that have investigated the patterns of merchandise bilateral trade/exports both at commodity and aggregate level, however, the empirical work on trade/exports in services is limited. The empirical literature on trade in goods and service and facilitation conducted for Pakistan has also been part of this chapter. The review of literature has revealed the fact that not much literature both on services trade and facilitation is available with regard to Pakistan. In addition, there is a detail discussion on the theoretical foundation of the gravity model which shows that there is no longer any doubt about the theoretical justification for the model, however, its empirical application created some issues pertaining to the use of appropriate estimation method. In this regard, studies on some alternate methods to estimate the gravity model has also been included very briefly. Overall, we have observed that the gravity model is a convenient and extensively used empirical tool to quantify the impact of trade-related policies and trade flows between different countries. Furthermore, the "gravity model" is not restricted only to analyse the merchandise trade but it has been successfully modelled to the services trade.

Chapter 3 of our study has a detailed discussion on Pakistan's trade profile both in goods and services, in particular, we have presented a historical review since 1980 by focusing on exports. The analysis unveils the fact that over the years, our export performance has not been consistent on account of various factors emanated both from the demand and supply side. The chapter talks about the composition and direction of exports in details along with a brief analysis of imports. The chapter reveals that exports earnings have not witnessed persistent growth over the years rather, high growth in one year followed by an insignificant rise next year. Instead, the import growth surpassed the expansion of the export, consequently, the trade deficit widened by a significant margin. Similarly, the chapter will shed some light on Pakistan's export performance at the global level to assess whether the country has been successful in increasing its share in World exports or not. An assessment of Pakistan's exports relative to its competitors has also been done which has revealed the fact that there is a

consistent decline in exports to GDP ratio relative to India, Bangladesh, Sri Lanka, Egypt, Indonesia and Vietnam. Moreover, the analysis has confirmed that Pakistan is a less- export dependent country. A brief discussion of the factors affecting Pakistan's export performance over the years would also be a part of this chapter. This part would be supportive in finding out the chronic issues Pakistan's export sector is facing over the years. A detailed discussion on export diversification and composition would also be included in the chapter. The unique part of this study is the sectoral analysis in which we will discuss the contribution and composition within important sectors. Most importantly, with regard to the services sector, we have added details to find out how the services sector has been evolved over the years and how much it has been successful in showing its presence at the global level. Similarly, the chapter includes a detailed discussion on the importance of trade facilitation along with different types of indicators to measure as suggested by the UN, World Bank and OECD etc.

Chapter 4 contains the discussion on model, methodology and data. In this chapter, a general description of the gravity model (basic and augmented) has been discussed. On the basis of which we have specified our specification by including various other variables along with the traditional gravity variables. A brief explanation of the variables included in the present study with their source and their theoretical justification is also part of this chapter. In this part of the study, we have also included a detailed discussion on panel data framework and its three main estimation techniques i.e., "Pooled, Fixed Effect (FE) and Random Effect (RE)". One of the unique aspects of this chapter is the discussion on alternate estimation methods of the gravity model. In particular, Poisson pseudo-maximum-likelihood (PPML) has been discussed as a preferred estimation technique that will be used in the present study. Furthermore, the chapter will discuss the methodology of AMAF which is a simple and easy method and produces more realistic results. This method will be used in the present study in order to calculate the product-wise trade potential. The specification of the gravity model in the present study is symmetric, however, this will include a brief discussion on the asymmetric specification of the gravity model. For this purpose, we will decompose the movement in the exchange rate into "depreciation" and "appreciation" through the "partial sum" decomposition method.

Chapter 5 and 6 would be important chapters in view of a discussion on the findings of the gravity model. This section will start with estimating the trade/export determinants (goods and services) through OLS and PPML estimation method. Chapter 5 is distributed into two parts. The first part is comprised of factors of trade/exports in goods and services estimated

through the gravity model. This part would also discuss the determinants of trade/exports of various commodity groups as well as the components of services trade. Overall, this chapter would be helpful in finding out the important determinants that can be significant in affecting the bilateral trade flows in products and services between Pakistan and its trading partners. Part 2 will evaluate the influence of trade facilitation indicators on merchandise trade/exports. Similarly, the impact of different components on trade/exports would also be a part of this chapter.

Chapter 6 is devoted to the analysis of Pakistan's trade/export potential. On the basis of results obtained through PPML, we will calculate the trade/export potential for 101 countries along with regional distribution of potential both in goods and services. This would provide a comprehensive view of countries and regions with high trade/export potential for Pakistan. In this chapter we will choose those countries with whom Pakistan has maximum trade/export potential in goods, then we use AMAF to explore the products with maximum potential.

Whereas Chapter 7 is dedicated to concluding the study. On the basis of estimated results, we will draw conclusions and will give policy recommendations.

CHAPTER 2: THEORETICAL FOUNDATION OF THE GRAVITY MODEL & LITERATURE REVIEW

This chapter is dedicated to discussing various studies in order to review the theoretical advancement of the gravity model of trade. Furthermore, the chapter is an appraisal of some of the most prominent existing literature associated with our study. The chapter is organized into four different parts. The first section is dedicated to a brief analysis of literature on the theoretical foundation of the gravity model, the second part will talk about the econometric issues of the gravity model. The third part will discuss the country-specific empirical studies both at Pakistan and international level with regard to trade potential and trade facilitation, while the last section will conclude the chapter.

There has been considerable development over the years, both in terms of understanding the theoretical foundations of the gravity model as well as improving its empirical estimation. However, this literature review could not be considered a comprehensive survey of a vast literature that is still expanding. The objective is to give the reader a cognisant view of the empirical issues. The "gravity model" has been a frequently used empirical tool since its introduction in the 1960s. It is also termed as the workhorse in international trade (Yotov "et al," 2017). For more than 50 years now, the model is being utilized to quantity the bilateral trade flows along with evaluating the impact of trade policy and "Free Trade Agreements" on international trade [Kepaptsoglou "et al" (2010); Brandicourta "et al" (2008); Shepherd (2013)]. The gravity framework now regularly covers behind-the-border obstacles such as tariffs enforced at the border along with the regulatory policies and profound institutional and political features of countries (Shepherd, 2013). In addition, the gravity model is not restricted merely to analyze the merchandise trade, but it has been successfully modelled to services trade [Kimura & Lee (2004); Walsh (2006) etc.). Initially, the gravity model was presented as an intuitive concept as to which factors are likely to affect trade, however, in later years, different "micro-founded" theories of international trade were used to formulate the "theoretical" gravity models (Shepherd, 2013).

Before we analyze the theoretical underpinning of the gravity model, it is important to mention that there are at least five convincing arguments or properties explained by Yotov el.al (2017) that could enlighten the notable achievement and attractiveness of the gravity model.

i. The gravity model of trade is very intuitive as it has originated from Newton's Law of Universal Gravitation.

ii. It is a structural model with a strong theoretical underpinning. This feature makes the gravity framework suitable in particular for measuring the impact of trade policy.

iii. The model incorporates numerous countries, various sectors, and even firms at the same time, thus reflecting a practical general equilibrium environment.

iv. The model can be integrated within a wide class of broader general equilibrium models to study the links between trade and labour markets, investment, the environment, etc.

v. The predictive power of the gravity model is one of the most important properties. Empirical gravity equations of trade flow consistently deliver a remarkable fit of between 60 and 90 percent with aggregate data as well as with sectoral data for both goods and services.

2.1 Theoretical Viewpoint on the Progress of the Gravity Model

This part demonstrates the historical development of the gravity model which are divided into four different phases from 1885 to 2017 (Shahriar "et al", 2019).

2.1.1 The Origin of the Gravity Equation

I: Basic Gravity Model

The notion of the gravity model is originally inspired by "Newton's Law of Universal Gravitation" introduced in 1687. According to it, "given two bodies' m1 and m2, the force F between them is given by the equation" (Abueg, 2018):

$$F = G\frac{m1m2}{r^2} \tag{2.1}$$

where G is "gravitational constant", and r: is the "distance between m1 and m2".

The above equation explains that the gravitational force between two bodies depends directly on their respective "masses" and indirectly related to the "square distance" between them.

2.1.2: 1962-1966: Establishment of the Conventional Gravity Model

I: Gravity Model of Tinbergen (1962) and Linnemann (1966)

The use of the gravity equation in the field of international trade was first presented by "Tinbergen (1962)" and "Pöyhönen (1963)". Tinbergen (1962) recommended the gravity equation approximately in the same functional form mentioned in eq (2.1). Although it was without any sound theoretical foundations, still his model was able to explain the international trade flows. Further contribution to develop the theoretical foundation came from Pöyhönen

(1963) and Linnemann (1966). The traditional equation defines the trends of bilateral trade flows between any two countries "A" and "B" as "proportional to the gross national products" of those countries and inversely "proportional to the distance" between them

$$\text{Trade}_{\text{AB}} = \propto \frac{\text{GDP}_{\text{A}}^{\alpha}\,\text{GDP}_{\text{B}}^{\beta}}{\text{Distance}_{\text{AB}}^{\tau}} \tag{2.2}$$

with $\alpha, \beta \; and \; \tau \approx 1$. The gravity equation in international trade has proven remarkably stable over time and through different countries and methodologies (Chaney, 2018). The model in linear form can be written as under:

$$\log(Trade_{AB}) = \propto \; + \alpha \log(GDP_A . GDP_B) - \beta \log(Distance_{AB}) + \mu_{AB} \tag{2.3}$$

Where $\propto$, α and β are coefficients to be estimated, while to account for any other unobserved factor or shock that can influence the bilateral trade flows between the two countries, an error term μ_{AB} has been added in the model. Equation (2.3) represents the basic gravity equation which shows that bilateral trade is positively dependent on income (GDP) and negatively on distance.

2.2.3: 1966-2003: The Theoretical Foundations of the Gravity Model

Anderson (1979) was the first to provide the "theoretical foundation" of the gravity equation with the assumptions of "product differentiation by place of origin and Constant Elasticity of Substitution (CES) expenditures". According to his suggested gravity equation country, i and j specialized in the production of differentiated goods. Hence, each country has one good that can be traded between them. He assumes that there is no transport cost, no tariff restriction and each country have the same Cobb Douglas preference. Thus, in both countries, the portion of income consumed on the tradable products is the same and is denoted by b_i. In addition, it has also been assumed that prices are stable at the equilibrium level.

$$M_{ij} = b_i Y_j \tag{2.4}$$

M_{ij} represents the export of good 'i' from the country "i" to "j" while bi is the portion of expenditure on tradable goods and Y_j is the income of importing country. The condition that income must equal sales denotes that

$$Y_i = b_i \sum_j Y_j \tag{2.5}$$

Solving eq (2.4) for b_i and substituting in eq (2.5) yield the simplest form of the gravity model.

$$M_{ij} = \frac{Y_i \; Y_j}{\sum_j Y_j} \tag{2.6}$$

The above specification is based on identical Cobb Douglas preferences. Anderson assumes that countries produce traded and non-traded goods thus the utility function of each country is given as:

U=U (g (traded goods), (non-traded goods)).

Due to homothetic choice, the demand for individual traded goods is maximized given a budget constraint including the total expenditure on traded goods. Let θ_i is the share of tradable products of country i on total spending for traded goods by country j while φ_j is the proportion of spending on all traded goods in the total expenditure of country j. Thus, Demand for tradable goods in country j from country i is mentioned as:

$$M_{ij} = \theta_i \varphi_j Y_j \tag{2.7}$$

It shows that income for country i from trade goods is equal to country j's expenditure which it has spent on traded goods. Thus, it implies that

$$Y_i \varphi_i = (\sum_j \ Y_j \varphi_j \ ) \ \theta_i \tag{2.8}$$

It shows that the income of country "i" is equal to the outlay of country "j". Solving eq (2.8) for θ and substituting in eq (2.9) we obtain

$$M_{ij} = \frac{\varphi_i Y_i \varphi_j Y_j}{\sum_j \ \varphi_j Y_j} = \frac{\varphi_i Y_i \ \varphi_j Y_j}{\sum_i \ \sum_j \ M_{ij}} \tag{2.9}$$

Equation (2.9) is the deterministic version of the gravity equation with the distance term suppressed and a scale term added. Suppose θ_i is a function of Y_i and N_i then

$$\theta_i = F(Y_i, N_i)$$

If we add error term ε_{ij} in equation (2.9) and constant α, then

$$M_{ij} = \alpha \frac{Y_i \, F(Y_i, N_i) Y_j \, F(Y_j, N_j)}{\sum_j Y_j \, F(Y_j, N_j)} \varepsilon_{ij} \tag{2.10}$$

Let F ( ) is log linear form, interchange denominator with K, this yields

$$M_{ij} = \frac{\alpha}{K} \ Y_i^{\alpha_1} \ N_i^{\alpha_2} \ Y_j^{\beta_1} \ N_j^{\beta_2} \ \varepsilon_{ij} \tag{2.11}$$

Where K refers to world expenditure of trade. Taking natural log of equation (2.11), then

$$lnM_{ij} = ln\frac{\alpha}{K} + \alpha_1 \ lnY_i + \alpha_2 lnN_i + \beta_1 lnY_j + \beta_2 lnN_j + ln\varepsilon_{ij} \tag{2.12}$$

The above equation is the simplest form of the gravity model and can be estimated through the OLS technique. Similarly, the gravity equation can be formulated assuming either perfect competition or a monopolistic structure of the market.

I: Gravity Model of McCallum 1995

McCallum (1995) estimated the regional trade pattern between the US and Canadian provinces and found that the intra-provincial trade was 20 times higher than trade between the provinces of Canada and the US states. This phenomenon is known as the "Border Puzzle". He argues that trade between countries depends on the respective country's income, the "distance between countries" and some other related factors. McCallum has used the following gravity model to estimate the trade flows between intra-provincial trade and trade between provinces to state:

$$lnx_{ij} = \alpha_0 + \alpha_1 lny_i + \alpha_2 lny_j + \alpha_3 lnd_{ij} + \alpha_4 \delta_{ij} + \in_{ij} \quad (2.13)$$

Where: x_{ij} is exports from the country "i" to "j", y_i and y_j is income in the country "i" and "j", d_{ij} is the distance between country "i" to country "j", δ_{ij} is dummy variable (1: inter-provincial trade and 0: state- provincial trade) and $\in_{ij}$ is the error term. The above model has been estimated through the OLS method. The equation has been estimated in three different ways. Initially, McCallum estimated the intra-provincial trade between Canadian provinces. The findings indicate that the effects of provincial GDP have a major and direct impact on trade, while distance has an inverse impact on trade flows. The second equation evaluated the trade between the "U.S" and "Canadian provinces". According to the results, trade between Canadian provinces is 22 times higher than trade with provinces in the U.S. Third equation estimated the trade between those provinces and states that generate US$ 10 billion or more of GDP. The explanatory power of all three equation is more than 80 percent. McCallum is of the view that in the case of no border, the gravity equations would predict much greater south-north trade between the provinces because of the size of their economy. Nevertheless, the genuine trade trends suggest that the national border has a strong impact on regional trade pattern even if countries like the US and Canada are similar in terms of language, economic institution and culture.

2.1.4: 2003- 2017: The Renaissance of the Gravity Model

I: Gravity Model of Anderson and Van Wincoop 2003

Basically, this period is considered to be the revival of the gravity model as studies using the gravity model have proliferated. The most notable study in this respect is by "Anderson and Van Wincoop (2003)". They built a coherent and proficient model by incorporating the multiple resistance term and used it to resolve the popular "McCallum border puzzle". They decomposed the "multilateral resistance" into three parts: (i) "the bilateral trade barrier between region i and region j", (ii) "i's resistance to trade with all regions", and (iii) "j's resistance to trade with all regions".

The gravity model has been developed on the following assumptions. First, each region specializes in the production of only one product, resulting in monopolistic competition. Second, countries have the same homothetic preferences and can be best estimated by a "CES utility function". If c_{ij} is the consumption of region j in goods from region i and σ define the elasticity of substitution, the consumers of region j maximize the following utility function:

$$U = (\sum_i \beta_i^{(1-\sigma)/\sigma} c_{ij}^{(\sigma-1)/\sigma})^{\sigma/(\sigma-1)} \quad (2.14)$$

Given the budget constraint

$$\sum_i p_i t_{ij} c_{ij} = y_j \quad (2.15)$$

The parameter β_i is positive, y_j is the nominal income of region "j" residents. Equation (2.15) represents the total outlay of country j which are spent on purchasing products from country i. p_i is the supply price of exporter while t_{ij} specifies the cost of trade between the two countries. $p_i t_{ij} c_{ij}$ is costs of country j which are assumed to import products from country i. As $p_{ij} = p_i t_{ij}$ therefore p_{ij} is replaced for $p_i t_{ij}$. These trade costs are passed on from the exporter to the importer. The nominal value of exports from "i" to "j" is:

$$x_{ij} = p_{ij} c_{ij} \quad (2.16)$$

Total income in country "i" is described as:

$$y_i = \sum_j x_{ij} \quad (2.17)$$

The nominal demand for region "i" products in region "j" consumers that maximize the utility function given the budget constraint.

$$x_{ij} = \left(\frac{\beta_i p_i t_{ij}}{P_j}\right)^{(1-\sigma)} y_j \quad (2.18)$$

p_j is the consumer price index of j given by

$$P_j = \left[\sum_i (\beta_i p_i t_{ij})^{1-\sigma}\right]^{1/1-\sigma} \quad (2.19)$$

The market clearance condition is:

$$y_i = \sum_j x_{ij} = (\beta_i p_i)^{1-\sigma} \sum_j \left(t_{ij}/P_j\right)^{1-\sigma} Y_j \quad (2.20)$$

In order to develop the gravity equation, Anderson (1998) and Deardorff (1998) using market clearance condition to estimate the coefficient βi **.** While "Anderson and van Wincoop (2003)" applied a similar approach to describe the general equilibrium for prices and comparative static and take the scaled prices $\beta_i p_i$ from markets clearance condition. By substituting the equation (2.20) in demand function (2.18), we get world nominal income which is:

$Y^w = \sum_j y_j$, income shares by $\theta_j = Y_j/Y^w$.

From here we obtain:

$$x_{ij} = \frac{y_i y_j}{Y^w} \left(\frac{t_{ij}}{\pi_i P_j}\right)^{1-\sigma} \quad (2.21)$$

Where:

$$\pi_i = \left[\sum_j \left(t_{ij}/P_j\right)^{1-\sigma} \theta_j\right]^{1/1-\sigma} \quad (2.22)$$

Substitute the equilibrium scaled price in equation (2.19) yields

$$P_j = \left[\sum_i \left(t_{ij}/\pi_i\right)^{1-\sigma} \theta_i\right]^{1/1-\sigma} \quad (2.23)$$

In the above equation, π_i is shown as "outward multilateral resistance" and P_j is the "inward multilateral resistance" term. Solved above two equations for multilateral resistance ($\pi_i \; and \; P_j$) in terms of $\sigma, t_{ij} \; and \; \theta_i$. Assuming trade barriers are symmetric so $t_{ij} = t_{ji}$. Under this assumption it is also $P_i = \pi_i$ with:

$$P_j^{1-\sigma} = \sum_i p_i^{\sigma-1} \theta_i t_{ij}^{1-\sigma} \qquad \text{For all j.} \quad (2.24)$$

It provides a solution to the price indices as a function of all bilateral trade barriers and income shares. The gravity equation then becomes:

$$x_{ij} = \frac{y_i y_j}{y^w} \left(\frac{t_{ij}}{P_i P_j}\right)^{1-\sigma} \quad (2.24)$$

The equation (2.23) indicates the basic form of the "gravity model" which is subject to equation (2.24). The logarithmic transformation of the model can be explained as:

$$lnx_{ijt} = \beta_0 + lny_{it} + lny_{jt} - lny_t^w + (1-\sigma)t_{ijt} - (1-\sigma)p_{it} - (1-\sigma)p_{jt} + \epsilon_{ij} \quad (2.25)$$

The above equation is similar to McCallum (1995) model; however, the multilateral term has been included which make it different from the McCallum gravity equation. By including coefficients with each variable, the model can be written as:

$$lnx_{ij} = \beta_0 + \beta_1 lny_{it} + \beta_2 lny_{jt} - \beta_3 lny_t^w + \beta_4 t_{ijt} + \beta_5 p_{it} + \beta_6 p_{jt} + \epsilon_{ij} \quad (2.26)$$

Equation (2.26) is the final gravity model that capture relative trade barriers. So, the fundamental gravity model includes all bilateral trade barriers into account when finally defining general equilibrium for trade.

2.2: Theoretical Literature

Starting with "Tinbergen (1962)" and "Pöyhönen (1963)", the gravity model produced a large number of empirical studies covering a broad range of areas, time periods, and industries (Shepherd, 2013). While using the analogy of the universal law of gravitation, Tinbergen (1962) built a gravity equation. He defines the trends in bilateral trade flows of 42 European countries. He explains that "the trade between the two countries is directly dependent on the income of those countries and negatively proportional to the distance between them". Poyhonen (1963) explain the structural features of international trade flows. His study was based on a structural and explanatory model for analysis, which was similar to the input-output model for ten European countries to explain the trade between commodities in the year 1958. Linnemann (1966) included additional variables and explained the theoretical basis of the gravity equation in terms of the "Walrasian model". Leamer & Stern (1970) used the Savage-Deutsch model to establish a theoretical framework of the gravity model. This approach was plausible and provided a basis for the "multiplicative functional form of the gravity equation". Deardorff (1998) observed that Leamer and Stern applied this approach only to trade and there was not any clear association with the H-O model. However, in a subsequent study, Leamer

(1974) used both the gravity equation and the H-O model, but two approaches were not theoretically integrated.

Later on, "Anderson (1979)", "Bergstrand (1985 & 1990)" and "Deardorff (1998)" provided a micro foundation to the gravity model. The theoretical explanation given by Anderson (1979) is built on CES preferences and nationally differentiated products. Bergstrand (1985) in his first study introduce a general equilibrium model of world trade to derive a gravity equation. Afterwards, Bergstrand (1990) applied monopolistic competition to derive the gravity equation. At this juncture, it is imperative to state that Helpman & Krugman (1985) has made an important contribution by deriving a gravity model on the basis of increasing returns to scale in production. Deardorff (1998) has used two extreme cases of the Heckscher-Ohlin model (H-O model) to derive the gravity equation. The first was "frictionless trade and homogenous products", in which the absence of all trade barriers triggers producers and consumers to be indifferent among trading partners, including their own country, so long as they buy or sell the desired goods. The second case included those countries that produce different goods as in the "H-O model" with complete specialization or a variety of other models. Deardorff used "Cobb-Douglas preferences" and "CES" preferences to derive expressions for bilateral trade. Eaton & Kortum (2002) established a "Ricardian trade model" by including geographic characteristics into general equilibrium. It explains trade based on relative differences in technology across countries (Ivus & Strong, 2007). However, since Anderson & Wincoop (2003) famous work "gravity with gravitas", the applied literature stringently focused on the theoretical underpinning of the gravity models. Their suggested method efficiently estimates the theoretical gravity model that accurately computes the comparative statics of trade fraction. In this regard, the authors used the technique to resolve the popular McCallum border puzzle. Their study demonstrates that by incorporating the multilateral resistance term the estimation of the gravity model can be significantly enhanced. The "multilateral resistance" terms include costs of trade through all bilateral paths which imply that if there is any change in trade cost on one bilateral route, it can influence the trade flows on all other routes due to relative prices (Shepherd, 2013). With regard to the addition of the "multilateral resistance term" in the gravity model, "Anderson and van Wincoop" believe that it cannot be measured through the variable of "remoteness" which is based on measures of distance. They argue that it does not account for border effects, instead the gravity model needs to be solved by taking into consideration the effect of barriers on prices.

Despite the great acknowledgement of their contribution in the literature, Feenstra (2003) revealed that incorporating the fixed effects generates consistent estimates as of

"Anderson and van Wincoop (2003)". It is rather easy to use and have been considered a preferred estimation method used in many other studies such as Cheng & Wall (2004) and Walsh (2006). Particularly, Cheng & Wall, (2004) compared different forms of the gravity model of trade with "country-pair fixed effects" to account for heterogeneity. They have concluded that without proper dealing with the heterogeneity, the "gravity models" can significantly miscalculate the impact of integration on trade volume. Yotov "et al" (2017) termed Eaton & Kortum (2002) work as the most effective structural gravity theories in economics as they have derived gravity on the supply side as a Ricardian structure with intermediate goods. They have established a "Ricardian trade model" to incorporate the geographic features into general equilibrium. They have applied a "probabilistic formulation of technological heterogeneity" under which the model covers the world with many countries divided by geographic barriers. Hence, it contributes to a flexible framework for including geographical features in general equilibrium analysis.

This section clearly indicates that the" theoretical foundation of the gravity model" is not built on a single theory of trade. The researchers have used numerous ways to describe the theoretical underpinning of the gravity model. In this regard, they have used various assumptions and trade models. After a brief review of the gravity model based on different theories like "endowment and technological differences, increasing returns to scale, and Armington demands", it can be concluded that all foresee a gravity relationship for trade flows similar to "Newton's law of universal gravitation" (Silva & Tenreyro, 2006). Moreover, it can be inferred that the gravity model has obviously shown a significant move towards the structural specification derived from the standard economy theories (Brandicourta "et al", 2008). To sum up, various studies were conducted with an aim to explore a more precise gravity model for bilateral trade analysis hence concluded with a diversity of theoretical gravity models. After some additional discussion relating to its various specifications in the nineties, the debate turned its focus on the performance of various estimation techniques for the gravity model. While there is no longer any doubt about the theoretical justification for the model, however, its empirical application created some important controversies largely attributed to the use of appropriate estimation method (Kareem & Kareem, 2014).

2.3: Econometric Issues

Despite the considerable success of the gravity model as an empirical tool for the assessment of trade policies and the estimation of trade potential, a comprehensive analysis of the theoretical foundation, use of larger dataset and improvement in statistical and econometric

techniques evoked various other problems in the estimation of the model (Herrera, 2013). In this connection, the problem of heteroscedasticity and the presence of zero observations were addressed owing to the inefficiency of conventional estimators. Similarly, the log-linear formulation of the model was challenged because of the biased estimates in the presence of heteroscedasticity (Wijesinghe, 2014). The researchers focus on estimation techniques that resulted in "econometrically advanced alternative estimators" other than the traditional "Ordinary Least Squares estimation" method. Fik & Mulligan (1998) examined the functional form and functional misspecification in regression-based spatial interaction models. He suggested the use of Box-Cox transformations because it offers an enormous potential to re-examine the imposed restriction on linear models.

Traditionally, the multiplicative gravity model has been linearized and estimated through OLS with an assumption the variance of the error is homoscedastic. In view of Silva and Tenreyro (2006), nonlinear estimators should be used. They argued that when there is heteroscedasticity, the log linearization of the model is not appropriate as it generates inconsistent estimates. Moreover, the method is not compatible especially when there is zero trade data. Thus, it leads to unsatisfactory results by excluding zero trade values. In order to address this problem, they suggested using a simple Poisson pseudo-maximum-likelihood method. In addition, by including exporters and importers fixed effects not only accounts for multilateral resistance but also resolves the omitted variable bias. In this regard, the PPML method with "fixed effects" is the appropriate technique to estimate the gravity model (Nordås, 2018). Similarly, to account for zero values, "Helpman "et al" (2008)" suggested a model with heterogeneous firms that is consistent with a number of stylized facts of the data. Herrera (2013) has explored at least two main issues relating to the log linearization of the gravity model after conducting an extensive study on recent developments in the literature in the context of the estimation methods for the gravity equation. He emphasized further research owing to the failure in finding out any optimal method for its solution. In his view, misspecification due to the omission of the "multilateral trade resistance" and the "unobserved heterogeneity in trade data" gives biased estimates. To resolve the problem, the author suggests that log linearise the model and estimate it by OLS with fixed effects. However, the inbuilt heteroscedasticity in the log-linear formulation of the gravity model can result in biased and inefficient estimates when applying OLS. The second problem highlighted by the author is zero trade flows, as the log of zero values is impractical therefore such observations must either be dropped or replaced by an arbitrary positive value, resulting in sample selection bias and loss of information.

Herrera (2013) has compared different methods with a dataset covering 80 percent of world trade. The results indicate that the "Heckman sample selection model is the appropriate estimation method within nonlinear techniques when data has heteroscedasticity and a significant number of zero observations".

2.4: Empirical Literature on Trade/Export Potential in Goods

There are numerous studies that have examined the bilateral trade patterns and estimated trade potential at aggregate and product-level trade. In this regard, the gravity model has been used extensively. However, there are some other studies that have used trade potential index or export potential index, "Revealed Comparative Advantage (RCA) Index" to estimate the trade potential. These indices are indicative and allow estimating the trade potential only at the commodity level. Although every index/method has its own advantages and disadvantages, however, they do not account for factors that affect bilateral trade. While gravity model not only applied at the aggregate or industry level, but it also captures many economic factors that could affect the bilateral trade flows. Now we will analyze some of the important studies.

Kexin (2018) has calculated the "trade potential" and "trade efficiency" for 35 countries along "The Belt and Road" for the period 1995 to 2014. The gap between the estimated and actual values have been shown as the trade potential. In addition, the author has analyzed the factors affecting "trade efficiency" and "trade potential" by introducing various indices such as the "trade diversification, trade concentration and trade complementarity index". Results show the country possess higher trade potential when there is a low level of trade diversification and a higher degree of trade concentration. Waugh & Ravikumar (2016) developed a "trade potential index". They have used a standard multi-country trade model in which a country's trade potential depends only on the "country's observed home trade share, it's level of GDP, and the trade elasticity". Results suggest that poor countries have a higher level of trade potential as compared to rich countries. This implies that rich countries have more liberalized trade. Their trade potential index significantly relates to estimates of trade costs, while both the welfare cost of autarky and the volume of trade weakly associates with trade costs.

Chaudhary (2016) has used the "Revealed Comparative Advantage (RCA)" to analyze the export potentials and competitiveness of the Indian textiles from 2005 to 2014. The RCA is used to evaluate the export potential and relative advantage or disadvantage of a specific country in a certain class of goods or services. It has been observed that in the post MFA period, there is a continuous rise in India's export potential for textiles along with having a strong

comparative advantage for the industry in form of the total world's textiles exports. The author is of the view that after the phase-out of MFA, India needs to strengthen policies to overcome the challenges by Indian textiles exporters in international markets. Zhangy & Wang (2015) have built an export equation for China on the basis of the gravity model and calculated the "trade potential index of China's export to the member states of ASEAN". The study has used new economic mass proxies as suggested by Baldwin and Taglioni. Results of China's export potential with ASEAN are very convincing as the export equation based on the new economic mass proxy has stronger explanatory power compared to the standard gravity model by using GDP as an economic mass proxy.

Geda & Seid (2015) inspected the trade potential for "intra-Africa" and the future of developing regional economic integration through the gravity model. They have used a variety of methods such as the PPML technique to tackle the issues pertaining to OLS estimation. Additionally, a "panel-Tobit based estimation" has also been used for completeness and as a robustness check of the results. Findings of the study indicate the presence of immense potential for "intra-Africa trade", however, exploiting this potential and the effort to develop regional integration is challenged owing to the absence of complementarity of exports and imports as well as the relative competitive position of potential African suppliers. This result is attributed to "weak infrastructure, weak productivity and weak trade facilitation".

Mehchy "et al" (2015) analyzed aggregate and manufacturing exports separately. They have estimated the major determinants of exports for Syria between 1995 and 2010 through the "gravity model" applying "Heckman's two-step approaches" with "Least Squared Dummies Variables". Furthermore, the gravity model is extended by including the "nominal effective exchange rate" and "institutional performance variables." Their study reaffirmed that the improvement in institutions is imperative for export expansion in Syria. The study has also estimated an index to find countries with a high potential demand for Syrian products. According to the result, Syria's export potential is expected to decline by more than 70 percent on account of sanctions and the worsening of institutional factors. Nurseiit (2014) has identified the determinants of Kazakhstan's international trade and estimated the trade potential for 1995-2011 with members of the Customs Union like "Russia, Kazakhstan and Belarus". The trade potential has been estimated through weighted ordinary least squares (OLSQ) to capture the issue of "heteroscedasticity" and "autocorrelation" and GMM techniques in the presence of endogeneity. Results show that Kazakhstan's exports and imports both have attained their potential level.

Malik & Mir (2014) have estimated the trade potential of India with the Central Asian States for the period between 2000-2012 while using the OLS estimation technique on the basic and augmented gravity model. The authors have used the coefficients obtained from the gravity equations to compute the trade potential. According to the results, India has huge trade potential with the Central Asian States. However, keeping in view the geopolitical issues, particularly, the political tensions in Pakistan and Afghanistan, the authors suggest that both regions should look at different options to further improve their trade relations. In this regard, the restoration of "historical" and "cultural linkages" between India and Central Asian republics could be supportive in improving bilateral trade. Ferrarini (2013) has estimated the export potential of Myanmar using the gravity model. The study confirms that Myanmar has huge unexploited trade. The majority of the gap is determined by very low trade with the industrialized countries. The study concludes that Myanmar's gradual integration with the global economy in addition to domestic economic reforms and unrestricted entree to the "European" and "American markets" could be supportive in bridging this gap.

Tripathi & Leitao (2013) have used the gravity model to investigate India's trade flows for the period between 1998 and 2012 with its major trading partners. The authors have applied "Tobit, random effects and GMM system estimator" for the analysis. The study confirmed that political globalization and cultural proximity positively affect bilateral trade. In addition, results have shown the positive impact of "economic size" and common border on bilateral trade. Bano "et al" (2013) analyzed the development of trade between "ASEAN" and "New Zealand" by using the trade intensity and trade potential indices. The purpose was to assess the strength of existing trade and trade potential for the period 1980-2010. The findings reveal substantial future growth opportunities in specific export sectors, as well as shifting trade trends between New Zealand and ASEAN members. Results also indicate that despite fluctuations, New Zealand-ASEAN trade has grown over time. Using a dynamic gravity model, Rahman, and Ara (2010) calculated Bangladesh's trade potential with its major trading partners. The gravity model has been augmented by including tariff and transaction cost. Their results indicate that trade expansion between the countries has been stifled due to higher trade costs and tariff. Jakab "et al" (2001) has used the concept of speed of convergence and the gravity model to analyse the development of potential and actual trade in the Czech Republic, Hungary, and Poland. Using panel error-correction models they find significant convergence to the estimated potential trade. The conclusions drawn from the measure of the speed of convergence are robust across diverse estimation methodologies. Baldwin (1994) has estimated the potential

pan-European trade patterns for two distinct scenarios i.e., medium term and long term. Like previous studies, he has used West European data to estimate the gravity model and then computed the trade potential.

2.4.1: Studies related to Pakistan

In order to find out the trade potential of Pakistan with China, Irshad "et al" (2018) estimated the gravity model for 1992–2015. The study has used different estimation methods like "EGLS, REM, two-stage EGLS, GMM, Tobit and PPML". The results have shown significantly predicted signs except for language and PTA. The study has found huge trade potential between Pakistan and China, however, the impact of PTA has been found significantly negative. This implies that new steps should be taken by Pakistan to increase and diversify its exports to China, as well as to achieve trade equality. Mohmand "et al" (2015) has evaluated the export potential of Pakistan through the gravity model. The study has not only identified the countries with high export potential for Pakistan but it has also indicated the major factors that can affect the country's trade environment. According to the results, Pakistan's export potential is high with Iceland, Brunei Darussalam and Barbados. The study has mentioned that in 2011, Pakistan's foreign trade with the "United States, United Kingdom, United Arab Emirates and Germany" is almost 33 percent of the country's overall exports. This implies that the major trading partners of Pakistan are the developed countries particularly in terms of exports. In this regard Pakistan is required to direct its foreign trade to countries with high export potential, hence it will be supportive in reducing the trade deficit.

Similarly, Shahzad (2015) has used the RCA index to inspect Pakistan, Bangladesh and India's comparative advantage in textiles and clothing. The static and dynamic analyses of textiles and clothing for the selected countries reveals that Pakistan possesses a comparative advantage in both product groups, but it has the highest revealed comparative advantage for textiles over both India and Bangladesh. The static analysis has been done in the year 2010 while the dynamic is based on 1980, 1990, 2000 and 2010. The author has used the average of the three previous years from 2010 and has estimated the revealed comparative advantage for the purpose of dynamic analysis. Sultan & Munir (2015) have estimated the determinants of export, import and total trade along with calculating Pakistan's potential on the basis of the gravity model for the period between 2000 and 2013 with 38 countries. The results show that the determinants and potential of exports and imports differ from those of overall trade. The study indicates the highest trade potential for Pakistan with Norway and Hungry. In terms of exports, Switzerland and Hungry have been identified as countries with maximum potential,

while Norway followed by the Philippines, Portugal and Greece have shown the highest potential in imports with Pakistan.

In order to examine the possible gains for Pakistan under the proposed PTA, Gul (2014) has evaluated the potential trade opportunities between Pakistan and Turkey through descriptive statistics and three trade indices i.e a "trade complementarily index, export similarity index, and intra industry index" and concluded that robust export similarities and intra-industry trade would be helpful in providing great opportunities to both Pakistan and Turkey. Consequently, Pakistan's exports will benefit from substantial value addition and a wider consumer base. According to the author, Pakistan should vigorously advocate for the proposed PTA and exploit the agreement to optimize the country's potential benefits. Ahmad & Garcia (2012) have employed the gravity model on panel data from 1991-2010 to evaluate those factors that are responsible to affect trade at the commodity-specific level. In this particular study, the rice sector of Pakistan has been chosen. The estimated coefficients are used to forecast possible trade within the sample markets. The findings show that Pakistan's rice exports have untapped potential in emerging and developing economies, which can be realized by increasing production capacity, improving market access through bilateral trade agreements, and improving marketing efforts. Gul & Yasin (2011) have assessed the overall trade potential of Pakistan for the period between 1981-2005 across 42 countries through the gravity model. The study shows a huge trade potential with countries in the "Asia-Pacific region", the "European Union", the "Middle East", "Latin America", and "North America". Particularly, the highest potential exists with "Japan, Sri Lanka, Bangladesh, Malaysia, the Philippines, New Zealand, Norway, Sweden, Italy, and Denmark". Findings suggest that Pakistan is required to improve the export's quality and reduce the cost of production besides finding new ways and means to improve its trade ties with countries having high trade potential.

Kaur & Nanda (2011) have estimated Pakistan's export potential with SAARC nations through gravity model for the period 1981-2005. Further, they have used the speed of convergence in order to obtain the convergence and divergence of Pakistan's exports to SAARC members. Results have found that Pakistan's actual exports have converged to the estimated potential. The study has also observed the net export potential of Pakistan with Bhutan, India, Maldives and Nepal. Authors have mentioned that as Bhutan, Maldives and Nepal do not have any common borders with Pakistan, therefore Pakistan requires a facility for transit trade with these countries through India to realize its export potential. In this particular study, Kaur & Nanda have calculated export potentials by using three formula mentioned i.e i) Predicted

Export Flows – Actual Export Flows (P-A), ii) Predicted Export Flows / Actual Export Flows (P/A) and, iii) Speed of Convergence. The speed of convergence formula was proposed by Jakob et al. (2001) to calculate potential trade instead of using the first two methods. It is calculated by dividing the average growth rate of future trade by the average growth rate of real trade for the time period under consideration. According to the concept, if the growth rate of potential exports is lower than that of actual exports and the computed speed of convergence is negative then it implies there is a convergence while in the opposite case there would be divergence. Butt (2008) has estimated the gravity model through the PPML method and analysed Pakistan's export potential in 19 sectors of the economy. The study is conducted for 132 exporting and 154 importing countries during the year 2002-03. The highest export potential has been found with India, Japan, Hong Kong, China and the USA while the countries with whom Pakistan has already exhausted its export potential are UK, Turkey and Bangladesh. At the sectoral level, Pakistan's export potential has been found in 13 out of 15 sectors with India. Likewise, with China, there are 10 out of 15 sectors in which there exist significant export potential.

The appraisal of literature specifies that there is more than one type of method to estimate the trade or export potential in addition to the gravity model. Other methods include RCA, trade potential index and speed of convergence. Nevertheless, there is extensive literature in which trade/export potential has been estimated through the gravity model. The gravity model captures important economic, social, and cultural factors which could significantly impact the trade flows between the countries. Similarly, the literature review has enabled us to know that various techniques have been used to estimate the gravity model in addition to the conventional estimation technique i.e., OLS. Regarding Pakistan, we have observed that there is a significant number of studies in which trade potential has been estimated, however, most of the studies have used the OLS estimation method or concentrated only on estimating the potential of some specific commodities or sectors. Most importantly, their focus always remained on traditional trading partners of Pakistan. While in the present study our focus is not only on Pakistan's major and traditional trading partners but also on those with whom existing trade volume is exceptionally low and considered to be non-traditional partners. Moreover, we will estimate the gravity model through PPML in addition to the OLS method. Similarly, it will measure the effect of FTA and PTA on bilateral trade flows between Pakistan and its trading allies.

2.5: Empirical Literature on Trade/Export Potential in Services

Within the available limited literature, we will discuss a few of the important studies conducted to investigate the factors and potential of trade/export in services. Although the focus of current study is on estimating the determinants and potential of trade/export in services using the gravity model, yet it will briefly discuss the application of other empirical tools used in view of finding determinants and potential of trade in services. In order to find out the important factors of service export in selected emerging Asian economies, Ahmad, "et al" (2017) used an export demand function. The primary finding showed that in selected emerging Asian countries, exchange rates, foreign earnings, foreign direct investment, service value-added and communication services could affect the service exports. The study indicated that services exports can support these countries to compete worldwide only if they are successful in exploiting and enhancing their potential by concentrating on the appropriate and important factors.

Pham "et al" (2014) estimated the key factors of services trade using the gravity model for the period between 2002 and 2011. The analysis has used pooled, random and fixed effect estimation separately for overall trade, exports and imports in services between Vietnam and the European Union. The findings of the study specify that "gap in GDP per capita between Vietnam and partner countries, partner country's population, real effective exchange rate, colonial relationship and being former members of CMEA" are the main determinants in influencing the services trade flows. The study has shown an insignificant impact of distance which implies that services trade may not have to be physical transported from one destination to another. Depending on the nature of the service, it may necessitate physical movement, but in other situations, it may be conveyed electronically. Kaur (2011) examined the US service export capacity with Japan, China, India, Singapore, South Korea, and Hong Kong using the gravity model. The period of analysis span over 9 years (2000-2008). The study's results revealed the United States' export potential in services with India and Japan. In addition, the study showed that the USA has convergence in exports with Hong Kong, India and Korea and divergence with Japan, China and Singapore. Shepherd & Marel (2010) inspected the key factors of trade in services through the gravity model. The regulatory factors of services trade have mainly focused under this study relative to the geographical and historical features. The authors have used a variety of regulatory measures rather than relying on one, such as the OECD Product Market Regulations that were widely used in prior work. This strategy enabled them to validate that regulation is a major factor of the observed pattern of international trade

in services because it significantly contributes to the general level of trade transaction costs in the services sector.

Kandilov & Grennes (2010) have estimated the gravity model on disaggregated data for services exports to classify the origins of Central and Eastern Europe (CEE) advantages over rival exporters like India, China and Brazil. The study looked at the effect of distance, time zones, legal institution efficiency, and other factors on service export separately. The findings show that the importance of geographic distance varies greatly depending on the form of service exported. Like for exports in construction services, geographical location is essential, but it has little effect on computer-related services. However, the relative efficiency of legal institutions has an effect on trade across a wide spectrum of service categories. Overall, the findings indicated that non-homogeneous aggregate services could mask significant differences in the effects of geographical distance and other variables on service trade patterns. SAWTEE (2008) assessed Nepal's export potential in education, health, and high-end retail services in one of the diagnostic studies. The study revealed that the country has comparative advantages in services. It also revealed that factors such as a friendly environment, low cost of housing, cultural and religious affinity, and ease of FDI and individual movement contribute to Nepal's potential in education services exports. The study also explored some factors that appeared to be a competitive disadvantage to the country like “lack of quality control, price discrimination, language barriers, poor infrastructure, insecurity, and insufficient marketing”. Brandicourta “et al” (2008) used a two-step strategy to estimate the trade potential in services through the gravity model for a sample of 65 nations in individual service categories during 2000 - 2005. In specific, they concentrated on the potential for unexploited trade in services that seems significant for the Austrian economy. They focused on the export side, while the import side may also be significant, especially with respect to the role of commercial services as inputs in production. The research divided the determinants of bilateral trade flows into specific parts of origin, destination, and bilateral. GDP per capita, country size, institutional factors and overall trade orientation are among the variables that capture origin- and destination-specific characteristics such as distance, common language and adjacency. The study showed that Austria, France, and, to a lesser degree, Germany, have significant untapped trade capacity.The UK and the Netherlands emerged as resilient over performers given their predicted potential. Although most countries, including Austria, export more travel services than the model predicts, commercial services also have the most untapped potential.

Seyoum (2007) has used three indices of RCA to evaluate the competitiveness of selected services. The analysis is focused on business, financial, transport and travel services in developing countries relative to the rest of the world. The findings of the study indicated a strong comparative advantage for various developing countries in terms of transport and travel services. Moreover, considerable scope for expansion in "financial" and "business services" was also indicated. Furthermore, the findings showed that country wealth and a shared language are the most important factors in services trade, with distance being unimportant. The study has also introduced a variable to measure the barriers to services trade mainly based on trade restrictiveness indexes of the Australian Productivity Commission however, it is only found to be weakly significant. Walsh (2006) examined the determinants of service trade and the role of non-tariff barriers to service trade using a gravity model. He has used and tested different types of panel data estimators and found that the Hausman-Taylor estimator was the most accurate. The study also showed that the gravity model fit services trade flows the same as trade in goods. Kimura and Lee (2004) used the standard gravity model to compare the effects of different determinants of services trade to those of goods trade. The gravity model was estimated for merchandise and services trade from 10 OECD member countries to other economies (including OECD and non-OECD member countries) for the years 1999 and 2000. The findings showed that the gravity equation better forecast trade in services than trade in products. Similarly, merchandise exports and services imports have been found to have a complementary relationship. The study has also shown that for services trade, distance is more important relative to goods trade. It may imply that for tradable services, transportation costs are "generally" greater than for products.

Grünfeld & Moxnes (2003) have estimated the gravity model to identify the factors of service trade and foreign affiliate sales for the OECD countries. The study included a measure of corruption in the importing country as well as a trade restrictiveness index (TRI11) to quantify the barriers to services trade in the importing country, in addition to standard gravity variables. Results found a significant negative impact of barriers on service exports and FDI (a proxy for foreign affiliate sales). In addition, this study confirmed that the trade in services is negatively associated with the distance variable is negatively and positively dependent on GDP, thus it simply implies that the gravity model better applies on the services trade same as for the goods trade. Park (2002) explained that service trade barriers are not the import tariffs, but rather a complicated range of quantitative constraints, prohibitions and regulations. By using the gravity model, Park (2002) try to evaluate tariff equivalents in seven services traded for

fifty- one nations. Park has used GDP, distance, prices of fifty-one countries for the year 1997, a dummy for a common language and capturing regional characteristics. The model is shown to have excellent explanatory power to illustrate trade trends in goods, besides services. Sapir & Lutz (1981) concentrated on determinants of "comparative advantage" in service trade (freight transport, other transport, and insurance) based on Heckscher Ohlin (H-O) structure. Their study revealed that in explaining trends in services trade, standard trade theories can be used. They also inferred that in freight services, "comparative advantage" is linked to capital intensity, scale, trade structure, and distance from trading partners. It further added that the availability of human resources and economies of scale appeared to be the main factors for trade in insurance services, while the efficiency of passenger services is dependent on capital abundance and passenger flow.

2.5.1: Studies related to Pakistan

As mentioned earlier, that to the best of our knowledge we haven't found any significant work on trade/export in services with regard to Pakistan with a particular focus on estimating determinants and potential. However, Gulzar (2011) developed a strategic framework of liberalizing trade in services in 12 categories with 26 partner countries of Pakistan using OLS, PLS and 2SLS on panel data (annual and quarterly). Gulzar has proposed that the government should adopt a "bottom-up" rather than "top-down" approach in developing a comprehensive framework for the "Trade Policy" in order to maximize the benefits of trade liberalization in total services. In particular, he estimated the relative trade (export) potential) for each type of exports of service with the partner countries of Pakistan using the gravity model with the two-stage least square method. The explanatory variables included for this purpose were GDP, distance, population, per capita income, multilateral openness term, market regulation indicator and dummy for language and border. With regard to potential, the study indicated the unexploited export potential in five out of eleven services categories such as "Travel, Insurance, Financial, Other business services, governmental services".

In addition to the above study, here we explain a few important studies conducted to emphasize the importance of growing service trade/exports and their effect on Pakistan's economic development. Ajmair & Ahmed (2011) estimated the determinants of growth in the services sector in Pakistan. They used time-series data to estimate separate regression equations for analysis purposes. Similarly, they used a dummy variable for the period 1990-2005 to capture the impact of reforms. Their study unveils that the rise in growth of the services during

1990-2005 was largely attributed to higher growth in "communication services, financial services, business services (IT) and community services". High-income elasticity of service demand, increased input use of services by other industries, and increasing exports have been found to be important factors in stimulating service development. In addition, supply-side factors like reforms and technological advances also played a vital role. Mujahid & Alam (2014) examined the factors that influence the growth in the service sector. To this end, the study used the method of co-integration and the model of vector error correction to investigate both long-term and short-term relationships between variables during the time period 1976-2010. Findings of the study suggested that population, foreign direct investment, consumption and investment significantly influence the services sector's growth in Pakistan.

Atif "et al" (2016) examined the trends in specialization and dynamic positioning of Pakistan's comparative advantage in bilateral services with major trading partners for the period between 2007 and 2014. In this context, different measures of "comparative advantage" were used to evaluate the competitiveness of services trade for 11 services categories. The results of the study revealed that specialization patterns have become more polarized in bilateral services trade with most of the trading partners. Similarly, the findings also indicated the reversal of comparative advantage in some services trade. The services sector has emerged as one of the most significant drivers of economic growth, however, the amount of empirical research and studies on the potential and determinants of trade in services is very limited. However, within the available limited literature on trade/export potential in services, the gravity model fit services trade same as trade in goods. Regarding Pakistan, the review of various studies has not brought out any significant or comprehensive study that has discussed the potential of the services sector in improving overall trade/exports. Despite the studies are more focused on estimating the major factors that can influence the growth in the services sector. To fill this gap, we will estimate the trade/export potential of Pakistan in services by including a maximum number of countries and data that is available.

2.6: Empirical Literature of Trade Facilitation

Similar to services, the literature on the effect of trade facilitation on bilateral trade/exports is also limited. Nevertheless, few of the important studies have been reviewed here with an aim to examine the significance of trade facilitation for expansion in trade. Zhang, "et al" (2019) have used the principal component analysis to calculate the trade facilitation of 13 countries with large trade flows of forest products with China along the "Belt and Road". The study has used an "extended gravity model" on transitional panel data to estimate the effect

of trade facilitation on the ternary margins of China's export growth for the period between 2007 to 2016. The study revealed that improving trade facilitation will substantially increase the exports of forest products. Furthermore, it will always encourage the transformation and upgrading of the pattern of growth in trade, guided by the better quality of forest products exported. Santhi & Setyari, (2019) have looked at how trade facilitation affected the export performance in six ASEAN countries while using panel data regression. To measure trade facilitation, "port efficiency, burden customs procedure and fixed broadband" have been used. The study concludes that trade facilitation reform increases export performance in six ASEAN countries. Host "et al" (2019) have used LPI to measure the impact of trade facilitation on international trade through the gravity model. Findings confirm the positive impact of trade facilitation on that trade. The study has also concluded that the logistics performance of an exporter is more important than an importer. Altaf "et al", (2017) have analysed the determinants of trade costs for overall trade, "agricultural and non-agricultural trade" of Pakistan with its main trading allies in Asia, the European Union and North America from 2003-2012 on the basis of the gravity model. Furthermore, the research looked into the relationship between trade costs and their main determinants. Results show that development in port infrastructure and "membership of free trade agreement" reduce the trade cost substantially. On the basis of results, the authors have recommended implementing the agreement on trade facilitation and thus reduce the red tape at border crossings to decrease the trade costs.

Ghani (2017) has used a measure of logistic performance both in standard export and import equations and investigated its impact on international trade. The findings show a substantial positive impact on exports and imports. The author is of the view that consistent investment in logistics infrastructure and facilities, can have a major effect on international trade. Trpčevska & Tevdovski, (2016) assessed the importance of trade facilitation on trade between the selected group of countries in South-Eastern Europe for the period between 2008 and 2012. For this purpose, they have used the OECD database for the values of the trade facilitation indicators and used them in the augmented gravity trade model to evaluate their effect on bilateral trade flows. The study has followed Moïsé and Sorescu (2013) approach. Results indicate that "information availability, the involvement of the trade community, appeal procedures, formalities – automation and border agency cooperation and external" have a significant impact on exports. Seetanah, "et al", (2016) analysed the effect of trade facilitation on trade flows on 20 African economies for the period between 2007 and 2014 using a panel

vector autoregressive framework. The study has used LPI data to measure the impact of facilitation indicators. Results confirm that trade facilitation is helpful in trade expansion and also has positive impacts on economic growth. Chakraborty & Mukherjee, (2016) have assessed the relationship between trade facilitation measures, and "export orientation (export as a percentage of GDP)" during 2007, 2010, 2012 and 2014. The study has used LPI to quantity trade facilitation. The results indicate that there is a difference in the impact of trade facilitation on export orientation in higher-income and lower-income countries. Daryanto & Sahara, (2016) analysed the impact of LPI on agricultural exports of Indonesia with its 21 trading partners over the period 2005-2013. Besides LPI several independent variables have been used as control variables like GDP, distance, tariff, population, information technology, governance index, and trading cost borders. The study founds a positive impact of LPI on Indonesian agricultural exports. The findings of the study imply that improving logistic performance would be an important development policy for Indonesia.

In order to analyze the effects of logistics on international and interregional trade in Spain, Bensassi et al. (2015) estimated the gravity model. Their study affirmed the significance of logistics in analyzing the merchandise trade, especially, "the number, size and quality of logistics facilities" positively affect export flows. Puertas "et al" (2014) evaluated the significance of "logistics performance" in the context of "EU" exports while using the gravity model. The study inferred that logistics are more important for exporting nations than importing nations. Within the components of the LPI, the study has shown the significance of Competence and Tracking. According to Jordaan (2014), the country's trade relies not just on its own trade facilitation reforms, but also on the reforms of its trading partners. In this context, the author explored the factors of trade facilitation that affect South Africa's exports to other selected African countries while using the standard gravity model, complemented by selected trade facilitation measures. The study has used four measures of "trade facilitation" that has been proposed by Wilson "et al" (2004) i.e "port efficiency, customs environment, regulatory environment and domestic infrastructure". The study concluded that improving the "customs environment" in the importing country would be supportive in increasing the trade flows, followed by the "regulatory environment" and "domestic infrastructure". Moïsé & Sorescu, (2012) describes the results of the OECD indicators to test the impact of specific trade facilitation initiatives on the trade in developing nations. Sixteen trade facilitation indicators (TFIs) have been constructed in this regard, consisting of 97 variables, the values of which are extracted from publicly presented data and then double-checked with the respective

governments. Improving trade facilitation has a major effect on trade flows, according to the findings. The most significant trade facilitation measures in terms of the highest impact on trade volumes have been found as “information availability, harmonisation and simplification of documents, automated processes and risk management, streamlining of border procedures and good governance and impartiality”. Considering the significance of trade facilitation as a key policy tool for trade growth, Felipe & Kumar, (2010) have examined the relationship between bilateral trade flows and trade facilitation while using the gravity model. In their study, they have estimated the gains in trade derived from improvements in trade facilitation for the Central Asian countries. For this purpose, trade facilitation is measured through LPI. The results show significant trade gains in Central Asian countries in response to the improvement in trade facilitation. Among various components of the LPI, the study finds that the highest increase in total trade is attributed to infrastructure improvement, led by customs and other border agencies ' logistics and productivity. Zaki, (2010) examined the effect of various features of trade facilitation in low and higher-income countries using an augmented gravity model. The study has used the World Bank Doing Business database. The finding indicates that the internet, bureaucracy, corruption, and geographic variables have a significant impact on the transaction time to import and export. Iwanow & Kirkpatrick, (2009) have analysed the impact of trade facilitation and other institutional constraints on the export performance of the manufacturing sector. The study has used the OLS estimation method to estimate the standard gravity model for 124 “developed” and “developing” countries during 2003-04. Findings confirm the significant impact of trade facilitation on export performance, however other reforms like the “quality of the regulatory environment and the quality of the basic transport and communications infrastructure”, are also required.

Weerahewa, (2009) investigated the impact of trade facilitation on agriculture trade in South Asia. The analysis is based on the sectoral gravity models of exports for five product categories, i.e., “all food and agriculture; live animals; vegetables; processed food; and manufactured products”. The model has used conventional explanatory variables along with “trade restrictiveness indices”, “presence of trade agreements”, as well as “trade facilitation” variable. LPI has been used as a proxy for trade facilitation. Results indicate significantly positive effects of trade facilitation on exports of all the product categories. Wilson, “et al” (2005) have developed a measure of trade facilitation and analysed their association with the trade for a sample of 75 countries. For this purpose, “port efficiency, customs environment, regulatory environment, and service sector infrastructure” has been used to create the indicators

for measuring trade facilitation and incorporated in a gravity model to investigate their importance for trade flows. The study emphasizes the major impact of trade facilitation reforms on export development. Wilson "et al", (2003) examined the impact of trade facilitation on trade in the Asia Pacific region through the gravity model. The country-specific data for "port efficiency, customs environment, regulatory environment, and e-business usage" has been used to quantify the trade facilitation. The findings of the study show that improvement in "port efficiency, customs and e-business use" considerably enhance trade while regulatory barriers discourage trade.

2.6.1: Studies on Pakistan

Taimur, "et al", (2016) examined the impact of trade facilitation on sectoral export of the SAARC region namely primary and manufacturing through the gravity model while including trade facilitation indicators. The model is estimated through "OLS, FE and Poisson FE". For the purpose of analysis, three proxies of trade facilitation indicators have been calculated from Doing Business i.e., "number of documents, number of day and cost to export per standard container". The study indicates that trade facilitation reforms are effective policy to ensure the better export performance of the region. Saeed (2014) assesses the impact of the Trade Facilitation Agreement on Pakistan's trade policy and illustrates how Pakistan's policy-making process can be adjusted so that the agreement can be enforced quickly and correctly on a long-term basis. The author is of the view that Pakistan has performed relatively better in the area of trade facilitation mainly in customs, however, still there is enough room to improve.

2.7: Concluding Remarks

In this chapter, we included various studies associated with our work on merchandise and services trade potential along with the impact of trade facilitation on bilateral trade/exports flows. The chapter was divided into different sections including a brief appraisal of the studies on theoretical foundation and econometric issues of the gravity model, country-specific empirical studies both at Pakistan and international level in the context of trade potential and trade facilitation. With regard to the "theoretical foundation of the gravity model", the literature review enabled us to know that it is not based on a single theory of trade. In fact, there are numerous ways used by different researchers to explain the theoretical foundation of the gravity model. Despite presenting different theories including "endowment and technological differences, increasing returns to scale, and Armington demands", it can be concluded that all foresee a gravity relationship for trade flows similar to Newton's law of universal gravitation.

However, the gravity model has clearly shown a significant move towards the structural specification derived from the standard economic theories. After some additional discussion relating to its specification in the 90s, the discussion moved to the performance of various estimation methods for the gravity model. It was observed that in the presence of heteroscedasticity, using the conventional method OLS produces inconsistent estimates. Moreover, the method is not compatible especially when there is zero trade data, hence, leads to unsatisfactory results by excluding zero trade values. However, using Poisson pseudo-maximum-likelihood method is more appropriate due to its robustness in the presence of heteroscedasticity and a natural way to deal with zeros in trade data. With regard to the empirical studies, a large number of studies is comprised of estimating the trade/export potential, trade/export determinants and trade/export direction using the gravity model and RCA etc. The appraisal of studies has shown that there is more than one type of methods to estimate the trade/export potential i.e. gravity model, trade potential index and speed convergence. However, there is extensive literature available in which trade potential have been estimated based on the gravity model. It can be used both at the aggregate or industry level. Contrary to the gravity model, methods based on trade indices compute the trade potential only at the product level.

The services sector has emerged as one of the most significant drivers of economic growth in recent years., however, there is an inadequate amount of empirical studies on the potential and factors of service trade in comparison with the accessible literature on trade/export in products. Particularly, in the case of Pakistan, there is not any significant or comprehensive study to the best of our knowledge that has discussed the potential of the services sector in improving overall trade/exports. Apropos trade facilitation, it has been observed that there are different measures introduced by various international organizations and used by a number of studies. In addition, Wilson, “et al” (2005) have developed a measure of trade facilitation. They have used, “port efficiency, customs environment, regulatory environment, and service sector infrastructure” to measure the impact of trade facilitation. Many studies have used these indicators to quantify the impact of trade facilitation on trade flows. The review of literature affirmed that trade facilitation is generally a notion of reducing trade-related costs which in fact refer to us non-tariff barriers. Despite a significant decline in tariff barriers over the past many decades through several types of multilateral and bilateral trade agreements, high non-tariff barriers have severely affected the trade flows between the countries. From these studies, we infer that the trade facilitation agreement is now an effective

policy tool to positively affect the trade performance of any country. At the same time, it will encourage transformation and upgrading the pattern of trade growth.

CHAPTER 3: HISTORICAL EVALUATION OF PAKISTAN'S TRADE POLICIES & PERFORMANCE

This chapter is distributed into three different sections. The first section is devoted to the historical evaluation of various trade policies Pakistan has adopted to improve trade performance. The second section will discuss in detail how Pakistan's trade both in goods and services have been evolved and whether the trade policies have proved to be successful in improving export performance. While in the third section, we will discuss Pakistan's performance with regard to trade facilitation. This will help us understand the significance and role of trade facilitation in improving trade competitiveness. However, at the outset, it is important to review trade policies Pakistan has adopted over the years. The analysis will enable us to know how far those policies remained successful in improving Pakistan's trade profile. Pakistan has formulated various trade policies over the years to support the trade sector. Historically, the country adopted a protectionist and vigorous import substitution (IS) strategy with an aim to become self-sufficient and protect its domestic industry. While in the late 80s, it followed a policy of trade liberalisation and export promotion, followed by Export promotion (EP) strategy adopted in the early 1990s (Afzal & Ali, 2008).

3.1: Review of Trade Policies

3.1.1: Liberal Trade Regime

During the 6th Five-year Plan (1983-88) the liberalisation process was started, however, executed after 1988. This policy was in fact considered to be different from earlier industrial development policies, as the first time "Export-Led Industrialisation" was declared as the main policy objective. The focus was on stimulating manufactured exports of higher value-addition. In this context, the then government initiated various measures to liberalise the trade regime by removing the non-tariff barriers imposed in the 1970s due to oil shock and Balance of Payment's (BOP) problems (Afzal & Ali, 2008).

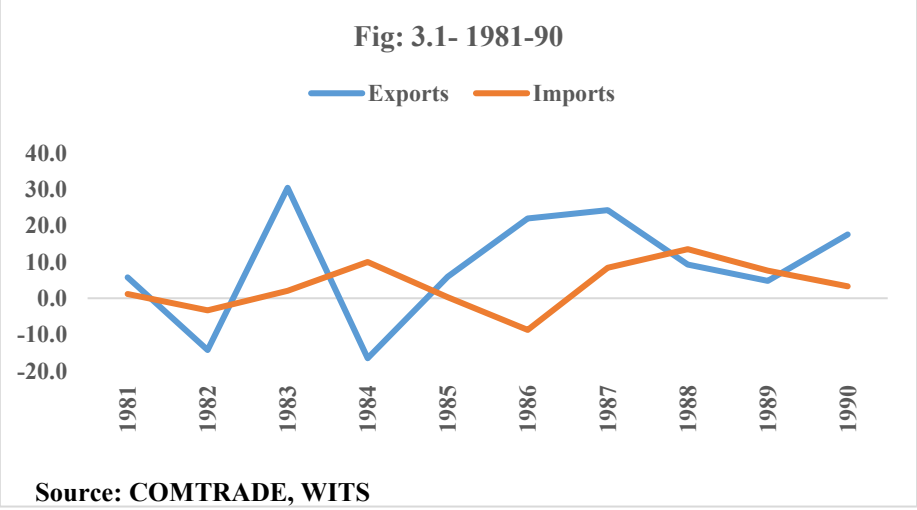
The number of products on the free list was increased from 438 to 539 between 1977 and 1983 (ADB, 1985), while the procedure for importing commodities was reorganised and made easier and simple (Zaidi, 2015). However, the World Bank, which was evaluating the trade policy regime of the 1980s was not satisfied even with these early measures. The World Bank claimed that "approximately 41 percent of the domestic industrial value added was protected by import bans and another 22 percent by different forms of import restrictions" thus concluded that Pakistan's import regime is more restrictive (Zaidi, 2015). The government at

that time adopted a series of measures to promote exports, as well as to liberalize the trade regime. Particularly, the import quotas on "non-capital imports" as well as the number of commodity categories subject to import licensing value ceilings were decreased from 406 in 1980/81 to 5 consumer goods in 1983.

To enhance exports following measures were announced:

- Export rebates
- Concessionary credit for exports
- Income tax and import facilities for exporters
- Delinking of the Pakistani rupee from the dollar
- Introduction of the flexible exchange rate

Major policy reforms were introduced in 1988 under Structural Adjustment Programs with an aim to bring extensive changes in the trade regime by rationalizing the tariff structure. To account for the impact of various measures as mentioned above, we will look at the performance of the external sector. As a result of liberalization policy, the imports (in absolute term) increased from $5.4 billion in 1980 to $ 7.4 billion in 1990, thus cumulative growth was 37 percent. In contrast, exports increased to $5.5 billion in 1990 from $2.6 billion in 1980, posting a cumulative growth of around 112 percent. The year-wise analysis also shows that despite an increase in absolute term imports growth remained below than the growth in exports.



The comparison between the growth in exports and GDP shows that economic growth was not much dependent on exports like when the export growth witnessed a significant decline from 5.8 percent in 1981 to negative 14.2 percent in 1982, the economic growth increased from 6.4 percent to 7.6 percent during the same period.

Fig:3.2- Comparision between Exports and GDP

Source: COMTRADE, WITS

3.1.2: Export-Led Growth: 1990s

The trade policy followed during the 90s was significantly focused on enhancing exports through "fiscal incentives, diversification of export structure and import liberalization". However, during this period, the external sector came under significant pressure owing to the dismal performance of the world economy along with the low price of most of the export products. Resultantly, exports could not perform as it was expected, while imports observed a significant rise due to trade liberalization policies (Afzal & Ali, 2008). In 1993, the government initiated various steps based on Structural Adjustment Program. According to this,

- Maximum tariff reduced from 225 percent in 1988 to 90 percent at the end of the adjustment program.
- Import licensing was abolished in March 1991 excluding the commodities in the negative list.
- Resident Pakistanis were allowed to open foreign currency deposits (FCD) accounts in February 1991.

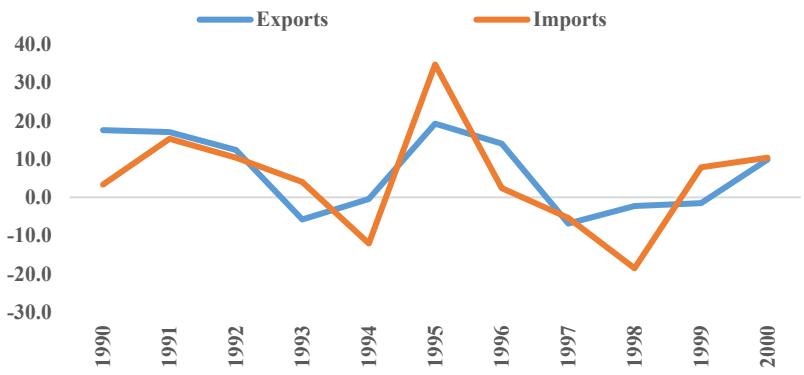
The World Bank made some recommendations at the end of the 1988 Structural Adjustment Program. Keeping in view the recommendations, the new trade reform package announced in 1993 comprised of the following important steps (Zaidi, 2015).

- Maximum tariff levels will be at 35 or 50 percent with six slabs of 10, 15, 25, 35, 45 and 50 percent. Existing tariff rates will apply to motor vehicles, alcoholic beverages, POL, wheat, fertilizers, pesticides, and lifesaving drugs.
- There would be a gradual reduction in tariff over a period of three years.

- Tariff on machinery and equipment will be 10 percent unless it is produced domestically.
- Engineering and Chemicals will receive nominal protection of 50 percent.
- There would be a zero rate of duty on raw material and intermediate goods used in the production of exportable products.

Zaidi (2015) has mentioned that the World Bank strongly suggested replacing non – tariff barriers with the tariff. On the basis of their evaluation of Pakistan's trade regime, World Bank claimed that the changes made since the 1980s were not considerable enough to create a more neutral trade regime. The reason was attributed to non-tariff barriers as they generate more serious distortions with greater resource allocation inefficiencies as compared to tariffs which actually is the direct price protection. The measures adopted in the trade policy for 1992-93 supported export-oriented industrialization through liberalisation of imports. However, the policy was not proved to be successful in stimulating export. It is evidenced from this fact that during 1993, the growth in export nosedived from 12.4 percent in 1992 to negative 5.8 percent in 1993 and -0.4 percent in 1994.

Fig: 3.3- 1991-2000



Source: COMTRADE,WITS

Export growth, which peaked at 17.5 percent in 1990 against 3.3 percent growth in imports, has since slowed to a negative 1.5 percent growth rate in 1999, while on the other hand imports witnessed 7.9 percent growth during 1999. Consequently, the trade deficit witnessed a sharp rise. In terms of GDP, although the contribution of exports increased during the 1990s against the preceding decades, however, the growth could not perform accordingly as it was expected in the response to various export-oriented measures initiated during the early

90s as indicated in the graph. On the other hand, exports contribution in GDP was not very impressive as it increased from 13.80 percent in 1990 to reach at the highest level of that decade at 14.94 percent in 1992 followed by 14.63 percent during 1996 and thereafter it deteriorated and reached 12.35 percent in 2000. Nevertheless, the export to GDP ratio performed relatively better against the previous decade of the 80s which is an indication of Pakistan's growing reliance on the international economy but a shift towards export promotion. Contrary to exports, imports contribution in GDP surpassed exports leading to high growth in the trade deficit.

3.1.3: WTO and Pakistan

The "World Trade Organization (WTO)" is a multilateral organization that not only manages the rules of trade between countries for smooth, free and fair trade but an important forum for governments for trade negotiations, settling trade disputes and helping developing countries in various issues in trade policy by providing technical cooperation and training programs "(http://www.wto-pakistan.org/, 2019)". The mid-90s witnessed a marked development when in 1995 WTO was created in response to the "Uruguay Round" (1986-1994) under "General Agreement on Tariff and Trade (GATT)". This was the last and most detailed of all the activities that led to the WTO. GATT largely dealt with merchandise trade while the "WTO" and its agreements now cover trade in services and in traded inventions, creations and designs (intellectual property) "(http://www.wtopunjab.gov.pk)". There are various agreements under the WTO, and it is important for the member countries to accept all of them. Pakistan is one of the founding members of the GATT as well as of WTO. Like other countries, Pakistan also agreed to abide by these agreements (Suleri , 2003).

The trade and industrial sectors have experienced significant changes in compliance, first under "Structural Adjustment Programs" of the "IMF" and "World Bank" and then with GATT and WTO. WTO comprises various agreements and protocols aimed at improving exports and imports. The member nations needed to decrease/eliminate tariffs and quotas with an aim to improve the entree into international markets and products. Similarly, subsidies both on exports and credit and on domestic products were to be eliminated and countervailing and anti-dumping measures taken (Zaidi, 2015). It was expected that under the direct and indirect effects of the WTO agreements, Pakistan's foreign trade would improve as most of these agreements aimed at improving competitiveness and fewer restrictions on both exports and imports in comparison with pre-WTO periods. The performance of both imports and exports in terms of growth and GDP in the post-WTO period has remained less than expected. Volatile growth in exports, political instability, floods, and droughts all led to variability in the trade

deficit. The export to GDP which was 10.92 percent during 1980 rose to 14.63 percent in 1996 and recorded at the highest level of 14.55 percent in 2005. After attaining this level, a downward trend has been observed for more than 10 years now. Other details have already been discussed in the previous part. In short, Pakistan's imports always surpassed the exports level throughout the pre and post WTO period which implies that Pakistan still running deficits in its balance of trade.

3.1.4: Export Oriented Policies

Pakistan adopted export-led growth policies in the 90s, however, ironically exports could not achieve the level as was expected. In this regard, government initiated various policies with an aim to stimulate exports. Like in the fiscal year 2007-08, the government took various Export Promoting Measures (SBP, 2006-07). A few of the important are mentioned below:

- It was decided to establish Equity Funds, not exceeding $ 5 million per proposal for brand acquisition.
- To promote Sectoral investments, the government decided to allow first year allowance (FYA) on investment in plant, machinery, and equipment (PME). The rates at the cost of PME was set at 90 percent for Hi-tech and value-added industries, @ 75 percent for developmental categories and agro-based industries and @ 50 percent for other industries.
- It was also decided to exempt hi-tech and value-added industries from customs duty and taxes on the import of PME.
- Another important decision was to set Social, Environment & Security compliance Board in TDAP in order to educate, coordinate and monitor the local laws relating to these standards.
- Establishment of Export Skills Development Council and convert the existing institutes into technological and skill development centres.
- It was decided to hire international consultants for selected companies on cost-sharing basis with an objective to identify the deficiencies and assist the firms in removing them. Initially, textiles and apparel, surgical instruments, leather products and sports goods were included in the scheme.
- For various compliance certification (quality, environment and social), the subsidy level was decided to increase from 50 percent to 100 percent.

- With an aim to diversify exports, one of the major steps initiates was to engage international consultants who would Identify Industrial, Agricultural and Service sectors where Pakistan may have or create some competitive advantage internationally and prepare short-, medium- and long-term plans for such sectors.
- To control the decline in exports of carpets, the government allow the import of semi-finished carpets on a temporary basis for processing for exports under Customs SRO 1065.

During the period between 2001-10, Pakistan 's trade account witnessed a significant rise in imports relative to exports. Particularly, during 2005, when the growth in export reached 30.9 percent from 2.8 percent in the preceding year, the sharp rise in imports to 64.6 percent nullified the impact of rise in export. Resultantly, the trade deficit witnessed the highest growth during the decade of 2001-10. On other hand, significant improvement in trade account was witnessed during 2009, when, the country recorded a significant contraction in the trade deficit to 36.6 percent, despite a 13.0 percent decline in exports during 2009. However, the contraction in the trade deficit was largely due to a 25.5 percent fall in imports during the same period hence it outpaced the effect of a fall in exports.

Fig: 3.4- 2001-10

Source: COMTRADE,WITS

The decline in growth of both export and imports was expected on the back of the "global financial crisis" as well as a decline in international commodity prices. These external factors, domestic factors (contractionary fiscal and tight monetary policy, depreciation of Rupee, sluggish economic activity, financial constraints in the petroleum group, energy crises and poor law & order situation) further aggravated the situation on the external front (SBP,

2008-09). To support the export and manufacturing sectors, the government changed its policy stance to support these sectors. For this purpose, SBP announced various credit-related incentives during the fiscal year 2008-09, the monetary policy loosening, announcement of a wide range of financial support measures in the federal budget for the fiscal year 2009-10 and most importantly the "Strategic Trade Policy Framework (STPF) 2009-12", and "Textile policy 2009-14". It was expected that the change in policy stance would bring some recovery in exports, besides increasing imports.

3.1.5: Strategic Trade Policy Framework (STPF) 2009-12

Generally, to gauge the level of export competitiveness, a country's share in the world market considered to be a good indicator. According to this, Pakistan's share in global export hovered between 0.12 and 0.19 percent from 1980 to 2009. In 1992, the share was at the highest level in decades at 0.19 percent which declined to 0.12 percent in 2008 which slightly increased to 0.14 percent in the next year and remained stagnant for three consecutive years. Although, Pakistan's exports were facing traditional supply-side problems like "low productivity, lack of scale and poor trade services", nevertheless, the global financial crisis together with "oil and price crisis, energy crisis, high cost of capital and law & order situation" brought a plethora of challenges for external sector. Similarly, the lack of sophistication indicates the slower movement towards technology and innovation. Particularly, the stable composition of Pakistan's exports further signifies the slow structural transformation of its productive capabilities (STPF, 2009-12).

In an effort to reap the gains from the expansion of international trade, Pakistan incorporated the structural reforms of the 80s and integration in the global trading system through WTO. However, less than expected performance of exports both in terms of GDP and share in global exports shows that the opportunity to achieve higher sustainable growth through exports was missed. Not only the ineffectiveness of government's policies to stern the erosion of the competitiveness of Pakistan's exports but failure to diversify exports both in terms of product and market attributed to unsatisfactory performance. Realizing the need to improve the competitiveness, the sophistication of products and diversification of products and markets, medium-term plan Strategic Trade Policy Framework (STPF) 2009-12 was developed in 2009 with the sole purpose to structurally transform Pakistan's exports which could support in achieving the higher sustainable economic growth (STPF, 2009-12). The strategy was developed to cope with the concerns like "declining export competitiveness, lack of

sophistication, diversification of products and market". STPF was comprised of six pillars namely:

- "Supportive Macro Policies and Services"
- "Enhancing Product Sophistication level in Pakistan's Exports"
- "Enhancing Firm level Competitiveness"
- "Domestic Commerce Reform and Development"
- "Product and Market Diversification"
- "Making Trade Work for the Sustainable Development"

Based on the strategy, it was decided to set the target of export growth at 6.0 percent for the fiscal year 2009-10 and then 10.0 percent and 13.0 percent for subsequent years. Key Measures announced are as follows (Balance of Payements, Pakistan Economic Survey, 2009-10):

- Support for opening exporters offices abroad.
- In previous years, the government announced 50 percent support for various quality, environmental and social certifications. The support was progressively increased to 100 percent of the cost of certification.
- Surgical instruments, sports goods & cutlery sector would be granted 25 percent subsidy on brand promotional expenses.
- A special fund would be created for product development & marketing for the light engineering sector.
- Leather apparel exporters would be provided 50 percent subsidy for on the floor expert advisory/consultancy and matching grant to establish design studios or design centres in their factories.
- A freight subsidy at 25 percent would be extended on air shipments of live seafood products.
- Processed food exports would be supported initially by reimbursing research &development cost at 6 percent of the exports.
- Sharing 25 percent financial cost of setting up of design centres and labs in the individual tanneries.
- Industrial importers would be allowed to import new, refurbished and upgraded machinery on the basis of trade - in with their old, obsolete machinery.

- The natural pearls and other synthetic or reconstructed precious or semi-precious stones would also be exempted from customs duty and sales tax.
- Limit for physicians' samples would be enhanced to 20 at the time of launch with the first shipment.
- In order to encourage the use of computers by a low-income segment of the population, the import of old used computer components would be allowed.

The export performance at the end of STPF 2009-12 shows that exports increased from $17.3 billion in 2009 to $25.1 billion in 2011. The rise during 2011 was largely attributed to a one-off increase in the cotton and cotton yarn prices that grew by 106.9 and 78.4 percent, respectively (SBP, 2011-12). However, export witnessed a decline of 2.68 percent to stand $24.5 billion due to a sharp decline in prices of key exports item (cotton and cotton yarn) (SBP, 2011-12). In addition, reduced global demand in the wake of the global financial crisis, power shortages and security related issues also remained the main factors in the unsatisfactory performance of exports during 2012. On the other hand, the imports grew from $31.5 billion in 2009 to $43.6 billion during 2012. The major contribution to the higher import bill during the period mainly came from increased global oil prices. In addition, higher food prices also remained the major factor in accelerating the import bill.

3.1.6: Strategic Trade Policy framework (STPF, 2012-15)

In view of the challenges to Pakistani exports, the government established the second Strategic Trade Policy Framework (STPF) 2012-15 with the goal of assisting Pakistani firms in producing and exporting a more sophisticated and diverse range of products to existing and new markets, as well as reducing unemployment and poverty in the country (STPF, 2012-15). STPF 2012-15 was designed on the basis of STPF 2009-12. The noticeable features are as follows:

- Focus on Regional Trade
- Create Regulatory Efficiencies
- Promote Agro-processed exports
- Increase Exports from less developed Regions of Pakistan
- Promote exports of Services Sector
- Enhance access to export financing and credit guarantees
- Mobilize new investment in export-oriented industries
- Facilitate Exporting industry overcome energy crisis

- Enhance Product and Market Development and Diversification
- Undertake effective Trade Diplomacy
- Increasing Green Exports
- Rationalize the Tariff Protection Policy
- Enhance Role of Women in Exports
- Reform and Develop Domestic Commerce

There were three main parts of STPF 2012-15. The first part comprises of the interventions aimed at bolstering existing "trade-related institutions" and establishing the "missing institutions". The second section contains export growth measures to resolve the competitiveness deficit. The third part contains "the regulatory amendments to the Import Policy Order and Export Policy Order in order to improve the ease of doing business and streamlining of procedures and strengthening the regulations pertaining to public safety and security" (Trade and Payments, Pakistan Economic Survey, 2012-13)

Major initiatives announced in the "STPF, 2012-15" are as follows:

- Mark-up support of 2 percent on prevailing Long Term Financing Facility (LTFF) for future import/purchase of machinery
- Mark-up Rate support of 1.5 percent on the Export Finance Scheme (EFS) to selected export sectors
- Ad-Hoc relief @ 3 percent of the fob to offset the impact of the higher cost of utilities for Pakistani exporters in selected sectors
- Marketing development assistance for regional countries
- Export promotion campaigns for agro-processed products
- Encouraging the opening of retail outlets
- Subsidizing 50 percent cost of plant and machinery for establishing processing plants for meat, fruits, vegetables, dates and olives in Baluchistan, Gilgit-Baltistan, KP and FATA
- Up-gradation of Rice Inspection Labs
- Mark-up subsidy @ 100 percent of the prevailing mark-up rate and 50 percent subsidy for wire saw cutting machinery to reduce wastages for establishing mining and processing in KP, FATA, GB and Baluchistan
- Strengthening Women Chamber of Commerce
- Establishment of Leather Export Promotion Council

During the Plan period, the performance of exports remained less than satisfactory as exports which were at $24.5 billion in 2012 grew by 2.27 percent to reach $25.0 percent in 2013, however, in the subsequent years it witnessed a sharp reduction of 2.06 percent and 10.68 percent during 2014 and 2015 respectively (STPF 2015-18). It may be noted that 2015 was the third consecutive year when world trade grew less than 3 percent. During 2013, the world trade growth rate was at 0.5 percent against the WTO prediction of 2.5 percent and increased to 2.4 percent in 2014 (STPF 2015-18). Hence, Pakistan's trade could not remain protected from the sluggish growth in trade at the global level. Similarly, various domestic factors were also responsible for the decline in exports like the global process of cotton declined and Pakistan received minor earnings on "raw cotton, cotton yarn and cotton cloth". The performance of the food group as a whole was less than satisfactory because of the low share of the basmati rice market (STPF 2015-18). With regard to imports, after witnessing negative growth in 2013 it grew by 9.22 percent to 47.4 billion in 2014. However, imports again registered a sharp fall and registered a negative growth of 7.64 percent to stand at $43.8 billion in 2015.

3.1.7: Strategic Trade Policy framework (STPF, 2015-18)

The government launched the third "Strategic Trade Policy Framework (STPF) 2015-18" in 2016 which intended to improve "Export Competitiveness, increase contribution in regional trade and transition from factor-driven economy to efficiency-driven and innovative-driven economy". The key drivers to attain the targets are as follows: -

- Competitiveness (quality infrastructure, labour productivity, access to utilities, and level of technological development)
- Compliance to Standards (convergence of local & international standards, protection of intellectual property, and effective and efficient disputes resolution mechanism)
- Policy Environment (monetary policy, tariff & tax regime, and synergic industrial & investment policies)
- Market Access (multilateral, regional, and bilateral)

There are four main pillars that have been identified by STPF 2015-18 on the basis of key drivers i.e "Product sophistication and diversification (research and development, value addition, and branding), Market access (enhancing share in existing markets, exploring new markets, trade diplomacy and regionalism), Institutional development and strengthening (restructuring, capacity building, and new institutions) and Trade facilitation (reducing the cost of doing business, standardization, and regulatory measures)."

During the STPF 2015-18, exports that posted a negative growth of 10.68 percent in 2015 improved slightly though remained negative at 7.01 percent to stand at $20.4 billion during 2016 and further improved by 5.51 percent to reach $21.5 billion during 2017. Not only external factors but domestic factors in confluence with inbuilt structural issues have contributed to the less than satisfactory performance of Pakistan's trade sector. At the global level, the economic recovery remained instable with substantial downside risks. The modest growth in developed countries has meant a low demand for imports from developing countries like Pakistan in recent years, and this has been cited as one of the key reasons for the country's declining exports. Furthermore, rising global prices have exacerbated the trade balances of net commodity importers such as Pakistan (SBP, 2016-17). Pakistan's economy experienced a high growth trajectory on account of "improvement in energy supplies, industrial expansion, and rising consumer spending", however, it caused a surge in demand for imports. After posting negative growth of 7.64 percent in 2015, imports posted a growth of 6.88 percent to reach $46.8 billion in 2016 and $57.2 billion during 2017 with 22.3 percent growth. Further pressure on the import bill emanated from continued work on CPEC related power and road construction projects (External Sector. Annual report, 2016-17).

3.2: Concluding Remarks

The liberalization process of Pakistan's economy started during the late 80s and continued to deepen into the 90s. To effectively implement the policy, it was important to increase competitive pressures by facilitating the entry of new producers and encouraging more imports into the country. It was expected that it will not only increase the efficiency of the producers but would also compel them to upgrade the technology, in turn, it will give a boost to export growth (McCartney, 2015). However, the macroeconomic outcomes were not encouraging. In particular, the economic growth that averaged 5.8 percent between 1960-61 and 1979-80 reduced to an average of 5.3 percent between 1980-81 and 1999-00 and continued to decline further to an average of 4.4 percent from 2000-01 to 2016-17. On the other hand, the growth in exports remained uneven with high growth in one year and decline in the next year. The trade (exports plus imports) contribution in GDP grew from 33.5 percent in 1980 to only 36.6 percent in 2008 and with an uneven trend between the years, it ended up at 25.8 percent of GDP in 2017. The brief analysis explains that Pakistan could not fully exploit the benefits from various trade policies implemented during the course of more than 35 years. This also indicates the ineffectiveness of trade policies to address the inbuilt structural deficiencies in the export sector of Pakistan.

There are many studies in which the researchers have attempted to search for the reasons for the ineffectiveness of trade policies. Like in one of the study, Malik "et al" (2017) identified an inconsistency in the trade policy formulation in Pakistan while stating that the trade policy in Pakistan has not been aligned with other related policies and is unduly influenced by external actors. They are of the view that the "trade liberalisation policies" should be associated with other macroeconomic policies like "exchange rate liberalisation" that would also work to lessen budgetary pressures. While discussing the constraints in the implementation of STPF, Ahmed (2017) has also mentioned that earlier the trade liberalization reforms under various policies over the years were not aligned with the complementary reforms that could have ensured macro-level competitiveness, energy sector improvements and lowering of regulatory duties on the industry. Although, Pakistan has initiated various steps for trade liberalisation, however, overall tariff levels remain high if compare with India and Sri Lanka. For Pakistan, the mean tariff reduced to 12.55 percent in 2016 from 50.3 percent in 1995 (WDI, 2018). Similarly, the trade liberalization policies brought significant challenges to "strengthen the productivity growth, efficient resource allocation and the integration of Pakistan into global value chains". Moreover, the frequently used short term trade policy measures under SROs caused unpredictability of the trade regime and promotes a culture of rent-seeking (Malik "et al" 2017).

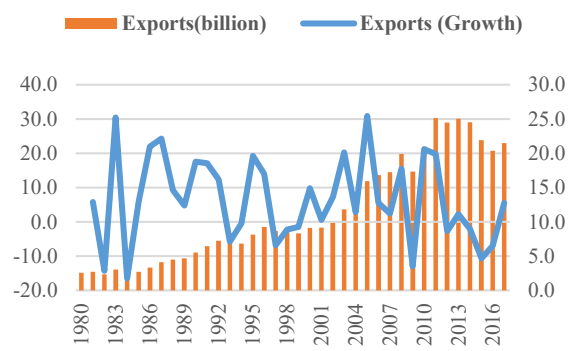
With regard to STPF, it has often been criticised owing to the lack of a bolder vision for competitiveness and not considering the key issues which led to the failure in achieving its objectives. Most importantly, the ad hoc sector-specific fiscal packages continued to hamper the effective implementation of trade policy. For instance, during the fiscal year 2014-15, a fiscal package was announced for the textile sector, while zero-rating for the sector was announced in the fiscal year 2016-17. Similarly, for the agriculture sector, the fiscal package was announced in the fiscal year 2015-16 (Ahmed, 2017). In addition to the above, we have also observed that not much attention to improving services trade has been given despite its significant contribution to the domestic economy. Almost all the trade policies emphasized trade/export diversification in goods along with rationalizing tariffs to give a boost to overall trade. However, we don't see any effective policy framework to diversify the trade/exports in services by markets and its various sub-components. Similarly, with regard to facilitating the trade in removing hurdles by improving logistics, not much attention has been given. In order to improve overall trade/exports, Pakistan needs to tap new markets and products both in goods and services.

3.3: Trade Performance of Pakistan

3.3.1: Merchandise Trade

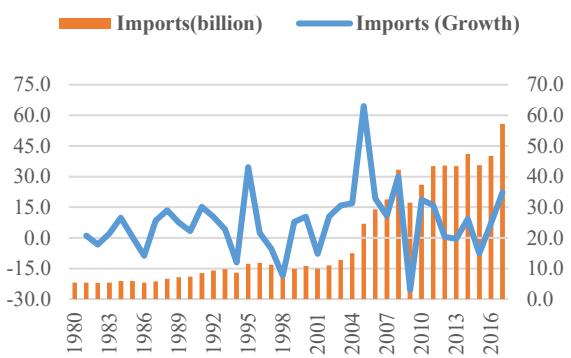
Pakistan's exports profile paints a mixed picture of exports performance in terms of growth rates, composition, and destination. A cursory look at Pakistan's export performance since 1980 shows that overall exports increased to $21.5 billion in 2017, up from $ 2.6 billion in 1980, posting a CAGR of 5.72 percent. The exports touched the highest level of $25.1 billion in 2011 and hovered around $25 billion up till 2014 while it posted a negative growth of 2.1, 10.7 and 7.0 percent during 2014, 2015 and 2016 respectively (COMTRADE (WITS), 2019). Thus, exports earnings have not witnessed persistent growth over the years rather, high growth in one year followed by an insignificant rise next year. In contrast, imports surged from $5.4 billion in 1980 to $57.2 billion in 2017, posting a CAGR of 6.41 percent. This shows that over the years, growth in imports surpassed exports expansion, resultantly, the trade deficit widened and reached $35.7 billion in 2017 from $2.8 billion in 1980.

Fig: 3.5- Exports



Source: COMTRADE (WITS) 2019

Fig: 3.6- Imports



Source: COMTRADE (WITS) 2019

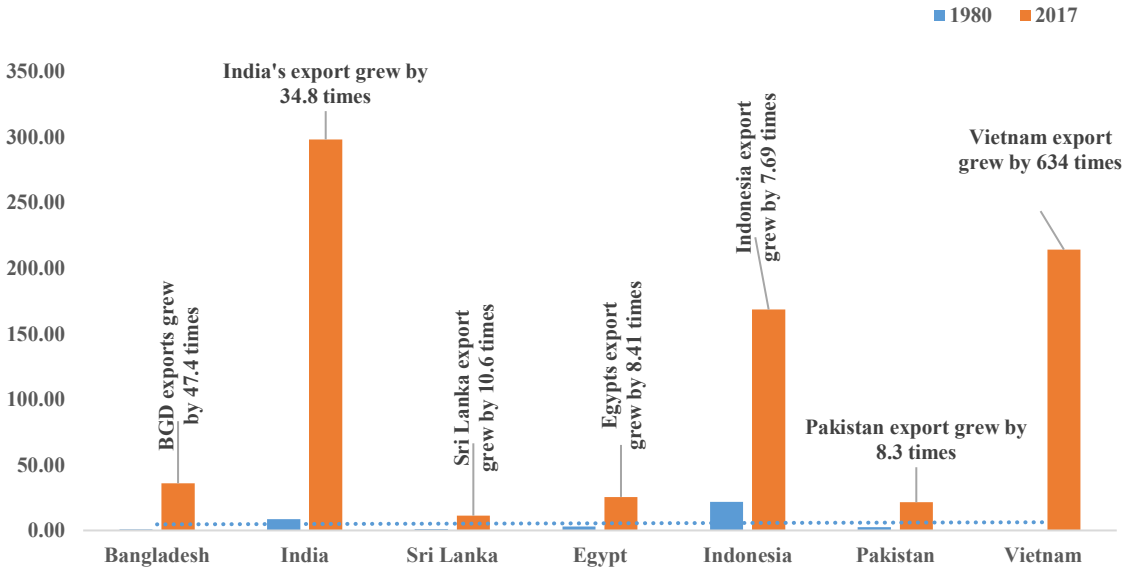
3.3.2: Export Performance

From 1980 until 2017, Pakistan's exports have grown 8.3 times, however, during the same period, countries like Bangladesh, India and Sri Lanka have witnessed a significant rise in exports by 47.4, 34.8 and 10.6 times whilst Vietnam has performed remarkably as its exports increased by more than 600 times since 1980 (COMTRADE (WITS), 2019). An assessment of Pakistan's exports relative to its competitors undoubtedly points to the weaknesses in its trade Policies.

In this regard, the most alarming issue is the constant decline in exports to GDP ratio if to compare it with India, Bangladesh, Sri Lanka, Egypt, Indonesia, and Vietnam. In 2014, the

ratio of exports to GDP was 10.03, which in the later years have dropped further to single-digit and now it is recorded at 7.04 percent in 2017 (COMTRADE, WITS and World Bank data, 2019). The further trend of the data also demonstrates lower export to GDP ratio relative to imports. Overall, the analysis confirms the fact that Pakistan is a less export-dependent country.

Fig: 3.7- Comparative Analysis of Export



source : WITS and author's calculations

3.3.3: Pakistan's Share in Global Export

Pakistan's share in global exports has not been very impressive as it remained at 0.15 percent on average between 1980 and 2017 with a lowest of 0.12 percent in 2017 and a highest of 0.19 percent in 1992. The contribution has decreased from 0.18 percent in 1993 to 0.12 percent in 2017 (WDI, 2019). Contrary to Pakistan, its competitor's share in global exports has witnessed a considerable rise during the same period. Particularly, the contribution of Bangladesh in global exports grew to 0.20 percent in 2017 from 0.04 percent in 1980, India from 0.43 percent to 1.67 percent, and Vietnam from 0.02 percent to 1.20 percent (WDI,2019).

Table: 3.1 - Contribution in World Exports (%)

	1980	1990	2000	2010	2017
Bangladesh	0.04	0.05	0.10	0.12	0.20
India	0.43	0.51	0.65	1.47	1.67
Egypt, Arab Rep.	0.15	0.10	0.08	0.17	0.14
Indonesia	1.10	0.73	1.01	1.02	0.95
Pakistan	0.13	0.16	0.14	0.14	0.12
Vietnam	0.02	0.07	0.22	0.47	1.20

Source: WDI (2019) & Author's calculations

3.3.4: Causes of Instable Export Performance

Throughout the years, the weak performance of exports is attributed to a number of external and internal factors. In recent years, where the energy crisis remained an impediment in promoting export industries, other factors like unskilled labour, insignificant level of investment in exporting sector, high cost of production along with tough competition with emerging economies mainly Bangladesh and Vietnam further posed serious threats to the sustainability of exports and its competitiveness (SBP Q2. 2016). In addition, law and order, war and terror, overvalued exchange rate and weak external demand in response to a slowdown in global economic activity also attributed to sluggish growth in exports. There is no doubt that the aforementioned factors have made Pakistan's export profile somewhat fragile and consequently reflected the country's inability to enhance its export to its potential level, however, SBP in its report argued that the perceived impact of above-mentioned factors on export performance is perhaps overemphasized. The report further adds that the problems being faced today are too chronic to be linked up with these contemporary issues and thus requires removing hurdles at structural, institutional, and entrepreneurial levels (SBP, 2015). In 2015, the National Tariff Commission (NTC) conducted a study to determine the reasons for Pakistan's declining exports. The study attributed the decline in exports to a number of factors like "the high cost of doing business, lack of product and market diversification, low level of technological advancement and research & development, pending export refunds, non-compliance of quality standards, decreasing commodity prices, market accesses issues, poor trade facilitation, law and order, war on terror, less educated and un-skilled labour, low foreign direct investment, a low growth rate of GDP, interest rate and high average applied tariff rates" (NTC, 2015). The study uncovered all those factors which adversely affected the competitiveness of the country's exports in the international market, particularly, during the period between 2005-2015 when the world was experiencing the opening of a more competitive global trade regime.

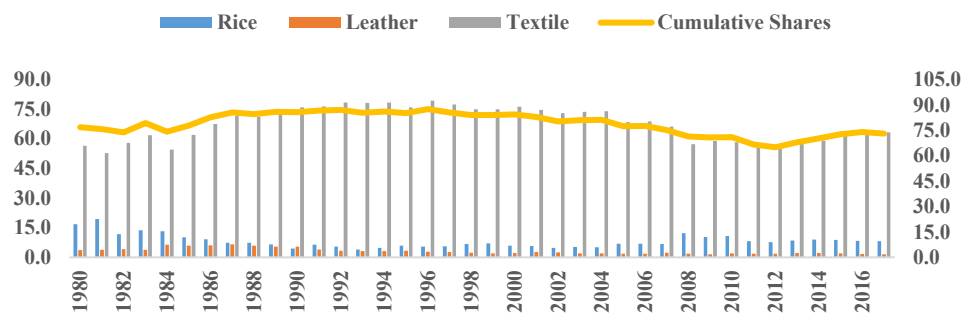
The transformation of Pakistan's economy from a "factor-driven to an efficiency-driven and innovation-driven" economy is one of the country's top trade policy priorities (Ahmed, 2017). Such structural transformation requires diversification of exports and product sophistication. However, the export basket is neither complex nor technologically advanced, producing low-tech undifferentiated products (Khan & Afzal, 2016). Contrary to these factors, Ahmed, (2017) has examined macro and micro-level issues that have significantly influenced the production and competitiveness of Pakistan's exports e.g. regulatory restrictions, the anti-

export bias in the prevalent tax and tariff structure, rising cost of doing business, inability to participate in the regional supply chain, insufficient trade facilitation, lack of coordinated support from the provincial government, low credit provision for exports and an exchange rate regime.

3.4: Export Diversification

Export diversification is described as a shift in the structure of a country's export destination or product mix. It may also be defined as the evolution from traditional to non-traditional exports, or the spread of production over various sectors. Export diversification provides essential support to the country against any external shock that emerged due to price and demand shocks in the international market and market saturation. It also helps the countries to formulate an effective trade policy (SBP, 2016). A narrow base and highly concentrated exports in few items for a long time have a tremendous bearing on the export performance of Pakistan.

Fig: 3.8- Shares in Total Exports



source: Author's calculations based on Comtrade data (WITS)

The structure of Pakistan's export is not much diversified rather it comprises of limited products largely textile manufacturers, leather, and primary products. Particularly, three main products such as textile, rice and leather dominated the export profile for the last many years. Since 1980, the cumulative share of these goods persisted above 70 percent for most of the period with the highest at 87.5 percent in 1996 and the lowest at 65.0 percent in 2012 (COMTRADE, WITS (2019)). Textile exports alone contributed more than 56.5 percent of total merchandise exports in 1980 with the highest reaching 79.2 percent in 1996 (COMTRADE, WITS (2019)). On average the share is 67.5 percent between 1980 and 2017. It is worth mentioning that duty-free access to Pakistan by the EU under its GSP+ Scheme is supporting Pakistani products to compete with products from Bangladesh, Vietnam and Turkey and many other countries, particularly, textile exports have gained momentum since 2014.

3.4.1: Composition of Exports

At this juncture, to further deepen our understanding of the international trade patterns of Pakistan and its diversification, we will discuss the composition of Pakistan's export both in terms of commodities and direction. The export sector of Pakistan has been facing tremendous challenges over the past many decades owing to various reasons emanated from the demand and supply side which has already been discussed in the previous section. However, one of the important factors behind slow and declining export growth is the lack of diversification by product and markets. It is a well-recognized fact that countries with a relatively small basket of products or highly concentrated exports in terms of markets generally faces export instability. In the case of Pakistan, both factors i.e lack of diversification by commodities and markets have taken a toll in form of unstable export performance over the last many years. For the purpose of analysis, commodity wise aggregated data on export as per SITC Rev 1 in SITC one digit has been taken. The analysis would be helpful in understanding the trends in exports during the past few decades.

Table: 3.2 - Composition of Total exports ($ billion)

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Total Exports	**2.6**	**5.5**	**9.1**	**21.0**	**25.1**	**24.5**	**25.0**	**24.5**	**21.9**	**20.4**	**21.5**
0. Food and live animals	0.6	0.5	0.9	3.4	4.6	3.9	4.7	4.5	4.2	3.7	3.9
1. Beverages and tobacco	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
2. Crude materials (except fuel)	0.6	0.6	0.3	0.7	0.9	1.1	1.0	0.9	0.6	0.5	0.6
3. Mineral fuels, lubricants and related material	0.2	0.1	0.1	1.2	1.3	0.3	0.5	0.7	0.3	0.2	0.3
4. Animal and vegetable oils and fats	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0
5. Chemicals	0.0	0.0	0.1	0.8	1.1	1.1	1.2	1.1	0.9	0.8	1.2
6. Manufact goods classified chiefly by material	1.0	3.0	4.7	8.6	10.0	9.8	10.3	10.1	8.8	8.2	6.5
7. Machinery and transport equipment	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2
8. Miscellaneous manufactured articles	0.2	1.4	2.9	6.0	6.6	7.4	6.7	6.9	6.8	6.8	8.8

Source: COMTRADE (WITS) 2019

The table above indicates the pattern of Pakistan's exports since 1980. Despite the fact that exports grew by 8.3 times to reach $21.48 billion since 1980, the composition of commodities is not much diversified. To determine how the structure of exports has changed over time, we have calculated the shares of commodities in total exports. According to this, manufacturing goods have taken the lead followed by food and live animals and chemicals. In 1980 when total exports were $2.59 billion, the share of manufacturing goods & misc manufactured, food & live animals and chemicals was 46.1, 23.0 and 0.79 percent, respectively. The share of food & live animals could not maintain the level and witnessed a sharp decline

with the lowest reaching 8.78 percent of total export in 1990. However, the share increased to 16.16 percent in 2010 and further to 18.07 percent in 2017.

Table: 3.3 - Contribution in total exports (%)

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
0. Food and live animals	23.0	8.8	10.1	16.2	18.4	15.9	18.9	18.2	19.4	18.1	18.1
1. Beverages and tobacco	0.3	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
2. Crude materials, inedible, except fuels	21.1	10.9	3.3	3.2	3.7	4.4	4.0	3.6	2.9	2.5	3.0
3. Mineral fuels, lubricants and related material	7.1	1.3	1.4	5.7	5.2	1.4	2.1	2.6	1.2	0.8	1.2
4. Animal and vegetable oils and fats	0.0	0.0	0.3	0.4	0.8	0.9	0.6	0.5	0.3	0.3	0.2
5. Chemicals	0.8	0.4	1.6	3.8	4.5	4.5	4.9	4.7	4.2	4.0	5.3
6. Manufact goods classified chiefly b	38.7	53.6	51.1	40.8	40.0	40.2	41.2	41.1	40.2	40.1	30.3
7. Machinery and transport equipment	1.3	0.3	0.4	1.1	1.2	1.1	1.3	1.1	0.9	0.9	0.9
8. Miscellaneous manufactured articles	7.4	24.4	31.6	28.7	26.1	30.2	26.9	28.1	30.9	33.2	40.9
9. Manufact goods and Misc manufactured articles	46.1	78.0	82.7	69.5	66.1	70.5	68.1	69.2	71.1	73.4	71.2

Source: Author's calculations based on COMTRADE data

3.4.2: Sectoral performance

In this section, we will briefly discuss two important sectors of the economy like agriculture and Manufacturing.

I. Agriculture Sector

Agriculture is a vital industry of Pakistan, however, its share in GDP is hovering in a narrow range between 19 and 22 since 2010. Overall, the contribution of agriculture in GDP reduced from 30.6 percent in 1980 to 19.2 percent in 2017. The declining share may be attributed to a change in the development priorities of various governments in which the focus has been to support industrialization in the country. In addition, natural disasters, floods, droughts, and a decrease in foreign direct investment have further aggravated the problem for the agriculture sector in Pakistan. Likewise, the contribution of agriculture export in total export has also followed a similar pattern since 1980. The significant

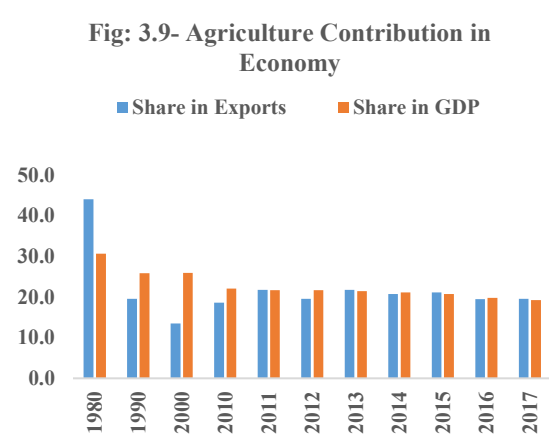


Fig: 3.9- Agriculture Contribution in Economy

Source: Author's calculations based oon COMTRADE

loss of the agriculture sector in overall GDP is directly reflected in the declining share in total exports during the period under review.

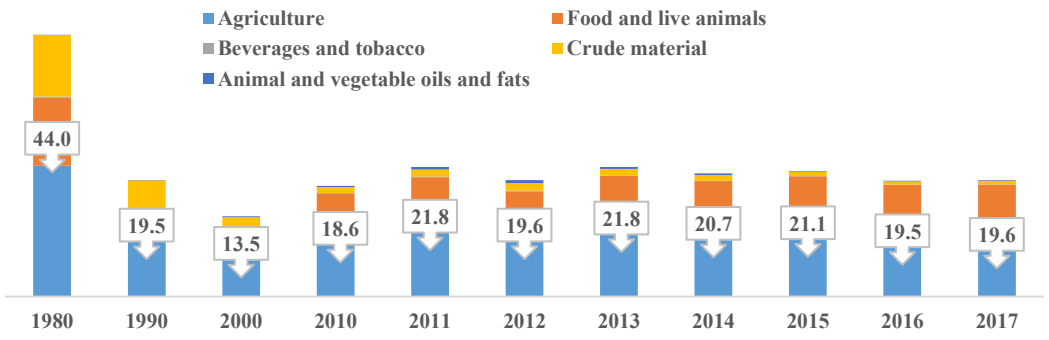
According to the standard product group based on COMTRADE data, the export of agriculture products increased to $4.20 billion in 2017 from $1.14 billion in 1980, posting a CAGR of 3.49 percent. While in terms of contribution to total exports, it registered a sharp reduction from 44.0 percent in 1980 to 19.6 percent in 2017. The major decline stemmed from a sharp deceleration in the share of food and live animal's exports within the agriculture group.

Table: 3.4 - Agriculture Export ($ billion)

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Total Exports	**2.6**	**5.5**	**9.1**	**21.0**	**25.1**	**24.5**	**25.0**	**24.5**	**21.9**	**20.4**	**21.5**
Agriculture	**1.1**	**1.1**	**1.2**	**3.9**	**5.5**	**4.8**	**5.5**	**5.1**	**4.6**	**4.0**	**4.2**
Food and live animals	0.6	0.5	0.9	3.4	4.6	3.9	4.7	4.5	4.2	3.7	3.9
Beverages and tobacco	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Crude material	0.5	0.6	0.3	0.4	0.6	0.6	0.5	0.5	0.3	0.2	0.3
Animal and vegetable oils and fats	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0

Source: COMTRADE (WITS) 2019

Fig: 3.10- Contribution of Agriculture export in total export (%)



Source: Author's calculations based on COMTRADE DATA (2019)

a. Composition of Agriculture Export

Within the agriculture sector, the food & live animals' sector is one of the most important items. The cumulative total export earnings from this group increased by 6.5 times since 1980 from $0.60 billion to $3.88 billion in 2017. Similarly, its share within agriculture export increased substantially from 52.3 percent during 1980 to 92.4 percent in 2017.

Table: 3.5 - Contribution in Agriculture (%)

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Food and live animals	52.3	45.0	75.0	86.9	84.5	81.0	86.9	87.7	91.8	92.8	92.4

Beverages and tobacco	0.6	0.6	0.5	0.8	1.1	1.0	0.6	0.5	0.3	0.4	0.8
Crude material	47.1	54.4	22.6	10.1	11.0	13.5	9.7	9.5	6.6	5.5	5.8
Animal and vegetable oils and fats	0.1	0.0	1.9	2.2	3.5	4.6	2.9	2.3	1.4	1.4	1.0

Source: Author's calculations based on COMTRADE data.

In the food & live animals' category, major contribution came from "Cereals and cereal preparations" followed by "fruits and vegetables and Sugar, sugar preparation & honey". On the other hand, fish and fish preparation which was the second major item in food and live animals during 1990 witnessed a sharp decline and reached the lowest in 2011, however, since 2012 its share has started rising but still below the level achieved in 1990. The exports of food items alone contributed a substantial share of 23.5 percent of total export earnings in 1980. The share gradually reduced to 16.8 percent in 2010 and in 2017 it stood at 18.7 percent of total exports. The State Bank of Pakistan in its annual report 2015-16 has termed the food group as a victim of international commodity prices, as the sector was severely influenced by the decline in international commodity prices. According to COMTRADE data, the total export of food group witnessed a negative growth of 6.53, 6.57 and 13.23 percent for three consecutive years i.e 2014, 2015 and 2016 respectively. In 2017, although the growth in food exports recovered (5.87 percent) it stayed below the level of 19.32 percent witnessed in 2013.

Table: 3.6- Food Contribution in Total Exports (%)

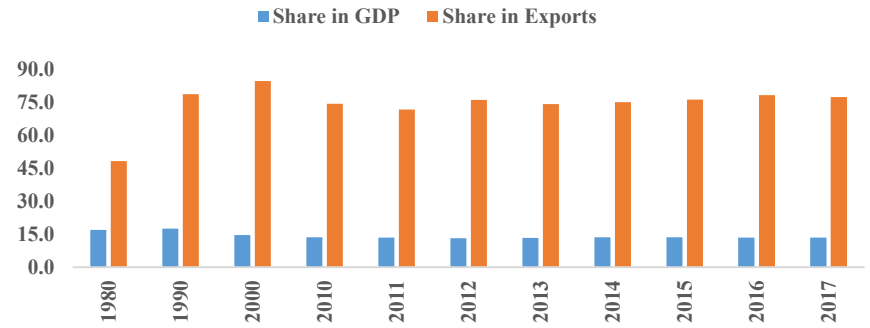
	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
0. Food and live animals	23.0	8.8	10.1	16.2	18.4	15.9	18.9	18.2	19.4	18.1	18.1
01. Meat and meat preparations	0.0	0.0	0.1	0.6	0.7	0.9	0.9	0.9	1.2	1.2	1.0
03.Fish and fish preparations	1.9	1.9	1.6	1.2	1.3	1.1	1.4	1.5	1.5	1.7	1.9
042.Rice	16.8	4.4	5.9	10.8	8.2	7.7	8.4	9.0	8.8	8.4	8.1
05.Fruit and vegetables	1.9	1.1	1.4	1.9	2.5	2.3	3.0	2.7	3.2	3.3	2.5
06.Sugar, sugar preparations and honey	0.7	0.8	0.6	0.4	0.3	1.0	2.6	1.8	1.7	1.3	2.4
1.Beverages and tobacco	0.3	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
22.Oil seeds, oil nuts and oil kernels	0.2	0.4	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2
4.Animal and vegetable oils and fats	0.0	0.0	0.3	0.4	0.8	0.9	0.6	0.5	0.3	0.3	0.2
Food (0+1+22+4)	23.5	9.3	10.5	16.8	19.5	17.1	20.0	19.0	19.9	18.6	18.7

Source: Author's calculations based on COMTRADE data

II. Manufacturing Sector

The manufacturing sector is a sub-sector of the industrial sector and an important part of Pakistan's economy, with both forward and backward links to other industries. The sector remained one of the leading sources of economic development albeit its share in GDP has reduced substantially over time. The manufacturing sector currently accounts for about 14 percent of GDP, down from 17 percent in 1980 with a minimum of 13.2 percent in the year 2012 and a maximum of 18.5 percent in 1994.

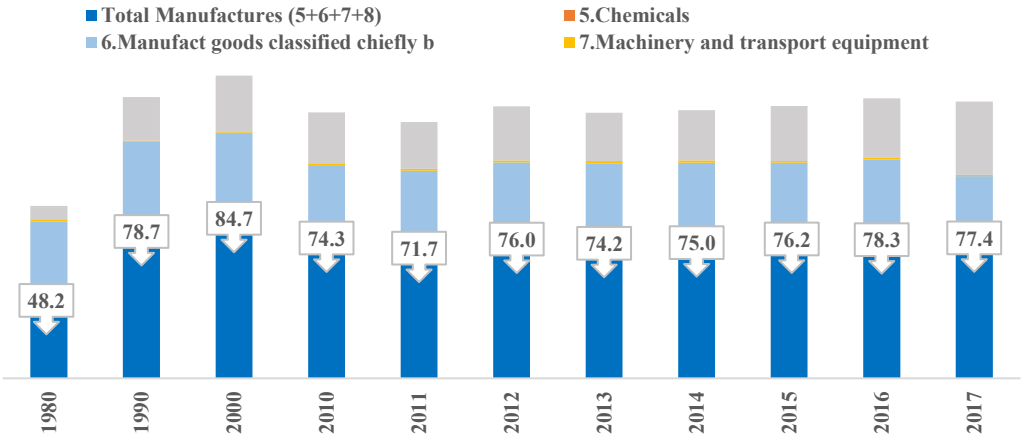
Fig:3.11- Contribution of Manufacturing Sector in Economy



Source: Author's caaclculations based on WDI and COMTRADE (2019)

Rasiah and Nazeer, (2015) have mentioned the reasons for a declining share in GDP including the lack of policy support for technological up gradating, political instability and lack of security which protected the country to provide excellent basic infrastructure to attract FDI whereas exchange rates and indirect taxation have undermined resource allocation in the sector. The authors further explain that in fact, premature deindustrialization has emerged in Pakistan since 1986. In addition, "energy shortages, high cost of energy and poorly negotiated FTA's" have severely affected the domestic industry coupled with "massive smuggling, under-invoicing, dumping and misuse of the Afghan Transit Trade along with the huge informal sector".

Fig: 3.12- Contribution of Manufactures in total Exports (%)



Source: Author's calculations based on COMTRADE

Consequently, it added significant pressures to the manufacturing sector and resulted in the reversal of industrialization or deindustrialization[1]. The manufacturing sector is an important sector for economic growth as it is proficient to generate higher income, better job

[1] Increasing Imports, Declining Exports & premature Deindustrialization. 2017. The Pakistan Business Council.

opportunities and lead to a more vibrant and dynamic export sector by creating a base for diversified and value-added exports. In Pakistan, its contribution to exports has improved since 1980 from 48.2 percent to 77.4 percent in 2017 with the highest level achieved 86 percent in 1997 and the lowest with 51 percent in 1981. Since 2008, this ratio is moving between 74 and 78 percent. Overall, the export of manufactures increased from $1.2 billion in 1980 to $16.6 billion in 2017. Within the sector, the main impetus originated from "manufactured goods classified chiefly by material and miscellaneous manufactured articles".

a. Composition of Manufacturing Sector

Within the manufacturing sector, currently, manufactured goods classified mainly by material playing an important role in boosting total manufactures export followed by miscellaneous manufactured goods. However, there is a significant change witnessed in the composition within the sector since 1980. In 1980, manufactured goods classified by material were the topmost group with 80.2 percent contribution within the manufactures export. The share witnessed a gradual reduction and presently it is recorded at 39.2 percent in 2017. The group comprises of "Leather, Rubber manufactures, Wood and cork manufactures, Paper, paperboard and manufactures, Textile yarn, fabrics, made-up article, Non-metallic mineral manufactures, Iron and steel, Non-ferrous metals and Manufactures of metal". Textile yarn, fabrics, made-up article has contributed a substantial share in the manufacturing sector. Within the group, its contribution through reduced over the years still is considerable. The share has been declined from 87.6 percent in 1980 to 84.3 percent in 2017. The other major item is Leather, Manufs., & dressed fur skin, however, its share has reduced from 9.7 in 1980 to 5.3 percent in 2017. Leather exports alone have witnessed a decline in terms of their share in manufactures exports from 7.5 percent in 1980 to 2 percent in 2017.

3.4.3: Direction of Exports

The direction of exports, in addition to the composition of exports, has influenced export performance over time. Despite having a large number of trading partners, Pakistan's exports are restricted to just a few countries and regions mainly the United States, China etc and the European Region. Going forward, as a subdued global economic growth kept import demand from major markets in check, it is therefore very important for Pakistan to diversify its export destinations (SBP report, 2015-16). Over the years, Pakistan has adopted various trade policies to expand and diversify its exports by countries as well as products. To see how much the strategy of diversification is successful, here we will briefly discuss the share of

countries and regions in Pakistan's global export. For this purpose, the contribution of various regions and countries have been computed based on COMTRADE data.

Considering the EU region, its contribution to Pakistan's global export is currently at 34 percent (Appendix-II). Within the region, UK's share is maximum around 8 percent followed by Germany (6 percent), Spain (4.2 percent), Netherlands (3.5 percent), Italy (3.3 percent) and Belgium (3.1 percent). In our dataset, there are 25 countries included in the EU region, out of which only six countries are contributing a significant share in Pakistan's export. These six countries are contributing 80 percent in total export to the EU, while 20 percent is contributing by the rest of the member countries. The rise is largely attributed to the increase in shipments to the UK, Germany, Spain, Netherlands, and Italy (SBP, 2015-16). Encouragingly, Pakistan's exports to Denmark, Ireland, Latvia, Poland, Romania, and Slovenia have witnessed a rise as it is evidenced by the increase in their contribution to Pakistan's global export, however, the rise is not very significant as for the countries mentioned above. ASEAN accounted for 4.39 percent of Pakistan's total world export. The graphical representation of share (Appendix-II) clearly indicates that only Vietnam has received a major share from Pakistan's global export. The historical trend shows that Indonesia, Singapore, and Thailand were the major partners from within ASEAN, however, their share in Pakistan's global export has declined significantly in recent years. Contrary to it, Cambodia, Myanmar, and the Philippines have witnessed a rise. CAR has contributed a meagre share of 0.38 percent with the rising level of exports to Kazakhstan and Uzbekistan and thus both have witnessed a significant rise in their contribution to Pakistan's global export. Currently, the share of Latin America in Pakistan's export is around 2 percent. We have identified four countries e.g Brazil, Colombia, Mexico and Peru, whose contribution to Pakistan's export has witnessed a significant rise. However, the magnitude of trade is very low. In contrast, the share of export has witnessed a decline in Argentina, Chile and El Salvador etc. The share of the African region is 4.32 percent. Of 20 countries in our sample, only Kenya and Tanzania have witnessed a significant rise in exports from Pakistan as depicted from the increase in share during 2017 as against the preceding years. ECO region has contributed a 2 percent share in Pakistan's export. However, we can see from the graph that, except for Turkey and Kazakhstan, the export share for the rest of the countries is constantly on the decline.

SAARC share in Pakistan's export is around 6 percent. Within the region, only Bangladesh has witnessed a rise in its share of Pakistan's export since 1980. On the contrary, for the remaining countries, the share is persistently on the decline since 1980. Middle Eastern

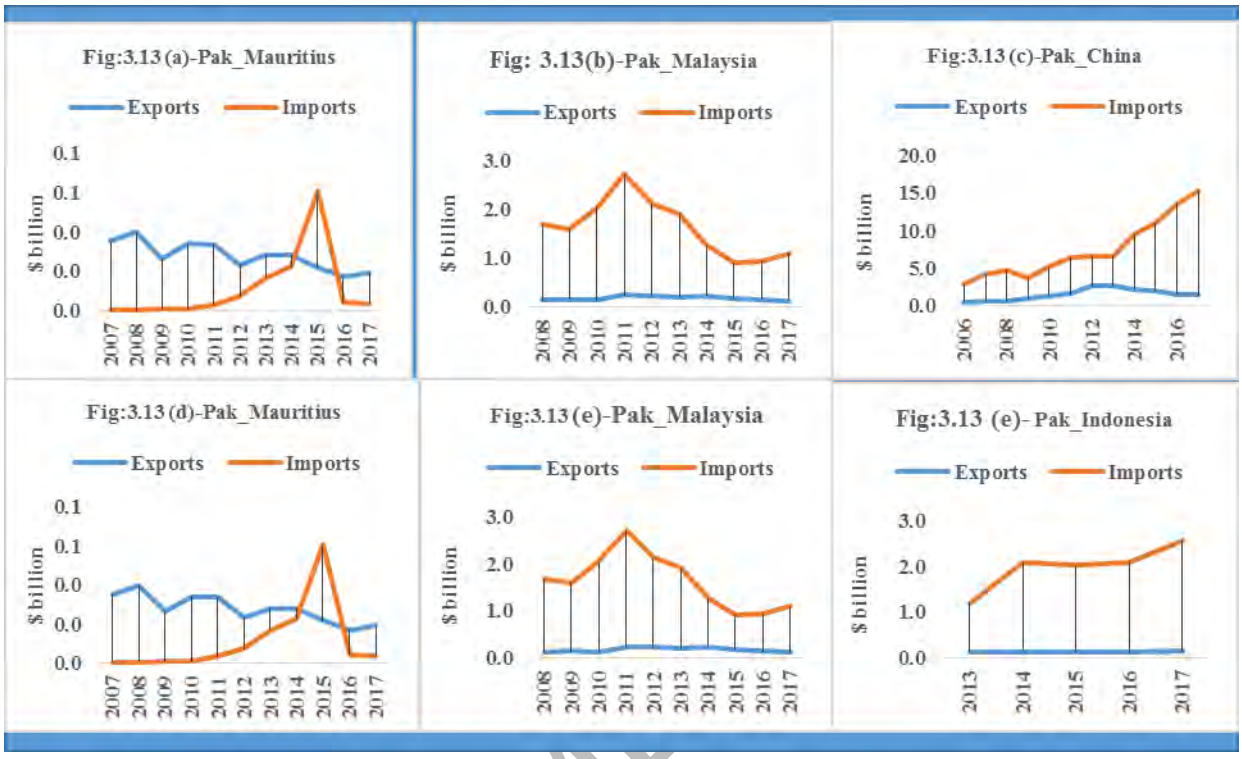
countries are contributing a significant share of around 9 percent in Pakistan's global export. However, as far as exploring this region is concerned, since 1980 the share of exports has witnessed a rise for Turkey, Egypt, Jordon and Oman. In contrast, the contribution from the major partners like Saudi Arabia, UAE, Kuwait, Bahrain, and Iran has declined significantly. In the case of Transitional economies, we found their share in Pakistan's export at 11.0 percent. However, Pakistan's export to China is significantly high as can be seen through the percentage share in the diagram (Appendix II). China is the third-largest export destination for Pakistan. Nevertheless, its share has witnessed a significant decline since 1980 and reached only 1.21 percent during 1990, which in later years started rising and now it is around 7 percent. Contrary to above Kazakhstan, Russia, Slovenia, and Vietnam have witnessed a rise in the share of export from Pakistan since 1980. NAFTA's share in Pakistan's export is 18.1 percent. Since 1980, the USA has been the major trading partner of Pakistan despite the decline in its share. The US' share in Pakistan's exports went down from 24.5 percent, on average, during 2001-05 to 15.3 percent in 2011-15.

3.5: Trade Agreement

Pakistan is required to have greater access to international markets in order to have a successful implementation of its trade policy to stimulate export-led growth. In this regard, Pakistan has negotiated various "Free Trade Agreements (FTAs)" and "Preferential Trade Agreements (PTAs)" with different countries like "China, Malaysia, Sri Lanka, Indonesia, Iran and Mauritius". However, due to an inflow of cheap goods from these countries, domestic manufacturing severely affected. Equally, Pakistan has not been able to fully exploit the partner country's market. In addition, "under-invoicing and misdeclaration" of import consignments to take benefit of tariff concessions has further damaged the local manufacturing.[2] Similarly, the importance of regional trade cannot be ignored, however, Pakistan has not been able to fully realize its regional potential. Despite various efforts, the volume of Pakistan's trade within SAARC and ECO is not encouraging owing to political and military tensions that have prevailed among the major players for decades, and the protectionist policies adopted by the nations concerned (Gul & Yasin, 2011). The impact of various bilateral trade agreements on Pakistan's trade is not very encouraging as can be seen in the figures [3.13(a) to 3.13(e)]. Pakistan could not get many benefits from these agreements with the exception of Sri Lanka. The aforementioned analysis of Pakistan's trade portfolio stresses the need to formulate such

[2] Increasing Imports, Declining Exports & Premature Deindustrialization. 2017. The Pakistan Business Council

strategies which could not only direct the country towards diversifying its export portfolio by exploring new products and new markets but should be supportive in developing affective trade linkages with different regions and countries of the world.

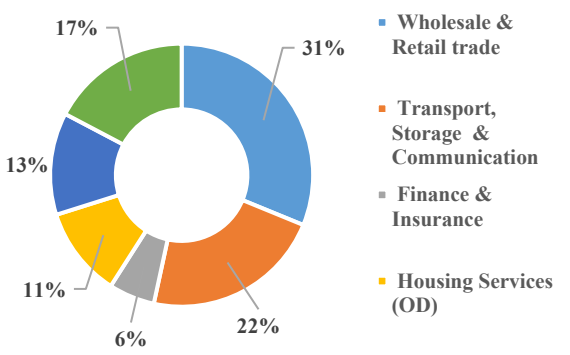


3.6: Performance of Services Trade

3.6.1: Trends in Services Sector

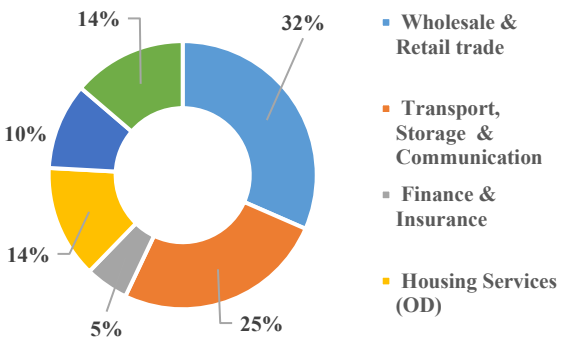
The services sector of Pakistan has witnessed a remarkable performance in terms of growth and contribution to GDP during the last few years. Its share has witnessed a steady rise in the overall economy from 53.61 percent in the fiscal year 2000 to 60 percent in the fiscal year 2017 (SBP, 2016). The major contribution within the services sector stemmed from wholesale & trade, transport, storage, finance & insurance, and general government services. Similarly, the services sector has performed remarkably well during the last few years in terms of growth in contrast with the growth performance of commodity-producing sectors (agriculture and industrial sector)(Ahmed & Ahsan, 2011). The services sector has shown great resilience, especially during the global financial crisis of 2008-09. While Pakistan's GDP increased at a rate of 2.6 percent and 3.6 percent during the financial year 2010 and 2011, the services sector increased by 3.2 percent and 3.9 percent respectively(Pakistan Economic Survey, 2018-19). The sector reported the highest growth among all other economic sectors with 6.5 percent in 2017 and proved to be the main factor of Pakistan's economic growth.

Fig 3.14 (b): Contribution (2017)



source: Pakistan Bureu of Statistics

Fig 3.14 (a): Contribution (2000)



source: Pakistan Bureu of Statistics

Table: 3.7- Contribution of Services in GDP

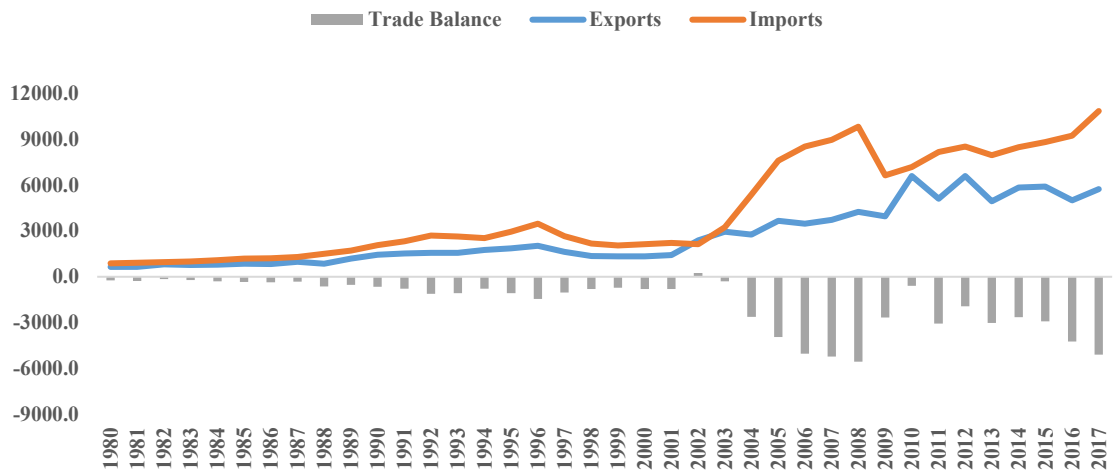
Sector/Financial Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Services Sectors	**53.61**	**54.35**	**54.96**	**55.00**	**54.36**	**54.68**	**56.04**	**56.07**	**56.04**
Wholesale & Retail trade	16.91	17.29	17.30	17.46	17.95	19.03	19.74	19.80	19.93
Transport, Storage & Communication	13.66	13.88	13.74	13.58	12.97	12.57	12.44	12.60	12.66
Finance & Insurance	2.80	2.89	2.90	2.94	3.08	3.33	3.67	3.79	3.84
Housing Services (OD)	7.29	7.30	7.38	7.21	6.93	6.67	6.54	6.45	6.39
General Government Services	5.58	5.51	5.75	5.87	5.63	5.28	5.51	5.36	5.12
Other Private Services	7.36	7.49	7.89	7.95	7.81	7.80	8.15	8.07	8.11
Sector/Financial Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Services Sectors	**56.59**	**56.93**	**57.10**	**57.41**	**58.22**	**58.44**	**58.61**	**59.26**	**59.97**
Wholesale & Retail trade	19.26	19.12	18.84	18.44	18.41	18.54	18.28	18.31	18.70
Transport, Storage & Communication	13.25	13.30	13.15	13.24	13.29	13.27	13.40	13.44	13.32
Finance & Insurance	3.45	3.26	3.01	2.95	3.08	3.09	3.16	3.21	3.39
Housing Services (OD)	6.62	6.71	6.74	6.75	6.77	6.76	6.76	6.72	6.64
General Government Services	5.39	5.67	6.24	6.67	7.17	7.08	7.14	7.49	7.54
Other Private Services	8.61	8.87	9.13	9.36	9.50	9.70	9.88	10.09	10.37

Source: Pakistan Bureau of Statistics. Government of Pakistan

Although the rising share of services in GDP is promising and in line with other emerging economies, the spillover impact on the export of services has not yet been fully realized (SBP, 2016 & 2017). The reason may be ascribed to the intangible nature of services which makes them prone to quantification issues relative to merchandise trade. Unlike physical goods which can be stored and consumed anywhere and at any time, intangible services can hardly be separated from its production and consumption (SBP, 2009). Over the past few years, the global imports in services have witnessed a significant rise, however, the contribution of services export from Pakistan has declined persistently from its peak level of 0.17 percent in

2010 to 0.10 percent in 2017(SBP & WDI,2019). A brief review of Pakistan's trade profile in services shows that Pakistan's exports in services increased from $652.0 million in 1980 to $5,732 million in 2017 while imports reached $10,829 million from $877.5 million in 1980. Consequently, the trade deficit widened from $225.5 million in 1980 to $5,097 million during 2017.

Fig: 3.15- Trade in Services ($ million)



Source: WDI (2019) and author's calculations

Pakistan has remained engaged in negotiating the Trade in Services Agreement (TiSA)[3] with an aim to ensure market access for services exports in developed and developing countries along with encouraging a transparent investment regime in the services sector (Ministry of Commerce). There are 23 members of the "WTO" currently negotiating, including the EU counted as one country" (https://ec.europa.eu/trade/policy/in-focus/tisa/)**".** Under TISA, most of the member countries are already involved in mutual bilateral or plurilateral arrangements, however, Pakistan has two bilateral services agreements i.e., with China and Malaysia but outside the TISA club. Hence, Pakistan has an opportunity to explore further markets in services exports and ensure investments through services imports under TISA. It is important to mention that in 2010, a "SAARC Agreement on Trade in Services (SATIS)" was signed which was implemented in 2012. Nevertheless, the slow pace in executing the schedules of a specific obligation, it could not achieve the desired goals (Javed, 2019).

[3] "TiSA is based on the WTO's General Agreement on Trade in Services (GATS), which involves all WTO members. The key provisions of the GATS – scope, definitions, market access, national treatment and exemptions – are also found in TiSA.((https://ec.europa.eu/trade/policy/in-focus/tisa/)"

3.6.2: Composition of Services Exports

According to the "Balance of Payments Manual 6th edition" (BPM6)[4] classification, the services sector has twelve standard components: i.e. "Manufacturing services on physical inputs owned by others, Maintenance and repair services, Transport, Travel, Construction, Insurance and pension services, Financial Services, Charges for the use of intellectual property, Telecommunications, computer, and information services, Other business services, Personal, cultural, and recreational services, Government goods and services" (SBP, 2019). The composition of services exports specifies that the services exports are concentrated in five groups i.e., government goods and services, other business services, transport, telecommunication and travel. Government goods and services accounted for more than 30 percent in total exports of services for the last many years with the highest at 55.4 percent witnessed in 2010 and the lowest at 27.3 percent during 2016. However, higher contribution does not bode well for the long-term stability of export receipts owing to the non-economic nature of government services (SBP, 2016). Conversely, the export in commercial services (excluding government goods and services) is limited in transport, travel, telecommunication, and other business services. All these categories collectively contributing above 90 percent in commercial services exports for more than a decade now.

Further details reveal that other business services registered a significant rise in their contribution from 17.4 percent in 2007 to 34.0 percent during 2017. The increase in share is largely stemmed from "legal, accounting, management consulting, technical, and other business services segments" under the category of other business services. The share of "telecommunications, Computer, and information services" increased from 11.5 percent in 2007 to 26.0 percent in 2013.

Table: 3.8- Share of Components within Exports of Commercial Services (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1.Manufacturing services on physical inputs owned by others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.Maintenance and repair services n.i.e.	0.0	0.1	0.3	0.1	0.3	0.2	0.1	0.3	0.1	0.1	0.2
3. Transport	48.9	48.7	45.8	48.6	47.7	43.1	37.3	38.6	33.9	29.0	23.4
4. Travel	12.6	12.6	10.8	10.4	10.8	10.6	8.7	7.9	9.2	8.9	9.0
5.Construction	3.0	1.7	0.7	0.7	0.5	1.0	0.6	1.1	1.2	1.8	1.7

[4] "According to the State Bank of Pakistan, the data on services is according to the classification of BPM6 [Extended Balance of Payments Services Classification (EBOPS-2010)] classification aligned with Manual on Statistics of International Trade in Services (MSITS-2010) classification. The most distinctive feature of MSITS 2010 is a description of how services may be supplied, of which identified by the GATS: cross-border; consumption abroad; commercial presence and presence of natural persons (Manual on Statistics of International Trade in Services 2010, 2011)".

6. Insurance and Pension services	1.7	2.9	1.8	1.5	2.5	1.6	1.8	2.6	1.6	1.7	1.0
7. Financial services	3.1	2.2	4.0	1.7	2.0	1.3	2.5	2.9	3.1	3.1	4.2
8. Charges for the use of intellectual property n.i.e.	1.7	1.5	0.2	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.2
9. Telecommunications, Computer, and information services	11.5	11.0	18.5	14.8	12.8	18.2	26.0	22.8	22.8	24.1	25.8
10. Other business services	17.4	19.2	17.9	21.9	23.1	23.5	22.5	23.3	27.2	30.3	34.0
11. Personal, cultural, and recreational services	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.7	0.4

Source: SBP & WDI (2019)

However, the subsequent years witnessed an almost stagnant share on the back of a decline in earnings from the international network operators within telecommunication services. This decrease has occurred as domestically Skype, Viber, and WhatsApp, have gained enormous popularity (SBP, 2016). Whereas the exports in computer services are on a continuous rise and during 2017 its share reached above 16 percent in commercial exports services. Contrary to the above, the transport services registered a significant decline in its share in commercial services exports from 49 percent in 2007 to 23.4 percent during 2017. This sharp decline is largely attributed to a decline in bulk freight rates; a decline in the country's exports; and the squeezing operations of the main Pakistani air carrier (SBP, 2016).

3.6.3: Direction of Exports in Services

With regard to diversification, the performance of services exports is not very different from merchandise exports. The USA remain the top destination for services exports by contributing the highest share in total exports of services since 2007. During 2017 is reduced to 38 percent after reaching the highest in 2015 at 50 percent. Other major destinations for Pakistan's services exports include UAE followed by the UK, Saudi Arabia, China, Singapore, Thailand, Germany, Switzerland, and Hong Kong. These economies have collectively contributed more than 50 percent in Pakistan's services exports since 2007 with the maximum level attained during 2015 at 83.2 percent, while in the subsequent years the contribution of these countries in Pakistan's services exports remained above 70 percent. In the context of the region, presently NAFTA has the highest proportion in Pakistan's services exports with the USA (38.0 percent) being the leading destination followed by Canada (0.6 percent). NAFTA has contributed 39 percent to Pakistan's total exports in services during 2017.

The Middle East accounted for a 17.0 percent share within Pakistan's global exports in services during 2017. The highest contribution within Pakistan's exports attributed to UAE, Saudi Arabia Kuwait, Bahrain, Oman, and Turkey. On the other hand, EU-EEA accounted for

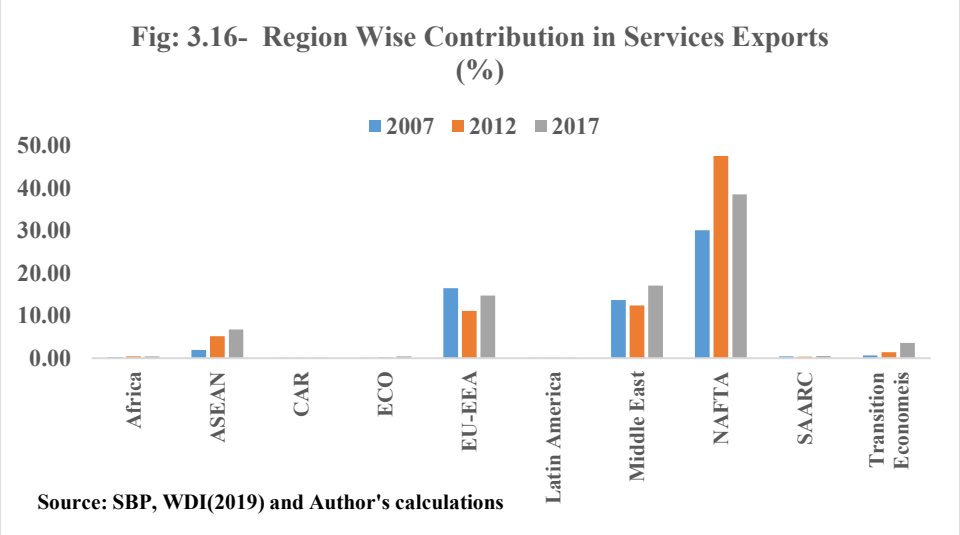
14.7 percent with the highest shown from the Netherlands, France, Germany, and the UK. The contribution of ASEAN is 6.7 percent.

Table: 3.9- Top ten Major destination: Share in Pakistan's total Exports in Services

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
China	0.6	0.6	0.6	0.7	1.3	1.3	2.0	2.6	1.8	4.1	3.4
Germany	1.8	2.7	2.4	2.0	2.8	1.7	2.3	2.1	1.9	2.2	2.4
Hong Kong	1.1	0.5	0.3	0.3	1.5	0.9	1.1	1.1	1.7	2.0	1.9
Saudi Arabia	6.2	5.2	5.5	3.0	4.6	3.4	4.2	3.4	3.9	4.8	3.7
Singapore	0.9	2.0	1.8	2.3	2.9	2.9	2.1	2.1	1.9	2.4	2.7
Switzerland	0.5	0.6	0.7	0.9	2.5	1.5	1.9	1.9	2.4	3.2	2.2
Thailand	0.3	0.8	0.6	1.1	2.8	1.8	2.4	2.0	2.2	3.0	2.6
UAE	6.4	7.0	7.2	5.6	8.4	7.0	11.8	10.6	11.7	13.2	10.9
United Kingdom	9.5	8.1	11.3	6.5	7.6	4.5	6.5	5.8	6.0	6.5	5.8
USA	29.7	30.5	43.5	53.0	28.0	47.2	37.9	46.5	49.8	35.0	38.0

Source: author's calculations based on SBP data

Within the region, the major contribution has shown from Singapore, Thailand, Malaysia, and the Philippines in Pakistan's services exports. As far other regions are concerned, their contribution to Pakistan's services exports is negligible particularly, in SAARC (0.52 percent), ECO (0.41 percent) and Africa (0.40 percent).

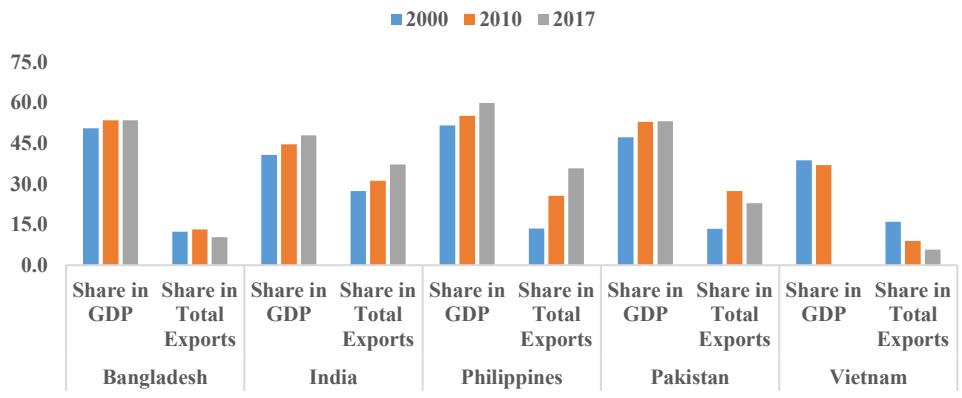


3.6.4: Issues and Challenges

In 2007, the government established a National Roadmap in order to increase the quality of services and make them exportable. The plan outlined the major barriers to services exports along with giving importance to various sections like Business Process Outsourcing (BPO), IT, and consultancy with a view to exploiting their potential competitive advantage. Nevertheless, instead of increasing the contribution of services in the country's total export

earnings, it has witnessed a modest drop, thus no substantial gains have been witnessed even after a decade (SBP, 2017). Contrary to Pakistan, its competitors like India and the Philippines have significantly increased their exports in services since 2000. However, despite a decline in the share of services exports during 2017, it has performed better relative to Bangladesh and Vietnam.

Fig: 3.17- Comparision of Services Sector



Source: WDI,2019

There are various challenges to Pakistan's services trade which has protected it to become a significant part of overall trade: These include "supply-side constraints, issues in market access[5], lack of sufficient knowledge and expertise in related services, lack of investment in human resource development, financial services and security, data related issues and access to cost-competitive finance and working capital" (Mukhtar, 2015). Similarly, "high transportation cost, lack of regional transit trade agreements and lack of cross border infrastructure" have also attributed to affect the trade not only in services but also in goods (Javed, 2019). In view of Banik and Bhaumik (2014) services trade is occurring informally due to high trade barriers including domestic regulations. Although, significant regulatory reforms have been initiated in the services sector over the last decade, yet a wide range of restrictions still exists. According to McGuire (2008) regulations by the government is the most common form of restriction on services trade, however, it is not easy to identify or measure it. Pakistan is no exception in this regard. While indicating trade restriction in subcategories of services in

[5] Mukhtar (2015) has briefly explained this fact that "there are different sectors in Pakistan are subject to complex regulations, mostly in developed markets". For instance, "Mode 1 (cross-border supply) in the case of outsourcing regulations; and Mode 4 (temporary movement of service suppliers) in terms of admission, work visa acquisition, qualification and licensing requirements for various skill levels, are examples of such complexities".

South Asian countries, Banik and Bhaumik (2014) revealed that in Pakistan, the travel and tourism sector is restricted among South Asian nations. On the basis of their study, they have proposed that in order to effectively address the services trade barriers, the countries in South Asia including Pakistan should not only go for liberalization in their FDI policy but also ensure transparent domestic regulations.

Based on the above discussion, we can now look at the "Services Trade Restrictiveness Index (STRI)" for Pakistan in relation to its trading partners. STRI is a combined product of the "World Bank" and the WTO which measures the restrictiveness for a country's regulatory as well as policy framework with regard to the trade in services. It ranges from 0 to 100, where 0 means there is no restriction and the market for services is completely open and 100 means completely that the subsector/mode is closed for foreign services and service suppliers.[6] Moreover, the index is an indication of policies and regulations which differentiate against foreign services and the overall regulatory environment that affects trade in services (Javed, 2019). According to the specific sector restrictiveness, professional and financial services are most restricted in the world. In terms of sector-wise professional services in "Argentina, Austria, Bangladesh, Belgium, Brazil, China, Egypt, France, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Kazakhstan, Kenya, Malaysia, Myanmar, Nigeria, Oman, Philippines, Poland, Portugal, Sri Lanka, Thailand, Tunisia and Turkey, telecommunication services in Canada, Egypt, Myanmar, Philippines, Sri Lanka and Uruguay", and financial services in "Bangladesh, Brazil, China, Egypt, Iceland, India, Indonesia, Kazakhstan, Kenya, Malaysia, Mexico, Myanmar, Pakistan, Russia, Sri Lanka, Thailand, Tunisia, USA and Vietnam", while transportation services in "Bangladesh, India, Malaysia, Mexico, Myanmar, Nigeria, Philippines, Sri Lanka, Thailand, Tunisia, Ukraine and Vietnam" are most restrictive sectors. The restrictiveness by the economy and by subsectors of services shows that in overall Japan is the least restrictive economy for foreign investors, while India is the most restricted.

Table: 3.10- Services Trade Restrictiveness Index (STRI)

Modes (All) 2016	Economy	Professional Services	Telecommunication Services	Distribution Services	Financial Services	Transport Services
Argentina	45.3	50.9	36.3	45.2	41.4	48.5
Australia	37.0	41.2	36.2	33.5	40.4	38.8
Austria	41.7	52.1	38.3	36.5	45.4	43.8
Bangladesh	42.9	53.9	42.1	26.8	56.5	61.1
Belgium	44.2	50.7	38.7	44.1	43.1	41.8
Brazil	42.9	56.8	43.6	32.8	57.5	39.2
Canada	35.9	32.6	51.3	32.7	39.9	36.4
Chile	34.1	36.6	36.4	30.8	40.6	31.7

[6] http://i-tip.wto.org/services/

China	59.4	71.7	64.4	56.4	65.5	45.8
Colombia	36.5	37.4	36.2	32.0	43.6	39.6
Denmark	42.0	48.5	37.9	37.0	47.7	44.1
Egypt	51.8	80.0	61.6	41.1	52.4	49.6
Estonia	39.1	43.4	38.3	37.0	37.6	42.8
Finland	44.2	43.7	37.9	43.5	48.2	44.2
France	39.4	52.0	32.9	40.0	35.1	33.6
Germany	37.1	42.9	35.0	34.0	37.2	41.1
Greece	42.5	45.9	38.3	43.4	41.8	39.3
Hong Kong, China	34.8	62.4	18.2	27.0	44.6	19.6
Hungary	42.3	50.0	41.4	37.4	46.4	44.9
Iceland	46.0	51.7	44.8	42.3	50.8	45.2
India	65.0	79.5	47.4	62.8	64.6	64.9
Indonesia	64.0	76.4	41.8	71.1	58.5	48.3
Ireland	38.6	54.2	33.9	33.9	37.2	40.5
Italy	35.9	40.2	34.6	33.8	35.9	38.2
Japan	27.4	42.9	33.3	16.8	34.6	30.8
Kazakhstan	45.5	52.1	44.7	40.0	55.4	42.4
Kenya	40.3	70.6	33.4	24.5	51.0	44.8
Latvia	35.7	27.1	35.4	37.6	39.8	33.7
Malaysia	54.2	53.7	28.9	49.5	62.1	68.8
Mexico	44.0	41.7	39.2	36.8	58.1	50.7
Myanmar	59.3	74.0	50.2	55.5	54.9	64.9
Netherlands	37.2	41.8	33.3	33.3	41.6	39.5
New Zealand	41.1	48.0	41.4	37.2	44.9	40.6
Nigeria	41.0	60.1	36.2	32.4	39.1	51.3
Norway	41.7	48.9	42.0	37.0	46.5	42.0
Oman	51.7	50.5	37.4	60.8	42.8	41.0
Pakistan	39.2	43.6	38.9	28.9	59.2	38.7
Peru	33.3	46.6	39.7	28.8	32.3	31.8
Philippines	53.5	88.2	54.3	38.5	49.3	67.4
Poland	45.1	70.9	42.2	36.5	47.3	42.4
Portugal	38.5	50.7	29.1	37.9	38.1	32.5
Russian Federation	42.3	41.6	42.1	33.1	58.4	48.7
Singapore	38.1	45.0	35.0	35.0	42.3	35.3
Slovenia	36.2	48.7	32.5	31.5	37.7	36.6
South Africa	34.2	48.1	36.5	23.2	45.0	36.9
Spain	34.1	43.7	32.5	31.5	32.5	34.8
Sri Lanka	46.4	70.5	55.3	28.3	56.2	57.8
Sweden	40.6	47.8	37.9	37.0	45.1	38.9
Switzerland	40.1	47.2	41.4	37.4	38.5	43.7
Thailand	52.3	72.3	35.1	41.4	58.5	63.0
Tunisia	49.9	82.7	41.9	36.0	52.5	57.6
Turkey	46.4	83.0	37.5	36.5	46.9	41.8
Ukraine	38.4	36.9	39.1	31.5	39.8	57.2
United Kingdom	41.3	43.7	37.9	37.0	48.8	43.1
United States of America	33.6	31.9	31.6	24.7	52.0	38.0
Uruguay	39.5	46.9	69.4	32.5	37.1	42.9
Viet Nam	48.5	42.9	45.3	48.8	52.0	50.0

Source: 2016 World Bank Services Trade Restrictions Index (STRI)

Pakistan, on the other hand, is relatively more open. Trade restriction in distribution services is lower followed by transport and telecommunication services. However, it is important to further reduce the restrictions on the connectivity modes as it will facilitate the trade process with its trading partners. In turn, countries will get benefit from the knowledge of each other and thus it will help in enhancing trade in services.

3.7: Trade Facilitation

Trade facilitation is widely accepted as a source of improving the efficacy of international trade by reducing costs and time in the processing of transactions across borders (Saeed, 2014). There are many international institutions[7] working in this area and accordingly, they have their own definitions consistent with their objectives and work program, however, in general, a brief analysis of these definitions brings forth a universal explanation of the trade facilitation concept. It suggests "simplification, harmonization, standardization and modernization of international trade and customs procedures" (Saeed, 2014). In a more comprehensive way, it covers all non-tariff barriers (NTBs) to trade, including behind the border costs linked with the institutional and business environment, services in support of trade, and physical infrastructure in transport, energy and information and communication technology (ICT) (Spence & Karingi, 2011). Ikenson (2008) is of the view that instead of engaging in new comprehensive multilateral agreements, countries can improve their international trade through trade facilitation. He further explains that the challenge is not due to high tariffs in most countries, but due to the existence of "administrative, bureaucratic and physical bottlenecks" in their supply chains for exports and imports. A broader explanation of trade facilitation implies reforms to strengthen the chain of administrative and physical procedures needed for cross-border transport of products and services (Ikenson, 2008), whereas, in narrow terms, it deals with the logistics of moving goods via ports or customs at the border (Weerahewa, 2009). Currently, the "WTO" trade facilitation negotiations are primarily focused on this aspect of border (or customs) facilitation. (Perez & Wilson, 2010). It is, therefore, the policymakers have now more focused on issues relating to administrative and logistics to further increase the trade liberalization instead of lowering tariffs and quotas. Transport connectivity, the quality of logistics services and border management have been recognised as a major determinant of international trade in this regard. Trade facilitation in particular has been identified as a mechanism for increased and smoother trade between countries (UNCTAD, 2016). It is often seen as an important tool to reduce costs linked with trade and transaction (Taimur "et al", 2016).

The work on trade facilitation has gone through various phases at WTO, from a relatively limited mandate to an aggressive negotiation process and eventually to a new multilateral agreement (WTO, 2015). The countries have now even more aware of the need

[7] "International Trade Centre (ITC), Organization for Economic Cooperation and development (OECD), United Nations Conference on Trade and Development (UNCTAD), World Bank (WB) and World Trade organization (WTO)" etc.

for global trade facilitation rules. Trade facilitation reforms were sought in other international fora, however, the rationale of multilateral trade facilitation finally managed to build up WTO negotiations resulting in the "Trade Facilitation Agreement (TFA)" (WTO, 2015). WTO concluded the TFA in 2013. The TFA came into effect on February 22, 2017, after two-thirds of the members endorsed it. It covers requirements for accelerating the "movement, release and clearance of goods". In addition, it sets out measures for cooperation on trade facilitation and customs compliance issues between customs and other relevant authorities [8]. WTO in its report (2015) has mentioned that with complete adoption of the TFA, trade costs of member countries is likely to reduce by an average of 14.3 percent with "African and Least Developed Countries (LDCs)". Similarly, full implementation would also impact manufactured and agricultural goods by reducing their trade costs by 18 and 10.4 percent respectively. In addition, TFA has the potential to decline the average time required to import by 47 percent. Particularly, the current average export time is expected to be reduced significantly by 91 percent. With regard to the gains as a result of cost and time reduction, exports from existing traders are likely to increase while adding new firms to export. In addition, the TFA is expected to contribute up to 2.7 percent per year to global export growth and more than 0.5 percent per year to global GDP growth over the 2015-30 period. It is predicted that the rapid and complete implementation of the TFA would enable developing countries to realize larger gains as their exports are estimated to increase by 3.5 percent on an annual basis which will stimulate their economic growth by 0.9 percent annually. Generally, it is expected that two-thirds of all benefits will go to the developing and least-developed world (WTO,2015).

3.7.1: Method of measuring Trade Facilitation

A variety of trade facilitation indicators and data sets are available for a large number of countries. Analysts can use various benchmarking tools to evaluate policies, regulations and practices in trade facilitation such as "Trading across Borders indicators" from the "World Bank's Doing Business" report, the "World Bank's Logistics Performance Index", the "World Economic Forum's Enabling Trade Index" and the "OECD's Trade Facilitation Indicators" (DB, 2019). Here we present a brief review of different standard measures of trade facilitation.

I. Doing Business/ Trading Across Borders

The composite indicator of trading across borders measures the "number of documents, time and costs" involved in the import and export of a 20-foot container shipment. The

[8] "https://www.wto.org/english/tratop_e/tradfa_e/tradfa_introduction_e.htm"

indicators record the total time and cost required to complete four predefined export and import phases: "document preparation, customs clearance, domestic transport, port and terminal handling" (DB, 2019). Since 2004, rankings and scores of countries have been released annually but not all years are comparable due to a change in the method of selection (UN, 2019).

II. World Bank's Logistics Performance Index (LPI)

The index measures the availability and efficacy of logistics and main transport and government services (UN, 2019). It is a composite indicator which covers six different aspects such as

- "Efficiency of customs and other border agencies"
- "Quality of transport and information technology (IT) infrastructure"
- "Ease and affordability of international shipments"
- "Competence of the local logistics industry"
- "Ability to track and trace"
- "Timeliness of shipments in reaching the destination"

The World Bank publishes the LPI every two years on the basis of a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade. They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries in which they trade and have global logistics environment experience.[9]

III. World Economic Forum's Enabling Trade Index

This index measures "the quality of institutions, policies and services" that facilitate the cross border free flow of goods. The index is comprised of seven pillars which are built on 56 indicators i.e "local market access, foreign market access, the efficiency and transparency of border administration, the availability and quality of transport infrastructure, the availability and quality of transport services, the availability and use of information and communications technologies, and the operating environment" (DB, 2019).

[9] https://lpi.worldbank.org/about

IV. OECD's Trade Facilitation Indicators

It covers 16 measures consistent with the key policy areas under negotiation at the WTO. These include "information availability, the involvement of the trade community, advance rulings, appeal procedures, fees and charges, formalities, cooperation, governance and impartiality, transit fees and charges, transit formalities, transit guarantees, and transit agreements and cooperation". In sum, all of the above methods of trade facilitation emphasise the effectiveness of business administration, logistic, ports and customs and thus provide an indication of an efficient trade environment.

3.7.2: Trade Facilitation and Pakistan

Pakistan has also conceded a number of much-needed reforms in trade facilitation over the past two decades. Therefore, the extent of enforcement of customs-related laws in Pakistan is relatively high (Saeed, 2014). Regarding the full implementation of trade facilitation measures, UNCTAD (2013) has confirmed that "measures with the strongest customs-related component, covered by Articles 4, 7, 10, 11 and 12 are characterized by high implementation rates" (Saeed, 2014). With regard to the implementation of the TFA, Pakistan has already invested time and resources in improving its effectiveness, whether as a national initiative supported by development partners or as a result of ratifying the "Revised Kyoto Convention of the WCO" (Saeed, 2014). Concerning the status of implementation on TFA, Pakistan approved the Trade Facilitation Agreement (TFA) in October 2015. As part of its trade facilitation and regional trade enhancement agenda, Pakistan is focused on reforming, modernizing, upgrading, and automating its cross-border trade infrastructure.

The importance of logistics for trade can also be assessed from the fact that an effective and consistent logistics network together with a transparent and reliable facilitation mechanism for cross-border trade is fundamental for the country's export competitiveness and foreign market expansion for indigenous goods. In addition, efficient logistics give a boost to investment particularly FDI and in turn, it stimulates the country's trade (MoC, 2019). Besides improving the logistic services, it is equally important to reduce its cost so that it will make products more competitive. At present, the logistic cost in Pakistan is even higher than in the USA (9-10 percent), Europe (10 percent) and Japan (11 percent). In Pakistan, 95 percent of freight is moving on roads, which is substantially higher than in major developed countries (MoC,2019). Better quality of public infrastructure is a prerequisite for efficient logistic services. However, Pakistan has been facing multiple challenges on both physical and non-physical infrastructure including crowded roads access to the seaports and low quality of

trucking and rail services. The fact is that the logistics costs in Pakistan can be above 20 percent of the overall product cost, thus the reduction in cost is fairly lead towards product competitiveness. In addition, Pakistan's trade is 90 percent dependent on shipping, however, its Liner Connectivity Shipping Index (LSCI) (WDI,2019) is lower than its neighbours except for Bangladesh which is not desirable. Efficient logistics and freight have tremendous potential to provide significant benefits to Pakistan's economy (MoC,2019). Furthermore, to reduce the cost and increase the speed, it is very important to reduce the extensive paperwork and difficult procedures to move freight within and outside Pakistan.

3.7.3: Measure of Trade Facilitation for Pakistan

There are various approaches to measuring trade facilitation in the literature, as discussed previously. However, the "World Bank's Logistics Performance Index (LPI)" and Doing Business Indicators have been used extensively as proxies [Seetanah, "et al", (2016); Chakraborty & Mukherjee, (2016); Zaki, (2010) and Taimur, "et al", (2016) etc]. Here we will use the LPI as a measure of trade facilitation. The selection of LPI to measure the trade facilitation stemmed from the fact that continued growth of global trade, as well as the inclination of countries to accelerate the speed of integration into the global trading system would be dependent not only on preserving an open global economic system but also on improving the quantity and effectiveness of support systems such as logistics services (Ghani, 2017). In addition to above, the LPI data is easily available for a large number of countries and it provides a comprehensive representation of various features of trade facilitation, ranging from "customs procedures to logistics costs, infrastructure quality to the competency of the domestic logistics industry" (Felipe & Kumar, 2010). Efficient logistics not only stimulates the productivity and competitiveness of firm and country but also enables them to connect with domestic and international markets thus it can significantly affect a country's prospects of integration within global value chains. Most importantly, it supports trade expansion, job creation, and economic development (Hofman, 2017). Considering the importance of logistics in improving trade performance, it is important to assess logistics performance. As already mentioned, the "World Bank's Logistics Performance Index" will be used which is available for alternate years since 2007.

3.7.4: Assessment of Trade Facilitation Measures

Pakistan's trade performance in general and exports, in particular, has been facing multifaceted challenges as already been discussed in this chapter. Particularly, the lack of

diversification by products and markets and higher concentration in relatively low value-added products has posed a significant risk for export earnings (Mahmood, 2017). Moreover, Pakistan's prospects for trade/export expansion opportunities are very limited as current export markets have slow growth in import. Mahmood (2017) is of the view that only a considerable change in the export base can play a vital role in promoting exports. However, one of the main hurdles in improving trade/export performance is higher trade cost due to a lack of international connectivity and trade facilitation. As already mentioned that trade facilitation has become an important policy tool in recent years that can effectively reduce cost and time through "simplification, modernization and harmonization of trade processes" hence can increase trade flows and the world GDP growth. Furthermore, it can lead to improving export diversification. Thus, here we will analyse the status of Pakistan in LPI in comparison with its neighbouring as well as competitor countries such as Bangladesh, China, India, Iran, Srilanka, Thailand and Vietnam.

Table: 3.11-Logistic Performance Index

	LPI Score						LPI Rank					
	2007	**2010**	**2012**	**2014**	**2016**	**2018**	**2007**	**2010**	**2012**	**2014**	**2016**	**2018**
Pakistan	2.62	2.53	2.83	2.83	2.92	2.42	68	110	71	72	68	122
Bangladesh	2.47	2.74		2.56	2.66	2.58	87	79		108	87	100
China	3.32	3.49	3.52	3.53	3.66	3.61	30	27	26	28	27	26
India	3.07	3.12	3.08	3.08	3.42	3.18	39	47	46	54	35	44
Iran	2.51	2.57	2.49		2.60	2.85	78	103	112		96	64
Sri Lanka	2.40	2.29	2.75	2.70		2.60	92	137	81	89		94
Thailand	3.31	3.29	3.18	3.43	3.26	3.41	31	35	38	35	45	32
Vietnam	2.89	2.96	3.00	3.15	2.98	2.85	53	53	53	48	64	39

source: World Bank

According to the table, Pakistan's overall LPI rank which was at 68th with a score of 2.62 in 2007 witnessed a sharp deceleration as it dropped to a low of 110th position with a score of 2.53 during 2010. However, the rank improved by 42 indexes from 110th to 68th position in 2016 while achieving a score of 2.42. The comparison with other countries as mentioned in the table clearly indicates that in 2007 China was taking a lead with 30th position (3.32 score) followed by Thailand, India, Vietnam, Pakistan, Iran, Bangladesh and SriLanka. Nevertheless, over the period of 10 years, Pakistan's position deteriorated. The country ranked at 122 among 160 countries lagging behind a number of Asian economies. The volatility and deterioration are mainly due to less than optimal logistics parameters in the country. A considerable decline

in trade facilitation has been witnessed since 2007 with the largest drop in Customs, and Tracking and Trace (NFLP, 2020). There are various other reasons which added to the deterioration of trade facilitation. The institutional structure regulating the logistic sector of Pakistan is not well developed. It is governed by a combination of both old and new laws. Therefore, it is in dire need to be modernized as well as harmonised. Pakistan's government recently introduced a National Transport Policy, which is yet to be implemented. It has been observed that in the past various policies were designed but have either not approved or formally implemented. Like a draft law entitled Carriage of Goods by Road Act, which was drafted in 2003 but not adopted. Similarly, there was no implementation of the Trucking Policy of 2007 which established the need for a sector change (NFLP, 2020). Moreover, numerous provincial and federal laws are obsolete and not suitable for the logistics industry of today. In addtion, the absence of a unified transport ministry contributes to additional cooperation efforts and slows down policy implementation. Heavy documentation standards and customs procedures contribute to delays and accelerate shipping costs (NFLP, 2020). In addition to the above, the international transport conventions particularly, Transports Internationaux Routiers, has not been fully operationalized. Similarly, transit trade agreements with Afghanistan, are also not completely functional (NFLP, 2020).

3.7.5: Comparision of Factors under LPI

I. Efficiency of customs and other border agencies

This aspect of LPI pertains to the customs clearing process which assesses the quality and ability of customs agencies with regard to its services, transparency in custom clearance, timely provision of relevant information on regulatory changes, clearance and physical inspection time (PAJCCI, 2016). Table 3.12 presents the rank of various components of LPI for Pakistan since 2007. According to this, the efficiency of customs have declined and currently at the lowest (137th) since 2007. Under this category, Pakistan’s score has reduced sharply by 0.29 points or 12 percent since 2007. Custom delays and unfair behaviour of custom officers may be the major factors behind the inefficiency in the customs clearing process (Husain & Elahi, 2015).

Table: 3.12- Components of LPI for Pakistan

	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
2007	69.0	71.0	65.0	63.0	76.0	88.0
2010	134.0	120.0	66.0	120.0	93.0	110.0

2012	46.0	71.0	68.0	72.0	90.0	83.0
2014	58.0	69.0	56.0	75.0	86.0	123.0
2016	71.0	69.0	66.0	68.0	67.0	58.0
2018	139.0	121.0	97.0	89.0	136.0	136.0

source: The World bank

II. Quality of transport and information technology (IT) infrastructure

It includes trade and transport-related infrastructures like roads, railroads, ports and information technology. Pakistan's ranking in infrastructure quality which improved from 71st place in 2007 to 69th position in 2016, witnessed a sharp decline and stood at 121st place during 2018. Thus since 2007, it reduced by 50 indexes. With regard to score, it deteriorated by 0.17 point or 7 percent. However, Pakistan's performance on the LPI's infrastructure component may improve, especially on the back of CPEC-related projects including road, rail and Gwadar port. Moreover, CPEC is also expected to boost the shipping industry's prospects, and forward-looking investors are reportedly keen to explore these opportunities (SBP, 2019).

III. Ease and affordability of international shipments

This component of LPI measures the ease of arranging competitively priced international shipments (SBP,2019). Pakistan's ranking under this component has also declined since 2007. It was placed at 65th in 2007 which dropped to a low of 97th position, a decline of 32 indexes. With regard to score, 0.09 points or 3 percent decline has been witnessed in ease of affordability of international shipments. PAJCCI (2016) in its report has mentioned that "poor maintenance of operational crafts, lack of development of old vessels, deterioration of pilot tugs and pilot boats" attributed to the decline in the performance of international shipment.

IV. Competence of local logistics industry

It measures the competence and quality of logistics services e.g "transport operators and customs brokers" etc (SBP,2019 & PAJCCI,2016). This component has also witnessed a decline in its ranking since 2007 from 63rd position to currently at 89th during 2018, thus showing a decline of 26 indexes. The score has declined by 0.12 points or 4 percent since 2007. It is important to mention that Pakistan's performance in logistic services witnessed a sharp decline in its rank when it was at 120th position in 2010.

V. Ability to track and trace

It measures the "ability to track and trace consignments" (SBP,2019). Pakistan's rank in tracking and tracing of consignments have declined from 76th position in 2007 to the lowest

at 136th during 2018, drop by 60 indexes. While it has witnessed a decline of 0.3 points or 12 percent over the period of 10 years since 2017.

Table: 3.13- Logistic Performance index (LPI) Score and Rank

Year	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
2007	2.62	2.41	2.37	2.72	2.71	2.57	2.93
2010	2.53	2.05	2.08	2.91	2.28	2.64	3.08
2012	2.83	2.85	2.69	2.86	2.77	2.61	3.14
2014	2.83	2.84	2.67	3.08	2.79	2.73	2.79
2016	2.92	2.66	2.7	2.93	2.82	2.91	3.48
2018	2.42	2.12	2.2	2.63	2.59	2.27	2.66
	LPI Rank	**Customs**	**Infrastructure**	**International shipments**	**Logistics competence**	**Tracking & tracing**	**Timeliness**
2007	68	69	71	65	63	76	88
2010	110	134	120	66	120	93	110
2012	71	46	71	68	72	90	83
2014	72	58	69	56	75	86	123
2016	68	71	69	66	68	67	58
2018	122	139	121	97	89	136	136

Source: World Bank

VI. Timeliness of shipments in reaching destination

It measures the frequency in which shipments reach the destination during the planned or anticipated supply time (SBP,2019). Pakistan has witnessed a significant improvement under this category since 2007 from 88th position to 58th place in 2016, however, the rank reduced sharply to 136th place in 2018. Thus it registered a decline of 78 indexes in just two years. On the other hand, the score under this component reduced by 0.82 points or 24 percent in just two years. While since 2007, it witnessed a decline of 0.27 points or 9 percent. In fact, the six components show the broad-based vulnerabilities for Pakistan. Pakistan's rating ranges from 100 to 140 in four out of six components.

In sum, the LPI is conducted once every two years and is comprised of six components including “customs, infrastructure, logistics competence, shipments, tracking and tracing and timeliness”. A brief comparison between Pakistan and its competitors have shown that Pakistan’s LPI ranking is even below the least developed country Bangladesh. Currently, Pakistan is placed at 122 out of 160 countries in LPI (2018) which clearly indicates a weak performance of the logistic sector in Pakistan. Overall, six dimensions of LPI demonstrate broad-based weaknesses in Pakistan’s logistics services which is in fact a measure of trade

facilitation. Amongst six, Customs has witnessed a deterioration in its ranking with the lowest score in 2018 followed by Tracking and Tracing, Timelines and Infrastructure.

3.8: Concluding Remarks

This chapter was dedicated to examining the trade performance of Pakistan in goods and services along with the status of trade facilitation in the country. Most importantly, the chapter has included a detailed discussion of Pakistan's various trade policies. From the analysis of trade policies, it has been observed that over the years, different governments in Pakistan formulated various trade policies with a view to strengthening the trade sector. Initially, Pakistan adopted an import substitution (IS) strategy, while in the late 80s, it followed a policy of trade liberalisation and export promotion, followed by an export promotion (EP) strategy adopted in the early 1990s (Afzal & Ali, 2008). Lately, Pakistan has adopted a multi-pronged strategy to enhance export competitiveness by implementing three years "Strategic Trade Policy Framework". However, it has failed to attain its objectives, as it did not consider key issues. Moreover, due to the short-term sector-specific fiscal packages, the implementation of trade policy continues to be undermined. Similarly, we have observed that there is not any effective policy framework to diversify the trade/exports in services by markets and its various sub-components. Furthermore, not much attention has been given to trade facilitation by improving logistics.

The trade profile analysis has reaffirmed that Pakistan's exports whether in goods or services are heavily concentrated in a few markets and items. The lack of diversification triggered instability in overall exports due to which exports earnings have not witnessed persistent growth over the years. With regard to merchandise exports composition, three main products such as textile, rice and leather dominated the export profile over the past many years. Similarly, since 1980, Pakistan is heavily reliant on its traditional partners like the USA, China, UK, Germany, Italy, Netherlands, Spain, Saudi Arab, and UAE for exports. Although it has explored some new markets in "Latin America, Africa, the Middle East and CAR", still the magnitude of its export is very small. On the services side, we have observed that despite a significant contribution of the services sector to the economy, the present level of Pakistan's services exports does not reflect the country's true potential. Similarly, with regard to the composition and direction, the situation is not very different from merchandise exports. Not only that the exports in services are concentrated in five sectors i.e government goods and services, other business services, transport, telecommunication, and travel but its base is also

narrow and concentrated to 10 major destinations like the USA, UAE followed by UK, Saudi Arabia, China, Singapore, Thailand, Germany, Switzerland and Hong Kong. The lack of diversification by destination and sectors have taken a toll on overall exports in services over the years.

Detailed analysis shows that Pakistan is facing chronic as well as contemporary issues in improving its trade performance. To cope with these issues, Pakistan not only focuses on new markets and products but also needs to remove hurdles at structural, institutional, and entrepreneurial levels. For that matter, the role of facilitation would be highly significant, as it will be supportive in removing these hurdles thus will reduce the trade cost. Amongst many, we have analysed LPI (a proxy for trade facilitation) to evaluate Pakistan's situation. Through the descriptive analysis it can be inferred that most of the components have witnessed some progress, however, the most recent data in 2018 indicates deterioration in performance. Particularly, Customs, Tracking &Tracing and Timelines have witnessed a sharp deterioration in its score during 2018 if to compare it with it score in 2010. Apparently, the LPI scores in Pakistan have not shown any significant improvement rather it was either remained constant or getting worse in the last 10 years.

CHAPTER 4: METHODOLOGY & DATA

The objective of this study is twofold. First, it will estimate the trade/export potential in goods and services by country and region through the gravity model. At the same time, product/industry-wise potential in goods trade would also be analysed by using the trade potential index. Thus, by using the gravity model the study would allow us to measure the country and region wise trade/export potential of Pakistan and secondly, the trade potential index would provide a deep insight in investigating products with high potential in those countries with whom Pakistan's trade/export potential is high. The other objective is to evaluate the impact of trade facilitation indicators on bilateral trade/export flows in goods between Pakistan and its trading partners. This will allow us to investigate which indicators are more significant in stimulating the overall trade and exports in particular. This analysis is important owing to the number of efforts taken by the government to give a boost to Pakistan's trade with its trading allies along with enhancing the trade within and outside the region. In addition, the current study would be helpful in providing useful insight to envisage the additional bilateral and multilateral trade agreements.

The literature review in the previous chapter has enabled us to know that in most of the studies two different methods have been used extensively with an aim to assess the foreign trade potential i.e., "the gravity model and trade indices". Every method has its own set of benefits and drawbacks; however, the gravity model is the widely used approach to calculate the potential of foreign trade. Baldwin (1994) used the gravity model to calculate coefficients, which he then used to forecast a country's trade potential. The ratio of "predicted trade (P)" and "actual trade (A)" i.e., "(P/A)" is then used to analyse the country's trade potential (Batra, 2006), (Kaur & Nanda, 2011) and (Nurseiit, 2014) etc. Alternatively, the value of (P-A) has also been used to calculate the trade potential. This methodology of trade potential calculation has been extensively used by researchers and can be applied at the aggregate and industry level (Irshad "et al", 2018) and (Rahman, 2009) etc. The second approach, on the other hand, estimates trade potential only at the product level and does not allow for the analysis of the impact of various trade factors (Nurseiit, 2014).

4.1: Specification of Gravity Model

The gravity model is a very popular empirical tool in international trade and has been used as a workhorse for evaluating the determinants of bilateral trade flows for more than 50

years now. We have already mentioned in the previous chapter that initially Tin Bergen (1962) and Pöyhönen (1963) used this notion in the field of international trade, but it was not based on theoretical models. However, in later years, concerted efforts of trade theorists to find its connection with the basics of trade theory produced a considerable number of studies that have provided a range of rigorous theoretical foundation (Chapter 2). They established the fact that the gravity equations, developed solely from mainstream modelling frameworks in economics and should no longer be considered as deriving from some murky analogy with Newtonian physics (Head & Mayer, 2014).

I. Basic Gravity Model

The gravity model of trade originated from "Newton's universal law of gravitation" in physics. It defines that the gravitational force between the two physical bodies is positively related to the product of their masses and negatively related to the square of their distance (Christie, 2002).

$$F_{ij} = G\frac{M_i M_j}{D_{ij}^2} \qquad (4.1)$$

In view of the above, the gravity model can be defined as "the trade flows between two countries are proportional to the product of each country's economic mass, generally measured by GDP and inversely proportional to the distance between them".

$$X_{ij} = \alpha\frac{Y_i^{\beta} Y_j^{\gamma}}{D_{ij}^{\delta}} \qquad (4.2)$$

Similarly, a simple mathematical representation of the model can be specified as

$$X_{ij} = \alpha Y_i^{\beta} Y_j^{\gamma} D_{ij}^{\delta} \qquad (4.3)$$

Wherein X_{ij} defines the flow of export from the country "i " (Pakistan) to country "j" (partner country), Y_i is GDP of country *"i"*, Y_j is GDP of country *"j"* and D_{ij} is the geographical distance between country "*i"* and "*j",* while α,β,γ and δ are the coefficients to be estimated empirically. For estimation purpose, equation (4.3) can be represented in a log-linear form to make it more convenient for regression analysis.

By taking log, equation (4.3) can be written as:

$$\ln(X_{ij}) = \alpha + \beta \ln(Y_i) + \gamma \ln(Y_j) - \delta \ln(D_{ij}) \quad (4.4)$$

In its simple form, the gravity model describes that the trade between the two countries is proportional to the product of their GDP (national income) and inversely proportional to the distance between the countries (Rahman M. M., 2010)

II. Augmented Gravity Model

In literature, eq (4.4) is known to be a standard gravity equation, however, it is not a true representative of the complex real-world situation (Rahman & Ara, 2010). There are certain other elements that significantly influence the trade flows between the countries. For instance, eq (4.4) may include population, absolute difference in per capita GDP, real exchange rate (Kaur & Nanda, 2011) or bilateral exchange rate and per capita GDP (Batra, 2006) as well. In the context of the exchange rate, the effect of a change in the exchange rate on trade has been argued to be asymmetric and nonlinear (Verheyen, 2013). The trade flows may be asymmetrically affected by currency depreciation or appreciation (Dreyer & Fedoseeva, 2016). Dreyer & Fedoseeva (2016) has modelled the asymmetric effect of exchange rates on exports in the gravity equation. In addition, trade policies and trade transaction costs have also been used in many studies. To capture such factors, the researchers have used proxies and represented through various dummies like "regional trading arrangements, connectivity, language, historical relationships", etc. (Rahman & Ara, 2010). The dummy variables may be represented through a vector of variables $Z_{ij.}$ By including the vector of variables *Zij,* eq (4.4) will be written as

$$\ln(X_{ij}) = \alpha + \beta \ln(Y_i) + \gamma \ln(Y_j) - \delta \ln(D_{ij}) + \lambda Z_{ij} + \varepsilon_{ij} \quad (4.5)$$

It may also be noted that different researchers have used a variety of variables to account for their impact on trade flows. In addition to traditional variables as mentioned earlier, Nurseiit (2014) has included density of rail lines (a proxy for the measuring the level transport infrastructure development), the ratio of average trade-weighted tariffs in the partner countries "(to measure the impact of trade barriers on the intensity of mutual trade)", trade freedom index in partner country to the value of this index in the host country "(to measure the degree of a country's trade liberalization regime)" and real effective exchange rate "(a proxy for financial

risk, relative prices, and purchasing power parity etc)". Similarly, other variables are inflation, trade openness (Irshad "et al", 2018), cultural proximity, political globalization (Tripathi & Leitao, 2013), nominal effective exchange rate and political risk index etc. (Mehchy "et al", 2015).

4.2: Econometric Model

It has already been mentioned that the current study aims to evaluate the export/trade potential of Pakistan by country, region, and products. In this regard, the specification of the gravity model would be similar as mentioned in equation (4.5), however with minor changes. We will estimate the gravity model through the "OLS" and "PPML" method. The coefficients will be used to predict export/trade potential for Pakistan. In general, the specification of our model would be as follows:

I. Basic Model

$$\ln(Trade_{ij}) = \alpha + \beta \ln(GDP_i) + \gamma \ln(GDP_j) + \delta \ln(D_{ij}) + \upsilon_{ij} \quad (4.6)$$

II. Augmented Model

$$\ln(Trade_{ijt}) = \alpha + \beta_1 \ln(GDP_{it}GDP_{jt}) + \beta_2 \ln(PCGDP_{it}PCGDP_{jt}) + \beta_3 ln(D_{ijt}) + \beta_4(Border_{ij}) + \beta_5(Lang_{ij}) + \beta_6(RTA) + \upsilon_{ij} \quad (4.7)$$

$$\ln(Exports_{ijt}) = \alpha + \beta_1 \ln(GDP_{it}) + \beta_2 ln(GDP_{jt}) + \beta_3 \ln(PCGDP_{it}) + \beta_4 ln(PCGDP_{jt}) + \beta_5 ln(D_{ijt}) + \beta_6(Border_{ij}) + \beta_7(Lang_{ij}) + \beta_8(RTA) + \varepsilon_{ij} \quad (4.8)$$

To estimate the above model, OLS is a commonly used method. The model specification is generally log linearized for this purpose, and its validity is based on the assumption of homoscedasticity. However, in estimating the gravity model by OLS, researchers have raised different concerns regarding methodological and modelling problems. The PPML method is another alternative method that estimates the gravity model in its multiplicative form. Silva & Tenreyro (2006) have suggested a simple PPML method which can be specified as follows:

$$Y_{ij} = \exp\left[ln\beta_0 + \beta_1 lnX_I + \beta_2 lnX_j - \beta_3 lnD_{ij}\right]\eta_{ij} \quad (4.9)$$

ηij is a "log normal random variable with mean 1 and variance $\sigma i2$"

They have explained that when heteroscedasticity exists, traditional empirical methods for estimating the gravity model in log-linear form produce inconsistent results. They further mentioned that "the expected value of the logarithm of a random variable depends on higher-order moments of its distribution, hence the transformed errors will be generally correlated with the covariates". Similarly, with zero trade flows, the standard method is not appropriate. In view of Silva & Tenreyro (2006) their proposed method is robust even if there is heteroscedasticity and also deals with zeros in trade data. Under this method, the dependent variable trade is expressed in level not in log while the explanatory variables are in the log forms. The present study will use both OLS and PPML estimation techniques to estimate the gravity model. This would enable us to make a comparison between the results obtained through both methods. In general, the specification of the model in eq (4.7) and (4.8) to estimate through the PPML method would be as follows:

$$Trade_{ijt} = \exp\left[a_{ij+}lna_t + \beta_1 \ln\left(GDP_{it}GDP_{jt}\right) + \beta_2 \ln(PCGDPitPCGDPjt) + \beta_3 \ln\left(D_{ij}\right) + \beta_4\left(Border_{ij}\right) + \beta_5\left(lang_{ij}\right) + \beta_6(RTA_{ij})\right] \varepsilon_{ij} \quad (4.10)$$

$$Exports_{ijt} = \exp\left[a_{ij} + lna_t + \beta_1 \ln(GDP_{it}) + \beta_2 ln\left(GDP_{jt}\right) + \beta_3 ln(PCGDPit) + \beta_4 \ln(PCGDPjt) + \beta_5 \ln\left(D_{ij}\right) + \beta_6\left(Border_{ij}\right) + \beta_7(lang_{ij}) + \beta_8(RTA)\right] \varepsilon_{ij} \quad (4.11)$$

The above models will estimate the effect of various traditional and non-traditional variables on trade/exports in goods and services. Similarly, we will use the same model to inspect the importance of facilitation indicators for bilateral trade/export flows.

4.2.1.: Asymmetric Specification of Gravity Model

The specification of the gravity described in this study incorporates the symmetric effect of the bilateral exchange rate. Earlier studies on the gravity model have established the relationship between the exchange rates and trade flows and predicted that the depreciation in the exchange rate would expand the exports while an appreciation would restrict them. However, there was no clear agreement on the magnitude of the impact emerging. It has been argued that not only that exchange rate must be included in the gravity model in order to capture the "complete exchange rate pass-through" when it is uncertain but it was also argued that the effect of movements in exchange rate i.e appreciation or depreciation on trade is asymmetric and nonlinear. Therefore, in the present study, we will also empirically examine this issue by

considering a disaggregated sight. We have assumed here that if the exchange rate is disaggregated into depreciation and appreciation, the equal magnitude of appreciation and depreciation would have different effects on trade/exports. The asymmetric impact will be incorporated by decomposition of the exchange rate in depreciation and appreciation through a partial decomposition approach (Shin, Yu, & Nimmo, 2014). We will compare the estimated models with the exchange rate while assuming it has a symmetric impact and then with partial sums to account for the asymmetric effect. This will follow a formal testing of symmetry betweenβ_4 and β_5. It will be helpful in concluding whether modelling asymmetry in trade in response to the exchange rate changes is necessary to describe the trade level between the partner countries. The analysis will be supportive in evaluating whether the changes in the exchange rate (appreciation or depreciation) has a different effect on trade/export flows.

The decomposition of the exchange rate is explained as:

$BER_t = BER_0 + BER_t^- + BER_t^+$ (4.12)

where *BERt* is the "log of the bilateral exchange rate at time *t*, BER_0 is the value of the first observation at time *t*0, and BER_t^- & BER_t^+ represents partial sum processes of depreciation and appreciation of the exchange rate, respectively".

$BER_t^- = \sum_{j=1}^{t} \Delta\ BER_j^- = \sum_{j=1}^{t} \Delta BER_j I\{\Delta BER_j < 0\}$ (4.13)

$BER_t^+ = \sum_{j=1}^{t} \Delta\ BER_j^+ = \sum_{j=1}^{t} \Delta BER_j I\{\Delta BER_j > 0\}$ (4.14)

In the above equations, $I\{\Delta BER_j < 0\}$ and $I\{\Delta BER_j > 0\}$ are the indicator functions and take the value of 1 if the condition is satisfied and 0 otherwise. The specification of the gravity model will replace the original exchange rate variable with its partial sums. We will estimate the asymmetric specification of the model both for total merchandise trade and exports.

4.2.2. Description of Variables

As per the requirement of the current study, we will include the following set of variables.

I. Dependent Variable

i. **Trade:** $Trade_{ijt}$ represents the "value of bilateral trade flows between Pakistan and its trading partners in year t". It is the sum of exports and imports between the two partners (in value terms).

ii. **Exports**: $Exports_{ijt}$ defines the "value of export flows from the country (i) i.e Pakistan to country (j) i.e trading partner." There are numerous studies in which researchers have used either both trade and export as a dependent variable or have used both variables separately depending upon the nature of their analysis. As far as the current study is concerned, we will use both variables in two separate models define in eq (4.7) and (4.8).

II. Explanatory Variables

i. **Gross domestic product (GDP):** GDP_{it} & GDP_{jt} is the "gross domestic product of exporting country (Pakistan) and its trading partner in year t and based on current US$." Theoretically, GDP in gravity models measures the "economic size" and "productive capacities" of the two countries (Irshad "et al," 2018), (Kaur & Nanda, 2011) and (Benedictis & Vicarelli, 2005). It suggests that the country with a large size of the economy, are more strongly involved in trade, therefore, the coefficient of the variable is likely to be positive and have a significant effect on trade.

ii. **Population:** $Popit$ & $Popjt$ represents the "population of the country (i) and the same holds for the country (j) i.e., the partner country" (Matyas, 1997). The population of the countries concerned is sometimes used as a proxy for market size (Gul & Yasin, 2011). Giorgio (2004) is of the view that the signs for population's coefficients may be different depending upon whether the country is developed or developing. In the case of a developed country, we do not expect a positive sign owing to a stable population which does not likely to affect the import/export relationship. Developing economies, on the other hand, are at a different level of the demographic transition, hence there is a strong influence of the population on imports, however, the sign is not clear. Similarly, Kaur & Nanda (2011) have described that the coefficient of the population of the exporting country may be positive or negative based on whether the country exports less when it is big (absorption effect) or whether a big country exports more than a small country (economies of scale). Likewise, for importing country, the sign is ambiguous due to the same reason.

iii. **GDP per Capita (GDPpc):** $GDPpc_{it}$ & $GDPpc_{jt}$ are "GDP per capita for exporting (i) and importing (j) country in year t". The variable per capita GDP has been used extensively to measure the level of development in the gravity model. It explains that

the "countries with the same level of output per capita will trade more than countries with dissimilar levels" (Rahman, 2009). Hence, we anticipate a positive effect of GDP per capita on trade. Even though this variable is precisely the same whether we include either GDP or population separately or as GDP per capita to account for two in one (Gul & Yasin, 2011), we will prefer to include both the variables (GDP and population) separately to evaluate their differences (Giorgio, 2004).

iv. **Absolute Difference in GDP Per Capita (PCGDPD):** $PCGDPD_{it}$ & $PCGDPD_{jt}$ illustrates **"**absolute per capita differential for the country (i) and country (j) in year t". Although, the current study is focused on estimating trade potential, however, we are also interested to test two contrasting hypotheses i.e Linder and Hecksher-Ohlin (H-O) hypothesis. The aim is to infer whether similar countries are involved in more trade or dissimilar countries. The analysis would be supportive in suggesting better policy options for the purpose of trade/export diversification. A positive sign of this variable would support the "Hecksher- Ohlin (H-O) hypothesis" (influences of factor endowments differences), while a negative sign would support the" Linder hypothesis" (influences of style taste differences) (Rahman 2009).

v. **Bilateral Exchange Rate (BER):** It is defined as "local (Pakistan) currency value per unit of foreign currency". In literature we can find the use of both "nominal" and "real bilateral exchange rates". The real exchange rate is adjusted for domestic and foreign inflation (Gul & Nazia,2011) and (Kaur & Nanda, 2011). The exchange rate variable was introduced in the gravity model to measure the prices by Bergstrand (1985,1989). The variable also quantifies financial risk, relative prices and purchasing power parity (PPP) (Greene, 2013). The estimated coefficient may be either positive or negative (Greene, 2013). The devaluation of the local currency can stimulate domestic export while the appreciation of the currency can lower exports while increasing the demand for imports (Kexin, 2018) (Bergstrand 1985, 1989).

vi. **Trade Openness:** It is the "ratio of trade to GDP." In literature, two alternative proxies for openness have been used i.e., the proportion of customs-to-total tax revenues and the trade-GDP ratio. Nevertheless, the trade to GDP ratio is widely used as a proxy for openness due to its easy availability for a significant number of countries. Rahman (2009) and Gul & Yasin (2011) have used this ratio in a gravity model to analyse the

effect of trade openness on bilateral trade flows. The variable specifies that the more open countries engage in higher trade, thus we expect a positive sign.

vii. **Human Capital Endowment:** It is described as "the index of human capital per person on the basis of schooling years and returns to education". Mirza and Nicolette (2004) have used human capital endowment proxied by "the average number of years of schooling" and found that it is positively related to services exports. Covaci & Moldovan (2015) are of the view that the partner country's education level is an important factor for services exports because it enables the population to absorb the services exports. There are several studies in which a direct link between human capital endowment and exports of services have been found. Like Mirza & Nicoletti, (2004) has found a positive impact both at the aggregate level. Amin & Mattoo, (2008) found a positive impact of skilled labour on per capita output in aggregate services. In this study, we will use this variable for both trade and exports in services and is computed as "a ratio of the exporter's (Pakistan) index of human capital per person to the importer's (partner) index of human capital per person".

viii. **Foreign Direct Investment (FDI):** It is defined as "an investment made by individual or separate companies from one country to another". It is an important vehicle to bring vital benefits through technology transfer and management improvement [(Saleena, 2013) (Mahfooz "et al", 2018)]. FDI also leads to improve productive capital stock, technological growth and facilitates the transfer of management skills. Thus, it helps in improving the global market access. Despite wide-ranging linkages between the FDI and trade, very little empirical work is being done to explore the effect of FDI on export services (Saleena, 2013). Contrary to it, we can find extensive empirical studies in which the effect of FDI on commodity exports have been studied. Therefore, in an attempt to examine the impact of FDI inflows on services trade, we will use FDI of exporting country (Pakistan) and FDI of importing (partner) country on trade and exports in services.

ix. **Private sector credit to GDP ratio:** It is an indicator used as "a proxy for financial development" (Beck T., 2002). It is explained as "the domestic credit to the private sector as a share of GDP provided by the banks and other financial institutions" (WDI, 2019). Raboloko (2018) has used private sector credit to find out its impact along with

other variables on the growth of services. Results suggest that extension in private sector credit is important for the development and growth of the services sector. In this study, we will use this variable for exporting and importing country to evaluate the effect of financial development both on trade and exports in services.

x. **Fixed Broad Band Subscription (per 100 person):** It is the "number of fixed broadband subscription per 100 persons" and will be used as a proxy for ICT. In literature there are various proxies used to find out the relationship between the economic growth and ICT such as "number of fixed telephone subscriptions per 100 inhabitants"; "number of mobile cellular subscriptions per 100 inhabitants"; "number of Internet users per 100 inhabitants" and the number of fixed broadband subscriptions per 100 inhabitants (Bahrini & Qaffas, 2019). It has been observed that the fast-growing ICT has provided an impetus to services trade more than the trade in goods. Yousefi, (2018) has estimated the effect of the internet on services trade while using the number of internet users per 100 people as a proxy. In order to assess the impact of ICT on trade and exports in services, we will use a fixed broadband subscription as a proxy for both exporting and importing countries.

xi. **Logistic Performance Index (LPI): LPIi and LPIj** is "a proxy for trade facilitation in country i and country j". It is based on a worldwide survey of operators on the ground, providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade (Beverelli:2014). It is provided on a 5-point scale and is a composite measure of six components such as "the efficiency of customs and other border agencies, quality of transport and information technology (IT) infrastructure, ease and affordability of international shipments, the competence of local logistics industry, ability to track and trace and timeliness of shipments in reaching the destination". In addition to the overall LPI variable, we will include the above components to account for their effect on bilateral trade/exports. LPI indicates the significance of trade facilitation in export flows thus we expect positive sign for both the coefficients (Marti, "et al" 2014).

xii. **Distance:** $Distance_{ijt}$ *is* "the geographical distance between exporting country (i) and trading partner (j) and is expressed in km between the capital cities". The variable is used as "a proxy for the cost of transportation". The coefficient is expected to be

negative as the distance between the exporting and importing countries increases, exports will fall (Kaur & Nanda, 2011). Ramos "et al" (2007) have discussed the role of distance in their study while explaining that the gravity models of trade use distance between countries as a proxy for transport costs with the assumption that transport cost from the exporting country to the importing country is the same as it does from the importing to the exporting country. The study further adds that the geographical distance may represent a series of factors such as cultural proximity, a shared history & perception of closeness and information costs rather than acting as a proxy for transport costs since they tend to be fixed according to the supply and demand conditions in the market. The distance thus is a proxy for transport costs. It is an indicator of the time elapsed during shipment. For perishable goods, the probability of surviving intact is a decreasing function of time in transit.

Going forward, there are several other variables that are commonly used to observe the trade cost. Usually, bilateral distance measures the trade cost in most empirical studies. Nevertheless, there are dummies to capture not only geographical factors and historical ties (Batra, 2006) but also to account for trade cost. Likewise, to observe trade cost, some additional dummy variables can be included such as "islands, landlocked countries and common borders". These variables show the hypothesis that trade cost increases with the distance, for landlocked countries and islands but for border countries it is lower (UNCTAD/WTO, 2012). In addition to the above dummy variables, there are certain other dummies that are used to account for cultural features and information costs like a common language, other relevant cultural features and colonial history (UNCTAD/WTO, 2012). However, in the present study, we will include the dummies for border/adjacency and common/official language. In addition, we will include a dummy for Regional Trading Arrangement (RTA) to analyse the trade diversion or trade creation impact. A brief description is given below.

i. **Border /Adjacency:** It is "the land border between the host country (Pakistan) and its trading partner (j) in year t". Border dummy takes the value 1 if country i and j are adjacent to each other and 0 otherwise. It has been observed that the two countries are strongly involved in higher trade if they are sharing a common border owing to stronger social and economic relations (Gul & Yasin, 2011). To observe the impact of sharing border on trade, a dummy variable is often used in the gravity model, and it is expected to affect the trade in a positive way. It is important to mention here that the inclusion

of border dummy is in addition to the variable of physical distance to account for the effective distance between the neighbouring countries often engaging in large volumes of border trade (Head, 2000). On the other hand, Magerman "et al" (2015) explained that both distance and border not only account for the geographical barriers between two trading partners, but they also capture different types of costs that traders may incur while transporting a good to its final consumer.

ii. **Language (Official):** "It takes 1 if two countries share a common language (official) and 0 otherwise". One of the impeding factors in trade is transaction cost driven by cultural differences and the inability to communicate. People of two countries who speak the same language will engage in higher trade against those pairs that do not share a common language (Head, 2000). Moreover, a common medium of communication is supportive for trade partners in simplifying the trade negotiations (Batra, 2006). Therefore, we expect a positive sign for the language dummy.

iii. **Free Trade Agreement (FTA):** The coefficient "takes the value 1 if both countries have signed FTA and 0 otherwise". FTAs are expected to increase the trade by around 50 percent on average (Head, 2000).

iv. **Regional Trading Agreement (RTA):** The dummy "takes the value of 1 if both countries are the members of the same regional group and 0 if they are not". Countries often enter into bilateral and regional trading agreement with an aim to facilitate international trade. Numerous studies have shown that while the RTAs can raise the merchandise trade among member countries but at the cost of trade among non-members. However, whether joining RTAs is beneficial or not depends on the structure of cost in partner countries compared with the cost structures in nonmembers (Ekanayake "et al" 2010). There are different studies that have examined the impact of regional trade blocs on the economic welfare of the integrating partners as well the excluded countries while making the claim that trade creation and diversion are important in understanding which and how RTAs form, but the effects of RTA formation are typically ambiguous since the relative size of trade creation and diversion is in general indeterminate (Ekanayake "et al" 2010).

4.3: Panel Data Framework

Panel data is the combination of time series and cross-section data. Cross-section data is pertaining to the data at one point of time for different cross-sections, while the time-series component pertaining to the data over the time for a single cross-section. Both types of data have their own disadvantages such as in cross-sectional data, there would be the problem of heterogeneity and multicollinearity. While the time-series data may have the problem of non-stationarity and autocorrelation etc. Sometimes both individually cannot provide useful information, therefore we combine both. In the current study, from the review of the empirical literature, we have observed that conventionally the cross-sectional analysis was used to estimate the gravity model (Anderson, 1979; Bergstrand, 1985 & 1989) and the estimation technique for analysis was used to be the Ordinary Least Squares (OLS) method. However, the traditional cross-section approach is affected by a severe problem of misspecification (Egger, 2002). Matyas (1997) is of the view that the "correct econometric representation of the gravity model is a three-way specification and eliminating one of the three dimensions (time) indicates that the representation of a time-averaged gravity model is a two-way panel with the (fixed or random) exporter and importer effects". Thus, OLS estimates are most likely to give inconsistent estimates. Kareem (2014) points to the failure of the traditional cross-sectional gravity model on account for country-specific time-invariant unobservable such as "distance, common language and border dummies" etc. Kareem (2014) further adds that the error term takes into account the unobservable country-specific time-invariant determinants of exchange, which are supposed to be associated with observed regressors. In this context, the use of the OLS technique will give inconsistent least square estimators. Furthermore, using OLS estimates to measure trade potentials can result in a problematic inference, affecting both the in-sample and out-of-sample prediction concepts (Egger, 2002).

Similarly, OLS does not take into account the heterogeneity among individual countries thus, assessing cross-sectional formulation without considering these country-specific unobservable effects has the potential of resulting in a biased estimate (Kareem, 2014). However, in recent year, the uses of panel data and panel econometrics methods to estimate the gravity model have gained momentum (Baldwin, 1994; Benedictis & Vicarelli, 2005; Ahmad & Garcia, 2012; Bano "et al", 2013 etc). The unique advantages of the panel data framework are that it captures the omitted variables in the form of unobserved heterogeneity. Furthermore, since panel data has more freedom and sample variability than cross-sectional

data, it improves the accuracy of estimates (Hsiao, 2007). In the same way, Baltagi (2005) describes that "panel data provides more informative data, less collinearity among the variables, more degrees of freedom and more efficiency". He further adds that it can better perceive and quantify the impacts that cannot be captured in pure cross-section or pure time-series data. According to Arvas & IC(2008), panel data allows for the monitoring of unobservable individual effects between trading partners. Since a proper econometric specification of the gravity equation can control for heterogeneous trading relationships, these aspects of panel data are critical. Keeping in view the advantages of the panel data framework we prefer to use the same in our present study.

4.3.1: Estimation Techniques

In this part, we will discuss different methods of estimating the model using panel data. Broadly, there are three different approaches through which panel data models can be estimated. Commonly used techniques are the "Pooled Least Square (PLS), the Fixed Effect (FE) and Random Effect (RE)" estimation, however selection of the appropriate technique relies on their assumptions (Asteriou, 2006) & (Kareem, 2014). Before we briefly discuss different approaches to estimate the panel data, it is important to first specify the framework for panel data analysis as discussed by Greene (2010).

$$\boldsymbol{y_{it}} = \boldsymbol{X'_{it}\beta} + \boldsymbol{Z'_i\alpha} + \varepsilon_{it} \quad \textbf{(4.15)}$$

$$= \boldsymbol{X_{it}\beta} + \boldsymbol{C_i} + \varepsilon_{it} \quad \textbf{(4.15.a)}$$

There are K regressors in X_{it}, with no constant term. $\boldsymbol{Z'_i\alpha}$ represents the heterogeneity or individual effect where $\boldsymbol{Z_i}$ includes a constant term and a group of specific variables, which can be observed (race, sex, location etc) or unobserved (family-specific characteristics, individual heterogeneity in skill or preferences etc) all of which are taken to be constant over time t.

I. Pooled Regression model/Pooled least Square (PLS)

It is also known as the "Common Constant method". Greene (2010) has used the term "Population averaged model" based on the assumption that any latent heterogeneity has been averaged out. If Z_i includes only a constant term, then OLS gives consistent and efficient estimates of the common α and the slope vector β. Hence, the method is simple and is based on the assumption that there are no differences between the estimated cross sections or there is

no heterogeneity. This method does not consider time and individual dimension. It assumes that the behavior of data is the same in various time periods (Zulfikar, 2018), hence we use a pooled OLS method to calculate general β. Under this method, the form of the regression equation is similar to the Ordinary least squares. The simplest version of the pooled model is as follows (Greene, 2010).

$$\boldsymbol{y_{it}} = \boldsymbol{\alpha} + \boldsymbol{X'_{it}\beta} + \varepsilon_{\boldsymbol{it}} \quad (4.16)$$

where i=1, ... , n , t= 1, ... , T_i

II. Fixed Effect Model (FEM)

This model allows cross-sectional heterogeneity based on the assumption that the unobserved heterogeneity is correlated with the error term. While Greene (2010) explained the model while stating that "if Z_i is unobserved, but correlated with X_{it}, then the least squares estimator of β is biased and inconsistent as a consequence of an omitted variable". The model is described as

$$\boldsymbol{y_{it}} = \boldsymbol{X'_{it}\beta} + \boldsymbol{\alpha_i} + \varepsilon_{\boldsymbol{it}}$$

where $\boldsymbol{\alpha_i} = \boldsymbol{Z'_i\alpha}$ represents all the observable effects. This approach takes $\boldsymbol{\alpha_i}$ to be a group-specific constant term, which implies different constants for each group. Therefore, the dummy variable technique is used to estimate the model with different constants for each group and the technique is often referred to as the Least Square Dummy Variable technique (LSDV). The LSDV model can be written as:

$$\boldsymbol{y} = \boldsymbol{X\beta} + \boldsymbol{D\alpha} + \varepsilon \quad (4.17)$$

Greene (2010) has noted one of the important weaknesses of the fixed effects approach is that any time-invariant variables in X_{it} will mimic the individual specific constant term. The author has described the formulation of fixed effects as follows:

$$lnWage_{it} = X'_{it}\beta + [\beta_{10}Ed_i + \beta_{11}Fem_i + \beta_{12}\beta lk_i + C_i] + \varepsilon_{it} \quad (4.18)$$

The above formulation of the model will absorb the last four terms in the regression in $\boldsymbol{\alpha_i}$. The coefficients on the time-invariant variables cannot be estimated. The author has stated

that this lack of identification is the price of the robustness of the specification to the unmeasured correlation between the common effect and the exogenous variables.

III. Random Effect Model (REM)

This method is based on the assumption of no correlation between the unobserved heterogeneity and regressors (Kareem, 2014). In other words, Greene (2010) defines that if the unobserved heterogeneity can be assumed to be uncorrelated with the included variables, then the model may be formulated as:

$$\boldsymbol{y_{it} = X'_{it}\beta + E[Z'_i\alpha] + \{Z'_i\alpha - E[Z'_i\alpha]\} + \varepsilon_{it}} \quad \textbf{(4.19)}$$

$$\boldsymbol{y_{it} = X'_{it}\beta + \alpha + \mu_i + \varepsilon_{it}} \quad \textbf{(4.19.a)}$$

According to the above approach, μ_i is a group-specific random element, like ε_{it} except that for each group, there is however a single draw that enters the regression identically in each period (Greene, 2010). The random-effects method manages the constants for each group as random which is in contrast with the fixed effect approach.

4.3.2: Advantages/Disadvantages

Hsiao (2007) while explaining the advantages has stated that the individual and/or time-specific effects can be associated with the explanatory variable X_{it} under FE. It does not require an investigator to model their correlation patterns. However, one of the main issues in FE model is that it drops time-invariant variable, particularly, the model excludes some important and theoretically relevant variables from the gravity equation such as “distance, common language, common borders”, thus the impact of these variables cannot be determined (Kareem,2014), (Hsiao, 2007) & (Asteriou, 2006). Nevertheless, Cheng & Wall (2005) suggested to estimate the time-invariant variables using the individual effects. Furthermore, the FE method is considered to be inefficient as it estimates a large number of parameters (Asteriou, 2006). On the other hand, Hsiao (2007) has mentioned that the number of unknown parameters increases with the number of sample observations. On the other hand, one of the main benefits of RE specification is that it has fewer parameters to estimate relative to the FE method (Asteriou, 2006), while Hsiao (2007) explains that the number of parameters stays constant when sample size increases. Hsiao (2007) further adds that the RE method allows the estimation of the impact of time-invariant variables. To comprehend the discussion, we can conclude as stated by Hsiao

(2007) that the "advantages of RE specification are the disadvantages of FE specification and the disadvantages of RE specification are the advantages of FE specification".

Now the question arises that which technique is more appropriate in general and for the current study in particular. Arvas & IC (2008) are of the view that the RE method would be more applicable to estimate the trade flows between a randomly drawn sample of trading partners from a larger population. Contrary to it, the FE method would perform relatively better when the objective is to estimate trade flows between a predetermined selection of countries. However, researchers generally choose the appropriate technique based on the Hausman specification test to determine whether the fixed effects model is more appropriate or the random-effects model. In most of the studies, the FE method has been chosen to estimate the gravity model and based on the estimated coefficients, trade/export potentials have been calculated (Kaur & Nanda, 2011). Sultan & Munir (2015) have chosen the RE method to estimate the trade potential of Pakistan on the basis of two reasons i.e. a number of cross-sections are greater than the number of time series data and to estimate the effects of both time-invariant and time-variant variables. Going forward, if the number of time series data is greater than the cross-sectional units, then Gujarati (2003) states that the values of the estimated parameters by FE and RE method may differ slightly, therefore, the choice is based on computational convenience and FE method may be preferable. Asteriou (2006) is of the view that as RE is the Generalized Least Square (GLS) estimators, therefore, it is superior to the FE estimator, however, as RE model is based on the assumption that the FE are uncorrelated with the explanatory variables which create strict limitation in panel data treatment. Then, there is a formal test; the Hausman specification test as mentioned earlier is use to decide whether to choose FE or RE method. Keeping in view the above discussion, we are of the view that the choice between the techniques, however, depends on once own judgment that what kind of analysis is required.

4.4: Alternative Estimation Method

Conventionally, the OLS is a commonly used method for the estimation of the gravity model. The model specification is usually "log-linearized," and the validity is built on the assumption of homoscedasticity. Despite the common use of the OLS method, researchers highlighted various issues pertaining to the methodology and its modelling while estimating the gravity model. Silva & Tenreyro (2006) argued that the standard empirical methods to

estimate the gravity model in the log-linear form provides inconsistent estimates due to the presence of heteroscedasticity. They are of the view that the expected value of the logarithm of a random variable depends on higher-order moments of its distribution. Hence, in the presence of heteroscedasticity, the transformed errors will be generally correlated with the covariates. Another problem attached with the log linearization of the gravity model is that due to the zero trade flows, the method is not appropriate because it eliminates the zero trade pairs. Therefore, in the presence of heteroscedasticity and zero trade flows, log linearization and then the use of standard estimation technique are problematic. In view of the above, Silva & Tenreyro (2006) suggested to estimate the gravity model in its original multiplicative form and proposed a simple Poisson pseudo-maximum-likelihood method. They have concluded that their proposed method is robust in the presence of heteroscedasticity even deals with zeros in trade data.

In recent years, the emphasis is on using more suitable techniques to deal with zero trade flows and log transformation of the gravity model. In this regard, we can find various alternative estimation techniques that are being applied progressively in recent years like the "Tobit and Probit" models, "truncated regression", "Poisson and modified Poisson models", "Nonlinear Least Square (NLS)" and "Feasible Generalized Least Square (FGLS)" etc (Kareem, 2014). In addition, GMM has also been applied to estimate the gravity model and the estimated coefficients have been used to calculate the trade potential (Nurseiit, 2014). Tripathi & Leitao (2013) have used Tobit, Random Effects and GMM system, in particular, a "dynamic panel (GMM system estimator)" to resolve the issue of "serial correlation, heteroscedasticity and endogeneity". Irshad "et al" (2018) has used various techniques including EGLS, two-stage EGLS, GMM, Tobit to estimate the model. Similarly, the Heckman sample selection model based on a two-step estimation procedure has also been used to estimate the gravity model. The first step to estimate the Probit equation is to determine whether two countries trade or not while the expected values of the trade flow estimated in the second step using OLS (Herrera, 2013). Herrera (2013) has discussed the advantages and disadvantages of different estimation techniques for gravity model based on various research studies and states that every method has its own benefits and weaknesses, however, it cannot be affirmed that any of the technique/methods performed better as compared to others. Therefore, the inclusion of several estimation techniques in literature for the same database is in frequent practice.

4.4.1: Poisson pseudo-maximum-likelihood (PPML)

An efficient estimator can be obtained by using PML estimator based on some assumption of functional form $V(yi|x)$ [conditional variance of y]. Among the many possible specifications, the hypothesis that the conditional variance is proportional to the conditional mean is practically appealing. Indeed, under this assumption $E(yi|x) = \exp(xi\beta) \propto V(yi|x)$, and β can be estimated by solving the following set of first order conditions (Silva & Tenreyro, 2006).

$$\sum_{i=1}^{n}[y_i - \exp(x_i \tilde{\beta})]x_i = 0 \qquad (4.20)$$

Above is a PML estimator obtained assuming that $V(yi|x)$ is constant. The PML estimator based on the above equation gives the same weight to all the observations, rather than emphasizing those for which $\exp(xi\beta)$ is large. It is due to the fact that under the assumption$E(yi|x) \propto V(yi|x)$, all observations have the same information on the parameters of interest as the additional information on the curvature of the conditional mean coming from observations with large $\exp(xi\beta)$ is offset by their large variance. Silva & Tenreyro are of the view that "this estimator may not be optimal, but without further information on the pattern of heteroscedasticity, it seems natural to give the same weight to all the observations. The estimator in eq (4.20) is numerically equal to Poisson Pseudo-maximum likelihood (PPML) estimator, which is mostly used for the count data. It shows that all that is required for this estimator to be consistent is the correct specification of the conditional mean i.e $E(yi|x) = \exp(xi\beta)$. Thus, the data do not have to be Poisson at all and more importantly, yi does not even have to be integer for the estimator based on the Poisson likelihood function to be consistent".

Silva & Tenreyro (2006) have used PPML estimation method to estimate the gravity model and argued that it should be estimated in its multiplicative form. In the presence of heteroscedasticity, the "log linearization" of the gravity model provides inefficient estimates. The PPML is an alternative estimation technique that is theoretically sound and simple. It is a special case of the "Generalized Nonlinear Linear Model (GNLM) framework" (Mnasri, & Nechi, 2019). PPML method is consistent not only in the presence of heteroscedasticity but also naturally deals with zero values of the dependent variable. This method directly estimates the multiplicative form of gravity and avoid dropping zero trade as mentioned above. Under this method, the "dependent variable" trade is in level while the "explanatory variables" are in log forms. The PPML method has now been used extensively in the estimation of gravity equations (Irshad "et al", 2018; Bosquet & Boulhol, 2015; Sousa, 2012; Tenreyro, 2007 etc).

PPML method is a natural solution to deal with zero observations, as it does not need to linearize the model by using logarithms (Krisztin & Fischer, 2015). The gravity equation in multiplicative form can be written as "the exponential function" as follows:

$$\text{trade} = \exp\left[ln\beta_0 + \beta_1 lnX_i + \beta_2 lnX_j + \beta_3 lnD_{ij}\right] \quad (4.21)$$

It can be defined as the conditional expectation of *Yij* given *Xi , Xj* and **Dij** and denoted as

$$E = [Y_{ij}|X_i, X_j, D_{ij}]$$

$$\mu_{ij} = \boldsymbol{E}\left[\boldsymbol{Y_{ij}}\middle|X_i, X_j, D_{ij}\right] = \exp\left[ln\beta_0 + \beta_1 lnX_i + \beta_2 lnX_j - \beta_3 lnD_{ij}\right] \quad (4.22)$$

The specification in eq (4.21) is useful because the coefficients on the logged variables can be interpreted as the elasticity of the conditional expectation of Yij with respect to Xi , Xj and Dij (Krisztin & Fischer, 2015). In view of the current study, we will estimate the gravity model through Pooled, FE, RE and PPML. PPML would be the preferred method to calculate the trade/export potentials due to its relative robustness. Silva & Tenreyro proposed PPML with fixed effects. Incorporating the fixed effects generates consistent estimates as of Anderson and van Wincoop (2003) (Feenstra, 2003). Cheng & Wall, (2004) compared different specifications of the gravity model of trade with bilateral country-pair fixed effects to control for heterogeneity. They are of the view that without proper dealing with the heterogeneity, gravity models can significantly overestimate the impact of integration on the volume of trade. In the present study, while estimating the model through PPML, we will not exclude the time-invariant coefficients with an aim to see how they impact trade/exports. Whereas we will perform the sensitivity analysis while using the same specification of the gravity model by excluding time-invariant variables (Appendix VI). It would be helpful in analyzing the difference with and without those time-invariant variables.

4.4.2: Summary of Estimation Techniques

Herrera (2013) has summarised various estimation techniques with their advantages and disadvantages based on different studies in one of the tables mentioned in his study. Here we simply reproduce the same for the purpose of gaining further insight relevant to various estimation methods used for gravity model estimation.

Table: 4.1- Various Estimation Techniques

Estimation Method	Advantages	Disadvantages	References
Truncated OLS	– Simple	– "Loss of information" (elimination of zero flows) – "Biased coefficients"	Linders and de Groot (2006); Westerlund and Wilhelmsson (2009); Martin and Pham (2008)
OLS (1+Tij)	– Simple – It deals with the zero trade flows problem	– Biased coefficients	Linneman (1966), Bergeijk and Oldersma (1990); Wang and Winters (1991); Baldwin and diNino (2006)
Tobit (censored regression)	– Simple – It deals with the zero trade flows problem	– Same set of variables to determine the probability that an observation will be censored and the value of the dependent variable – Lack of theoretical foundation	Soloaga and Winters (2001); Anderson and Marcouiller (2002); Baldwin and diNino (2006); Schiavo (2007); Martin and Pham (2008)
Panel fixed effects	– "Simple" – "It controls for unobserved heterogeneity"	– "Loss of information (constant terms in the regression are dropped)" – "Elimination of zero flows" – "Sample selection bias"	Matyas (1998); Egger (2000); Glick and Rose (2002); Egger and Pfaffermayr (2003); Micco et al. (2003); Andrews (2006); Henderson and Millimet (2008)
Heckman two-step	– "Different set of variables and coefficients to determine the probability of censoring and the value of the dependent variable". – "No multicollinearity problems" – "It provides a rationale for zero trade flows"	– It may be difficult to find an identification restriction – Exclusion variables are required	Bikker and de Vos (1992); Linders and DeGroot (2006); Martin and Pham (2008)
PPML (Poisson Pseudo Maximum Likelihood)	– "It deals with the zero trade flows problem" – "It provides unbiased estimates in the presence of heteroscedasticity" – "All observations are weighted equally" – The mean is always positive	It may present limited-dependent variable bias when a significant part of the observations are censored	Westerlund and Wilhelmsson (2009); Siliverstovs and Schumacher (2009); Liu (2009); Shepherd and Wilson (2009); Martínez-Zarzoso et al. (2007); Santos Silva and Tenreyro (2006); An and Puttitanun (2009)
NLS (Nonlinear Least Squares)	– It deals with the zero trade flows problem	– It assigns more weight to observations with a larger variance (inefficiency). – Not robust to heteroscedasticity – Sample selection bias	Santos Silva and Tenreyro (2006)
FGLS (Feasible Generalised Least Squares)	– It deals with the zero trade flows problem – It is robust to heteroscedasticity	– The variance covariance matrix should be estimated first	Martínez-Zarzoso et al. (2007)
GPML (Gamma Pseudo Maximum Likelihood)	– It deals with the zero trade flows problem – It is robust to heteroscedasticity	– Less weight to observations with a large conditional mean (less prone to measurement errors)	Martínez-Zarzoso et al. (2007)
Helpman, Melitz and Rubinstein (2008)	– It provides a rationale for zero trade flows – Unbiased estimates	– Difficult to estimate – Additional data is required (exclusion variables)	Helpman et al. (2008); Santos Silva and Tenreyro (2008)

4.5: Data Sample

Although the "classical gravity model" has been used to estimate the cross-sectional data, however, there are countless studies that have used panel data. The panel data will be analyzed through Pooled, Fixed Effect and Random Effect which we have already discussed earlier in the previous section. In literature, we can find numerous studies which have used the FE method based on the Hausman specification test (Greene, 2013), (Kaur & Nanda, 2011) to calculate the trade potential. Similarly, some have used all three methods but (Sultan & Munir, 2015) have used the RE method to compute the trade/export potential. We will estimate the gravity model through "Pooled, FE, RE and PPML."

The study will cover data of 101 countries (Appendix-I) to ensure the widest possible coverage, however, the selection of countries have been made based on available data on relevant variables. The inclusion of a considerable number of countries emanated from the fact that despite Pakistan's trade ties with more than two hundred nations, its trade is concentrated in just a few countries and regions, primarily the United States and the European Zone. Both the USA and European region are traditional markets for Pakistan wherein the compliance of international standards after the implementation of WTO rules and regulations is higher and thus posed further challenges to Pakistani exports. However, in non–traditional markets the compliance with WTO rules and regulations are lower, therefore, Pakistan can gain by enhancing its trade relations towards these markets. Therefore, the analysis would be helpful in classifying those countries with whom Pakistan's trade potential is high and has never been given top priority while taking various policy measures for enhancing trade. Moreover, it would be supportive in formulating effective trade policies with respect to enhancing trade relations with the widest possible countries in the world. Similarly, our analysis will cover different regions like EU, ASEAN, Africa, Central Asian Region (CAR), Middle East, SAARC, Transition Economies and Latin American Region. Furthermore, using LPI as a proxy, we will be able to examine the relationship between bilateral trade flows and trade facilitation (TF). With regard to data sources, merchandise trade data (Exports+Imports) and products wise data of trade are retrieved from COMTRADE (WITS), services trade (Exports +Imports) from SBP, "GDP and GDP per capita" data are from "World Development Indicators" (WDI) 2018, and data related to "distance, common language and border dummy" are taken from "**Centre d'Études Prospectives et d'Informations Internationales (**CEPII)". Details of variables included in the present study have been given in the table (4.2).

Table: 4.2- Description of Variables

s.no	Variable	Description	Expected sign	Source
1	Trade (Dependent) Exports + Imports (goods) Exports+Imports (services)	$Trade_{ijt}$: "value of bilateral trade flows between Pakistan and its trading partners in year t".		COMTRADE (WITS) State Bank of Pakistan
2	Gross Domestic Product (GDP)	GDPit & GDPjt is "the gross domestic product" of exporting country (Pakistan) and its trading partner in year t and based on 2010 US$.	+	WDI 2019
3	Population (Pop)	Popit & Popjt represents the population of country (i) and same hold for country (j) i.e the partner country	+/-	WDI
4	GDP per Capita	$GDPpc_{it}$ & $GDPpc_{jt}$: GDP per capita for exporting (i) and importing (j) country in year t.	+	WDI
5	Absolute Difference in GDP Per Capita (PCGDPD)	$PCGDPD_{it}$ & $PCGDPD_{jt}$: absolute per capita differential for country (i) and country (j) in year t.	+	
6	Bilateral Exchange Rate (BER)	Local (Pakistan) currency value per unit of foreign currency	+	WDI & IFS
7	Trade Openness	Trade_Openi & Trade_ Openj is the trade openness of country (i) and country (j)	+	WDI
8	Relative Human Capital Endowment	RelativeHCapijt: It is a ratio of the exporter's index of human capital per person to the importer's index of human capital per person.	+	Penn World Table
9	Relative Political Risk Index	Ratio of importer's political risk index over the exporter's one	-	International Country Risk Guide (PRS).
10	Foreign Direct Investment	FDIi and FDIj represent Net Inflows	+	WDI2019
11	Credit to GDP Ratio	Credit_GDPi & Credit_GDPj: Proxy for financial development	+	WDI 2019
12	Fixed Broad Band subscription (per 100 people)	Fixed_BBi & Fixed_BBj represent a proxy for ICT	+	WDI 2019
13	Logistic Performance Index (LPI)	LPIi and LPIj	+	World Bank
14	Distance	Distanceijt: geographical distance between exporting country (i) and trading partner (j) and is expressed in km between the capital cities.	-	CEPII
15	Border/Adjacency (Dummy)	1: if country i and j share a common border, 0=otherwise	+	CEPII
16	Language (Dummy)	1: if country i and j share a common language.	+	CEPII

		0: otherwise	
17	Free Trade Arrangement (FTA) (Dummy)	1: if country i and j have signed the agreement. 0: otherwise	+
18	Regional Trade Agreement (RTA) (Dummy)	1: if both countries are the members of same regional trading agreement. 0: otherwise	+

4.6: Additional Market Access frontier (AMAF)

In this section, we will use AMAF to compute the trade potential of Pakistan with its trading partners by "matching the total export supply for a given commodity (or group of commodities/products) of a country with the total import demand for that commodity of a trading partner". Although, there are various methods to predict the likely trade potential between the countries and the gravity model is one of the most popular econometric methods in this regard. As we have already mentioned that we will use this method to compute the overall trade potential of Pakistan, however, it's use at the sectoral/product level is a cumbersome job. Butt (2008) has mentioned that the estimation of the gravity model at the sector-level requires to have sector-level specific production data instead of aggregate GDP variable which in the case of developing countries is difficult to get. To avoid this problem, Butt (2008) has used the exporter and importer fixed effects. In literature we find a trade potential index to analyse the commodity wise potential. This method is simple and easy which produces more realistic results despite being intuitive (Taneja, 2013). Mukherji (2002) was the first to use the concept in terms of "potential trade". Later on, Mukherji (2005, 2007) used it in his other studies followed by Bano (2013) and Taneja (2013). These researchers used this method to assess the magnitude of future trade possibilities in products.

Mukherji (2005) used the trade potential index as "bilateral potential trade (BPT)" to evaluate the benefits of the negative list approach in the economic integration of the "Asia-Pacific region". Earlier in 2002, Mukherji used this method to identify the products under potential trade to specify the supply-demand possibilities existing in the region. He is of the view that to stimulate regional trade, it is indispensable that the products identified for liberalization have ample trade potential. This implies that the identified products have sufficient demand in the receiving countries, and enough supply capabilities in the source countries. Mukherji (2007), is of the view that by "matching the import demand with the export supply of a given commodity, an estimate can be made of the possibility of trade expansion

under the most favourable competitive conditions, after subtracting existing trade". Bano "et al" (2013) has preferred this method as proposed by Mukherji due to its better performance relative to other methods. They have used this method to examine the importance of products in the context of high potential and mentioned that "the trade potential between two trading partners can be estimated by matching the total export supply for a given commodity (or group of commodities/products) of a country with the total import demand for that commodity of a trading partner". Similarly, Taneja (2013) has identified the products which have trade potential as those with sufficient demand in the receiving country and ample supply capabilities in the source country. Taneja defines that "trade potential for any commodity is given by Min (SE, MI) - ET where SE, MI, and ET are supplier's global exports, market's global imports, and existing trade respectively, between the supplier and the receiver".

The same method will be used in the present study to estimate the trade potential by-products as used by Mukherji (2002, 2005 & 2007), Bano (2013) and Taneja (2013) in their studies. In 2014, Mukherji used the concept of trade potential index under the term "Additional Market Access Frontier (AMAF)" to reveal a country's market access frontier as given below:

Additional Market Access Frontier (AMAF)

$$\boldsymbol{AMAF = \sum_{i=0}^{n} \min(SEi, MIi) - ETi} \qquad (4.23)$$

where: "*min* means having the smallest or minimum value of the pair of *SE* and *MI"*

SE – "Suppliers Global Exports (e.g., Pakistan's Global Exports)"

MI – "Markets Global Imports (e.g., Trading Partner's Global Imports)"

ET – "Existing Bilateral Exports (PAK Export of a product to a trading partner",

Summation over products gives the total or sectoral AMAF over all products/sectors. In the present study, we will use the AMAF approach to calculate the product-wise potential, however, we will not take the summation. It is important to mention here that through the gravity model we will first choose the countries with higher trade potential and then to analyze the product-wise potential in those countries, we will employ the AMAF approach. The products used in the analysis with their codes are given below:

0 = Food and live animals

1 = Beverages and tobacco

2 = Crude materials, inedible, except fuels

3 = Mineral fuels, lubricants, and related materials

4 = Animal and vegetable oils, fats, and waxes

5 = Chemicals and related products

6 = Manufactured goods classified chiefly by material

7 = Machinery and transport equipment

8 = Miscellaneous manufactured articles

4.7. Concluding Remarks

In this part, we have discussed the data and the methodology to be used in this study to evaluate the potential in merchandise and services trade/exports and to examine the effect of trade facilitation on trade flows. We briefly discussed the data framework for the gravity model and found that panel data is the preferred one. Similarly, the discussion has enabled us that there are numerous estimation techniques to estimate the gravity model with their own benefits and weaknesses, however, the PPML method will be used as a preferred method in addition to OLS. This will also enable us to check the relative robustness of the model. In addition, we discussed the method of trade potential index to find the sector-wise trade potential and found that it produces more realistic results despite being more intuitive and easier to use. Although in literature, we can find many studies conducted on the sectoral level trade potential based on the gravity model, however, it requires sector level-specific production data instead of aggregate GDP. It is not easy to get the data, particularly, for developing countries. As in our sample data, there is a considerable number of developing countries so to avoid this cumbersome job, we have chosen the trade potential index to identify the sectors with higher trade potential.

CHAPTER 5: ESTIMATION OF GRAVITY MODEL & RESULTS

This chapter is comprised of two parts. The first part includes the estimation of the gravity model for both the merchandise and services trade to find out the factors that are important in affecting the trade volume between Pakistan and its trading allies. To estimate the determinants, Pooled, Fixed Effect, Random Effect and PPML estimation method would be used. In addition, we will estimate the extended gravity model to determine the factors of trade/exports in various commodity groups. The second part will compute the impact of trade facilitation on merchandise trade/exports based on the gravity model.

5.1. Diagnostics/Test

To check heteroscedasticity in estimates of merchandise and services trade, the Breusch-Pagan / Cook-Weisberg test has been used. Similarly, partial correlation and then "variance inflation factor (VIF)" has been used to identify the problem of "multicollinearity" (Appendix-III). The results have shown the presence of multicollinearity as well as heteroscedasticity. Regarding the problem of multicollinearity, Binh "et al" (2011) has termed it as a statistical phenomenon that is common in the gravity model estimation. They are of the view that the effect of multicollinearity on estimated coefficients can be controlled owing to the large sample size. As we have a large sample size, therefore, we expect that the problem of multicollinearity will not affect the estimated results. On the other hand, to resolve the issue of heteroscedasticity the Feasible Generalized Least Square (FGLS) method can be used. However, Hoechle (2007) has mentioned two reasons due to which the FGLS method is not suitable for "medium- and large-scale" micro econometric panels i.e "when the panel's time dimension T is smaller than its cross-sectional dimension N and second, it produces unacceptably small standard error estimates". To avoid this problem, Beck & Katz (1995) suggested to estimate OLS coefficients by using panel corrected standard errors (PCSE). Nevertheless, Hoechle (2007) is of the view that the PCSE method suggested by Beck and Katz's (1995) estimates the full N × N cross-sectional covariance matrix and this estimate will be inaccurate if the ratio T/N is small. In this context, Hoechle suggests using the "Driscoll and Kraay's approach" because it is superior to other large T consistent covariance matrix estimators like the FGLS or PCSE approach because it eliminates the insufficiencies of other large T consistent covariance matrix estimators like the FGLS or PCSE approach, which are often incorrect when the cross-sectional dimension N is large.

5.2. Panel Cross-Section Dependence (CD) Test

Over the past few years, the "cross-section dependence" in macro panel data has gained much importance which may be attributed to the possible correlation that transpires in response to a global financial crisis in recent years and in the past oil crisis during the 70s and spill over effects of various domestic factors between the countries and regions (Irshad "et al", 2018). The presence of cross-section dependence may lead to bias results; therefore, it is imperative to first check if the data is "cross-sectional dependent or independent", or whether the residuals are correlated across the countries. In view of the above, the Pesaran (2004) residual CD test has been used which is based on "simple averages of pair-wise correlation coefficients" of OLS residuals from individual regressions. According to Pesaran the test is considered to be valid even when T is small and N large and can be applied to balanced and unbalanced panels. It follows a standard normal distribution with the assumption of symmetrically distributed errors.

The hypothesis of the CD test states that:

H_0: the residuals are not correlated or cross-sectional independent.

H_1: cross-sectional dependence is present.

Table 5.1: Pesaran's (2004) CD test for Merchandise Trade

Variable	CD test	P-value
lnTrade	218.5	0.000
lnGDPij	402.1	0.000
lnPopij	435.5	0.000
lnABSGDPD	234.5	0.000
lnBER	65.3	0.000
lnTrade_Openi	438.1	0.000
lnTrade_Openj	86.5	0.000

The CD test results are presented in Tables 5.1 and 5.2 for both the goods and services trades. The test is based on only time-variant variables of the gravity model. We may reject the null hypothesis and conclude that the data has cross-sectional dependency based on the findings.

Table 5.2: Pesaran's(2004) CD test for Services Trade

Variable	CD test	P-value
lnTrade	5.0	0.000
lnGDPij	217.2	0.000
lnPopij	234.9	0.000
lnBER	126.9	0.000
lnTrade_Openi	235.7	0.000

lnTrade_Openj	45.4	0.000
Relative_Humancapital	144.7	0.000
lnFDIi	235.7	0.000
lnFDIj	6.0	0.000
lnCredit_GDPj	25.2	0.000
lnCredit_GDPj	235.7	0.000
lnFixedBBi	235.7	0.000
lnFixedBBj	188.8	0.000

In the presence of CD, Hoechle (2007) has suggested estimating the "pooled OLS/WLS and FE (within) regression models with Driscoll and Kraay (DK)" standard errors. In the presence of cross-sectional dependence, the use of the standard technique will produce inconsistent and biased results (Hoechle, 2007) and (Driscoll & Kraay, 1998,). According to Hoechle (2007), the proposed DK nonparametric covariance matrix estimator generates heteroscedasticity compatible standard errors that are robust to a general form of spatial and temporal dependence. Hoechle (2007) has used the "OLS, White, Rogers and Newey-West standard errors" in his study and concluded that these are well-calibrated when the residuals of a panel regression are homoscedastic as well as spatially and temporally independent. Based on the above discussion, the gravity model will be estimated through pooled, FE and RE models using Driscoll Kraay (DK) standard errors. Similarly, the PPML estimation method would also be used to check the robustness. For the purpose of estimation, both equations (4.7) and (4.8) would be used with total trade and export as a dependent variable respectively. This will allow us to evaluate the trade, as well as export determinants and then we will compute the trade and export potential on the basis of estimated coefficients from the PPML method.

5.3. Impact of Geographical and Economic Factors on Merchandise Trade/Exports

5.3.1. Estimation of Gravity Model with Trade as Dependent Variable

I. Basic Gravity Model

First, we calculated the fundamental gravity model, specifically equation (4.6), for the time span t = 1980-2017 and a cross-section of i = 101 countries, including Pakistan (the jth country). Hence there are 101 pairs of cross observations for Pakistan's trade. The basic gravity model has been estimated through OLS and PPML estimation method. While estimating the model through least square, we have used pooled, FE, and RE model with Driscoll Kraay standard errors. Table 5.3 summarizes the predicted outcomes. The findings indicate that the

conventional variables i.e product of GDP and distance are significant and carry the anticipated signs with reasonable magnitude. It can be inferred that the trade ties of Pakistan with the countries included in the sample will increase significantly with a rise in the product of GDP. Similarly, results indicate that with the increase in distance between Pakistan and its trading partners, the trade is expected to decrease. It suggests that a larger distance between the trading partner may increase the transport and transaction cost. Overall, the basic gravity model is theoretically consistent for Pakistan and reaffirms that the trade is positively dependent upon the economic size and negatively associated with the distance between the trading partners.

Table 5.3. Basic Gravity Model of Trade in Goods

VARIABLES	Pooled lnTradeij	FE lnTradeij	RE lnTradeij	PPML Tradeij
lnGDPij	0.85***	0.58***	0.59***	0.54***
	(-0.03)	(-0.04)	(-0.04)	(-0.01)
lnDistanceij	-1.02***	-2.18***	-0.90	-0.35***
	(-0.14)	(-0.22)	(-0.83)	(-0.08)
Constant	-23.54***	0	-11.60*	-14.85***
	(-1.76)	(0)	(-5.9)	(-0.78)
Observations	3,432	3,432	3,432	3,623
R-squared	0.63		0.62	0.93
Within R squared		0.44		
Number of groups	101	101	101	

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

II. Augmented Gravity Model

The results based on the gravity model reported in table 5.3 indicate low explained variation as shown by the value of R-Squared. This clearly shows that not only GDP and distance is an important factor to influence the trade relations between Pakistan and its trading partners but there are some additional important factors which have to be included in the analysis. Therefore, the model has been extended by including other important variables with results described in table 5.4.

Table 5.4. Augmented Gravity Model of Trade in Goods

VARIABLES	Pooled lnTradeij	RE lnTradeij	FE lnTradeij	PPML (1) Tradeij	PPML(2) Tradeij
lnGDPij	0.45***	0.44***	0.44***	0.45***	0.65***
	(0.08)	(0.07)	(0.08)	(0.04)	(0.04)
lnPopij	0.64***	0.54***	0.53**	0.02	-0.29**

Table 5.4. Augmented Gravity Model of Trade in Goods

VARIABLES	Pooled lnTradeij	RE lnTradeij	FE lnTradeij	PPML (1) Tradeij	PPML(2) Tradeij
	(0.09)	(0.18)	(0.22)	(0.09)	(0.15)
lnABSGDPD	0.32***	0.09*	0.06	0.19***	-
	(0.04)	(0.05)	(0.06)	(0.04)	-
lnBER	0.02	-0.03**	-0.04*	-0.07***	-
	(0.01)	(0.02)	(0.02)	(0.02)	-
lnTrade_Openi	2.28***	1.00***	0.94***	0.58***	-
	(0.54)	(0.33)	(0.31)	(0.16)	-
lnTrade_Openj	0.45***	0.38***	0.38***	0.20***	-
	(0.10)	(0.13)	(0.13)	(0.07)	-
lnDistanceij	-1.30***	-1.11	-4.13***	-0.47***	-1.75***
	(0.14)	(0.83)	(0.57)	(0.12)	(0.58)
Border	-0.71***	-0.44	0.00	5.93***	-0.69**
	(0.06)	(0.80)	(0.00)	(0.91)	(0.28)
Comlang_Off	0.62***	0.37	0.00	-3.36***	-1.05***
	(0.04)	(0.38)	(0.00)	(0.56)	(0.29)
RTA	-0.94***	-0.97***	-0.91***	0.08	1.35***
	(0.13)	(0.16)	(0.16)	(0.13)	(0.47)
FTA	1.39***	0.02	0.04	0.30***	0.37***
	(0.11)	(0.25)	(0.13)	(0.08)	(0.10)
Relative_Political Risk	-	-	-	-	0.67***
	-	-	-	-	(0.11)
Constant	-36.08***	-26.85***	0.00	-14.48***	1.84
	(2.97)	(9.47)	(0.00)	(2.24)	(8.99)
Observations	3,313	3,313	3,313	3,465	
R-squared	0.68			0.95	
Number of groups	100	100	100		

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

Though we have used the Pooled OLS, FE and RE model, yet we focus on estimation results based on the PPML estimator. PPML has become an attractive estimator for applied policy researchers working with gravity models. It is particularly consistent when fixed effects are present, which can be entered as dummy variables as in simple OLS. As far as the explanation of the estimated coefficients through the Poisson model is concerned, it follows the same form as under OLS (Shepherd, 2016). The dependent variable is expressed in levels instead of a log, while the independent variables are in log forms and can be interpreted as simple elasticities. The estimated coefficient obtained in table 5.4, Column (4) shows that the

product of GDP and distance are theoretically consistent with the anticipated signs. Similarly, the coefficients of absolute GDP per capita differential, trade openness ratio of Pakistan and its trading partners, distance and FTA are not only significant but also carry the expected signs. To evaluate two contrasting hypothesis i.e Linder and Hecksher-Ohlin (H-O) hypothesis, we have used absolute GDP per capita differential. The objective is to deduce whether similar countries engage in more trade or dissimilar countries. The estimated coefficient is significantly positive suggesting that an increase in the dissimilarity between Pakistan's per capita GDP's and that of its trading allies would boost the bilateral trade. The Hecksher-Ohlin (H-O) hypothesis (influence of factor endowment differences) would be supported by a positive sign, whereas the Linder hypothesis would be supported by a negative sign (influence of style, taste differences). Hence our results support the H-O hypothesis.

The estimated coefficient of the bilateral exchange rate is not only negative but also small in magnitude. It implies that Pakistan's trade is less responsive to any change in the exchange rate. Pakistan's exports base is narrow and highly concentrated in a few items. Similarly, the country is falling behind in product diversification, value addition, sophisticated goods, and high-tech industries, making it difficult for it to compete in the global market. Hence, the exchange rate fluctuations have little impact on the performance of Pakistan's export (Ministry of Commerce, 2015). The coefficient of trade openness of Pakistan and its trading partners indicate that reducing trade barriers and opening markets would give rise to trade. However, opening Pakistan's trade would have a strong impact relative to the partner country's trade openness. The results imply that the rise in trade would be on account of the increase in imports if Pakistan lowers trade barriers and expands its markets. Resultantly it could further deteriorate Pakistan's trade balance. On the other hand, openness in Pakistan's partner countries would be more supportive for expanding its exports (Gul & Yasin, 2011). The coefficient of the language dummy is though significant but carries a negative sign. Irshad "et al" (2018) has also found a negative effect of the official language on Pakistan's bilateral trade. In our sample, we have only 28 countries out of 101 which have the same official language as Pakistan, while the trade is higher with those countries whose official language is different from Pakistan.

Unlike pooled OLS, RE and FE, the PPML has estimated theoretically consistent coefficient for common border dummy. It shows a significantly positive impact on raising bilateral trade. On the other hand, RTA dummy is insignificant. The estimated result is broadly

in line with the real situation, according to which Pakistan has not been able to gain the benefits despite being a member of SAFTA and ECO. Instead, the trade between Pakistan and the member countries is relatively low in magnitude due to numerous tariff and non-tariff barriers. On the contrary, the study has found that FTA may boost bilateral trade flows between the countries by a significant magnitude. It is pertinent to mention here that the gravity model with the PPML technique has also been estimated by excluding the variables of population and RTA dummy with an aim to check whether the exclusion of insignificant variables could improve the results. However, no substantial change in the results have been observed, thus we retain the variables in the final analysis.

III. Impact of Institutional Differences

In this part, the gravity model has been calculated in an effort to assess the effect of institutional gaps between Pakistan and its trading partners by including ***political risk index***[10] along with other variables of gravity model i.e., GDP, Population, distance, border, language, RTA and FTA. The findings are presented in column 5 of Table 2. This index explains the quality of institutions in a given country and demonstrates that bilateral trade will increase with the improvement in the quality of formal institutions. It reduces the uncertainty about contract enforcement and general economic governance thus it may not only lead to lessen the transaction costs but also help in raising the trust level in the process of economic transactions (De Groot "et al", 2003). The negative sign of the variable indicates that a relative improvement in the exporter's political risk index tend to increase the trade while relative improvement in the partner country's institutions reduces the trade. This suggests the general direction of trade in the world from North to South. Due to better institutions in the advance countries, they may export more than the less-developed economies which have a relatively low quality of institutions (Mehchy "et al", 2015). Our results confirm that improvement in the relative political index is important for Pakistan to enhance its trade.

[10] The variable is the composite index of "voice and accountability", "political stability" and "absence of violence", "Government effectiveness", and "regulatory quality", "rule of law" and "control of corruption". "A simple average of the scores of all these indicators has been calculated in order to make it composite thus it shows the average effect on bilateral trade/flows" (Sheikh, et.al, 2018). For the purpose of analysis, "relative political risk index has been calculated which is the "ratio of importer's political risk index over the exporter's one" (Mehchy et.al, 2015). The index covers only 87 countries for the period between 2002 and 2017. The data is obtained from the International Country Risk Guide (PRS).

5.4. Comparison between PPML, Pooled, FE and RE

If we compare PPML results with Pooled, FE and RE model, the main difference is visible in the number of observations, as it is greater with Poisson regression. This simply implies that there is a significant number of zero observations in the dataset. While in the case of others, we have witnessed that these observations were dropped as our dependent variable was in log form. However, Poisson regression has naturally included these observations as the dependent variable is in level form. According to the results estimated through PPML, the coefficient of GDP has been found as one of the main factors of bilateral trade. Similarly, the coefficient of absolute GDP per capita, trade openness ratio, distance, and FTA not only significant but also carry expected signs. Nevertheless, unlike Pooled, FE and RE, PPML has estimated theoretically consistent coefficients for border dummy while for the bilateral exchange rate, the result is significant but with a negative sign. Based on results, the following observations can be considered which are in accordance with Santos Silva (2006). The distance elasticity is large under OLS. Sharing border has shown a theoretically consistent sign under the Poisson method. While it has a negative effect under OLS. The language coefficient is negative but significant. The two techniques produce a theoretically consistent estimate for the FTA dummy; however, the magnitude of the dummy is relatively smaller under the PPML. Regarding other coefficients, we have observed the same effect of the product of GDP under OLS and PPML, in fact, the magnitude of the coefficient is almost the same. Similarly, the trade openness ratio is positive and significant under the two techniques but smaller in magnitude in the case of PPML. PPML is more efficient in the presence of zero trade flows as it estimates the model in its multiplicative form. In this regard, Santos Silva (2006) has opined that "log-linearization of the empirical model in the presence of heteroscedasticity leads to inconsistent estimates". Thus, we have selected the model based on PPML to estimate the trade and export potential for Pakistan.

5.5. Factors Affecting Trade in Various Commodity groups

After estimating the determinants of merchandise trade at the aggregate level, we have also estimated the factors that can influence the trade in various commodity groups using the PPML estimation method. According to the results, except for "animal and vegetable oils", the size of the economy measured by the GDP has a significant impact on trade expansion in all other commodities. However, the impact is strong in the case of trade in "machinery and transport" followed by "food and live animals".

Table: 5.5- Factors Affecting Trade in Various Commodity Groups (SITC-Rev-I)

VARIABLES	Food Live Animal Trade	Beverages & Tobacco Trade	Crude Material Trade	Mineral fuels Trade	Animal & Veg. Oil Trade	Chemicals Trade	Manufactured Goods Trade	Machinery & Transport Trade
lnGDPij	0.59***	0.55***	0.55***	0.48***	-0.28	0.33***	0.40***	0.72***
	(0.05)	(0.07)	(0.07)	(0.16)	(0.43)	(0.07)	(0.08)	(0.10)
lnABSGDPD	-0.02	-0.00	-0.00	0.00	1.53**	0.09	0.32***	0.24***
	(0.04)	(0.07)	(0.07)	(0.19)	(0.65)	(0.07)	(0.09)	(0.09)
lnPopij	-0.46***	-0.26	-0.26	-0.03	0.20	1.05***	-0.27	-0.68***
	(0.14)	(0.18)	(0.18)	(0.29)	(0.72)	(0.22)	(0.20)	(0.23)
lnBER	-0.07**	-0.11***	-0.11***	0.14***	-0.14	-0.14***	-0.08***	-0.42***
	(0.03)	(0.03)	(0.03)	(0.05)	(0.13)	(0.05)	(0.02)	(0.07)
lnTradeOpeni	0.70***	0.19	0.19	1.42***	0.02	0.72***	0.47**	0.07
	(0.24)	(0.36)	(0.36)	(0.32)	(0.78)	(0.20)	(0.19)	(0.33)
lnTradeOpenj	0.02	0.19	0.19	1.56***	-0.44	0.07	0.13	0.25
	(0.07)	(0.14)	(0.14)	(0.23)	(0.41)	(0.10)	(0.10)	(0.16)
lnDistij	-0.35*	-1.34***	-1.34***	1.53***	-2.56	-0.30	0.42**	-0.00
	(0.19)	(0.23)	(0.23)	(0.57)	(2.28)	(0.26)	(0.20)	(0.36)
Border	2.79***	1.73***	1.73***	10.40***	3.72***	0.07	1.22***	0.53
	(0.35)	(0.37)	(0.37)	(2.34)	(1.12)	(0.51)	(0.46)	(0.70)
Lang	-5.87***	-3.68***	-3.68***	-1.84	-1.68	1.79	-8.50***	-5.79***
	(1.20)	(1.34)	(1.34)	(1.58)	(2.96)	(1.55)	(1.20)	(1.40)
RTA	0.12	-0.23	-0.23	-2.23***	1.23*	1.67***	0.69***	0.31
	(0.20)	(0.19)	(0.19)	(0.47)	(0.73)	(0.30)	(0.14)	(0.24)
FTA	0.06	-0.18	-0.18	1.20***	0.17	0.49***	0.64***	0.33*
	(0.13)	(0.21)	(0.21)	(0.42)	(0.28)	(0.11)	(0.11)	(0.17)
Constant	-5.12	-1.39	-1.39	-41.38***	21.34	-48.97***	-10.15**	-8.86
	(3.39)	(3.89)	(3.89)	(5.82)	(35.54)	(4.82)	(4.11)	(5.81)
Observations	3,465	3,465	3,465	3,284	3,199	3,465	3,465	3,465
R-squared	0.78	0.76	0.76	0.96	0.75	0.92	0.93	0.92

"Robust standard errors in parentheses"

*** p<0.01, ** p<0.05, * p<0.1

With regard to the two contrasting hypotheses i.e Linder and Hecksher-Ohlin (H-O) hypothesis, findings suggest that the increase in the difference between the per capita GDP of Pakistan and its trading partners will lead to an increase in the bilateral trade in "animals and vegetable oils", "manufactured goods" and "machinery and transport". Thus, the result is in favour of the H-O hypothesis (influences of factor endowments differences). The impact of the population is significantly positive for the trade in "chemicals and related products", while for "food and live animals" and "machinery & transport" population has a significantly negative impact. As far as the impact of the bilateral exchange rate is concerned, the coefficient is positive for "mineral fuels" but negative in the case of all commodity groups. The results suggest that if there is a one percent devaluation in the Pakistani Rupee, the trade in all commodity groups will reduce significantly. This result is again a confirmation of the fact that

Pakistan's trade is insensitive to any change in exchange rate owing to the narrow base and highly concentrated product basket.

The estimated coefficient of Pakistan's trade openness is significantly positive for trade in "food and live animals, mineral fuels, chemicals and manufactured goods". However, the trade in mineral fuels is strongly influenced by both trade openness in Pakistan and its trading partners. Distance has a significantly negative impact on trade in "food and live animals, beverages and tobacco and crude material". It implies that the higher distance between the trading partners will lead to a decline in trade in these respective commodities. Contrary to it, the coefficient of distance is significantly positive for trade in mineral fuels and manufactured goods. The coefficient of the border dummy has shown a significant positive impact on trade in all commodity groups except for chemicals & related products and machinery & transport. The impact of border dummy is highly significant for trade in mineral fuels. Whereas the dummy of a common language has shown negatively in all commodity groups except for trade in chemicals. However, the negative impact is highly significant except for trade in mineral fuels and animals and vegetable oils. The RTA dummy is highly significant and positive in the case of trade in chemicals. This suggests that Pakistan can expand its trade in chemicals with its trading partners if they are a member of the same RTA. Whereas the FTA dummy has shown a significant positive impact on trade in mineral fuels, chemicals and manufactured goods. It suggests that FTA between Pakistan and trading partners would significantly increase trade in the above commodity groups, however, it will strongly influence the trade in mineral fuels.

5.6. Estimation of Gravity Model with Export as Dependent Variable

Consolidated results of all four methods using basic and augmented gravity model are presented in table 5.6 and 5.7. Here we will interpret the results estimated through PPML.

I. Basic Gravity Model

The basic gravity model for exports implies that Pakistan's and its partner country's income level and distance are major determinants that can influence the export flows. Results imply that exports are directly proportional to the economic size and inversely associated with the distance between Pakistan and its trading partners.

Table: 5.6- Basic Gravity model for Exports in Goods

VARIABLES	Pooled lnExportsij	FE lnExportsij	RE lnExportsij	PPML Exportsij
lnGDPi	0.14*	0.38***	0.28***	0.15***
	(0.08)	(0.12)	(0.10)	(0.05)
lnGDPj	0.94***	0.76***	0.87***	0.87***
	(0.01)	(0.10)	(0.05)	(0.05)
lnDistanceij	-0.95***	-2.22***	-0.85	-0.61***
	(0.17)	(0.30)	(0.91)	(0.13)
Constant	-9.18***	0.00	-11.94*	-11.11***
	(1.28)	(0.00)	(6.33)	(1.17)
Observations	3,402	3,402	3,402	3,622
R-squared	0.62			0.91
Number of groups	101	101	101	
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

II. Augmented Gravity Model

Before we discuss the results, it is pertinent to explain that we have estimated the model without the variable of population. With the inclusion of population, we found the negative impact of the host country's GDP and partner's country population, while the coefficients of absolute per capita GDP differential, bilateral exchange rate and FTA were highly insignificant. We again estimated the model by excluding the variable of population, resultantly, the significance level of the variable has improved, as well as we found a positive effect of "GDP, absolute GDP per capita GDP differential and bilateral exchange rate." It may also be important to explain that we attempt to estimate the model by excluding other insignificant variables like absolute per capita GDP differential, bilateral exchange rate and FTA one by one, however, there was no significant change in the results. Therefore, we keep these variables in our final model. Going forward, the results estimated through OLS and PPML provide evidence of the positive impact of GDP on exports between Pakistan and its trading allies. However, the magnitude of the host country's GDP is small relative to the GDP of partner countries. Similarly, the significance level is high when estimated through PPML relative to OLS. According to the results, a one percent rise in Pakistan's GDP leads to an increase the bilateral exports by 0.16 percent. But if the GDP of the partner's country rises by one percent, it will significantly increase the exports by 0.78 percent. It shows that the income level of partner countries may have a strong impact on Pakistan's exports. The absolute per capita GDP differential coefficient is positive, but it is small in magnitude. According to the result, the increase in the difference between the per capita GDP differential will give a boost to Pakistan's exports to its trading partners.

Table: 5.7- Augmented Gravity Model for Exports in Goods

VARIABLES	Pooled lnExportsij	RE lnExportsij	FE lnExportsij	PPML Exportsij
lnGDPi	0.00	0.16*	0.27	0.16**
	(0.07)	(0.09)	(0.16)	(0.07)
lnGDPj	1.10***	1.01***	0.87***	0.78***
	(0.03)	(0.08)	(0.17)	(0.08)
lnABSGDPD	-0.10**	-0.03	0.01	0.08*
	(0.04)	(0.09)	(0.09)	(0.04)
lnBER	-0.07***	-0.11***	-0.12***	0.00
	(0.02)	(0.01)	(0.02)	(0.02)
lnTrade_Openi	0.39	0.51	0.57	0.55***
	(0.52)	(0.63)	(0.68)	(0.19)
lnTrade_Openj	0.59***	0.52***	0.52***	0.33***
	(0.13)	(0.13)	(0.15)	(0.10)
lnDistanceij	-1.02***	-1.02	-2.66***	-1.31***
	(0.18)	(0.89)	(0.51)	(0.17)
Border	-1.45***	-0.86	0.00	0.74***
	(0.20)	(1.49)	(0.00)	(0.27)
Comlang_Off	0.70***	0.60*	0.00	-2.10***
	(0.05)	(0.35)	(0.00)	(0.30)
RTA	-0.11	-0.44*	-0.43**	-0.22**
	(0.16)	(0.25)	(0.18)	(0.09)
FTA	1.40***	0.03	0.01	0.08
	(0.12)	(0.32)	(0.25)	(0.10)
Constant	-12.14***	-14.50*	0.00	-6.79***
	(3.47)	(7.27)	(0.00)	(2.45)
Observations	3,286	3,286	3,286	3,467
R-squared	0.66			0.91
Number of groups	100	100	100	

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

In terms of the effect of bilateral exchange rates on exports, the findings from OLS indicate that devaluation will have a negative impact on exports., while estimated result through PPML is insignificant. The magnitude of the coefficient is also very small which may be another evidence to this fact mentioned earlier in this chapter, that Pakistan's export is insensitive to any change in exchange rate owing to the narrow base and highly concentrated export in few items. Both techniques have provided a strong influence of trade openness in the partner's country on Pakistan's export, however, the magnitude is relatively small when the coefficient is estimated through PPML. The result estimated through PPML indicates that a one percent rise in partner's country's openness may give a 0.33 percent rise in Pakistan's

export. Contrary to it, if Pakistan opens its trade by one percent, it will significantly increase Pakistan's exports to its trading partners. The distance coefficient is highly significant and has an expected a negative sign. As far as Border dummy is concerned, it has shown negative as well as insignificant impact when estimated through OLS, however, estimating the coefficient with the PPML method ensure this fact that sharing a common border may have a substantial impact on Pakistan's export. However, the dummy of a "common language" has a significantly negative effect on Pakistan's exports. Results are in line with the facts that have been mentioned earlier. Pakistan is sharing a common official language with only 28 countries from the sample of 101, while with the rest of the countries with whom Pakistan does not share the same language, the volume of trade is relatively higher. For instance, currently, Pakistan's trade is higher with China, Saudi Arabia, USA, UAE, Germany, and the UK etc. Amongst these top trading partners, only with USA and UK Pakistan is sharing a common language.

The impact of the RTA dummy is significantly negative on Pakistan's export in the case of both techniques. A negative sign implies that RTA is trade diverting between the members. However, FTA is found to be positive but insignificant when estimated through PPML. Particularly, with regard to regional trading agreements like ECO and SAPTA/SAFTA, they have not been proven very beneficial owing to various type of barriers whether tariff or non-tariff. It is important to mention that the concepts of "South Asian preferential trade agreement (SAPTA)" and "South Asian Free Trade Area (SAFTA)" have been created under the auspices of "SAARC", and now SAFTA is being implemented, however, the implementation process is not smooth as it was expected. The major reason for the slow execution process is attributed to stalled trade relations between the two important members i.e Pakistan and India. The volume of trade is very low between the two countries on the back of political conflicts and tariff & non-tariff barriers. Both countries have the potential to expand their future trade, but it has not been exploited as it was expected. In addition, by offering better tariff incentives, India has formed bilateral trade agreements with the rest of the SAARC member states. These two important factors have significantly undermined the effective implementation of SAFTA; hence the SAARC region has not been able to gain the benefits of SAFTA. It is pertinent to mention that FTAs are the most significant and preferred trading agreement among distinct kinds of RTAs, as it enables the countries to boost their access to more markets. Furthermore, the effective utilization of FTAs not only eliminate the tariffs but also assist in addressing other non-tariff barriers. Furthermore, FTAs increase access to a

broader range of competitively priced goods and services, as well as innovative and updated techniques.

5.7: Asymmetric Description of Gravity Model of Trade in Goods

The previous section has explained the results while considering the symmetric impact of the exchange rate. In this section, we have estimated the model with the asymmetric impact of exchange. There is very limited literature in which the impact of asymmetric exchange rate on trade/exports has been analysed under the gravity framework [(Dreyer & Fedoseeva (2016); Demian & Mauro, 2015)]. Most of the studies have used non-linear autoregressive distributed lag (NARDL) to investigate the presence of the asymmetric impact of exchange rate on trade/exports. Moreover, to decompose the effect of exchange rate into depreciation and appreciation, a partial sum process has been used [(Apanisile & Oloba (2020); Bahmani & Nouira (2020); Hayet Jihene El bejaoui (2013). This part of the present study is thus an attempt to focus on additional light on the "impact of exchange rate" changes under the gravity framework. Based on the estimated results, we observe that there is a significantly greater response "(in absolute terms)" of trade and export values to depreciation relative to appreciation.

Table:5.8- Gravity Model of Trade (Asymmetric Specification)

VARIABLES	Pooled lnTradeij	FE lnTradeij	RE lnTradeij	PPML Tradeij
	0.46***	0.54***	0.44***	0.58***
lnGDPij	(0.08)	(0.08)	(0.07)	(0.04)
	0.61***	0.81***	0.53***	0.12
lnPopij	(0.09)	(0.29)	(0.16)	(0.09)
	0.31***	0.04	0.09*	0.17***
lnABSGDPD	(0.04)	(0.06)	(0.05)	(0.04)
	0.02*	-0.43***	-0.03*	-0.37***
BER_POS	(0.01)	(0.14)	(0.02)	(0.04)
	0.02	-0.00	-0.03**	-0.01
BER_NEG	(0.01)	(0.03)	(0.02)	(0.01)
	2.28***	0.87**	1.00***	0.47***
lnTrade_Openi	(0.55)	(0.37)	(0.33)	(0.15)
	0.42***	0.40***	0.38***	0.27***
LnTrade_Openj	(0.10)	(0.12)	(0.13)	(0.07)
	-1.27***	5.86*	-1.06	-66.28***
lnDistanceij	(0.15)	(3.46)	(0.95)	(8.00)
	-0.51***	0.00	-0.25	-294.45***
Border	(0.10)	(0.00)	(1.22)	(35.65)
	0.58***	0.00	0.33	210.45***
Comlang_off	(0.05)	(0.00)	(0.47)	(25.14)
	-0.98***	-1.09***	-0.97***	-0.13
RTA	(0.13)	(0.26)	(0.17)	(0.13)
FTA	1.36***	-0.02	0.02	0.21***

Table:5.8- Gravity Model of Trade (Asymmetric Specification)

VARIABLES	Pooled lnTradeij	FE lnTradeij	RE lnTradeij	PPML Tradeij
	(0.10)	(0.17)	(0.24)	(0.08)
	-35.85***	0.00	-27.15**	551.33***
Constant	(2.97)	(0.00)	(10.13)	(69.04)
Observations	3,313	3,313	3,313	3,465
R-squared	0.68			0.95
Number of groups	100	100	100	
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Based on the PPML estimation method, results indicate that with one percent appreciation in the US dollar, the trade between the countries will decline by 0.37 percent, while exports will decline by 0.62 percent in response to one percent depreciation in the US dollar. In contrast, the impact of depreciation on trade is insignificant. On the contrary, the depreciation in the US dollar by one percent will significantly increase the exports by 0.05 percent. However, the magnitude of the impact is very small.

Table: 5.9- Gravity model of Exports (Asymmetric Specification)

VARIABLES	Pooled lnExportsij	FE lnExportsij	RE lnExportsij	PPML Exportsij
	-0.86***	-0.72***	-0.90***	-0.22**
lnGDPi	(0.08)	(0.16)	(0.13)	(0.10)
	1.13***	0.85***	0.92***	0.89***
lnGDPj	(0.08)	(0.14)	(0.16)	(0.08)
	2.60***	6.87***	3.37***	3.61***
lnPopi	(0.27)	(0.71)	(0.30)	(0.45)
	-0.04	-1.02***	0.06	-0.97***
lnPopj	(0.07)	(0.24)	(0.20)	(0.16)
	-0.11	-0.04	0.01	-0.03
lnABSGDPD	(0.07)	(0.10)	(0.11)	(0.04)
	-0.06***	-1.19***	-0.09***	-0.62***
BER_POS	(0.02)	(0.18)	(0.01)	(0.10)
	-0.06***	0.01	-0.09***	0.05**
BER_NEG	(0.02)	(0.02)	(0.01)	(0.02)
	0.40***	0.78***	0.57***	0.77***
lnTrade_Openi	(0.15)	(0.25)	(0.17)	(0.18)
	0.56***	0.40***	0.51***	0.31***
lnTrade_Openj	(0.13)	(0.12)	(0.14)	(0.10)
	-1.01***	20.35***	-0.99	-121.32***
lnDistanceij	(0.18)	(4.06)	(0.93)	(20.06)
	-1.29***	0.00	-0.56	-20.23***
Border	(0.21)	(0.00)	(1.34)	(3.68)
	0.67***	0.00	0.57	-133.53***
Comlang_off	(0.06)	(0.00)	(0.39)	(22.31)
	-0.17	-1.09***	-0.61***	-0.65***
RTA	(0.16)	(0.22)	(0.20)	(0.13)

Table: 5.9- Gravity model of Exports (Asymmetric Specification)

VARIABLES	Pooled lnExportsij	FE lnExportsij	RE lnExportsij	PPML Exportsij
	1.48***	0.07	0.15	0.17
FTA	(0.11)	(0.25)	(0.27)	(0.12)
	-39.03***	0.00	-50.61***	998.36***
Constant	(3.93)	(0.00)	(10.51)	(170.07)
Observations	3,284	3,284	3,284	3,464
R-squared	0.67			0.92
Number of groups	100	100	100	

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

Here we have tested the presence of asymmetry between the coefficients of BER_POS and BER_NEG through the "Wald test" on the null hypothesis of symmetry. According to the test: chi2 (1) = 67.71 and P value = 0.0000. Thus, the null hypothesis of symmetry may be rejected and determine the presence of asymmetrical effects of BER_POS and BER_NEG. Similarly, with regard to exports, we found a similar result on the basis of the Wald test i.e chi2 (1) = 36.45 and P value = 0.0000. Results are in accordance with the earlier studies conducted to examine the asymmetrical effect of exchange rate on trade/exports like Apanisile & Oloba (2020), Dreyer & Fedosseva (2016) and Demian & Mauro, (2015). Overall, results imply that "depreciation" and "appreciation" of the same magnitude do not have a similar effect on Pakistan's merchandise trade as well as on exports

5.8. Factors Affecting Exports in various Commodity Groups (SITC Rev-I)

According to the estimated results, Pakistan's GDP has a strong positive impact on exports in animal and vegetable oils, while the partner country's income has a highly significant impact on the export of manufactured goods. According to the estimated coefficient of per capita GDP differential, its impact is significantly positive in the case of exports in crude material while for mineral fuels, the impact is significantly negative. Hence, for exports in mineral fuels, the result is in favour of H-O while for exports in mineral fuels the result is in favour of the Linder hypothesis (influences of style taste differences) (Rahman 2009).

Table: 5.10- Important Factors Affecting Exports in Various Commodity Groups (SITC-Rev-I)

VARIABLES	Food & Live Animal	Beverages & Tobacco	Crude Material	Mineral Fuels	Animal & Vegetable Oil	Chemicals	Manufactured Goods	Machinery & Transport
Dependent	Exports	Exports	Exports	Exports	Exports	Exports	Exports	Exports
lnGDPi	0.26*	1.01	1.44***	1.31	5.95***	0.71	-0.76***	1.88***
	(0.15)	(0.77)	(0.23)	(0.82)	(1.26)	(0.48)	(0.10)	(0.57)
lnGDPj	1.12***	-0.07	0.23	0.20	0.74	0.83***	1.22***	0.11

	(0.12)	(0.43)	(0.14)	(0.57)	(0.60)	(0.18)	(0.09)	(0.25)
lnABSGDPD	-0.05	0.05	0.23***	-0.32*	0.31	-0.09	-0.02	-0.13
	(0.07)	(0.17)	(0.08)	(0.17)	(0.25)	(0.08)	(0.03)	(0.08)
lnPopi	-1.17**	0.21	-5.32***	-1.33	-15.96***	2.39	2.41***	-0.81
	(0.48)	(1.85)	(0.56)	(2.35)	(3.45)	(1.56)	(0.45)	(1.55)
lnPopj	-0.28	0.54	1.65***	-1.01*	-0.64	-1.01***	-1.27***	-1.38***
	(0.19)	(0.45)	(0.33)	(0.58)	(1.07)	(0.28)	(0.22)	(0.40)
lnBER	0.00	0.11*	-0.10***	-0.09	-0.09	0.03	-0.11**	0.02
	(0.04)	(0.06)	(0.04)	(0.17)	(0.19)	(0.05)	(0.04)	(0.06)
lnTradeOpeni	0.15	0.94	1.71***	4.75***	2.22	2.30***	0.71***	2.81***
	(0.24)	(0.92)	(0.33)	(1.25)	(1.69)	(0.37)	(0.23)	(0.49)
lnTradeOpenj	0.40***	0.10	-0.03	1.19*	-1.28	0.06	0.58***	0.05
	(0.15)	(0.23)	(0.17)	(0.70)	(0.85)	(0.09)	(0.12)	(0.32)
lnDistanceij	-1.77***	-0.36	0.72	2.05*	-1.56	-1.86***	-1.52***	-5.59***
	(0.40)	(1.25)	(0.62)	(1.07)	(1.94)	(0.59)	(0.40)	(1.13)
Border	-0.20	-1.64	-0.84	13.30***	-1.46	5.47***	4.02***	3.89***
	(0.57)	(2.19)	(0.98)	(2.57)	(2.78)	(0.80)	(0.65)	(1.49)
Comlang_Off	-1.37**	-2.13	0.91	4.61**	-1.38	-3.32***	-3.70***	-10.69***
	(0.69)	(2.10)	(1.18)	(1.95)	(3.31)	(0.86)	(0.73)	(1.87)
RTA	-0.48**	0.57	0.13	-0.95	1.35	-0.58	0.30**	-0.44
	(0.19)	(0.55)	(0.23)	(0.68)	(1.51)	(0.42)	(0.13)	(0.37)
FTA	0.32*	0.23	0.32	-0.82	0.40	-1.02***	0.33**	-0.86**
	(0.18)	(0.37)	(0.23)	(0.75)	(0.89)	(0.21)	(0.13)	(0.43)
Constant	13.07*	-34.91	21.30**	-32.54	151.07***	-53.01**	-17.62**	34.01
	(6.68)	(31.44)	(10.29)	(33.16)	(43.36)	(20.68)	(8.22)	(20.74)
Observations	3,460	2,723	3,460	2,154	2,300	3,421	3,460	3,427
R-squared	0.82	0.47	0.73	0.81	0.44	0.77	0.88	0.80

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Pakistan's population has a significantly positive impact on exports of manufactured goods, while it has a significantly negative impact on exports in food and live animals, crude material, animal, and vegetable oils. While partner country's population has a significantly positive effect on exports in crude material, while it has a substantial negative effect on exports in mineral fuels, chemicals, manufactured goods and machinery & transport. The bilateral exchange rate has a positive and significant impact on exports in beverages and tobacco. This implies that the devaluation in the currency will give a boost to exports in beverages & tobacco. However, in the case of exports in crude material, and manufactured goods the impact of the bilateral exchange rate is significantly negative. Pakistan's trade openness has a strong positive effect on exports in crude material, mineral fuels, chemicals, manufactured goods and machinery and transport. While the partner country's openness has a significantly positive impact on exports in food and live animals, mineral fuels, and manufactured goods. Distance has a significantly negative impact on exports in food and live animals, chemicals, manufactured goods, and machinery & transport. The study has found a considerable positive

effect of border dummy on exports in mineral fuels, chemicals, manufactured goods and machinery & transport. The impact is highly significant for exports in mineral fuels. The dummy of a common language has a significantly positive effect only in the case of exports in mineral fuels, however, the impact is significantly negative in exports of food and live animals, chemicals, manufactured goods, and machinery & transport. The RTA dummy has shown a significant positive effect only in the case of exports in manufactured goods while FTA would be highly beneficial to expand exports in manufactured goods.

5.9. Impact of Geographical and Economic Factors on Trade in Services

In this part, we have estimated the simple and extended gravity model with Pooled, FE, RE and PPML methods covering the period of eleven years from 2007 to 2017 with an aim to estimate the important geographical and economic factors that are important to determine the trade in services.

I. Basic Gravity Model

Results estimated through Pooled, RE and PPML shows that there is a positive relationship between the economic size as measured by the product of GDP and the trade in services while the trade in services is negatively depending upon the distance.

Table:5.11- Basic gravity Model of Trade in Services

VARIABLES	Pooled lnTradeij	FE lnTradeij	RE lnTradeij	PPML Tradeij
lnGDPij	0.99***	-0.05	0.34***	0.27***
	(0.02)	(0.04)	(0.08)	(0.06)
lnDistanceij	-0.88***	1.29***	-0.80	-1.82***
	(0.07)	(0.26)	(0.46)	(0.10)
Constant	-34.95***	0.00	-1.93	8.99**
	(1.09)	(0.00)	(3.31)	(3.88)
Observations	1,106	1,106	1,106	1,107
R-squared	0.54			0.96
Number of groups	101	101	101	

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

Nevertheless, in the case of the FE model, the coefficient of distance is significant but carried a positive sign. The result differs from the conventional interpretation of the gravity model, which says that the trade is negatively related to the distance. This result is in accordance with Walsh (2006) and Pham "et al" (2014). Walsh (2006) has mentioned that "service products do not have to be transported physically from one location to another. It

depends on the type of services, as in some cases it will require movement of physical persons, while in others it may be communicated electronically. The importance of distance in trade in services may therefore be small or even negligible."

II. Augmented Gravity Model

The model is computed through the "Pooled, FE, and RE" model, however, here we will discuss the results estimated through PPML which is the preferred estimation technique in this study. We have estimated the model through PPML twice. Specification (1) is estimated the model by including all the variables and it indicates that GDP, exchange rate, partner country's trade openness, credit to GDP ratio in Pakistan and border dummy are significant with expected signs. However, Specification (2) has been estimated by excluding the variables of population and relative human capital endowment. We found this specification more appropriate with respect to overall trade. In addition, it has included more observations in the model as compared to the first specification of the augmented gravity model.

Table: 5.12- Augmented Gravity Model of Trade in Services

VARIABLES	Pooled lnTradeij	FE lnTradeij	RE lnTradeij	PPML (1) Tradeij	PPML (2) Tradeij
lnGDPij	1.30***	0.38**	1.01***	0.33*	0.34**
	(0.08)	(0.13)	(0.16)	(0.19)	(0.15)
lnPopij	-0.31***	0.59	-0.14	0.26	
	(0.05)	(0.43)	(0.13)	(0.33)	
lnBER	0.06***	0.34**	0.18***	0.65***	0.63***
	(0.01)	(0.14)	(0.05)	(0.23)	(0.21)
lnTrade_Openi	0.09	0.26*	0.23	-0.21	
	(0.45)	(0.14)	(0.36)	(0.36)	
LnTrade_Openj	0.29**	0.13	0.13	0.68***	0.64***
	(0.12)	(0.09)	(0.09)	(0.22)	(0.19)
Relative_HumanCapital_Index	1.27***	0.81	0.77	0.09	
	(0.31)	(0.61)	(1.06)	(1.49)	
lnFDIi	-0.41**	-0.04	-0.21*	-0.03	0.04
	(0.16)	(0.05)	(0.09)	(0.10)	(0.07)
lnFDIj	0.00	0.07*	0.06	-0.00	-0.00
	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
lnCredit_GDPi	1.82***	0.71***	1.33**	0.78*	0.56
	(0.55)	(0.19)	(0.45)	(0.45)	(0.39)
lnCredit_GDPj	0.66***	0.04	0.33***	-0.13	-0.07
	(0.05)	(0.15)	(0.10)	(0.18)	(0.14)
lnFixedBBi	-0.19***	-0.03	-0.12**	-0.01	0.01
	(0.05)	(0.04)	(0.05)	(0.07)	(0.07)
lnFixedBBj	-0.07	-0.17*	-0.10	0.01	
	(0.05)	(0.08)	(0.07)	(0.08)	
lnDistanceij	-1.61***	-4.36**	-1.48**	0.62	-0.21
	(0.07)	(1.45)	(0.49)	(1.43)	(0.27)
Border	-2.73***	0.00	-2.05	6.99***	1.75***
	(0.52)	(0.00)	(2.82)	(1.91)	(0.58)
Comlang_off	1.35***	0.00	1.14**	-2.55*	1.69***

Table: 5.12- Augmented Gravity Model of Trade in Services

VARIABLES	Pooled lnTradeij	FE lnTradeij	RE lnTradeij	PPML (1) Tradeij	PPML (2) Tradeij
	(0.09)	(0.00)	(0.39)	(1.43)	(0.64)
FTA	2.38***	0.00	2.41***	-3.29	2.40***
	(0.14)	(0.00)	(0.73)	(2.13)	(0.64)
Constant	-35.86***	0.00	-30.28***	-28.98	-13.85*
	(5.08)	(0.00)	(4.37)	(25.28)	(7.36)
Observations	956	956	956	957	983
R-squared	0.75			0.96	0.96
Number of groups	96	96	96		

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

According to the results, the income level as represented by the GDP in host and partner country has a significant effect in expanding the trade in services between them. The sign of the coefficient is theoretically significant since a larger country in size can supply more services both to its domestic and international consumers, thereby contributing to the expansion of exports in services. The coefficient of the bilateral exchange rate has shown a significant positive impact. It shows that if there is a one percent devaluation in the Pak rupee, trade in services will increase by 0.63 percent. Here the credit to GDP ratio has been included to measure the effect of financial development in Pakistan. An increase in credit to GDP ratio implies "financial development of the economy" and allocation efficiency. In the first specification, the coefficient of credit to GDP ratio for Pakistan is significantly positive, however, the second specification shows a positive but insignificant impact on expanding services trade between Pakistan and its trading partners.

In Pakistan, the credit to GDP ratio remained within the narrow range since 2000, reaching at highest with 28.7 percent during 2004 and 2008. However, it witnessed a significant declined since 2008, falling from 28.7 to a historic low of 15.4 percent in 2015 (SBP, 2015). An insignificant impact on services trade may be due to the fact that Pakistan's manufacturing sector is receiving the highest share in overall credit allocation, while the services sector despite contributing significantly to GDP, receiving less than 20 percent of the total credit. There are multiple factors both on the demand and supply side that has restricted the credit expansion over the years like there is a dominant borrower i.e., the government and extending credit in favor of the government are risk-free. Hence the banks have little incentive to extend a loan to the risky private sector. On the demand side, due to the high real cost of borrowing the private sector is reluctant to borrow from the banking system. There is low financial deepening as evident from the low penetration of Pakistan's banking sector as according to the WDI, only

25 out of 1,000 adults borrow from commercial banks (SBP, 2015). In addition, there is less than 10 percent of registered firms in Pakistan that uses the banking system to finance them. Furthermore, the high cost of borrowing, low level of financial education and bank-corporate nexus also attributed to the low magnitude of private sector credit. The most important factors that have limited the credit expansion in the past are attributed to structural issues like energy shortages and law & order situation (SBP, 2015). In short, reasons for limited extension in private sector credit in Pakistan lies with both demand and supply-side factors. The government's heavy demand for credit is the most important factor weighing heavily on the willingness of banks to extend credit to the private sector (SBP, 2015).

The coefficient of distance has found to be insignificant but with expected sign. The insignificance may be attributed to the fact that physical distance has less importance for the movement of numerous services items (Walsh, 2006). The coefficient of border dummy shows that sharing borders will give a boost to trade in services between Pakistan and its neighboring countries. In our sample, there are only three countries with whom Pakistan is sharing its common border i.e India, Iran, and China. Only China has been ranked as one of the major trading partners of Pakistan in trade in services. The coefficient of common language implies that if Pakistan is sharing a common language with its trading partners, then the trade would significantly improve between them. The positive impact of a common language is in anticipation of the fact that there are many service transactions that depend on the movement of physical persons and person to person communication (Walsh, 2006). Thus, sharing a common language provides great support in improving the trade ties in services between the countries. The estimated coefficient of FTA suggests that if there is an FTA between Pakistan and its trading partner in services trade, it will lead to an increase in the services trade by a significant magnitude. Overall, we found the product of GDP, Bilateral exchange rate, partner country's trade openness, border, common language, and FTA as major determinants of trade in services. Based on these results, we will calculate the trade potential in services for Pakistan.

5.10. Estimation of Gravity Model with Export as Dependent Variable

I. Basic gravity Model

Results obtained from the basic gravity model of exports are broadly in line with the traditional gravity approach. It shows that trade/exports in services between Pakistan and its trading partner will significantly increase with the rise in income. However, with regard to exports, rise in partner country's GDP would have a significantly positive impact on Pakistan's

export relative to its own GDP. While higher distance between the two would lead to a significant decline in trade flows between Pakistan and its trading partners.

Table: 5.13- Basic Gravity Model of Exports in Services

VARIABLES	Pooled lnExportsij	FE lnExportsij	RE lnExportsij	PPML Exportsij
lnGDPi	0.97***	1.21***	1.03***	0.37
	(0.24)	(0.20)	(0.25)	(0.25)
lnGDPj	1.02***	0.66**	0.97***	0.81***
	(0.04)	(0.22)	(0.15)	(0.21)
lnDistanceij	-1.04***	-4.86***	-1.02*	-0.76***
	(0.10)	(0.94)	(0.55)	(0.24)
Constant	-35.60***	0.00	-36.05***	-18.42**
	(6.16)	(0.00)	(7.67)	(8.93)
Observations	1,057	1,057	1,057	1,107
R-squared	0.48			0.89
Number of groups	101	101	101	

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

II. Augmented Gravity Model

Like trade, the augmented gravity model has been estimated twice for exports to improve the model estimates. Specification (1) has estimated the model by including all the variables, while population and the human capital index has been excluded in the specification (2).

Table: 5.14- Augmented Gravity Model of Exports in Services

VARIABLES	Pooled lnExportsij	FE lnExportsij	RE lnExportsij	PPML (1) Exportsij	PPML(2) Exportsij
lnGDPi	0.38	-0.01	-0.05	-3.40*	-1.81*
	(0.87)	(0.87)	(0.81)	(1.88)	(1.08)
lnGDPj	1.52***	0.60***	1.30***	1.74***	1.62***
	(0.08)	(0.17)	(0.13)	(0.42)	(0.37)
lnPopi	5.42	10.51*	9.16	9.88	
	(5.58)	(5.76)	(5.85)	(9.43)	
lnPopj	-0.49***	-0.53	-0.37**	-0.79	
	(0.07)	(0.56)	(0.13)	(0.59)	
lnBER	0.06***	-0.24	0.11	-0.32	-0.28
	(0.02)	(0.14)	(0.07)	(0.42)	(0.49)
lnTrade_Openi	-0.37	1.29	0.48	-1.59	-2.32**
	(0.95)	(0.86)	(1.01)	(1.20)	(0.98)
LnTrade_Openj	0.31**	0.12	0.19	1.66***	1.41***
	(0.14)	(0.09)	(0.14)	(0.58)	(0.46)
Relative_Humancapital_index	1.40***	-0.74	0.79	-1.60	
	(0.43)	(2.26)	(1.27)	(3.43)	
lnFDIi	-0.47**	-0.34*	-0.40**	-0.35	-0.11
	(0.17)	(0.18)	(0.17)	(0.27)	(0.20)
lnFDIj	-0.03	0.04	0.03	0.01	0.02
	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)

Table: 5.14- Augmented Gravity Model of Exports in Services

VARIABLES	Pooled lnExportsij	FE lnExportsij	RE lnExportsij	PPML (1) Exportsij	PPML(2) Exportsij
lnCredit_GDPi	2.52***	2.37***	2.67***	1.31	0.52
	(0.70)	(0.73)	(0.68)	(1.11)	(0.81)
lnCredit_GDPj	0.79***	0.15	0.39**	0.65**	0.66***
	(0.07)	(0.11)	(0.14)	(0.28)	(0.22)
lnFixedBBi	0.15*	0.21*	0.14	0.25	0.38**
	(0.08)	(0.10)	(0.10)	(0.17)	(0.17)
lnFixedBBj	-0.17*	-0.21***	-0.12*	-0.05	-0.06
	(0.08)	(0.06)	(0.06)	(0.19)	(0.18)
lnDistanceij	-1.95***	-23.76*	-1.89***	-0.82	-2.94***
	(0.06)	(10.82)	(0.34)	(1.20)	(1.03)
Border	-3.60***	0.00	-3.17***	0.05	-11.16***
	(0.20)	(0.00)	(0.80)	(2.57)	(4.01)
Comlang_off	1.75***	0.00	1.65***	0.32	4.16*
	(0.14)	(0.00)	(0.46)	(3.08)	(2.47)
FTA	2.42***	0.00	2.58**	1.35	1.33
	(0.27)	(0.00)	(0.95)	(1.86)	(1.17)
Constant	-120.84	0.00	-181.63*	-115.47	37.74
	(88.34)	(0.00)	(95.92)	(146.54)	(29.15)
Observations	916	916	916	957	957
R-squared	0.71			0.94	0.93
Number of groups	96	96	96		

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

It has been found that there is a difference in the factors that determine the overall trade and exports in services. Results show that relative to Pakistan's GDP, the GDP of a partner country has a substantial impact on the services exports of Pakistan. It implies that higher income in partner country would give a significant rise to Pakistan's exports. Similarly, the results reveal that the partner country's trade openness policy would be more supportive of Pakistan's services exports. We found specification (2) more appropriate, according to which, GDP of the partner country, trade openness of partner country, credit to GDP ratio of a partner, fixed broadband subscription in Pakistan, distance and common language are the key factors that determine the exports in services. On the other hand, the border dummy has a significant impact, but it carries a negative sign. This implies that sharing a border would reduce Pakistan's exports by a significant magnitude. It has already been mentioned that within border countries, only China has secured a significant share in Pakistan's trade in services. Particularly, its share in Pakistan's services exports 3.37 percent during 2017. As far as India and Iran are concerned their share in Pakistan's export is only 0.27 and 0.01 percent, respectively.

Similarly, we found no impact of FDI and FTA on Pakistan's exports in services. The insignificant impact of FDI on services exports may be attributed to its inward diversion for

domestic services. This is evidenced by the fact that over the years, the contribution of the services sector in GDP is above 50 percent and currently it is 60 percent and being a developing country, Pakistan does not have the surplus to export the services. In the first specification of the model, we found a negative and insignificant impact of relative human capital endowment on services exports, which may be attributed to the reason mentioned above. It confirms the fact that Pakistan exports less skill-intensive services compared to services produced in its partner countries. Similarly, the result reveals that FTA between Pakistan and its trading allies has not any effect on expanding exports in services. Based on results estimated through PPML (2), we will estimate the export potential for Pakistan.

5.11. Components of Services Trade/Exports

To examine the difference in estimated results of trade/export services at aggregate and disaggregate level, the gravity model has been estimated for a different component of services trade. The selection of component is dependent upon the availability of data from SBP. The "augmented gravity model" has been estimated for trade/export in telecommunication, Financial, Construction, Travel and Transportation. There are 41 countries included in model estimation for financial services, while 24 countries in construction and 54 countries are included in travel services. However, all 101 countries are part of analysis for trade/export in computer & communication and transportation. We have estimated the gravity model using the PPML estimation method.

Table:5.15-Augmented Gravity Model for Components in Services Trade

	Telecom	Financial	Construction	Travel	Transport
VARIABLES	Tradeij	Tradeij	Tradeij	Tradeij	Tradeij
lnGDPij	-0.65	-0.33	2.01***	-0.25	0.17
	(0.85)	(0.28)	(0.67)	(0.33)	(0.24)
lnPopij	3.82	6.12***	-0.10	8.56***	-1.08**
	(4.49)	(1.66)	(1.88)	(1.85)	(0.52)
Relative_Humancapital Index	-5.02	-3.06	15.69*	15.33**	0.36
	(6.19)	(5.49)	(9.29)	(6.22)	(1.64)
lnBER	0.92	-0.47	-1.32*	0.24	-0.39
	(0.73)	(0.29)	(0.72)	(0.33)	(0.30)
lnTrade_Openi	-0.09	3.26**	-3.61**	1.95**	1.19**
	(1.86)	(1.36)	(1.83)	(0.97)	(0.46)
lnTrade_Openj	0.38	-1.08**	0.83	-1.64***	-0.17
	(1.14)	(0.50)	(1.44)	(0.54)	(0.33)
lnFDIi	0.15	0.29*	-0.64	-0.37**	0.21**
	(0.39)	(0.17)	(0.41)	(0.16)	(0.09)
lnFDIj	-0.11	0.04	-0.22**	0.10**	-0.05*
	(0.11)	(0.05)	(0.10)	(0.05)	(0.03)
lnCredit_GDPi	5.11***	0.27	2.55	0.92	-0.34

Table:5.15-Augmented Gravity Model for Components in Services Trade

	Telecom	Financial	Construction	Travel	Transport
VARIABLES	Tradeij	Tradeij	Tradeij	Tradeij	Tradeij
	(1.93)	(0.67)	(1.67)	(0.61)	(0.39)
lnCredit_GDPj	-0.63	-1.10***	1.08*	0.28	-0.24
	(0.67)	(0.41)	(0.64)	(0.32)	(0.43)
lnFixedBBi	0.50*	-0.09	-0.24	-0.48***	0.19***
	(0.29)	(0.11)	(0.23)	(0.09)	(0.07)
lnFixedBBj	0.73	0.42*	-0.39	0.84***	-0.11
	(0.49)	(0.23)	(0.44)	(0.25)	(0.11)
lnDistanceij	12.07	1.24*	1.05	13.88***	-5.53**
	(18.65)	(0.70)	(1.66)	(3.23)	(2.17)
Border	19.71	-20.49***	-7.87		-2.52
	(20.40)	(6.70)	(12.15)		(3.11)
Comlang_off	2.33	-16.90***	-4.04	-45.35***	0.61
	(7.91)	(3.78)	(3.30)	(11.24)	(1.71)
FTA	8.42	-15.13***		-35.73***	12.89***
	(7.82)	(3.85)		(9.00)	(3.09)
Constant	-219.54	-198.10***	-90.57	-379.52***	78.44**
	(317.57)	(64.80)	(67.22)	(84.05)	(37.33)
Observations	957	395	232	570	957
R-squared	0.62	0.95	0.61	0.98	0.95

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

In the previous section, we observed that a significant rise in the product of GDP, depreciation in Pak Rupee, rising openness of partner country, sharing a border & language, and FTA between Pakistan and its partner country would be important determinants in giving a boost to overall trade in services. On the contrary, a higher level of income, increase in trade openness and expansion in credit to GDP in the partner country, while increase in fixed broadband subscription in Pakistan, distance and common language are important determinants in expanding exports in services between Pakistan and its trading partners. We are of the view that the effect of various indicators included in our study may have different for a different type of services. Therefore, in the following section, the result of five disaggregated services sectors (telecom, financial, construction, travel and transportation services) is examined.

Table:5.16- Augmented Gravity Model for Components in Services Exports

	Telecomm	Financial	Construction	Travel	Transportation
VARIABLES	Exportsij	Exportsij	Exportsij	Exportsij	Exportsij
lnGDPi	0.67	2.27	8.99**	3.37***	1.44
	(4.26)	(2.57)	(3.79)	(1.11)	(1.80)
lnGDPj	0.03	-1.25	-0.56	-1.39	-0.23
	(1.19)	(1.16)	(1.55)	(1.14)	(0.52)
lnPopi	-14.27	-3.36	-11.45	-5.52	-8.90
	(26.40)	(15.39)	(21.42)	(6.58)	(7.17)
lnPopj	5.16	5.31	-7.69***	5.08	1.54

	(6.95)	(3.45)	(2.12)	(4.39)	(1.11)
Relative_HumanCapital Index	-6.32	-7.12	-29.82*	25.26*	7.01
	(9.67)	(10.11)	(16.26)	(15.13)	(4.38)
lnBER	0.74	1.03	1.93**	1.73	-1.26***
	(0.89)	(0.88)	(0.95)	(1.06)	(0.39)
lnTrade_Openi	-3.28	1.66	-1.29	1.73	2.57**
	(4.31)	(3.23)	(3.31)	(2.30)	(1.10)
lnTrade_Openj	0.90	-2.59*	0.50	-3.71***	-1.22
	(1.97)	(1.33)	(2.05)	(1.41)	(0.78)
lnFDIi	0.75	0.38	-0.21	-0.43**	0.36*
	(0.81)	(0.40)	(1.07)	(0.19)	(0.20)
lnFDIj	-0.17	0.03	-0.04	0.20**	0.02
	(0.17)	(0.11)	(0.16)	(0.09)	(0.06)
lnCredit_GDPi	4.79	-0.18	2.24	1.26	-2.05**
	(3.40)	(1.60)	(3.69)	(0.79)	(0.90)
lnCredit_GDPj	-0.97	-0.81	0.28	1.98***	0.49
	(0.93)	(0.56)	(0.65)	(0.61)	(0.36)
lnFixedBBi	0.94*	-0.06	-0.65	-0.20	0.33**
	(0.52)	(0.31)	(0.43)	(0.19)	(0.16)
lnFixedBBj	0.97*	-0.18	-0.75	0.25	-0.21
	(0.56)	(0.43)	(0.47)	(0.39)	(0.19)
lnDistanceij	19.24	0.09	3.11	7.21	9.29*
	(30.35)	(1.49)	(2.20)	(8.78)	(5.61)
Border	25.80	-13.36	50.97***		6.69
	(30.47)	(15.50)	(17.91)		(5.22)
Comlang_off	6.38	-8.50	3.51	-33.77	13.40***
	(14.24)	(8.34)	(5.10)	(30.66)	(4.49)
FTA	10.42			-46.37	16.97***
	(12.86)			(43.54)	(3.61)
Constant	-14.23	-39.76	110.19	-81.16	17.25
	(561.80)	(237.89)	(365.82)	(191.21)	(128.04)
Observations	957	395	232	570	828
R-squared	0.59	0.91	0.67	0.99	0.90

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

a. Telecommunication, Computer, and Information services

The estimated results for trade in communication services found that only credit to GDP ratio (a proxy for financial development) and fixed broadband subscription in Pakistan are the major determinants. While for exports in communication services, only fixed broadband subscription in Pakistan and its partner country have shown a significant impact on ICT services.

b. Financial Services

In the trade of financial services, Population, Pakistan's trade openness, FDI in Pakistan and fixed broadband in partner country have been found significant with expected signs. While trade openness in the partner country, credit to GDP ratio of the partner country, border dummy,

common language and FTA are significant but theoretically inconsistent. Whereas the estimated results for exports in services have not shown any significant impact of various indicators included in the analysis.

c. Construction Services

The estimated coefficients obtained from the gravity model for trade in construction services have shown that GDP, relative human capital index and credit to GDP ratio of partner country are important factors that may stimulate the trade in this category. Whereas the exports in construction services can be influenced by an increase in GDP of Pakistan and depreciation of the Pak Rupee.

d. Travel Services

In travel services trade, population, relative human capital index, Pakistan's trade openness, partner country's FDI and fixed broadband subscription in partner country would be influential factors. On the other hand, the exports in travel services, Pakistan's GDP, relative human capital index, FDI in the partner country and credit to GDP ratio in partner country are important determinants.

e. Transportation Services

In transportation services trade, Pakistan's trade openness, FDI in Pakistan, fixed broadband subscription in Pakistan, distance and FTA are more important determinants in influencing the trade. Whereas trade openness in Pakistan, FDI in Pakistan, fixed broadband subscription in Pakistan, common language and FTA have shown significant impact on exports in transportation.

5.12: Impact of Trade Facilitation on Trade/Exports in Goods

The aim of this section is to assess the effect of trade facilitation on Pakistan's merchandise trade and exports. For this purpose, the "Logistics Performance Index (LPI)" has been used as a proxy variable for trade facilitation. The data for the LPI has been obtained from the "World Bank" database and is available for the years 2007, 2010, 2012, 2014 and 2016. The index is composed of six components such as "the efficiency of customs and other border agencies, quality of transport and information technology (IT) infrastructure, ease and affordability of international shipments, the competence of local logistics industry, ability to track and trace and timeliness of shipments in reaching the destination". We estimate the Model

I and II in equation (5.23) and (5.24) for the period between 2007 and 2017 while using PPML estimation method.

$$Trade_{ij} = exp[a_{ij} + lna_t + \beta_1 \ln(GDP_{it}GDP_{jt}) + \beta_2 \ln(Tradeopenjt) + \beta_3(LPI_{it}) + \beta_4(LPI_{jt})\eta_{ij}] \quad (5.23)$$

$$Exports_{ij} = \exp[a_{ij} + lna_t + \beta_1 \ln(GDP_{jt}) + \beta_2 ln(Popjt) + \beta_3 ln(Tradeopenit) + \beta_4 ln(LPI_{it}) + \beta_5(LPI_{jt})\eta_{ij}] \quad (5.24)$$

In eq (5.23) & (5.24), we've included the exporter and importer LPI. Trade facilitation plays a vital role in improving the export flows thus we expect a positive sign for both the coefficients (Marti, "et al" 2014). In addition to the overall LPI variable, all six components have also been included to capture their effect on bilateral trade/export flows. We have estimated the eq (5.23) and (5.24) separately for all components to avoid the problem of collinearity. With regard to other variables, only GDP and trade openness in partner country has been added in eq (5.23), while in eq (5.24) we have added GDP, the population of partner country and trade openness in Pakistan. Since the objective is to evaluate the effect of trade facilitation on trade, therefore, all these variables have been treated as control variable. Moreover, in the previous section, the basic and augmented gravity model has already been estimated by including traditional and non-traditional variables.

5.13: Discussion of Results

We have initially estimated the gravity model for all the countries (Table5.17) using LPI as an indicator of trade facilitation to examine its effects on overall trade in general and exports in particular. Furthermore, to investigate whether the findings are similar for advanced and emerging countries, we have estimated the model for higher (Table-5.18) and lower-income groups (Table-5.19) as classified by the World Bank. Similarly, various components of LPI on overall trade/exports have also been analysed. Tables are divided into seven columns with column 1 presents the findings pertaining to the effect of overall LPI on trade while the rest of the six columns shows the results on the impact of various LPI components on trade. Table-5.17 shows a significantly negative impact of Pakistan's trade facilitation while the partner country's trade facilitation has an insignificant effect on bilateral trade flows. This finding is in contrast to results obtained in various studies like Host "et al" (2019), Marti "et al" (2014) and Felipe & Kumar, (2010) etc. These studies indicate a positive effect of both host and partner country's trade facilitation. With regard to Pakistan's logistics performance index, results suggest that the achievements in logistics like infrastructure and regulatory

environment may not be well developed. The result is also an indication of the fact that the level of international trade is low, therefore, logistics may not matter much. Usually with an open trading system and superior logistics development, one can expect a positive effect.

Table 5.17: Impact of Trade Facilitation on overall Trade

Variables	(1) Tradeij	(2) Tradeij	(3) Tradeij	(4) Tradeij	(5) Tradeij	(6) Tradeij	(7) Tradeij
lnGDPij	0.58***	0.47***	0.53***	0.43***	0.57***	0.47***	0.51***
	(0.10)	(0.11)	(0.09)	(0.11)	(0.11)	(0.11)	(0.10)
lnTradeopenj	0.13	0.11	0.03	0.08	0.10	0.11	0.11
	(0.29)	(0.28)	(0.26)	(0.28)	(0.27)	(0.28)	(0.28)
lnLPIi	-1.58***						
	(0.45)						
lnLPIj	0.29						
	(0.48)						
lnCustomsi		-0.36***					
		(0.10)					
lnCustomsj		0.32					
		(0.39)					
lnTracktracei			-1.42*				
			(0.74)				
lnTracktracej			0.04				
			(0.27)				
lnCompetenessi				-0.41**			
				(0.19)			
lnCompetenessj				0.51			
				(0.31)			
lnEaseofarrangei					-1.67***		
					(0.53)		
lnEaseofarrangej					-0.56		
					(0.41)		
lnFrequencyi						-0.36***	
						(0.10)	
lnFrequencyj						0.32	
						(0.39)	
lnQualityi							-0.54***
							(0.17)
lnQualityj							0.01
							(0.31)
Observations	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Number of id	97	97	97	97	97	97	97

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

In addition to the above, we have also analysed the significance of all components of trade facilitation on trade flows. At the outset, it was expected that each component of host and partner countries would display a significantly positive sign, however, table 5.18 indicates somewhat different outcomes. According to results, these components have shown a

significantly negative impact on trade. The results reaffirm the fact that in Pakistan logistics are not well developed. Table 5.18 presents the results estimated by including high-income countries as trading partners of Pakistan. We found a significantly negative impact of Pakistan's and insignificant impact of partner countries trade facilitation on bilateral trade flows.

Table 5.18: Impact of Trade Facilitation on Bilateral Trade Flows (High Income Countries

Variables	(1) Tradeij	(2) Tradeij	(3) Tradeij	(4) Tradeij	(5) Tradeij	(6) Tradeij	(7) Tradeij
lnGDPij	0.63***	0.50***	0.55***	0.46***	0.63***	0.50***	0.55***
	(0.10)	(0.11)	(0.10)	(0.11)	(0.11)	(0.11)	(0.11)
lnTradeopenj	0.31	0.26	0.15	0.20	0.27	0.26	0.27
	(0.47)	(0.48)	(0.46)	(0.48)	(0.45)	(0.48)	(0.47)
lnLPIi	-1.85***						
	(0.48)						
lnLPIj	0.21						
	(0.69)						
lnCustomsi		-0.45***					
		(0.10)					
lnCustomsj		0.37					
		(0.57)					
lnTracktracei			-1.50*				
			(0.79)				
lnTracktracej			-0.03				
			(0.38)				
lnCompetenessi				-0.49**			
				(0.21)			
lnCompetenessj				0.34			
				(0.33)			
lnEaseofarrangei					-2.18***		
					(0.54)		
lnEaseofarrangej					-0.65		
					(0.43)		
lnFrequencyi						-0.45***	
						(0.10)	
lnFrequencyj						0.37	
						(0.57)	
lnQualityi							-0.67***
							(0.19)
lnQualityj							-0.13
							(0.49)
Observations	676	676	676	676	676	676	676
Number of id	65	65	65	65	65	65	65

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

In view of the low-income group, we have found no impact of trade facilitation on trade. Ghani(2017) has used dummy LMC to capture the effects of low and middle-income countries.

His study found a significantly negative effect of trade facilitation on trade. In his view, a low level of logistic achievements in comparison to high-income countries may be the cause of this outcome. As far as various components of trade facilitation is concerned the only improvement in ease and affordability of international shipments in Pakistan may lead to significantly higher trade.

Table-5.19: Impact of Trade Facilitation on Bilateral Trade Flows (Low Income Group)

Variables	(1) Tradeij	(2) Tradeij	(3) Tradeij	(4) Tradeij	(5) Tradeij	(6) Tradeij	(7) Tradeij
lnGDPij	0.38***	0.38***	0.45***	0.37***	0.35***	0.38***	0.38***
	(0.10)	(0.10)	(0.07)	(0.09)	(0.13)	(0.10)	(0.09)
lnTradeopenj	-0.06	-0.07	-0.07	-0.05	-0.07	-0.07	-0.06
	(0.12)	(0.11)	(0.11)	(0.13)	(0.11)	(0.11)	(0.12)
lnLPIi	0.24						
	(1.30)						
lnLPIj	0.33						
	(0.50)						
lnCustomsi		0.28					
		(0.34)					
lnCustomsj		-0.03					
		(0.32)					
lnTracktracei			-0.59				
			(1.33)				
lnTracktracej			0.23				
			(0.28)				
lnCompetenessi				0.02			
				(0.47)			
lnCompetenessj				0.70			
				(0.45)			
lnEaseofarrangei					1.23**		
					(0.49)		
lnEaseofarrangej					-0.27		
					(0.58)		
lnFrequencyi						0.28	
						(0.34)	
lnFrequencyj						-0.03	
						(0.32)	
lnQualityi							0.24
							(0.53)
lnQualityj							0.06
							(0.30)
Observations	329	329	329	329	329	329	329
Number of id	32	32	32	32	32	32	32

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

5.14: Impact of Trade Facilitation on Exports

Table 5.20 presents a significantly positive effect of trade facilitation on exports between Pakistan and its trading partners. The results indicate that the improvement in the LPI score of trading partners will increase Pakistan's exports to its trading partner by a significant margin relative to the improvement in the LPI score of Pakistan. Results reaffirm the findings of the previous studies [(Host "et al" , 2019) (Ghani, 2017) (Bensassi,"et al", 2015) and (Marti,"et al", 2014)]. These studies have confirmed that logistic performance has a significant and positive impact mainly on exports.

Table: 5.20- Impact of Trade Facilitation on Exports

VARIABLES	(1) Exportsij	(2) Exportsij	(3) Exportsij	(4) Exportsij	(5) Exportsij	(6) Exportsij	(7) Exportsij
lnGDPj	0.61***	0.65***	0.66***	0.71***	0.55***	0.65***	0.63***
	(0.14)	(0.15)	(0.16)	(0.15)	(0.14)	(0.15)	(0.14)
lnPopj	-0.99***	-0.93***	-0.97***	-0.93***	-1.27***	-0.93***	-0.96***
	(0.20)	(0.21)	(0.22)	(0.22)	(0.20)	(0.21)	(0.19)
lnTradeopeni	0.53	0.35	1.04***	0.17	0.60*	0.35	0.35
	(0.35)	(0.36)	(0.19)	(0.37)	(0.35)	(0.36)	(0.36)
lnLPIi	0.85*						
	(0.48)						
lnLPIj	1.01**						
	(0.46)						
lnCustomsi		0.20					
		(0.14)					
lnCustomsj		0.64					
		(0.39)					
lnTracktracei			2.31**				
			(1.08)				
lnTracktracej			0.11				
			(0.34)				
lnCompetenessi				-0.21			
				(0.16)			
lnCompetenessj				0.44			
				(0.36)			
lnEaseofarrangei					2.33***		
					(0.46)		
lnEaseofarrangej					0.66***		
					(0.25)		
lnFrequencyi						0.20	
						(0.14)	
lnFrequencyj						0.64	
						(0.39)	
lnQualityi							0.20
							(0.18)
lnQualityj							0.80**
							(0.39)
Observations	1,009	1,009	1,009	1,009	1,009	1,009	1,009
Number of id	97	97	97	97	97	97	97

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

Given the positive impact of trade facilitation on exports, the study is further extended to test whether any of the logistics sub-components are important for the expansion in exports. Thus we tested the impact of six disaggregated measures of logistics and found that "ability to track" and "trace consignments" in Pakistan have a significantly positive effect on exports while "ease of arranging competitively priced shipments" both in Pakistan and in its trading partners have a significantly positive impact in boosting exports between the two. Similarly, we have found that improvement in the "quality of trade and transport-related infrastructure" in the partner country will increase Pakistan's exports. It implies that with improvement in the "quality of trade and transport infrastructure", the partner country's export will increase. In turn, it may have a spillover impact on Pakistan's exports through strong demand for imports of raw material and other intermediate good. The result reaffirms the fact that by involving in international trade, a country can enhance its production capacity through the import of better raw material and by adopting the latest technology. Amongst the significant component, ease of arranging shipments have shown a significantly higher impact in increasing Pakistan's exports to its trading partners. This implies that developing a capability for competitive transport is one of many factors which may lead Pakistan to become a good exporter. Similarly, an increase in the ability to tracking and tracing consignment in Pakistan has a significant impact on exports. Overall results imply that good shipment tracking and control along with the well-developed infrastructure will play a vital role in the export expansion of Pakistan.

In terms of high-income trading partners, the improvement in Pakistan's logistics may lead to expanding its exports to high-income countries. The significantly positive impact of Pakistan's LPI has been realized on account of "the ability to track and trace consignments" and "ease of arranging competitively priced shipments" in Pakistan. In contrast, the trade facilitation in partner countries has a positive but negligible effect on Pakistan's exports. The result is in contrast with Host "et al" (2019) which reveals that the high-income countries have the best quality of logistics service, most advanced infrastructure, the usage of digital technology, good regulatory environment and trade facilitation, thus high LPI rank has the significantly highest impact on trade. On the other hand, customs efficiency and frequency to meet timelines in its trading partner would give a significant boost to Pakistan's exports.

Table-5.21: Impact of Trade Facilitation on Exports (High Income Countries)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Exportsij	**Exportsij**	**Exportsij**	**Exportsij**	**Exportsij**	**Exportsij**	**Exportsij**
lnGDPj	0.55***	0.55***	0.61***	0.65***	0.48**	0.55***	0.54***
	(0.19)	(0.18)	(0.22)	(0.20)	(0.20)	(0.18)	(0.17)

lnPopj	-1.12***	-1.05***	-1.14***	-1.05***	-1.38***	-1.05***	-1.06***
	(0.21)	(0.19)	(0.21)	(0.19)	(0.24)	(0.19)	(0.19)
lnTradeopeni	0.45	0.34	1.00***	0.09	0.52	0.34	0.30
	(0.38)	(0.38)	(0.21)	(0.40)	(0.38)	(0.38)	(0.40)
lnLPIi	0.99**						
	(0.47)						
lnLPIj	0.54						
	(0.65)						
lnCustomsi		0.22					
		(0.14)					
lnCustomsj		1.16*					
		(0.63)					
lnTracktracei			2.50**				
			(1.19)				
lnTracktracej			-0.26				
			(0.46)				
lnCompetenessi				-0.14			
				(0.14)			
lnCompetenessj				0.20			
				(0.48)			
lnEaseofarrangei					2.30***		
					(0.49)		
lnEaseofarrangej					0.49*		
					(0.29)		
lnFrequencyi						0.22	
						(0.14)	
lnFrequencyj						1.16*	
						(0.63)	
lnQualityi							0.24
							(0.17)
lnQualityj							0.92
							(0.74)
Observations	680	680	680	680	680	680	680
Number of id	65	65	65	65	65	65	65

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

Similarly, in the case of low-income countries, relative to Pakistan, the impact of the partner country's trade facilitation is positive and significant, and it matters most for Pakistan's export expansion. In case of low-income countries, ability to tracking and tracing in partner country has a significantly positive effect on Pakistan's exports, while ease of arranging competitive prices in both Pakistan and its trading partners have a significant impact in expanding Pakistan's export towards its trading partners. Nevertheless, the effect is higher in the case of Pakistan.

Table-5.22: Impact of Trade Facilitation on Exports (Low Income Countries)

VARIABLES	(1) Exportsij	(2) Exportsij	(3) Exportsij	(4) Exportsij	(5) Exportsij	(6) Exportsij	(7) Exportsij
lnGDPj	0.88***	0.88***	0.80***	0.82***	0.72***	0.88***	0.88***
	(0.22)	(0.21)	(0.21)	(0.21)	(0.20)	(0.21)	(0.21)
lnPopj	2.45**	3.24***	2.53**	2.92***	2.01*	3.24***	2.86**
	(1.15)	(1.17)	(1.03)	(1.08)	(1.08)	(1.17)	(1.19)
lnTradeopeni	1.77***	1.87***	2.11***	1.72***	1.77***	1.87***	1.84***
	(0.27)	(0.44)	(0.39)	(0.28)	(0.25)	(0.44)	(0.32)
lnLPIi	-0.84						
	(1.27)						
lnLPIj	0.82*						
	(0.48)						
lnCustomsi		-0.40					
		(0.44)					
lnCustomsj		-0.18					
		(0.29)					
lnTracktracei			0.68				
			(1.08)				
lnTracktracej			0.52*				
			(0.29)				
lnCompetenessi				-0.83			
				(0.67)			
lnCompetenessj				0.23			
				(0.29)			
lnEaseofarrangei					1.02*		
					(0.57)		
lnEaseofarrangej					0.90*		
					(0.54)		
lnFrequencyi						-0.40	
						(0.44)	
lnFrequencyj						-0.18	
						(0.29)	
lnQualityi							-0.53
							(0.57)
lnQualityj							0.28
							(0.23)
Observations	329	329	329	329	329	329	329
Number of id	32	32	32	32	32	32	32

"Robust standard errors in parentheses"
*** p<0.01, ** p<0.05, * p<0.1

In this part, we have estimated the effect of trade facilitation measures on overall trade in general and on exports in particular. To measure the impact, LPI has been used as a proxy variable. Besides, the impact of sub-components has also been analysed. According to the results, we have found that the impact of trade facilitation is more pronounced on exports as compared to overall trade. With regard to exports, trade facilitation both in Pakistan and its

partner country has a significant impact on boosting exports. However, the impact of the partner country's trade facilitation is more in terms of magnitude as well as significant. With regard to various subcomponents, we found that "ease of arranging competitively priced shipment", "ability to track and tracing consignment" and "quality of trade and transport logistic" may have a significant impact on exports. Now if we compare Pakistan's rank and our estimated results, it indicates some of the important conclusions. With regard to the ease of arranging competitively priced international shipments, Pakistan's ranking has been dropped from 65th place in 2007 to a low of 97th position. The decline is largely attributed to "poor maintenance of operational crafts, lack of development of old vessels, deterioration of pilot tugs and pilot boats" (PAJCCI, 2016). The estimated results based on the gravity model indicate that with ease and affordability in arranging competitively priced international shipments both in Pakistan and its partner country exports would be increased by a significant magnitude. However, the fact is that Pakistani ports compromise the price competitiveness for international shipments due to the cartels in the transport sector along with a relatively lower number of containers. In this regard, the transport cost can be reduced considerably by introducing effective policy reforms in customs, ports, road authorities and traffic regulators (NFLP, 2020).

Similarly, we have found a significant positive impact on the ability to track and trace exports. We have seen that Pakistan's rank in this sub-component has also declined from 76th position in 2007 to the lowest at 136th during 2018. Lowering the ability to track and trace may be due to the fact that there is no such facility on the rail network, although for road transport a very limited percentage of tracking system exists. Moreover, such a facility at Customs is also very rare. In order to improve the capability, the customs, ports, and railway's organisations need to support and encourage the track and trace (NFLP, 2020). Pakistan's ranking in infrastructure quality although improved from 71st place in 2007 to 69th position in 2016 but witnessed a sharp decline and stood at 121st place during 2018. We found that better infrastructure quality in the partner country has a substantial positive impact on Pakistan's exports, while in the case of Pakistan this component is although positive but insignificant. The improvement in the quality of logistic in the partner country may have a spill over effect on Pakistan's exports through strong import demand for raw material and other intermediate good. The insignificant coefficient in the case of Pakistan may be an indication that due to the heavy reliance on road transport for freight transportation there are significant challenges in improving the efficiency of national trade. The infrastructure quality index includes "trade and

transport-related infrastructures" like roads, railroads, ports, and information technology. In addition, it includes regulatory controls, standards, dispute resolutions mechanisms etc. As far as roads and rails infrastructure are concerned, it has witnessed a considerable improvement since 2007, however, very limited attention is paid to improve the regulatory, controls, standards and dispute resolution mechanism which are equally important. In this context, the public sector is likely to perform its' regulatory function which has been largely missing in the past (NFLP, 2020).

In order to improve the "quality of trade and transport-related infrastructure", both the private and public sector can perform efficiently in their domain. The role of the government is to facilitate, support, help in creating transparency, removal of physical and non-physical barriers, reducing cost and increasing reliability. While the private sector can perform very efficiently in activities relating to freight transport and logistics (NFLP, 2020). Overall, the transport and logistics sector of Pakistan is facing various challenges. Although, much emphasis has been on building road links, however, failure to develop contemporary transport and logistics infrastructure and services contributed to the deterioration in the logistic sector. Thus, the instability in the LPI value clearly indicates the inefficiencies in one or more of the LPI sub-dimensions. The performance of Pakistan on the infrastructure component of the LPI is expected to improve, especially on the back of CPEC-related projects like road, rail, and Gwadar port. In addition, CPEC is also expected to improve the prospects for the shipping industry, and future-oriented investors are reportedly keen to pursue these opportunities (SBP, 2019). The finding of this study reaffirms that logistic plays an important role in boosting exports. We are of the view that through effective implementation of logistic services and removing the bottlenecks, Pakistan would not only be able to gain the benefits in terms of wider integration in world trade but would also be capable to tap better export opportunities in the global market. However, it can be possible through improving the quality and efficiency of logistic services, and significantly higher investment would make it possible. Particularly, investment for the improvement in information technology-related infrastructure, management and human resources capabilities would lead to producing more well-organized and proficient logistics services. For this purpose, the public-private partnership may be important in the context of investment and efficient governance. In addition, to streamline the logistic services and removing the bottlenecks, there is a need to integrate the trade-related institutes along with those which are playing their parts in providing administrative and financial support like

Customs, Ministry of Commerce, TDAP, SBP, Ministry of Finance and Pakistan Bureau of Statistics.

5.15: Concluding Remarks

In this chapter, the gravity model has been estimated for bilateral trade/exports in goods and services between Pakistan and its trading allies. The gravity model is estimated through the Pooled, FE, RE and PPML estimation method. The comparison between the two methods reveals that PPML is more efficient with zero trade flows as it computes the model in its multiplicative form. In view of the above, we have selected the model based on PPML estimation in order to estimate the trade and export potential for Pakistan in goods and services with its trading partners. Results indicate GDP, the coefficient of absolute GDP per capita, trade openness ratio of Pakistan and its trading partners, distance, sharing a common border and FTA as an important determinant to expand the trade between Pakistan and its trading partners in goods. With regard to exports, the income level of partner countries may have a strong impact relative to Pakistan's own GDP level. Similarly, the "absolute GDP per capita differential, bilateral exchange rate, trade openness, distance and border" are the major factors for expansion in exports between Pakistan and its trading partners. On the services side, we found the product of GDP, Bilateral exchange rate, partner country's trade openness, border, common language and FTA as major determinants of services trade. Whereas to give a boost to services exports, partner country's GDP, partner country's trade openness, partner country's credit to GDP, fixed broadband subscription in Pakistan, distance and common language are important factors. The implication for these findings is that while formulating trade policy the government should focus on these factors as these can be supportive in stimulating overall trade.

One of the unique aspects of the present study is that besides using the symmetric specification of the gravity model of trade/exports in goods we have also estimated the asymmetric specification of the model while disaggregating the impact of the exchange rate in depreciation and appreciation through partial sum decomposition approach. Earlier studies on the gravity model have established the link between the exchange rates and trade flows and predicted that the depreciation in the exchange rate would expand the exports while an appreciation would restrict them. However, there was no clear agreement on the magnitude of the impact emerging. It has been argued that the impact of changes in exchange rate i.e appreciation or depreciation on trade is asymmetric and nonlinear. Our results reaffirm that Pakistan's trade is less responsive to any change in the exchange rate as the exports base is

quite narrow and highly concentrated in a few items. However, it may be evidence of nonlinear mean-reverting association because some exchange rate changes of the same magnitude show different effects on other variables of interest. We have also evaluated the effect of trade facilitation on trade/exports while using LPI as a proxy. Findings suggest that the impact of trade facilitation is more visible on exports. Similarly, improvement in trade facilitation both in Pakistan and its partner country has a significant impact in boosting exports, however, the impact of the partner country's trade facilitation is more in terms of magnitude as well as significance.

CHAPTER 6: TRADE POTENTIAL OF PAKISTAN

This chapter will discuss the trade potential of Pakistan in three parts. In the first part, we will explore the countries and regions with whom Pakistan's trade/export potential in goods is at the maximum level. In the second part, we will identify different product categories with higher trade potential for Pakistan while using the Additional Market Access frontier (AMAF). This approach will be used only for merchandise trade/exports. Whereas, the third part will analyze the trade/export potential in services for Pakistan by country and by region.

In the present study, our focus is on exploring those countries which are still untapped markets for Pakistan along with those countries for which Pakistan has already exhausted its potential. To find out the potential we have selected the model estimated through PPML due to its relative robustness over least square methods. The estimated coefficients are used to anticipate the trade/export between Pakistan and its trading partners and then it is compared with the observed values to infer trade/export potentials in goods and services. For this purpose, the potential has been calculated using the ratio method i.e (P/A) the ratio of trade/export potential (P) as predicted by the model and actual trade/export (A) has been used to evaluate the future direction of Pakistan's trade. If the value of P/A is greater than one, it indicates that there is potential to expand trade/export with the respective country [(Batra, 2004) (Kaur & Nanda, 2011)]. Similarly, the absolute difference between the potential and actual level of trade (P-A) can equally be used for this purpose. A positive value implies the possibility of trade expansion in the future while a negative value shows that Pakistan has exceeded its trade potential with a particular country. By using either the ratio or the difference indicators, we can classify those countries with which Pakistan has potential for the expansion of trade or otherwise. Here we have divided Pakistan's trading partners into two parts on the basis of the value of P/A i.e the countries with whom Pakistan has great potential to expand its trade/export and countries with which Pakistan has already achieved its potential.

6.1: Trade Potential in Goods

The time (1980-2017) has been divided into four sub-periods and then we have calculated the average values of "predicted" and "actual" trade ratios. Similarly, to interpret the results, we have mentioned the trade potential for the most recent period i.e 2010-17, whereas details have been given in Appendix-IV. Likewise, to further simplify the analysis, the average trade potential for the period between 1980 and 2017 has been computed and the results are presented in Table 6.2. This will enable us to have a quick look at the potential level of Pakistan's trade with its trading partners over the years.

Table 6.1: Trade Potential between Pakistan and its Trading Partners (2010-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	0.96	El Salvador	3.23	Maldives	1.12	Slovenia	0.84
Argentina	1.28	Estonia	1.15	Mali	10.59	South Africa	0.76
Australia	1.30	Finland	1.62	Malta	2.64	Spain	0.84
Austria	1.00	France	1.17	Mauritania	2.17	Sri Lanka	1.41
Bahamas	12.35	Germany	1.10	Mauritius	1.62	Swaziland	0.00
Bahrain	1.41	Ghana	1.29	Mexico	0.82	Sweden	1.21
Bangladesh	0.90	Greece	1.33	Mongolia	3.61	Switzerland	1.59
Barbados	0.74	Hong Kong	2.67	Morocco	0.74	Tajikistan	3.01
Belgium	0.74	Hungary	1.60	Myanmar	2.27	Tanzania	1.05
Bermuda	0.75	Iceland	2.59	Nepal	3.47	Thailand	0.93
Bhutan	56.02	India	0.97	Netherlands	1.03	Tunisia	1.12
Bolivia	1.45	Indonesia	1.03	New Zealand	1.06	Turkey	1.17
Bosnia	2.22	Iran	2.50	Nigeria	1.57	Turkmenistan	1.33
Botswana	0.83	Iraq	1.78	Norway	1.53	Uganda	2.39
Brazil	1.30	Ireland	1.13	Oman	0.87	Ukraine	1.12
Brunei	3.93	Italy	1.07	Paraguay	1.23	UAE	0.93
Bulgaria	2.50	Jamaica	1.08	Peru	0.91	United Kingdom	1.09
Cambodia	0.88	Japan	1.11	Philippines	1.03	USA	0.99
Canada	1.10	Jordan	1.35	Poland	0.95	Uruguay	1.36
Cameroon	1.41	Kazakhstan	2.01	Portugal	1.04	Uzbekistan	6.16
China	0.97	Kenya	0.91	Romania	1.19	Vietnam	0.79
Chili	0.98	Kuwait	1.12	Russia	1.21	Zambia	1.58
Colombia	0.81	Latvia	0.91	Saudi Arabia	1.17	Zimbabwe	0.99
Cyprus	3.37	Lebanon	1.32	Senegal	0.64		
Denmark	0.84	Macao	13.11	Sierra Leone	0.77		
Egypt	0.98	Malaysia	1.28	Singapore	1.13		

Source: Author's own calculations

During the period between 2010 and 2017, Pakistan's trade potential on average is maximum with Bhutan followed by Macao, Bahamas, Mali, and Uzbekistan since the ratio of P/A are substantially very high. Pakistan has considerable potential to extend its trade with Brunei, Cyprus, El Salvador, Nepal, Tajikistan, Bosnia, Bulgaria, Hong Kong, Iceland, Iran, Kazakhstan, Malta, Mauritania, Myanmar, and Uganda. With a relatively low level, Pakistan's trade potential exists with Argentina, Australia, Bahrain, Bolivia, Brazil, Canada, Cameroon, Estonia, Finland, France, Germany, Ghana, Greece, Hungary, Japan, Jordan, Kuwait, Lebanon, Malaysia, Maldives, Mauritius, Nigeria, Norway, Paraguay, Romania, Russia, Saudi Arab, Singapore, Sri Lanka, Sweden, Switzerland, Tunisia, Turkey, Turkmenistan, Ukraine, Uruguay and Zambia. In addition, Pakistan trade potential with countries like Indonesia, Italy, Jamaica, Netherlands, New Zealand, Philippines, Portugal, and the United Kingdom is minimum. The (P/A) ratio equals unity or to one with Austria, Egypt, USA and Zimbabwe which

implies that Pakistan's actual trade with these countries has touched its potential level. On the contrary, the countries with which Pakistan's actual trade is more than its potential are Algeria, Bangladesh, Barbados, Belgium, Bermuda, Botswana, Cambodia, China, Colombia, Denmark, India, Kenya, Latvia, Mexico, Morocco, Oman, Peru, Poland, Senegal, Sierra Leone, Slovenia, South Africa, Spain, Thailand, UAE, and Vietnam. The analysis of trade potential from 1980 to 2017 in table 6.2 presents a different picture. It shows that over the years, on average Pakistan's trade potential has reached its high level with countries like El Salvador, Mali, Sierra Leone, Ghana, Paraguay, Uruguay, Jamaica, Latvia, Morocco, Bhutan, Bahamas, South Africa, Colombia, Tunisia, Chili and Zimbabwe. Similarly, countries like Cameroon, Egypt, Bolivia, Mexico, Macao, Senegal, and Vietnam also possess high potential for Pakistan to increase its future trade.

Table 6.2: Trade Potential between Pakistan and its Trading Partners (1980-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	2.51	El Salvador	53.22	Maldives	0.65	Slovenia	0.95
Argentina	1.43	Estonia	2.12	Mali	50.22	South Africa	9.61
Australia	0.95	Finland	1.78	Malta	1.67	Spain	1.17
Austria	1.07	France	0.93	Mauritania	2.20	Sri Lanka	0.73
Bahamas	6.50	Germany	0.92	Mauritius	0.96	Swaziland	0.0
Bahrain	1.28	Ghana	42.71	Mexico	4.89	Sweden	1.03
Bangladesh	0.98	Greece	1.06	Mongolia	1.62	Switzerland	0.92
Barbados	1.96	Hong Kong	1.13	Morocco	10.48	Tajikistan	1.39
Belgium	0.37	Hungary	0.76	Myanmar	0.60	Tanzania	0.70
Bermuda	0.18	Iceland	1.75	Nepal	1.35	Thailand	1.32
Bhutan	13.30	India	1.86	Netherlands	1.02	Tunisia	6.80
Bolivia	5.19	Indonesia	1.45	New Zealand	0.88	Turkey	0.98
Bosnia	1.27	Iran	1.05	Nigeria	1.99	Turkmenistan	1.48
Botswana	0.64	Iraq	1.06	Norway	0.92	Uganda	1.84
Brazil	1.07	Ireland	0.91	Oman	2.04	Ukraine	2.58
Brunei	1.81	Italy	0.94	Paraguay	28.58	UAE	0.47
Bulgaria	1.73	Jamaica	14.85	Peru	1.28	United Kingdom	0.90
Cambodia	1.17	Japan	0.91	Philippines	1.24	USA	0.98
Canada	1.04	Jordan	0.96	Poland	0.83	Uruguay	16.74
Cameroon	4.79	Kazakhstan	1.63	Portugal	1.24	Uzbekistan	1.64
China	1.09	Kenya	1.06	Romania	0.91	Vietnam	3.66
Chili	6.89	Kuwait	1.13	Russia	0.67	Zambia	0.67
Colombia	6.71	Latvia	13.64	Saudi Arabia	1.07	Zimbabwe	13.13
Cyprus	1.40	Lebanon	0.79	Senegal	3.49		
Denmark	1.07	Macao	3.87	Sierra Leone	44.40		
Egypt	4.22	Malaysia	0.92	Singapore	0.91		

Source: Author's own calculations

With relatively low magnitude, Pakistan's trade potential has increased on average with countries like Algeria, Estonia, Mauritius, Oman, Ukraine, Argentina, Bahrain, Barbados, Bosnia, Brunei, Bulgaria, Cambodia, Cyprus, Finland, Hong Kong, Iceland, India, Indonesia, Kazakhstan, Kuwait, Malta, Mongolia, Nepal, Nigeria, Peru, Philippines, Portugal, Spain, Tajikistan, Thailand, Turkmenistan, Uganda, Uzbekistan, Austria, Brazil, Canada, China, Denmark, Greece, Iran, Iraq, Netherlands and Saudi Arab. On the other hand, Pakistan's actual trade surpassed its potential level

with Australia, Bangladesh, Belgium, Bermuda, Botswana, France, Germany, Hungary, Ireland, Italy, Japan, Jordon, Lebanon, Malaysia, Maldives, Mauritius, Myanmar, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovenia, Sri Lanka, Sierra Leone, Switzerland, Tanzania, Turkey, UAE, UK, USA and Zambia.

In this section, we have presented the summary results where countries with high and low trade potential both are mentioned in table 6.1 and 6.2 for the period between 2010-2017 and 1980-2017 respectively. By analyzing the actual trade between Pakistan and these countries particularly, Bahamas, Bhutan, Macao, Mali, and Uzbekistan etc it is clear that the current magnitude of exports to these countries is very low and far from the potential.

6.1.1: Trade Potential of Pakistan with Countries in FTA

Considering the trade potential of countries with whom Pakistan has signed FTAs, it appears that the trade potential though exists but not significantly high. Pakistan is in free trade agreements with "Sri Lanka (2005), China (2006) and Malaysia (2007)". Here we are presenting a brief overview of all three FTAs and their impact on the trade relations of Pakistan with these three countries. Based on results obtained from the 2010-2017 analysis, the trade potential of Pakistan is lower with Malaysia and Sri Lanka, while with China, the potential is exceeded or in other words, there is over trade between the two countries. Contrary to the above, the analysis based on the period between 1980 and 2017, the trade potential between Pakistan and China although exist but it is not very significant. Whereas, with Malaysia and Sri Lanka, the potential is already exhausted. According to the estimates of trade potential during 2010-2017, the trade between Pakistan and China has increased significantly, particularly since 2013, the trade increased by 80 percent. However, the rise in trade is attributed to heavy imports by Pakistan from China, while exports from Pakistan is on a declining trend during the period under review.

As far FTA between the two countries is concerned, since 2006, Pakistan's imports from China increased by more than 400 percent as compared with a 188 percent rise in Pakistan's exports to China during the same period. However, in recent years, to contain the trade gap, Pakistan has imposed regulatory duties on various Chinese products like "mobile phones, telecommunication equipment, electro thermic domestic appliances and alloy steel". Irshad "et al" (2018) in their study has mentioned that there is a great opportunity for Pakistan to capture the Chinese market with a huge population, particularly after signing the FTA. There

is no doubt that at present Pakistan is running a trade deficit with China owing to a low level of diversity in exports and lack of expertise in exports competitiveness. Consequently, despite a rise in trade after FTA between the two countries, the export from Pakistan is still far from their potential. In this regard, Irshad et al are of the view that to capture the Chinese market, Pakistan is required to have coordination between the private and public sector (ministries and state-run institutions). Another important reason for low export to China is that Pakistan is still involved in the exports of low value-added items, however, China has already moved to "high value-added" and "high tech exports" to Pakistan. Therefore, it is very important for Pakistan to focus on the production of highly competitive products along with the improvement in the marketing of its products to create the demand for its exports in the Chinese market.

Considering Pakistan Malaysia bilateral trade relations, the situation is not very encouraging. From 2010-2017, trade potential between the two countries though increased, however, prior to 2010, the calculation of trade potential shows over trade between Pakistan and Malaysia. Unfortunately, the rise in actual trade over predicted has been realized on account of higher imports from Malaysia rather than exports from Pakistan. Especially, the imports witnessed the highest level during 2011 which in the following years dropped significantly after the signing of PTA with Indonesia. It enables Pakistan to import Palm oil from Indonesia instead of Malaysia. Since the signing of FTA between the two countries, the trade balance remained in favor of Malaysia, while for Pakistan the trade deficit which was at $0.71 billion in 2006 widened to $1.08 billion in 2007 while it touched the peak level of $2.49 in 2011. Hence, for Pakistan, the FTA is underutilized (Khan). The "Trade Development Authority of Pakistan (TDAP)" in its study has highly recommended renegotiating FTA as more importance has been given in the FTA with "India". Pakistan and Sri Lanka are the members of "South Asian Association for Regional Cooperation (SAARC)", "South Asia Preferential Trade Agreement (SAPTA)", "South Asia Free Trade Agreement (SAFTA)" and "Pak – Sri Lanka Free Trade Agreement (PSLFTA)". These promising agreements have provided Pakistan with an opportunity to explore the Sri Lankan market through tariff and non-tariff concessions. With Sri Lanka, Pakistan's trade balance is in surplus. If we look at the trade potential, year-wise analysis shows that it is continuously rising, however, on average it has increased significantly during 2010-2017.

Pakistan is highly committed to tapping the Sri Lankan market which has gained momentum in recent years. Consequently, Pakistan's exports to Sri Lanka are on a higher

trajectory and there is a surplus in the trade balance. Particularly, the post FTA scenario for Pakistan is very encouraging, as we can see there is a significant rise in Pakistan's exports since 2005. Regarding the potential, regardless of having potential with Sri Lanka, it is not very significantly high. There is the various reason, amongst many, one of the main is that Sri Lanka produces high-end articles of apparel and clothing (knitted petticoats, panties, pajamas, swimsuits, t-shirts, gloves, and trousers etc.) to export them to Europe and America. Contrary to it, the exports (knitted or man-made staple fibres and woven fabric) from Pakistan are expensive and of low-quality owing to supply-side bottlenecks in the domestic industry when compared against the supplies from India and China. Similarly, lack of research, innovation, technology, and skills are the significant limitations to efficient production that affect production capacity. Going forward exporters and manufacturers in Pakistan have already captured a significant market share in developed economies hence leaves no room for further expansion to economies like Sri Lanka. Sri Lanka has emerged as an important trading hub of textile products as many European and American apparel/garment brands have started to pile up their stocks in Sri Lanka. Consequently, it leads to a rise in demand for cotton yarn, man-made staple fibres and cotton fabric. In this regard, Pakistan has a great opportunity to tap the market and be part of the value chain process in Sri Lanka's rising textile industry. In an important study conducted by the Pakistan Business Council in 2015 to assess the bilateral relationship between Pakistan and Sri Lanka, they highlighted a major barrier to realize the existing potential between the two countries and that is the disengagement between the countries' businessmen as well as their policymakers which in fact attributed to misconceptions about the existing potential in both the countries as well as the lack of interest in each other's markets. In addition, both have given the least priority to each other in expanding the trade despite having great opportunities. It suggests that a lack of regular "trade delegations" and "single country exhibitions" resulted in weak ties between the business communities of the two countries, hence making it difficult to encourage trade within neglected high potential items.

6.1.2: Trade Potential between Pakistan and USA

Being a major trading partner of Pakistan, here we review the trade ties between Pakistan and the USA. Based on the analysis of trade potential in table 6.1 and 6.2, the actual trade is almost equal to the predicted level, which implies that Pakistan and the USA have reached their potential. The current level of Pakistan's merchandise trade with the USA stands at $6.30 billion in 2017 with exports reaching $3.55 billion and imports at $2.6 billion. Nevertheless, a decline in exports to the US has been witnessed since 2012 with the highest

decline during 2016 when exports reduced by 6 percent. There are more than 200 trade partners of Pakistan and with a market share of 3.95 percent, the United States is Pakistan's third biggest supplier while China is the largest supplier with its exports to Pakistan amounting to more than $15,339 million (Arshad). Pakistan's exports to the USA heavily relies on textile products which indicate a narrow base of exports. Contrary to it, US imports from Pakistan has witnessed continuous stagnation, hence, it may be one of the main reasons that Pakistan and US trade has almost reached its potential with a narrow base of products. However, since the United States is Pakistan's largest market and trading partner, we believe that in order to boost export earnings, Pakistan must concentrate on the supply of high-value-added goods and broaden its export base.

6.1.3: Region wise Distribution of Trade Potential

Here we have assessed the regional distribution of potential by dividing the countries into their respective regional blocs and regions i.e Africa, ASEAN, Central Asian Region (CAR), ECO, EU-EEA, Latin America, Middle East, NAFTA, SAARC, and Transitional Economies. The analysis would be supportive in finding out the relative importance of these regions for Pakistan with an aim to expand its trade opportunities in future. For analysis, we have divided the countries into their respective regions as mentioned in Appendix-I, while the period of the analysis is the same i.e 1980-2017. However, to interpret the results we have taken the average values calculated for the period 2010-2017 and for 1980-2017. The comparison of Pakistan's trade potential for the period 2010-2017 across different regions reveals that on average Pakistan's maximum potential lies within the SAARC region followed by CAR, ECO, Transitional Economies, Africa, Middle East, ASEAN, EU-EEA, and Latin America. Within SAARC, the highest potential for Pakistan is indicated with Bhutan and Nepal, while results show that with India and Bangladesh, Pakistan has exhausted its existing potential. In spite of the maximum potential for Pakistan, the share of trade with the SAARC countries is currently around 4 percent which is very small.

With regard to India, Pakistan's trade relations are restricted on account of economic and political tensions. While our findings show that both India and Pakistan have reached their maximum potential, the volume of informal trade between the two countries must also be considered when interpreting the findings. Although exceeding potential indicates the increased volume of trade between the two countries during 2010-2017, however, it is still low if to compare it with other countries. Both are neighbouring countries, but the level of trade has

not crossed $ 2.0 billion in recent history. Political tensions and frequent military confrontations between India and Pakistan has protected them to develop their economic ties despite immense potential. Although both countries have signed the SAFTA agreement in 2006, the prevailing tensions between these two major players within the SAARC region have severely affected the effective implementation of this agreement. This lack of effectiveness motivated the countries within the SAARC regions to become members of other trading arrangements both within and outside the regions. In the Central Asian Region (CAR), the highest potential exhibits with Uzbekistan followed by Tajikistan and Kazakhstan. Currently, this region indicates a meagre share of 0.15 percent in Pakistan's total trade. As far as transitional economies are concerned, again Uzbekistan shows maximum trade potential with Pakistan followed by Tajikistan, Bulgaria, Bosnia, Kazakhstan, Hungary, Turkmenistan, Romania, Estonia, and Ukraine. Transitional economies contribute more than 20 percent to Pakistan's global trade. Africa's contribution to Pakistan's trade is around 4 percent. Within the region, the highest potential exists with Mali, Uganda and Mauitania.

In Middle Eastern countries, Cyprus and Iran show maximum potential. Currently, the share of Middle Eastern countries in Pakistan's trade is 19 percent. Within ASEAN, Brunei and Myanmar possess the highest potential for Pakistan to expand its trade during 2010-17. ASEAN share in Pakistan's global trade is only 9 percent at present. Amongst the countries of EU-EEA, Cyprus, Malta, Iceland, and Bulgaria reveals considerable potential. The share of the EU-EEA region is currently around 17 percent. Latin American countries El Salvador, Bolivia, Uruguay, Brazil, and Argentina etc indicate significant potential for Pakistan to expand its future trade, while its share in Pakistan's global trade is only 2 percent. Pakistan has exceeded its potential with the NAFTA region, however, only Canada possesses future trade possibilities with Pakistan. Currently, NAFTA's share in Pakistan's trade is 9 percent. When we compared Pakistan's average trade potential across the different region since 1980, we found the highest potential indicated with Latin America followed by Africa, SAARC, NAFTA, Transitional Economies, EU-EEA, CAR, Middle East, ASEAN, and ECO. Within Latin America, the countries which reveal the maximum potential for Pakistan over the span of 39 years are El Salvador, Paraguay, and Uruguay. In Africa, Mali, Sierra Leone, Ghana, and Morocco indicate the highest potential. On the other hand, in the SAARC region Bhutan and India show maximum potential since 1980. Within NAFTA, Pakistan can enhance its future trade with Mexico, whereas in transitional economies Latvia, Vietnam, Ukraine, and Estonia possess the highest potential with Pakistan. Latvia is again indicated as the country with the highest

potential for trade expansion with Pakistan in the EU-EEA region, whereas Kazakhstan, Turkmenistan and Uzbekistan reveal the highest potential not only from the CAR region but also from ECO. In the Middle East, Egypt, and Oman, while amongst ASEAN countries Vietnam and Brunei can be the potential market for Pakistan's trade expansion.

6.2: Export Potential in Goods

Following a thorough examination of Pakistan's trade prospects with various countries and regions, we will now examine countries and regions with significant export potential. At the beginning of this study, we mentioned that Pakistan is facing a significantly high trade deficit and to overcome this, it requires exploring new markets for its exports. By analyzing overall trade potential, we are not able to quantify the export potential with a view to exploring the export markets. Keeping in view the importance of export markets for Pakistan we have calculated the export potential so that we would be in a better position to identify the countries where Pakistan can have better opportunities to expand the export. According to the results presented in table 6.3 Pakistan possess the highest average export potential for the period under review with Bhutan followed by Bahamas, Macao, Mali, Uganda, and Zambia. Other countries with which Pakistan significant export potential has been indicated are Iceland, Switzerland, Iran, Bosnia, Nepal, Cyprus, El Salvador, Kazakhstan, Brunei, and Hungary. With relatively low magnitude, Pakistan's export potential exists with "Australia, Austria, Bahrain, Bolivia, Bulgaria, Canada, Cameroon, Chile, Estonia, Finland, France, Ghana, Greece, Hungary, India, Indonesia, Iraq, Japan, Kuwait, Lebanon, Maldives, Malta, Mauritania, Mauritius, Mongolia, Myanmar, New Zealand, Nigeria, Norway, Oman, Paraguay, Philippines, Saudi Arab, Singapore, Sierra Leone, Sweden, Tajikistan, Thailand, Turkey, Turkmenistan and UAE". With countries like Brazil, China, Morocco, Portugal and Jordon, Pakistan's exports either touched its potential level or almost equal to the potential level (table 6.3).

Table 6.3: Export Potential between Pakistan and its Trading Partners (2010-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	0.77	El Salvador	3.21	Maldives	1.08	Slovenia	0.79
Argentina	0.94	Estonia	1.08	Mali	15.15	South Africa	0.86
Australia	1.26	Finland	1.11	Malta	1.40	Spain	0.76
Austria	1.91	France	1.14	Mauritania	1.73	Sri Lanka	1.14
Bahamas	25.98	Germany	0.91	Mauritius	1.58	Swaziland	0.00
Bahrain	1.07	Ghana	1.42	Mexico	0.73	Sweden	1.17
Bangladesh	0.84	Greece	1.17	Mongolia	1.44	Switzerland	4.10
Barbados	0.69	Hong Kong	3.11	Morocco	1.00	Tajikistan	2.54

Belgium	0.63	Hungary	1.62	Myanmar	1.23	Tanzania	0.91
Bermuda	0.65	Iceland	4.72	Nepal	3.67	Thailand	1.32
Bhutan	134.62	India	1.19	Netherland	0.91	Tunisia	0.73
Bolivia	1.27	Indonesia	1.42	New Zealand	1.11	Turkey	1.13
Bosnia	3.81	Iran	4.03	Nigeria	1.58	Turkmenistan	2.65
Botswana	0.78	Iraq	1.71	Norway	1.20	Uganda	8.59
Brazil	1.00	Ireland	0.95	Oman	1.12	Ukraine	0.64
Brunei	3.12	Italy	0.88	Paraguay	1.07	UAE	1.47
Bulgaria	1.97	Jamaica	0.87	Peru	0.79	UK	0.85
Cambodia	0.92	Japan	2.23	Philippines	1.04	USA	0.86
Canada	1.17	Jordon	0.98	Poland	0.91	Uruguay	0.86
Cameroon	1.44	Kazakhstan	3.14	Portugal	0.99	Uzbekistan	3.68
China	0.98	Kenya	0.78	Romania	0.93	Vietnam	0.80
Chili	1.06	Kuwait	1.39	Russia	0.76	Zambia	7.04
Colombia	0.78	Latvia	0.78	Saudi Arabia	1.51	Zimbabwe	0.92
Cyprus	3.51	Lebanon	1.17	Senegal	0.67		
Denmark	0.92	Macao	20.06	Sierra Leone	0.74		
Egypt	0.91	Malaysia	0.91	Singapore	2.14		

Source: Author's own calculations

On the contrary, there are many countries with which Pakistan's actual exports surpassed its potential level during 2010-2017. These countries are "Algeria, Argentina, Bangladesh, Barbados, Belgium, Bermuda, Botswana, Cambodia, Colombia, Denmark, Egypt, Germany, Ireland, Italy, Jamaica, Kenya, Latvia, Malaysia, Mexico, Netherlands, Peru, Poland, Romania, Russia, Senegal, Sierra Leone, Slovenia, South Africa, Spain, Tanzania, Tunisia, Ukraine, United Kingdom, USA, Uruguay, Vietnam and Zimbabwe". Regarding average export potential on the basis of the period between 1980 and 2017, we have found that there are many countries which are still considered to be untapped markets as there is maximum potential for Pakistan to expand its future export. On top of the list is Sierra Leone followed by Ghana, El Salvador, Bhutan, Paraguay, Jamaica, Latvia, Uruguay, Mali, Bahamas, Chile, Colombia, Peru, Mexico, Brazil, Macao, South Africa, Argentina, Egypt, and Tunisia. Similarly, Algeria, Bolivia, Brunei, Bulgaria, Cameroon, Kazakhstan, Kenya, Mauritania, Mongolia, Morocco, Nepal, Nigeria, Philippines, Senegal, Slovenia, Tajikistan, Turkey, Turkmenistan, Uganda, Ukraine, Vietnam, and Zambia also possess high potential for Pakistan's exports.

Table 6.4: Export Potential between Pakistan and its Trading Partners (1980-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	2.63	El Salvador	68.29	Maldives	0.76	Slovenia	2.18
Argentina	5.52	Estonia	1.99	Mali	11.17	South Africa	5.54

Australia	0.96	Finland	1.39	Malta	1.12	Spain	1.49
Austria	1.03	France	0.99	Mauritania	2.03	Sri Lanka	0.95
Bahamas	10.59	Germany	1.01	Mauritius	0.99	Swaziland	0.00
Bahrain	0.94	Ghana	71.09	Mexico	8.55	Sweden	0.78
Bangladesh	1.19	Greece	1.37	Mongolia	2.15	Switzerland	1.44
Barbados	1.89	Hong Kong	1.23	Morocco	2.85	Tajikistan	2.19
Belgium	0.38	Hungary	0.70	Myanmar	0.36	Tanzania	0.87
Bermuda	0.16	Iceland	1.88	Nepal	2.71	Thailand	1.23
Bhutan	30.45	India	1.12	Netherland	1.25	Tunisia	5.07
Bolivia	4.38	Indonesia	1.01	New Zealand	1.06	Turkey	2.61
Bosnia	1.53	Iran	1.75	Nigeria	2.09	Turkmenistan	2.84
Botswana	0.70	Iraq	1.37	Norway	0.98	Uganda	3.12
Brazil	6.04	Ireland	1.09	Oman	1.06	Ukraine	2.16
Brunei	2.48	Italy	1.05	Paraguay	25.33	UAE	0.49
Bulgaria	2.15	Jamaica	20.52	Peru	9.62	UK	1.07
Cambodia	1.38	Japan	1.34	Philippines	2.15	USA	1.39
Canada	1.19	Jordon	1.71	Poland	1.15	Uruguay	13.12
Cameroon	4.61	Kazakhstan	2.09	Portugal	2.10	Uzbekistan	1.17
China	1.09	Kenya	3.63	Romania	0.88	Vietnam	3.14
Chili	10.26	Kuwait	0.88	Russia	1.07	Zambia	2.07
Colombia	9.73	Latvia	19.50	Saudi Arabia	0.89	Zimbabwe	1.82
Cyprus	1.45	Lebanon	0.72	Senegal	3.18		
Denmark	1.01	Macao	5.76	Sierra Leone	111.58		
Egypt	5.49	Malaysia	1.32	Singapore	1.12		

Source: Author's own calculations

With a relatively low level, countries like "Austria, Bangladesh, Barbados, Bosnia, Cambodia, Canada, China, Cyprus, Denmark, Estonia, Finland, Germany, Greece, Hong Kong, Iceland, India, Indonesia, Iran, Iraq, Ireland, Italy, Japan, Jordon, Malaysia, Malta, Netherland, New Zealand, Oman, Poland, Russia, Singapore, Spain, Switzerland, Thailand, UK, USA, Uzbekistan and Zimbabwe" retains the potential for Pakistan's future exports. The countries which have exhausted the existing export potential with Pakistan are Australia, Bahrain, Belgium, Bermuda, Botswana, Hungary, Kuwait, Lebanon, Maldives, and Myanmar. With France, Mauritius, Norway, Romania, Saudi Arab, Sri Lanka, Sweden, Tanzania and UAE, Pakistan's exports have reached its potential level.

6.2.1. Regional Distribution of Export Potential

Region-wise analysis of export potential during 2010-17 reveals SAARC as the region with maximum export potential for Pakistan followed by Central Asian Region (CAR), ECO, Africa, Middle East, Transitional Economies, ASEAN, EU-EEA, and Latin America while

NAFTA has been shown as the region with which Pakistan has exhausted its existing export potential. At present, SAARC share in Pakistan's export is around 6 percent and since 1980 it hovered between the narrow band of 3 to 6 percent. Within the region, Bhutan has shown the maximum potential for Pakistan followed by Nepal to expand its exports. Both Nepal and Bhutan are landlocked countries. The trade relations between Pakistan and Bhutan are not very impressive. The amount of trade between the two nations is significantly lower which may be attributed to the difficulties to access landlocked Bhutan. At present, major exports from Pakistan comprises textile and clothing and consumer goods, but the magnitude is very minimal (WITS). While Pakistan's exports to Nepal comprise consumer goods food products, capital goods, Hides and skins, textiles and clothing, Chemicals etc. As it has been found that the export potential between Pakistan and Bhutan & Nepal is significantly high, however, to tap this potential, India has an important role by allowing Pakistan the land routes to these countries (Ramay & Abbas, 2013).

Despite having a significant export potential between Pakistan and CAR, its share in Pakistan's export is only around 0.4 percent. Within the region, Uzbekistan and Kazakhstan have been identified as countries with high potential for Pakistan. Particularly, Uzbekistan is a "Central Asian" Economy bordered by five landlocked countries. It has a much smaller population and a lower GDP relative to Pakistan, however, its per capita income is much higher than Pakistan's. As far as the trade between the two countries is concerned, we have already seen that Pakistan's overall trade potential is high. When we compared the export and imports between the two countries, it indicated that during the last 6 years, Pakistan has been witnessing a trade surplus with Uzbekistan on account of rising exports relative to imports. However, overall trade, in particular, exports are still far from existing potential. Pakistan's major imports from Uzbekistan consist of "cotton, plastics, salts and earthly stones, and vegetables". On the other hand, Pakistan's major exports include "pharmaceutical products, photography and cinematography equipment, other various textile and agricultural products" (PBC, 2017). Presently, Pakistan exports $3.9 million worth of products to Uzbekistan while according to our results, the predicted exports could reach around $8.0 million hence the gap is around $4 million. The share of ECO in Pakistan's global export is currently at 2.0 percent which is not very encouraging. Within the region, Iran, Uzbekistan, and Kazakhstan have shown the highest potential for Pakistan. Africa's share in Pakistan's export is above 4 percent, while Mali, Uganda and Zambia are important countries for Pakistan to expand its exports. Particularly

with Mali, Pakistan's export potential is the highest. Pakistan's major exports to Mali consists of Capital goods, textile, clothing, machinery, and electronics etc.

Within the Middle East, Iran and Cyprus possess maximum potential for Pakistan. Its share in Pakistan's export is currently at around 9 percent. While Bosnia, Uzbekistan, Tajikistan, and Kazakhstan are amongst the leading transitional economies with whom Pakistan's future export prospects are high. The share of transitional economies in Pakistan's export is 11 percent. In the ASEAN region, Brunei and Singapore are the countries with maximum export potential for Pakistan. Presently it is contributing above 4 percent to Pakistan's global exports. Latin America is contributing around 2 percent to Pakistan's exports, while within the region, El Salvador possesses the maximum potential for Pakistan. Similarly, Bolivia and Paraguay also hold sufficient potential for Pakistan to expand its exports. Within the EU-EEA region, Cyprus and Austria possess high potential for Pakistan. EU region has the highest contribution in Pakistan's exports over the years and presently it is 34 percent.[11]

6.2.2: Regional Distribution of Export Potential (1980-2017)

A quick review of export potential across different regions since 1980 reveals that the maximum average export potential for Pakistan has been indicated with the Latin America followed by the African region, SAARC, NAFTA, Transitional Economies, ECO, EU, CAR, Middle East, and ASEAN. In Latin America, El Salvador, Paraguay, Uruguay, and Chili has been identified as countries with high export potential. While, in the African region, Sierra Leone, Ghana and Mali are the main countries to focus on to expand Pakistan's exports. Within SAARC, Bhutan has shown maximum potential, while Mexico has been identified as the country for the higher export potential for Pakistan within the NAFTA. In Transitional economies, Latvia, Vietnam, and Turkmenistan have been indicated as countries with higher export potential. In the ECO region, Turkmenistan and Turkey have shown maximum potential for Pakistan. Within the EU-EEA region, Bulgaria, Latvia, and Slovenia possess maximum export potential, whereas in the CAR region countries with the highest potential are Turkmenistan and Tajikistan. Egypt, Turkey within the Middle East and Brunei, Vietnam and the Philippines within the ASEAN region have been identified as countries with which Pakistan's export potential is maximum.

[11] Here the number of countries included in EU is 25 based on the availability of the data, therefore the share in Pakistan's export is not comparable with the one mentioned in chapter 2 of this study.

6.4: Identifying high Potential Products Categories with Average market Access Frontier (AMAF)

The second part of this chapter is dedicated to evaluating product-wise possibilities for Pakistan to expand its future exports in those countries with which we found maximum trade/export potential in the first part of this chapter. The analysis is based on the results calculated while using the Additional Market Access Frontier (AMAF) approach. This method is highly supportive to comprehensively analyse the products with higher export potential while taking Pakistan as a supplier country. The AMAF for each product is estimated as being the minimum of the products (at SITC (Rev (1)) supply to the rest of the world and partner country's demand from the rest of the world. This brings out the trade frontier which could be exploited to deepen market within those countries/regions under static conditions. Initially, Mukherji (2002) used this concept under the term 'potential trade'. Later on, Mukherji (2005, 2012), Bano (2013) and Taneja (2003) used the same concepts in their studies. Mukherji (2014) have used the same concept under the term Additional Market Access Frontier which establishes the outer limit for mutual trade expansion among partner countries offering trade preferences to the supplier country. In this part, we have used this concept to identify various product categories which have a high market access frontier for the supplying countries. It is assumed that the larger the supply capability and the wider the market of the partner countries, and smaller the existing trade flows, the greater the possibility of trade expansion among them with the easing of mutual trade restrictiveness among them. In order to calculate the AMAF, eight product groups have been selected on the basis of SITC Rev (1) classification obtained from the "UN COMTRADE" database retrieved through "World Integrated Trade Solution (WITS)".

For the purpose of analysis, we have selected only those countries/regions which have been identified with maximum trade potential for Pakistan on the basis of the gravity model. We have divided the time period (1980-2017) into four sub-periods and calculated the average values. In order to interpret the results, we choose to explain the results for 2010-2017 (Appendix-VII (a)). The analysis will be helpful in capturing the product-wise trade pattern of Pakistan along with identifying the potential product groups in export markets with high trade potential. Trade potential analysis based on the gravity model has identified non-traditional partners of Pakistan with maximum potential for trade expansion. AMAF has clearly shown that Pakistan's existing exports with these countries is almost negligible despite higher demand in these countries of various product groups as reflected through their global imports.

To sum up, the results as inferred through the AMAF, highest potential for Pakistan has been identified in manufactured goods, food and live animals and chemicals. The countries with which Pakistan has a maximum potential to expand its export in manufactured goods are Switzerland, Hungary, Hong Kong, Iran, Kazakhstan, Bulgaria and Ireland. Amongst these countries, Switzerland ($9.0 billion), Hungary ($ 9.0 billion) and Hong Kong ($ 8.8 billion) have the highest AMAF in manufactured goods by articles. Pakistan has significantly highest possibility to expand its trade in manufactured goods to these countries. The manufacturing goods are classified mainly by material playing an important role in boosting total manufactured exports. However, there is a significant change witnessed in the composition within the sector since 1980[12]. There is a considerable share of textile yarn, fabrics and made-up article in the manufacturing sector despite a decline over the years. The share has been reduced from 87.6 percent in 1980 to 84.3 percent in 2017. Similarly, the second major item Leather, leather manufacture, & dressed fur skin, has also witnessed a decline in its share from 9.7 in 1980 to 5.3 percent in 2017. Leather exports alone witnessed a decline in terms of their contribution to manufactures exports from 7.5 percent in 1980 to 2 percent in 2017.

In food and live animals, the highest AMAF has been obtained in the case of Switzerland, Ireland, Hong Kong, Iran, Hungary, Kazakhstan, and Bulgaria. Food & live animals are one of the most important items within the agriculture sector. According to the available data at COMTRADE, the cumulative total export earnings of Pakistan from this group increased by 6.5 times since 1980 from $0.60 billion to $3.88 billion in 2017. Similarly, its share within agriculture export increased substantially from 52.3 percent during 1980 to 92.4 percent in 2017, however, Pakistan could not exploit its full potential. We also inferred that under this category, major contribution came from “Cereals and cereal preparations followed by fruits and vegetables and Sugar, sugar preparation & honey”. It is also important to mention here that the magnitude of potential exists with countries like Brunei, Cyprus, Malta, Mali and Mauritania is minimum as it has not crossed the even US $1 billion in any of the SITC categories. Region-wise analysis indicates highest AMAF is “manufactured followed by misc manufactured goods and food & live animals” (Appendix VII (b)). In manufactured

[12]. Within manufactured, classified by material, following items are included: “leather, leather manufactures, rubber manufactures, cork and wood manufactures (excluding furniture), paper, paperboard and articles of paper pulp, textile yarn, fabrics, made up articles, non-metallic mineral manufactures, iron and steel, non-ferrous metal, manufactures of metal” etc.

goods, the highest potential to expand trade is with Latin America and ASEAN followed by ECO, SAARC, Africa, NAFTA, EU, and CAR. In misc manufactured articles, Pakistan has the highest potential is with SAARC followed by ECO, ASEAN, Latin America, Africa. While to expand trade in food and live animals, Pakistan needs to focus on Latin America, NAFTA, ECO, SAARC, EU, and ASEAN.

From the analysis of AMAF, one can draw two conclusions. First, Pakistan has reasonable potential to expand its trade in manufactured goods, and food groups towards non-traditional markets. Secondly, the current level of exports between Pakistan and these markets is nearly negligible. TDAP has conducted a separate analysis of various countries in order to find out trade opportunities for Pakistan. They have highlighted that there are several reasons which tend to discourage Pakistani exporters to turn away from traditional to non-traditional markets despite having a reasonable magnitude of potential. A few of the important factors are "rising cost of production, access to trade finance, lack of appropriate production technology and skills, technical requirements and standards abroad, tariff and non-tariff measures in partner's market, delay in payments, language barrier, delays in delivery due to international transport, complicated processes at foreign customs, heavy documentation and un-recognised Pakistani products" etc. We are of the view that there is a need to conduct in-depth analysis to further investigate the relevancy of the above factors in non-traditional partners of Pakistan in order to remove the barriers for trade expansion.

6.5: Trade Potential in Services Trade

Due to a lack of necessary data, the literature on the trade potential in services is very limited. However, in recent years, the quality of data has been improved, still, the available information with regard to the services trade is relatively poor if to compare it with the trade in goods (Walsh, 2006). Nonetheless, we have estimated the model for services trade and calculate the trade potential to identify the potential markets for Pakistan to expand its future trade.

Table: 6.5 Trade Potential in Services (2014-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	0.46	El Salvador	4.54	Maldives	0.82	Slovenia	2.20
Argentina	0.53	Estonia	1.36	Mali	18.62	South Africa	0.98
Australia	0.88	Finland	1.88	Malta	8.19	Spain	0.96
Austria	0.74	France	1.16	Mauritania	1.11	Sri Lanka	0.86
Bahamas	27.88	Germany	1.04	Mauritius	0.87	Swaziland	0.00
Bahrain	0.59	Ghana	0.83	Mexico	1.76	Sweden	0.83
Bangladesh	1.33	Greece	0.92	Mongolia	1.53	Switzerland	0.75

Barbados	4.17	Hong Kong	1.06	Morocco	1.65	Tajikistan	0.55
Belgium	0.72	Hungary	0.53	Myanmar	1.73	Tanzania	1.48
Bermuda	0.00	Iceland	2.28	Nepal	1.09	Thailand	0.90
Bhutan	31.13	India	1.15	Netherlands	1.16	Tunisia	0.87
Bolivia	1.60	Indonesia	0.88	New Zealand	0.74	Turkey	0.64
Bosnia	79.83	Iran	347.49	Nigeria	1.03	Turkmenistan	0.00
Botswana	1.99	Iraq	0.00	Norway	0.55	Uganda	3.06
Brazil	1.12	Ireland	0.93	Oman	0.54	Ukraine	1.18
Brunei	1.15	Italy	1.05	Paraguay	1.00	UAE	0.91
Bulgaria	0.99	Jamaica	1.27	Peru	0.81	United Kingdom	1.13
Cambodia	0.78	Japan	0.88	Philippines	0.65	USA	0.75
Canada	0.00	Jordan	1.09	Poland	1.21	Uruguay	0.61
Cameroon	6.64	Kazakhstan	3.02	Portugal	1.16	Uzbekistan	0.00
China	0.96	Kenya	0.96	Romania	1.29	Vietnam	0.99
Chili	1.59	Kuwait	1.51	Russia	1.00	Zambia	2.60
Colombia	0.85	Latvia	3.61	Saudi Arabia	0.91	Zimbabwe	2.08
Cyprus	1.03	Lebanon	1.77	Senegal	1.09		
Denmark	0.85	Macao	3.38	Sierra Leone	93.59		
Egypt	1.90	Malaysia	1.19	Singapore	1.06		

Source: Author's own calculations

For the purpose of analysis, we have divided the time period (2007-2017) into three sub-periods and calculated the average values of predicted and actual trade ratios. However, to interpret the results, we have mentioned the trade potential for the most recent period i.e 2014-2017, while details are given in Appendix-V. Table 6.5 shows that Pakistan has a maximum trade potential for future expansion in services trade with Iran followed by Sierra Leone, Bosnia, Bhutan, Bahamas, and Mali. Other countries with high trade potential for Pakistan include Barbados, Cameroon, El Salvador, Iceland, Kazakhstan, Latvia, Macao, Malta, Uganda, Zambia, and Zimbabwe. Pakistan has relatively low potential with countries like Bangladesh, Bolivia, Botswana, Brazil, Brunei, Chile, Egypt, Estonia, Finland, France, Germany, India, Italy, Jamaica, Kuwait, Lebanon, Malaysia, Mauritania, Mexico, Mongolia, Morocco, Myanmar, Nepal, Netherlands, Poland, Portugal, Romania, Tanzania, Ukraine, and Uzbekistan. Whereas, with countries like Cyprus, Hong Kong, Jordan, Nigeria, Paraguay, Russia, Senegal and Singapore, Pakistan's actual trade has almost reached to its potential.

Table: 6.6 Trade Potential in Services (2007-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	1.15	El Salvador	4.39	Maldives	2.23	Slovenia	1.31
Argentina	1.47	Estonia	2.97	Mali	10.39	South Africa	1.03
Australia	1.02	Finland	0.96	Malta	4.62	Spain	1.03
Austria	0.78	France	1.02	Mauritania	4.31	Sri Lanka	1.04
Bahamas	10.95	Germany	1.00	Mauritius	1.22	Swaziland	0.00
Bahrain	0.83	Ghana	1.16	Mexico	1.38	Sweden	0.95

Bangladesh	1.05	Greece	1.15	Mongolia	1.30	Switzerland	0.84
Barbados	1.89	Hong Kong	1.13	Morocco	1.17	Tajikistan	2.83
Belgium	0.83	Hungary	0.88	Myanmar	1.48	Tanzania	1.29
Bermuda	0.00	Iceland	1.74	Nepal	1.11	Thailand	1.06
Bhutan	175.94	India	1.04	Netherlands	1.04	Tunisia	1.10
Bolivia	1.65	Indonesia	1.06	New Zealand	0.49	Turkey	1.27
Bosnia	29.67	Iran	127.82	Nigeria	1.20	Turkmenistan	0.00
Botswana	1.45	Iraq	4.55	Norway	0.96	Uganda	2.44
Brazil	1.15	Ireland	1.41	Oman	1.21	Ukraine	1.17
Brunei	1.10	Italy	0.94	Paraguay	1.30	UAE	1.03
Bulgaria	1.14	Jamaica	1.66	Peru	1.14	United Kingdom	1.01
Cambodia	2.40	Japan	0.84	Philippines	1.36	USA	0.95
Canada	0.18	Jordan	1.24	Poland	1.03	Uruguay	1.11
Cameroon	6.56	Kazakhstan	1.92	Portugal	1.09	Uzbekistan	0.00
China	1.05	Kenya	1.02	Romania	1.11	Vietnam	1.07
Chili	1.19	Kuwait	1.01	Russia	0.36	Zambia	1.84
Colombia	1.08	Latvia	6.06	Saudi Arabia	1.01	Zimbabwe	1.13
Cyprus	0.81	Lebanon	1.27	Senegal	2.33		
Denmark	1.23	Macao	1.91	Sierra Leone	56.42		
Egypt	1.31	Malaysia	1.03	Singapore	1.01		

Source: Author's own calculation

The average ratio over the period between 2007- 2017 reveals that there is a significantly high trade potential for Pakistan with countries like Bhutan followed by Iran, Sierra Leone, Bosnia, Bahamas, and Mali. Other countries with high trade potential in services for Pakistan during 2007 and 2017 are Cambodia, Cameroon, El Salvador, Estonia, Iraq, Latvia, Maldives, Malta, Mauritania, and Uganda. While with countries like "Algeria, Argentina, Barbados, Bolivia, Botswana, Brazil, Brunei, Bulgaria, Chile, Denmark, Egypt, Ghana, Greece, Hong Kong, Iceland, Ireland, Jamaica, Jordan, Kazakhstan, Lebanon, Macao, Mauritius, Mexico, Mongolia, Morocco, Myanmar, Nepal, Nigeria, Oman, Paraguay, Peru, Philippines, Paraguay, Romania, Slovenia, Tanzania, Thailand, Tunisia, Turkey, Ukraine, Uruguay, Vietnam, Zambia and Zimbabwe", the potential is low. Pakistan's trade has almost reached its potential with countries like "Australia, Bangladesh, China, France, Germany, Kenya, Kuwait, Malaysia, Netherlands, Poland, Saudi Arabia, Singapore, South Africa, Spain, Sri Lanka, UAE and UK". Amongst the major trading partners of Pakistan in services trade (USA, UAE, UK, China, Saudi Arabia, Thailand, Switzerland, Singapore, Hong Kong and France) Pakistan has already exhausted its potential in services trade with the USA, and Switzerland, while with the rest of the partners, Pakistan has almost reached its potential. In fact, the actual trade with these countries has already touched the potential level.

6.5.1: Regional Distribution of Trade Potential

The comparison of trade potential in services for the period 2014-2017 across different regions shows that there are considerable prospects for Pakistan to expand its future trade in services in ECO followed by the Middle East, Africa, SAARC, Transition economies, EU-EEA, Latin America, and ASEAN, while within NAFTA and CAR, Pakistan has already exhausted its potential during the period under review (Appendix V). Within ECO, Pakistan has maximum trade potential in services with Iran and Kazakhstan, while in the Middle East, Iran, Egypt, Lebanon, and Kuwait possess the highest potential for Pakistan to expand its trade in services. Countries within the African region with whom Pakistan's trade potential is at the maximum level are Sierra Leone, Cameroon, Uganda, Zambia, and Zimbabwe. In the SAARC region, Pakistan can expand its future trade in services with Bhutan and Bangladesh, while within transition economies, establishing trade relations with Bosnia, Kazakhstan, Latvia, and Slovenia would be highly beneficial for Pakistan as these countries lie the maximum potential for future trade expansion. Within the EU region, Latvia, Iceland, and Slovenia, whereas in the ASEAN region, Myanmar, Malaysia and Brunei have shown maximum trade potential for Pakistan. In Latin America, the maximum potential in services is indicated with El Salvador, Mexico, Bolivia, and Chili. The analysis of trade potential across different regions since 2007 revealed that maximum potential for future trade expansion for Pakistan lies within the SAARC region followed by ECO, Middle East, Africa, Transition Economies, Latin America, EU, ASEAN and CAR (Appendix V). Within the SAARC region, Bhutan and Maldives have shown the highest potential for Pakistan. In Latin America, El Salvador, and Bolivia, while Iran and Iraq have shown maximum potential for trade expansion in services within the Middle East. In the African region, Sierra Leone, Mali, and Cameroon have been identified as potential markets for Pakistan's future trade expansion. Within the EU-EEA, Latvia, Malta, and Estonia, while Cambodia, the Philippines and Myanmar have shown maximum potential in the ASEAN region. In CAR, Tajikistan and Kazakhstan have been indicated with the highest trade potential for Pakistan over the years.

6.6: Export Potential in Services

In order to identify the countries and regions with maximum export potential, we estimated the gravity model with exports in services as the dependent variable and then used the coefficients to calculate the potential for Pakistan in services. As it has already been mentioned while discussing the trade/export potential in goods that Pakistan has witnessed a significantly high trade deficit over the years, however, resolve the country is required to

explore new markets for its exports. Likewise, expansion in services export will further add impetus to overall trade and will be supportive in the containment of trade deficit within reasonable limits. In this regard, it is important to explore markets and regions to expand its exports in services which is already very small in magnitude. According to the results presented in table 6.7, Pakistan holds the maximum average export potential during 2014-2017 with Cameroon followed by Bosnia, Bahamas, Mauritania, Macao, Zambia, and Zimbabwe.

Table: 6.7 Export Potential in Services (2014-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	0.37	El Salvador	0.54	Maldives	0.73	Slovenia	0.89
Argentina	1.19	Estonia	0.44	Mali	3.12	South Africa	0.80
Australia	0.73	Finland	2.51	Malta	1.80	Spain	0.72
Austria	0.39	France	1.21	Mauritania	11.42	Sri Lanka	1.59
Bahamas	28.95	Germany	0.96	Mauritius	1.04	Swaziland	0.00
Bahrain	0.64	Ghana	1.38	Mexico	3.65	Sweden	0.77
Bangladesh	2.28	Greece	0.93	Mongolia	4.27	Switzerland	0.56
Barbados	2.48	Hong Kong	0.88	Morocco	5.31	Tajikistan	0.54
Belgium	0.51	Hungary	1.47	Myanmar	1.19	Tanzania	2.00
Bermuda	0.00	Iceland	2.48	Nepal	1.06	Thailand	0.87
Bhutan	1.48	India	1.02	Netherlands	1.13	Tunisia	0.81
Bolivia	3.70	Indonesia	0.73	New Zealand	0.41	Turkey	0.78
Bosnia	80.69	Iran	0.60	Nigeria	0.76	Turkmenistan	0.00
Botswana	3.36	Iraq	0.00	Norway	0.45	Uganda	2.27
Brazil	1.10	Ireland	1.35	Oman	0.63	Ukraine	0.56
Brunei	0.49	Italy	0.73	Paraguay	4.03	UAE	0.98
Bulgaria	0.69	Jamaica	4.76	Peru	5.92	United Kingdom	1.02
Cambodia	1.01	Japan	0.84	Philippines	0.82	USA	0.82
Canada	0.00	Jordan	0.66	Poland	1.27	Uruguay	0.85
Cameroon	442.28	Kazakhstan	2.71	Portugal	0.52	Uzbekistan	0.00
China	0.85	Kenya	1.34	Romania	1.19	Vietnam	1.17
Chili	4.87	Kuwait	0.82	Russia	1.07	Zambia	7.73
Colombia	3.56	Latvia	0.92	Saudi Arabia	0.75	Zimbabwe	7.11
Cyprus	1.22	Lebanon	0.26	Senegal	2.31		
Denmark	0.95	Macao	8.82	Sierra Leone	0.00		
Egypt	2.05	Malaysia	1.03	Singapore	1.15		

Source: Author's own calculations

Other countries with high trade potential for Pakistan to expand its exports are Bangladesh, Barbados, Bolivia, Botswana, Chile, Colombia, Egypt, Finland, Iceland, Jamaica, Kazakhstan, Mali, Mexico, Mongolia, Morocco, Paraguay, Peru, Senegal, Tanzania, and Uganda. Similarly, countries identified with relatively low potential in services exports are

Argentina, Bhutan, Brazil, Cyprus, France, Ghana, Hungary, Ireland, Kenya, Malta, Myanmar, Nepal, Netherlands, Poland, Romania, Russia, Singapore, Sri Lanka, and Vietnam. While the countries with whom Pakistan's actual exports are almost at the potential level are Cambodia, India, Malaysia, Mauritius, and UK. During 2007-2017, maximum potential in services exports has been shown with Cameroon, Bosnia, Bahamas, Senegal, Algeria, Uruguay, Chili, Jamaica, and Ghana (Table 6.8).

Table: 6.8 Export Potential in Services (2007-2017)

Country	P/A	Country	P/A	Country	P/A	Country	P/A
Algeria	7.36	El Salvador	0.43	Maldives	2.61	Slovenia	2.31
Argentina	2.09	Estonia	2.17	Mali	2.45	South Africa	1.06
Australia	1.21	Finland	1.56	Malta	3.02	Spain	1.44
Austria	0.81	France	1.03	Mauritania	4.45	Sri Lanka	1.17
Bahamas	24.59	Germany	1.01	Mauritius	1.15	Swaziland	0.00
Bahrain	0.83	Ghana	5.08	Mexico	1.99	Sweden	1.13
Bangladesh	1.25	Greece	1.38	Mongolia	1.80	Switzerland	1.12
Barbados	1.31	Hong Kong	1.29	Morocco	4.39	Tajikistan	3.95
Belgium	0.84	Hungary	3.52	Myanmar	0.43	Tanzania	1.97
Bermuda	0.00	Iceland	2.11	Nepal	1.26	Thailand	1.33
Bhutan	0.60	India	1.01	Netherlands	1.04	Tunisia	2.97
Bolivia	5.01	Indonesia	1.20	New Zealand	0.67	Turkey	1.46
Bosnia	31.10	Iran	0.78	Nigeria	1.27	Turkmenistan	0.00
Botswana	1.92	Iraq	2.69	Norway	1.29	Uganda	1.90
Brazil	1.37	Ireland	1.83	Oman	1.82	Ukraine	1.69
Brunei	1.67	Italy	1.77	Paraguay	3.21	UAE	1.00
Bulgaria	4.54	Jamaica	5.30	Peru	3.81	United Kingdom	1.01
Cambodia	3.37	Japan	0.85	Philippines	1.83	USA	0.98
Canada	0.18	Jordan	1.50	Poland	2.14	Uruguay	5.73
Cameroon	185.52	Kazakhstan	3.05	Portugal	2.17	Uzbekistan	0.00
China	1.22	Kenya	1.02	Romania	1.24	Vietnam	1.10
Chili	5.31	Kuwait	0.98	Russia	0.39	Zambia	3.25
Colombia	2.47	Latvia	1.03	Saudi Arabia	0.82	Zimbabwe	3.19
Cyprus	1.23	Lebanon	0.86	Senegal	14.62		
Denmark	2.27	Macao	3.81	Sierra Leone	0.00		
Egypt	1.41	Malaysia	1.25	Singapore	1.05		

Source: Author's own calculations

Similarly, other countries with higher export potential for Pakistan during 2007-2017 have been identified as Argentina, Bulgaria, Cambodia, Colombia, Denmark, Estonia, Hungary, Iceland, Iraq, Kazakhstan, Macao, Maldives, Mali, Malta, Mauritania, Morocco, Paraguay, Peru, Poland, Portugal, Slovenia, Tajikistan, Tunisia, Zambia, and Zimbabwe. Countries with

relatively low potential are Australia, Bangladesh, Barbados, Botswana, Brazil, Brunei, China, Cyprus, Egypt, Finland, Greece, Hong Kong, Indonesia, Ireland, Italy, Jordan, Malaysia, Mauritius, Mexico, Mongolia, Nepal, Nigeria, Norway, Oman, Philippines, Romania, Singapore, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Tanzania, Turkey, Uganda, Ukraine, and Vietnam. While Pakistan's exports have almost reached their potential level with countries like France, Germany, Kenya, Netherlands, UAE and UK.

6.6.1: Regional Distribution of Export Potential in Services

The African region has shown maximum potential for Pakistan's services exports during 2014-17 followed by transition economies, Latin America, NAFTA, SAARC, and EU-EEA. Within the African region, the maximum potential lies with Cameroon, Mauritania, Zimbabwe, Zambia, Morocco, Botswana, Mali, and Egypt. Bosnia, Botswana, and Kazakhstan have shown the highest potential within transition economies while Latin America, Peru, Chile, Paraguay, Bolivia and Colombia have been identified as potential markets for Pakistan's future expansion in services exports. In NAFTA, Mexico has shown the highest potential while within the SAARC region, Bangladesh, Bhutan, and Sri Lanka have been indicated with the maximum export potential for Pakistan. In the EU region, Finland, Iceland, Malta, Hungary, Ireland, Cyrus and France have the maximum potential for Pakistan to expand its exports (see Appendix-V). During the period between 2007-2017, the African region has shown the maximum potential for Pakistan's future export expansion followed by transition economies, Latin America, EU-EEA, CAR, ASEAN, ECO, SAARC, Middles East, and NAFTA. Within the African region countries with maximum export potential are Cameroon, Senegal Algeria, Ghana, Mauritania, Morocco, Zambia, Zimbabwe, and Tunisia. In transition economies, Bosnia, Bulgaria, Tajikistan, Hungary, Cambodia, Kazakhstan, Slovenia, Estonia, and Poland while Chili, Uruguay, Bolivia, Peru, Paraguay, Colombia and Argentina have been identified as the potential export markets for Pakistan. Within the EU region, Bulgaria, Hungary, Malta, Slovenia, Denmark, Estonia, Portugal, and Poland have shown the highest potential in services exports for Pakistan. Tajikistan and Kazakhstan have been indicated as the potential market for services export's expansion both within the CAR and ECO. In the ASEAN region, Cambodia, the Philippines, and Brunei whereas, Maldives, Nepal and Bangladesh have shown the maximum export potential. In the Middle East region, Iraq, Oman, and Jordan while Mexico in NAFTA is the potential market for Pakistan's services exports.

6.7: Concluding Remarks

In this chapter, we examined the trade/export potential in goods and services for Pakistan across different countries, regions and regional blocks. The gravity equation is estimated separately for overall trade and exports to distinguish the significance of determinants. For the analysis, we apply both the least square and the PPML estimation technique, however, we preferred to use the later method in order to calculate the trade/export potential. PPML method is consistent in the presence of heteroscedasticity and accounts for zero trade flows and above all estimate the model in its multiplicative form thus it leads to consistent estimates as compared to the least square method which is inconsistent. The gravity model estimated separately for both goods and services through PPML estimation technique by considering traditional variables i.s GDP, Population, distance, common language, the border along with other important economic factors such as bilateral exchange rate, trade openness, Foreign Direct Investment (FDI), credit to GDP ratio, Fixed broadband subscription, RTA and FTA. With regard to diversification, new markets identified for trade/export potential in both goods and services. In goods trade, Pakistan's trade/export potential is maximum with the countries which are not its traditional trading partners. Regional distribution of trade/export potential indicated that maximum potential lies within Latin America followed by Africa, SAARC, NAFTA, Transition Economies, EU-EEA, CAR, Middle East, ASEAN, and ECO.

While commodity wise analysis indicates that 'manufactured goods', 'misc manufactured articles' and 'food groups' are the products with higher AMAF. It implies that Pakistan has significant possibilities to expand its trade in these commodity groups. The comparison of trade/export potential in services across different regions shows that there is considerable potential for Pakistan in ECO followed by the Middle East, Africa, SAARC, Transition economies, EU-EEA, Latin America, and ASEAN, while within NAFTA and CAR, Pakistan has already exhausted its potential during the period under review. The African region has shown maximum potential for Pakistan's services exports during 2014-17 followed by transition economies, Latin America, NAFTA, SAARC, and EU-EEA. The findings suggest that Pakistan has substantial scope to expand its trade particularly exports in services by diversifying it to new markets and regions. Results have also confirmed the fact that Pakistan's services sector is domestic-oriented as evidenced by a significantly higher contribution in GDP. Not much attention has been paid to the services trade if to compare it with the merchandise trade.

CHAPTER 7: SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

7.1: Summary

International trade in goods and services plays a vital role not only in maximizing the wealth of countries but also increases the division of labour and specialization thus it supports the country to increase productivity and economic growth. However, countries that are more open to trade often face challenges in response to external vulnerability through instability in terms of trade and foreign demand. The vulnerability of a country to external economic shocks is generally embedded in a country's dependence on its export, as export revenues fund imports and also directly add to investment and growth. Although the impact of an economic shock is realized through a decline in earnings from export, however, the magnitude of the effect primarily depends on the composition and concentration of the country's exports. Nevertheless, diversification policies both in terms of markets and products can help countries to build their resilience against any type of external shock. For this purpose, the highly competitive and sustainable structure of production and exports is very important. In addition, international trade cannot be separated from a variety of barriers like tariff and non-tariff barriers. Particularly, as now the world is moving towards a more competitive global trade regime, the implementation of non-tariff barriers can cause severe implications for export competitiveness. Thus, the importance of trade facilitation has increased manifold in view of reducing the negative effect of "non-tariff barriers" and also in the context of integrating into the global value chain.

The present study has conducted a wide-ranging analysis to look into the details of Pakistan's merchandise and services trade profile with a particular focus on exports. Similarly, we discussed the importance of trade facilitation and different indicators to measure its impact on trade/exports. The detailed analysis enabled us to know how much Pakistan has been successful in diversifying its trade profile along with the efforts in improving trade facilitation. Furthermore, the analysis provided a deep insight into chronical and contemporary issues that Pakistan's trade especially exports have been facing over the years. The descriptive analysis reaffirmed that both exports and imports (goods and services) are heavily concentrated in terms of products/subcategories of services and markets. The lack of diversification leads to instability in overall exports due to which exports earnings have not witnessed persistent growth over the years. Not only there was an unparalleled widening of trade deficit, but Pakistan's share in global exports also remained at a negligible level whether in goods or

services exports. With regard to services trade, the analysis indicated that in spite of the growing share of services in Pakistan's economy, its contribution to world exports is insignificant. Furthermore, it has not any significant contribution in fostering the growth of Pakistan's over-all trade. Presently, Pakistan is following a mid-term trade policy Strategic Trade Policy Framework. One of the key goals of this policy is to "improve export Competitiveness, the transition from factor-driven economy to efficiency-driven and innovation-driven economy and to expand share in regional trade." For the successful implementation of this strategy, Pakistan needs to enhance the role of services trade along with goods trade. In addition, to improve the export competitiveness, trade facilitation is an important pillar that aims at reducing the cost of doing business, standardization, and regulatory measures. Thus, the implications of this study for policy purpose can be enumerated. Achieving a higher level of diversification would make the country's trade more secured against external shocks. To improve the trade balance Pakistan needs to boost the country's exports relative to imports. For this purpose, Pakistan needs to identify new markets and products for goods and services. Simultaneously, the effective implementation of trade facilitation measures would further stimulate trade in general and exports in particular. Most importantly, it will provide further impetus to increase the level of diversification by countries and products. Thus, it will support in improving trade balance which in turn would lead to stabilizing the exchange rate. Consequently, it will boost investor's confidence. Overall, it will positively affect the macroeconomic environment of the country.

7.1.1: Objective of the Study

In view of the above, the broad aims of the study were to assess the trade/export potential of Pakistan by country and region while using the gravity model both for merchandise and services trade, to compute the trade potential of products/industries through the AMAF approach and then to analyze the relationship between bilateral trade/export flows and trade facilitation. Within the broad objectives, we set various specific objectives for in-depth analysis. First, we explored the key factors of trade/exports in goods based on the gravity model. The estimated coefficient was then used to compute the trade/export potential. To identify the product groups with high potential, we used AMAF. Similarly, we estimated the impact of institutional differences between Pakistan and its trading partners by using the Political Risk Index. We have also measured the asymmetric effect of bilateral exchange rate using the partial sum decomposition method. In addition, we examined the impact of trade facilitation on trade/exports. It has also enabled us to find out the most important and relevant indicator for

the expansion of trade/exports. Lastly, the study estimated the determinants of trade/exports in services and based on those determinants we identified the markets in which Pakistan can expand its trade/exports in services. Besides, we have also conducted a brief analysis into the Services Trade Restrictiveness Index (STRI) in order to know the extent of openness for the services market in Pakistan relative to its partner countries. The present study is important on account of various steps initiated by the government to give a boost to trade between Pakistan and its trading partners along with enhancing the trade within the region as well as outside the region.

7.1.2: Methodology/Data

The present study has estimated the gravity model on panel data to estimate the trade/export potential along with investigating the effect of trade facilitation measures. Furthermore, we have used the AMAF approach to identify the products with high trade potential. The study has discussed briefly different estimation techniques to estimate the gravity model, however, we applied both least square and the PPML estimation technique and preferred to use the later method in order to calculate the trade/export potential. PPML method is consistent in the presence of heteroscedasticity and accounts for zero trade flows and above all estimate the model in its multiplicative form thus it leads to consistent estimates as compared to the least square method. For merchandise trade, the study has calculated the trade/export potential at the commodity level while using AMAF. Using a gravity model at the sectoral level is a cumbersome job as it needs to have sector-specific production data instead of aggregate GDP variable. For developing countries, it is very difficult to get this data, therefore, to avoid this problem we have used AMAF to explore products with maximum potential in different countries. To perform the analysis, the countries were chosen on the basis of higher trade/export potential estimated through the gravity model. It implies that "the trade potential between two trading partners can be estimated by matching the total export supply for a given commodity (or group of commodities/products) of a country with the total import demand for that commodity of a trading partner".

Overall, the present study is unique in several ways i.e it has estimated the trade/export potential of Pakistan both in goods and services using a gravity model with 101 countries. However, for goods trade/export the data covers the period between 1980 -2017, whereas, for services trade the data has been used for the period between 2007 and 2017 as per available information. The study has used OLS and PPML estimation technique on a gravity model, however, PPML is the preferred one on the basis of its relative robustness in the presence of

heteroscedasticity and naturally includes zero trade values because it estimates the gravity model in its multiplicative form. Besides estimating trade potential at the country level, we have evaluated the regional distribution of trade/export potential while focusing on Africa, ASEAN, Central Asian Republics (CAR), ECO, EU-EEA, Latin America, Middle East, NAFTA, SAARC, and Transition economies. Similarly, we have used the "Logistic Performance Index (LPI) "to measure the e trade facilitation effect on trade/export flows in goods. Hence, this study offers a more comprehensive analysis of Pakistan's trade with regard to the estimation of trade/export potential and the impact of trade facilitation on trade/exports. The study infers several findings which are briefly discussed here.[13]

7.2: Findings of the Study

7.2.1: Determinants of Trade/Exports in Goods

On the basis of the PPML estimation method, we found that the coefficient of GDP, absolute per capita GDP differential, trade openness ratio of Pakistan and its trading partners, distance, common border, and FTA are the major determinants to expand Pakistan's merchandise trade with its trading partners. While for bilateral exports in goods, it was found that the income level of partner countries may have a strong impact relative to Pakistan's own GDP level. Similarly, the absolute GDP per capita differential, trade openness, distance and border are the major factors to enhance the exports. The estimation of the gravity model yielded two significant results i.e "negative effect of common language dummy on Pakistan's trade/exports" and "insensitivity of trade/exports to changes in the exchange rate". The negative coefficient of language dummy implies that Pakistan is sharing a common official language with only 28 countries from the sample of 101 countries. Among countries sharing a common official language, only the USA and the UK are major trading partners. For the remaining 73 countries (not sharing a common official language) the volume of trade is relatively higher only with a few including mainly China, Saudi Arabia, UAE, Germany, Italy, Belgium and Bangladesh. It is also important to mention here that there are 15 countries from the African region with whom Pakistan is sharing a common official language, however, the magnitude of overall trade is very small. On the contrary, there is a large number of countries with whom Pakistan does not share the common language, yet the magnitude of trade is still very small. This result shows that the importance of language varies from region to region. However, the importance of a common official language for establishing effective trade

[13]The present study is based on empirical analysis depending upon the availability, completeness and reliability of data pertaining to countries in our data sample.

relations among the countries cannot be overlooked because trade requires communication, lack of which can give rise to language barriers (Molnar, 2013). Consequently, language barriers may result in substantial cost on bilateral trade among nations that have no common language to communicate with each other. Similarly, the impact of the exchange rate implies that Pakistan has a narrow export base and concentrated on a few items with inelastic demand. Therefore, the movements in the exchange rate may have a small impact on export performance.

With regard to the RTA dummy, we found it insignificant in boosting trade while in the case of exports, it has been found as trade diverting between the members based on its negative coefficient. Within the RTA dummy, we evaluated the impact of SAPTA and ECO. Results present the factual situation within the regional trading arrangements. Both of these RTAs are not playing their role in expanding trade at the global and regional level. Besides political tension between Pakistan and India, various tariff and non-tariff barriers have made these trading arrangements be mere as the nominal body. In contrast, we found an insignificant impact of FTA in boosting exports between Pakistan and its trading partners. Pakistan has established various FTAs and PTAs with China, Malaysia, Sri Lanka, Indonesia, Iran and Mauritius. However, due to an inflow of cheap goods from partner countries as a result of these FTAs, domestic manufacturing severely affected. Equally, Pakistan has not been able to access the market of the partner country. In addition, under-invoicing and misdeclaration of import consignments to take advantage of tariff concessions has further damaged the local manufacturing. The present study has also estimated the impact of institutional differences between Pakistan and its trading partners by including political risk index along with other variables of gravity model i.e., "GDP, Population, distance, border, language, RTA and FTA". Results confirm that improvement in the relative political index is important for Pakistan to enhance its trade.

We have also briefly touched on the asymmetric specification of the gravity model while disaggregating the effect of the exchange rate in depreciation and appreciation through the partial sum decomposition approach. Results indicate that Pakistan's trade is less responsive to any change in the exchange rate as the exports base is extremely narrow and highly concentrated in a few items. However, it may be evidence of nonlinear mean-reverting association because some exchange rate changes of the same magnitude show different effects on other variables of interest.

7.2.2: Determinants of Trade/Exports in Services

With regard to Services, we found the product of GDP, bilateral exchange rate, partner country's trade openness, border, common language, and FTA as major determinants of services trade, while stimulating the services exports, partner country's GDP, partner country's trade openness, partner country's credit to GDP, fixed broadband subscription in Pakistan, distance and common language are important factors. We found an insignificant impact of credit to GDP ratio in Pakistan on trade/exports in services which is mainly due to the fact that Pakistan's manufacturing sector is receiving the highest share in overall credit allocation, while the services sector despite contributing significantly to GDP, receiving less than 20 percent of the total credit. Similarly, the study found an insignificant impact of FDI on trade/exports, which may be due to its inward diversion for domestic services. This is evidenced by the fact that over the years, the contribution of the services sector in GDP is above 50 percent and currently it is 60 percent and being a developing country, Pakistan does not have the surplus to export the services. The coefficient of distance has found to be insignificant in the case of overall trade in services. The insignificance may be attributed to the fact that physical distance has less importance for the movement of various services items. Interestingly, we found a significantly positive impact of language in the case of trade/exports in services. The result is in anticipation of this fact that there are different service transactions that depend on the movement of physical persons and person to person communication. Thus, sharing a common language provides great support in improving the trade ties in services between the countries.

7.2.3: Trade/Export Potential in Goods

On the basis of coefficients estimated, we examined the trade/export potential in goods and services for Pakistan across different countries, regions, and regional blocks. With regard to diversification, new markets identified for trade/export potential in both goods and services. The study revealed that Pakistan's trade/export potential is maximum with the countries which are not its traditional trading partners. In goods trade, 24 out of 101 countries were identified during 1980-2017 with significantly high trade potential, while during 2010-2017, there were 20 countries with higher potential for Pakistan. On average maximum trade potential during 2010-17 was found with the Bahamas, Bhutan, Bosnia, Brunei, Bulgaria, Cyprus, El Salvador, Hong Kong, Iceland, Iran, Kazakhstan, Macao, Malta, Mali, Mauritania, Myanmar, Nepal, Tajikistan, and Uganda, Uzbekistan. However, from 1980 to 2017 on average Pakistan's trade potential has reached a considerably high level with countries like Bahamas, Bhutan, Chile,

Colombia, El Salvador, Ghana, Jamaica, Latvia, Mali, Morocco, Paraguay, Sierra Leone, South Africa, Tunisia, Uruguay, and Zimbabwe.

While analysing trade potential, it was also found that there is a sizeable number of developed and developing countries like Austria, Egypt, USA and Zimbabwe with whom Pakistan's actual trade reached its maximum potential, while with Algeria, Bangladesh, Barbados, Belgium, Bermuda, Botswana, Cambodia, China, Colombia, Denmark, India, Kenya, Latvia, Mexico, Morocco, Oman, Peru, Poland, Senegal, Sierra Leone, Slovenia, South Africa, Spain, Thailand, UAE and Vietnam, the actual trade exceeded its potential during 2010-17. On the other hand, on the basis of data from 1980 to 2017, Pakistan exceeded its potential with Australia, Bangladesh, Belgium, Bermuda, Botswana, France, Germany, Hungary, Ireland, Italy, Japan, Jordon, Lebanon, Malaysia, Maldives, Mauritius, Myanmar, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovenia, Sri Lanka, Sierra Leone, Switzerland, Tanzania, Turkey, UAE, UK, USA and Zambia. Unfortunately, Pakistan's bilateral trade reached its potential level or exceeded the actual level on the back of a narrow basket of commodities, consequently, it has severely affected overall level of exports relative to that of imports, and hence the overall trade deficit touched the highest level in recent years. Regional distribution of trade potential indicated that maximum potential lies within Latin America followed by Africa, SAARC, NAFTA, Transition Economies, EU-EEA, CAR, Middle East, ASEAN, and ECO.

7.2.4: Export Potential

The study has found 16 out of 101 countries with maximum potential for export expansion during 2010-17, whereas on the basis of data from 1980 to 2017, 42 countries were identified for Pakistan to expand its future exports. Countries indicated with maximum export potential for Pakistan on the basis of data 2010-17 are Bhutan, Bahamas, Macao, Mali, Uganda, and Zambia. Similarly, Pakistan also needs to tap the markets of Iceland, Switzerland, Iran, Bosnia, Nepal, Cyprus, El Salvador, Kazakhstan, Brunei, and Hungary as indicated with significantly high export potential. The analysis based on 1980 and 2017, revealed that there is maximum potential for Pakistan to expand its future export with Argentina, Bahamas, Bhutan, Brazil, Chile, Colombia, Egypt, El Salvador, Ghana, Jamaica, Latvia, Macao, Mali, Mexico, Paraguay, Peru, Sierra Leone, South Africa, Tunisia and Uruguay. Regional distribution of export potential reveals the maximum average export potential for Pakistan with the Latin America, African region, SAARC, NAFTA, Transition Economies, ECO, EU, CAR, Middle East, and ASEAN.

7.2.5: Additional Market Access Frontier (AMAF)

According to the results, since 1980 the export potential of Pakistan with its traditional and non-traditional trading partners have increased in almost all groups of products, however, between 2010 and 2017 the maximum potential found in manufactured goods and food & live animals and chemicals. In 2017, the maximum potential to expand its export in manufactured goods have been identified with Hungary, Switzerland, Hong Kong, Iran, Kazakhstan, Bulgaria, Ireland, Bosnia, and Nepal. In food and live animals, the maximum potential exists with Switzerland, Ireland, Hong Kong, and Iran. Within the region, maximum potential Latin America, ASEAN, ECO, SAARC, and NAFTA etc in manufactured goods, misc manufactured articles and food & live animals. The broad analysis helped to comprehend that even if Pakistan's trade/export exhausted or reached the potential, its export magnitude is smaller relative to imports with most of the countries.

7.2.6: Trade/Export Potential in Services

Pakistan has a maximum trade potential for future expansion in services trade during 2014-2017 with Iran followed by Sierra Leone, Bosnia, Bhutan, Bahamas, and Mali. Other countries with high trade potential for Pakistan include Barbados, Cameroon, El Salvador, Iceland, Kazakhstan, Latvia, Macao, Malta, Uganda, Zambia, and Zimbabwe. According to the average ratio over the period between 2007-2017, there is a significantly high trade potential for Pakistan with countries like Bhutan followed by Iran, Sierra Leone, Bosnia, Bahamas, and Mali. Other countries with high trade potential in services for Pakistan during 2007 and 2017 are Cambodia, Cameroon, El Salvador, Estonia, Iraq, Latvia, Maldives, Malta, Mauritania, and Uganda. While with countries like Algeria, Argentina, Barbados, Bolivia, Botswana, Brazil, Brunei, Bulgaria, Chile, Denmark, Egypt, Ghana, Greece, Hong Kong, Iceland, Ireland, Jamaica, Jordan, Kazakhstan, Lebanon, Macao, Mauritius, Mexico, Mongolia, Morocco, Myanmar, Nepal, Nigeria, Oman, Paraguay, Peru, Philippines, Paraguay, Romania, Slovenia, Tanzania, Thailand, Tunisia, Turkey, Ukraine, Uruguay, Vietnam, Zambia and Zimbabwe, the potential is low. The comparison of trade potential in services for the period 2014-2017 across different regions shows that there is considerable potential for Pakistan to expand its future trade in services in ECO followed by the Middle East, Africa, SAARC, Transition economies, EU-EEA, Latin America, and ASEAN, while within NAFTA and CAR, Pakistan has already exhausted its potential during the period under review.

7.2.7: Export Potential in Services

According to the results, Pakistan holds the maximum average export potential during 2014-2017 with Cameroon followed by Bosnia, Bahamas, Mauritania, Macao, Zambia, and Zimbabwe. Other countries with high trade potential for Pakistan to expand its exports are Bangladesh, Barbados, Bolivia, Botswana, Chile, Colombia, Egypt, Finland, Iceland, Jamaica, Kazakhstan, Mali, Mexico, Mongolia, Morocco, Paraguay, Peru, Senegal, Tanzania, and Uganda. During 2007-2017, maximum potential in services exports has been shown with Cameroon, Bosnia, Bahamas, Senegal, Algeria, Uruguay, Chili, Jamaica, and Ghana. Similarly, other countries with higher export potential for Pakistan during 2007-2017 have been identified as Argentina, Bulgaria, Cambodia, Colombia, Denmark, Estonia, Hungary, Iceland, Iraq, Kazakhstan, Macao, Maldives, Mali, Malta, Mauritania, Morocco, Paraguay, Peru, Poland, Portugal, Slovenia, Tajikistan, Tunisia, Zambia, and Zimbabwe. The African region has shown maximum potential for Pakistan's services exports during 2014-2017 followed by transition economies, Latin America, NAFTA, SAARC, and EU-EEA. During the period between 2007 and 2017, the African region has shown the maximum potential for Pakistan's future export expansion followed by transition economies, Latin America, EU-EEA, CAR, ASEAN, ECO, SAARC, Middles East, and NAFTA.

7.2.8: Impact of Trade Facilitation on Trade/Exports

After estimating the determinants of trade/export in goods, we attempted to evaluate the effect of trade facilitation measures. For this purpose, LPI has been used. According to the results, the effect of LPI is more pronounced on exports as compared to overall trade. We found that improvement in trade facilitation both in Pakistan and its partner country has a significant impact in boosting exports, however, the impact of the partner country's LPI is more in terms of magnitude. We have also evaluated the impact of various subcomponents of LPI and inferred that ease of arranging competitively priced shipment both in Pakistan and its partner country, ability to track and tracing consignment in Pakistan and quality of trade and transport logistic in partner country can significantly affect the exports. The study has found that Pakistan's rank in ease of arranging competitively priced shipments has been dropped mainly due to "poor maintenance of operational crafts, lack of development of old vessels, deterioration of pilot tugs and pilot boats". Similarly, Pakistani ports compromise the price competitiveness for international shipments due to the cartels in the transport sector along with a relatively lower number of containers. With regard to the impact of the ability to track and trace on exports, the study found that Pakistan's rank in this sub-component has also declined mainly due to the

absence of this facility on the rail network and at customs, while the very limited percentage of a tracking system is available for road transport. The situation in infrastructure quality is not different from other components, rather it has witnessed a sharp decline during 2018.

The infrastructure quality index consists of "trade and transport-related infrastructures like roads, railroads, ports and information technology". Similarly, it includes regulatory controls, standards, dispute resolutions mechanisms etc. Although, roads and rails infrastructure has witnessed a considerable improvement since 2007, however, very limited attention is paid to improve the regulatory, controls, standards and dispute resolution mechanism which are equally important. We have found that better infrastructure quality in the partner country has a significant positive impact on Pakistan's exports. The improvement in the quality of logistic in the partner country may have a spill over effect on Pakistan's exports through strong import demand for raw material and other intermediate good. Apart from examining the effect of logistics on overall trade/exports, we have also evaluated the same for higher and lower-income countries. According to the results, improvement in Pakistan's logistics may lead to expanding its exports to high-income countries. The significantly positive impact of Pakistan's trade facilitation has been realized on account of the "ability to track and trace consignments and ease of arranging competitively priced shipments" in Pakistan. Contrary to the above, in the case of low-income countries, the impact of the partner country's LPI is positive and significant for Pakistan's export expansion. The ability to tracking and tracing in partner country has a significantly positive impact on Pakistan's exports, while ease of arranging competitive prices in Pakistan and its trading partners have a significant impact in expanding Pakistan's export towards its trading partners. Nevertheless, the impact is higher for Pakistan.

7.3: Conclusions

The present study has comprehensively examined the trade/export potential in goods and services for Pakistan as well as assessed the impact of trade facilitation. For the purpose of analysis, the gravity model has been estimated through OLS and PPML estimation method, however, the PPML method was used as a preferred technique for further analysis. The model regressed two dependent variables i.e total trade and exports on traditional and other explanatory variables. The significance of trade as a dependent variable in fact shows the characteristics of demand and supply in the country (Kepaptsoglou, "et al" 2010). Besides we

have also used AMAF to identify the product groups with higher trade potential. The study has used panel data across 101 trading partners to estimate the trade/export potential in goods and services, while 97 countries were included to investigate the effect of trade facilitation on trade/exports. The "classical gravity models" use cross-section data for a specific period in order to analyse the trade flows between the countries. However, the panel data framework offers broad information since it enables the use of time series and cross-section data simultaneously. We have applied the gravity model for Pakistan in a number of ways, starting from the basic classical version to the most sophisticated framework of augmentation for goods, services, and trade facilitation. Besides the traditional explanatory variables, i.e., "size of the economies" concerned and the "distance" between them, we have also included certain dummies to capture the impacts of qualitative factors like "common border, language and association with socio-economic and regional groups". Similarly, we have used proxies for variables like the GDP for size, Trade-GDP ratio for the openness of the economies concerned, credit to GDP ratio for financial development, fixed broadband for ICT and logistic performance index (LPI) for trade facilitation. In addition, various other variables like bilateral exchange rate, relative human capital endowment have also been used. Before evaluating the trade/export potential both in goods and services, we first estimated the determinants. The study has found most of the coefficients with their expected (theoretically supported) signs and they are statistically significant. We found that the "coefficient of GDP, absolute per capita GDP differential, trade openness ratio of Pakistan and its trading partners, distance, sharing a common border and FTA" are the major factors to expand the trade between Pakistan and its trading partners in goods. While the income level of partner countries, the absolute GDP per capita differential, trade openness, distance and border are the major determinants of bilateral exports between Pakistan and its trading partners.

In the case of services, "a product of GDP, bilateral exchange rate, partner country's trade openness, border, common language and FTA" has been found as major determinants of trade, while to give a boost to services exports, partner country's GDP, partner country's trade openness, partner country's credit to GDP, fixed broadband subscription in Pakistan, distance and common language are important factors. In specific cases, the coefficients of certain variables and dummies both in goods and services either deviate from the expectations so far as signs are concerned or they turn out to be insignificant, obviously due to the fact that other factors not included in the model may be stronger. Finally, we have used the estimated model (coefficients of different variable) to evaluate the trade/export potential in the goods and

services of Pakistan with different countries. Overall, the analysis indicates that Pakistan has tremendous potential to exhaust by diversifying its trade towards new destinations. Similarly, Pakistan needs to focus on enhancing trade/export in services in order to transform its economy into innovation driven. According to the STRI, Pakistan is relatively more open as compared to most of its trading partners as trade restriction are lowered in distribution, transport, and telecommunication services.

On the basis of AMAF, we found since 1980 the estimated export potential of Pakistan with its "traditional" and "non-traditional" trading allies have increased in almost all groups of products, however, between 2010 and 2017 the maximum potential found in manufactured goods, and food & live animals and chemicals. The broad analysis helped to comprehend that even if Pakistan's trade/export exhausted or reached the potential, its export magnitude is smaller relative to imports with most of the countries. While analysing the country-wise results, we found that "rising cost of production, access to trade finance, lack of appropriate production technology and skills, technical requirements and standards abroad, meeting the quality with quantity demanded, tariff and non-tariff measures in partner's market, higher energy costs, delay in payments, language barrier, delays in delivery due to international transport, complicated processes at foreign customs, heavy documentation and unrecognised Pakistani products" are the main obstacles that are discouraging Pakistani exporters to turn away from traditional to non-traditional markets. Consequently, Pakistan has been unable to improve the level of diversification both in terms of markets and products despite having great potential for future trade expansion in different countries and regions.

Similarly, with regard to logistics, we found a significant positive impact of the overall LPI of Pakistan and its partner countries on exports relative to overall trade. However, the magnitude of impact in the case of Pakistan's trade facilitation is lower as compared with the trade facilitation of its partner countries. Amongst various sub-components, we found that ease of arranging competitively priced shipment both in Pakistan and its partner country, ability to track and tracing consignment in Pakistan and quality of trade and transport logistic in partner country may have a significant impact on exports. Overall, the current study has reaffirmed Pakistan's significant potential in merchandise and services trade/exports. However, there are certain chronic as well as contemporary issues which needs to be addressed.

We inferred three main conclusions from the present study i.e:

i. The merchandise and services trade/exports are highly concentrated in few countries and in limited products. According to AMAF, Pakistan has trade relations with a large number of countries around the world, but its current exports in various product categories are very small in magnitude if to compare it with the existing global exports of Pakistan and existing demand of the partner country reflected by their global imports.
ii. Based on LPI analysis, we can conclude that the trade costs in Pakistan are high owing to weak international connectivity and trade facilitation.
iii. Most importantly, Pakistan's trade policies always remained focused on goods trade/exports while ignoring the trade/exports in services which can play a critical role in increasing Pakistan's share in global trade/exports.

7.4: Policy Recommendations

The study has several applicable policy recommendations. There is no doubt that over the years, Pakistan has initiated various types of trade policies from import substitution to export-led strategy and now following STPF, but instead of focusing on effective implementation of these policies by addressing the structural issues, the country has focused on short term export stimuli. Therefore, the focus should be on the effective implementation of long-term trade policies. The present study has determined various important factors that can provide substantial support in stimulating merchandise and services trade/exports. The government should give due attention to these factors while formulating trade policies.

7.4.1: Competitiveness

In order to achieve sustainable and higher growth in exports, Pakistan needs to improve competitiveness and level of diversification in the export base. By adopting more skilled and technology-intensive activities, Pakistan can improve competitiveness, however, according to the findings of the present study, improvement in LPI (a proxy for trade facilitation) is fundamental for the country's export competitiveness and foreign market expansion for indigenous goods. In this regard, the transport cost can be reduced considerably by introducing effective policy reforms in customs, ports, road authorities and the traffic regulators. At the same time, the Government is required to ensure the smooth supply of raw materials and inputs such as gas and electricity to support the domestic industry in order to meet the international orders on time. In addition, the high cost of production as a result of higher energy prices have

also made Pakistani products uncompetitive. In this regard, the government should provide subsidized electricity and gas to priority industries.

7.4.2: Merchandise Trade/Export

To improve the share in global exports, Pakistan is required to change the composition of exports by focusing on medium and high-tech exports. In this context, domestic credit expansion would play a vital role. However, lessening the constraints that impede easy credit accessibility is essential. To better use innovative strategies and techniques, the workers need to be trained with adequate training facilities so that they could quickly adopt emerging technologies. Similarly, Pakistan is required to focus on establishing more trading agreements through bilateral, free trade or preferential arrangements with Latin America, Africa, CAR, and transition economies. Particularly, Latin America and Africa have tremendous potential for Pakistan to expand its export as concluded in this study. With an aim to exploit the existing potential in Latin America, Africa and other countries and regions, Pakistan also needs to adopt better marketing strategies by participating more in international trade exhibitions and events, along with improving quality assurance and adapting innovative strategies. Keeping in view the global demand for products, Pakistan needs to reprioritize its exportable products and provide its producers' incentives by declaring them priority industries.

With regard to FTAs, it has been seen that except with Sri Lanka, Pakistan's trade balance is in favour of China and Malaysia. Despite a rise in trade between Pakistan and the two countries after respective FTAs, the exports from Pakistan are still far from their actual potential. Instead, Pakistan has witnessed a significantly higher inflow of low-priced products from these partner countries, severely affecting the domestic industries making it difficult for Pakistan to tap their markets. In this regard, it may be suggested that Pakistan needs to adopt better marketing strategies by participating more in international trade exhibitions and events, along with improving quality assurance and adapting innovative strategies Pakistan needs to be cautious while entering into any future FTA because free trade plays a critical role in the expansion of the global products and the global value chains. It is imperative that both countries clearly articulate the directions for trade development, in particular, the trade policies of both countries must address various trade barriers and suggest prompt measures to remove them in order to increase trade openness. In turn, it will help in export expansion and overall will support trade expansion. We are of the view that the removal of tariff barriers alone cannot stimulate smooth and timely trade between the member countries, therefore it is important to

be focused on the elimination of "non-tariff barriers". As the present study has indicated the importance of LPI as a measure of trade facilitation, hence the improvement in logistics would further provide impetus to overall trade. Thus, Pakistan should ensure the inclusion of trade facilitation provisions in new and already established FTAs.

7.4.3: Services Trade/Export

We have found an insignificant impact of private sector's credit (a proxy for financial development) on the services sector that was due to the fact that the manufacturing sector is receiving the highest share in overall credit allocation, while the services sector despite contributing significantly to GDP, receiving less than 20 percent of the total credit. In this regard, it is imperative to increase the spending on the services sector. The banking sector should increase the credit expansion towards the services sector which can only be possible through a well-functioning and developed financial system. In terms of services, Pakistan has enormous potential to broaden its trade across different regions. The African region has shown maximum potential for Pakistan's services exports during 2014-2017 followed by transition economies, Latin America, NAFTA, SAARC, and EU-EEA. To tap the country-wise and region-wise potential in services, the trade policy of Pakistan must include a proper strategy to establish FTAs and RTAs in services trade. In doing so, the issues relevant to regulatory reforms should be at the forefront of all future efforts to liberalize trade in services. It is because most of the trade barriers in services are included in sectoral regulations in particular infrastructure and professional services. Pakistan has only two bilateral services agreements i.e with China and Malaysia but outside the TISA club. Hence, Pakistan has an opportunity to explore further markets in services exports and ensure investments through services imports under TISA.

Given the considerable share of services to the national economy and trade, countries must plan and execute a services-driven development strategy within a coherent and detailed policy context while maintaining linkages with other policy areas and overall national development objectives. Pakistan needs to work on a comprehensive policy framework to formulate a services-driven export development strategy that should not only be aligned with the objectives of the domestic economy but also provide support to capture the international market. It is important because it is often assumed that measures introduced for goods trade under export promotion strategies will also address the needs of the services sector, which is

wrong. However, there are multifaceted challenges in developing as well as implementing such a strategy due to the complex nature of the services sector. The services industry includes both the public and private sectors, therefore public-private partnership would be crucial in this regard.

Developing a strategy for trade in services, in particular, National export promotion strategies in services would provide a great opportunity for the private sector to expand their businesses. However, to address the concerns and need of the private sector, the "Federation of Chamber of Commerce and Industry (FPCCI)" can play a vital role. They can be an important lobby to bridge the gap between the government and the private sector. Acknowledging FPCCI as a representative of the services industry would boost its role in the effective implementation of the strategy. Similarly, our findings suggest that the government requires to develop digital infrastructure for export expansion. However, the scale of investment required for infrastructure development is not possible for the government alone. In this connection role of the private sector would be crucial. To secure investment from the private sector, Pakistan needs to ensure a conducive environment by removing various regulatory barriers.

7.4.4: Logistics

The finding of this study reaffirms that logistic plays an important role in boosting exports. Based on the results, it can be possible through improving the quality and efficiency of logistic services. In this regard, a significantly higher investment would be important. Particularly, investment for the improvement in information technology-related infrastructure, management and human resources capabilities would lead to producing well-organized and skilled logistics services. For this purpose, the public-private partnership may be important in the context of investment and efficient governance. In addition, to streamline the logistic services and removing the bottlenecks, there is a need to integrate the trade-related institutes along with those which are playing their parts in providing administrative and financial support like Customs, Ministry of Commerce, TDAP, SBP, Ministry of Finance and Pakistan Bureau of Statistics. Overall, the major policy implication is that Pakistan should adopt proactive steps to expand trade/export volume with the countries where the full potential of trade expansion is still to be achieved. It would be very beneficial if the trade policy is region-specific based on their requirement, challenges, and opportunities. Further, Pakistan not only needs to maintain

a high level of trade/export with the countries where it has already achieved the potential but more efforts should also be required to further strengthen the trade ties.

To sum up, we can conclude that trade/export expansion in goods and services to new destinations and in more products would not only decrease the export dependence of Pakistan in few countries and products, but it will also create an economic resilience of the economy against any internal or external shock. With regard to goods and services, the present study has identified the markets as well as product categories in detail, which may be helpful for the policymakers to further investigate by focusing on the factors that are actually protecting the country to achieve the existing potential. At the same time, the Government should focus on addressing the structural issues with an aim to further increase the magnitude of trade/exports with both traditional and non-traditional trading partners. Furthermore, it is vital to boost logistics in order to lower the cost of doing business and make goods more competitive on the global market.

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Appendices

Appendix I

Countries

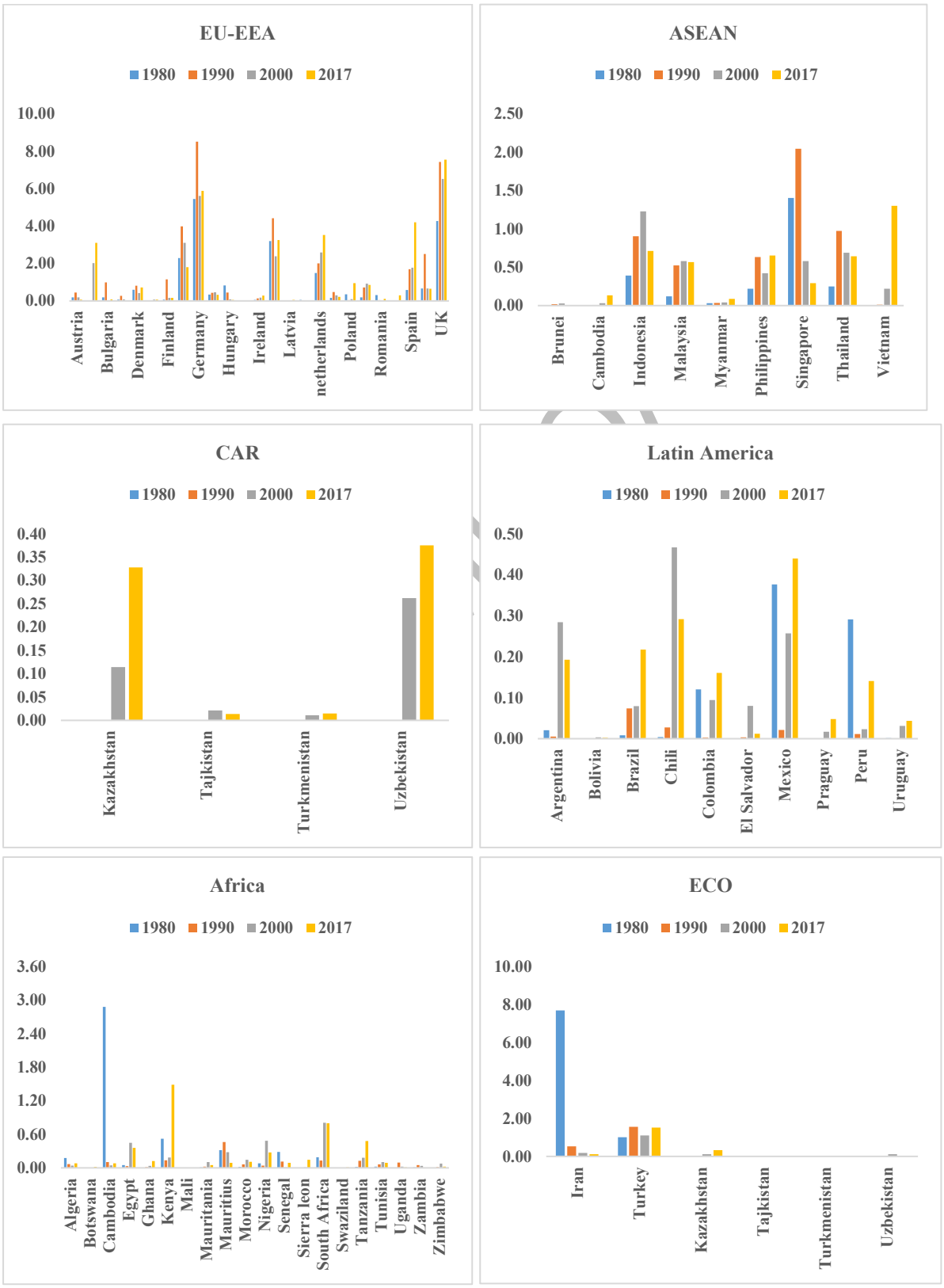
1	Algeria	**27**	El Salvador	**53**	Maldives	**79**	Slovenia
2	Argentina	**28**	Estonia	**54**	Mali	**80**	South Africa
3	Australia	**29**	Finland	**55**	Malta	**81**	Spain
4	Austria	**30**	France	**56**	Mauritania	**82**	Sri Lanka
5	Bahamas	**31**	Germany	**57**	Mauritius	**83**	Swaziland
6	Bahrain	**32**	Ghana	**58**	Mexico	**84**	Sweden
7	Bangladesh	**33**	Greece	**59**	Mongolia	**85**	Switzerland
8	Barbados	**34**	Hong Kong	**60**	Morocco	**86**	Tajikistan
9	Belgium	**35**	Hungary	**61**	Myanmar	**87**	Tanzania
10	Bermuda	**36**	Iceland	**62**	Nepal	**88**	Thailand
11	Bhutan	**37**	India	**63**	Netherlands	**89**	Tunisia
12	Bolivia	**38**	Indonesia	**64**	New Zealand	**90**	Turkey
13	Bosnia	**39**	Iran	**65**	Nigeria	**91**	Turkmenistan
14	Botswana	**40**	Iraq	**66**	Norway	**92**	Uganda
15	Brazil	**41**	Ireland	**67**	Oman	**93**	Ukraine
16	Brunei	**42**	Italy	**68**	Paraguay	**94**	UAE
17	Bulgaria	**43**	Jamaica	**69**	Peru	**95**	United Kingdom
18	Cambodia	**44**	Japan	**70**	Philippines	**96**	USA
19	Canada	**45**	Jordan	**71**	Poland	**97**	Uruguay
20	Cameroon	**46**	Kazakhstan	**72**	Portugal	**98**	Uzbekistan
21	China	**47**	Kenya	**73**	Romania	**99**	Vietnam
22	Chili	**48**	Kuwait	**74**	Russia	**100**	Zambia
23	Colombia	**49**	Latvia	**75**	Saudi Arabia	**101**	Zimbabwe
24	Cyprus	**50**	Lebanon	**76**	Senegal		
25	Denmark	**51**	Macao	**77**	Sierra Leone		
26	Egypt	**52**	Malaysia	**78**	Singapore		

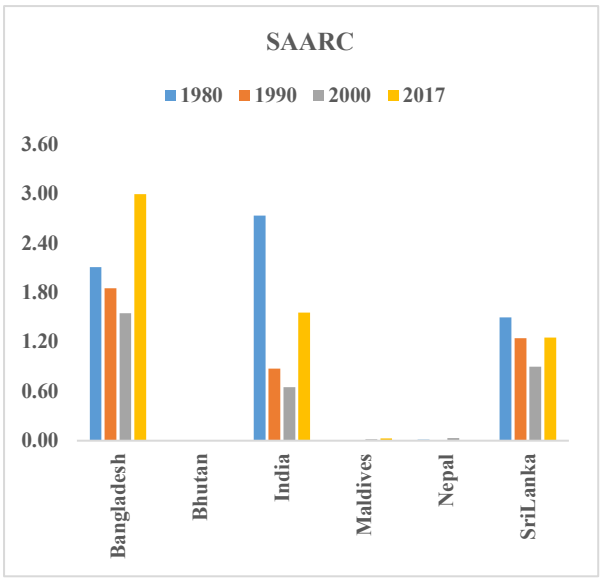
Regions

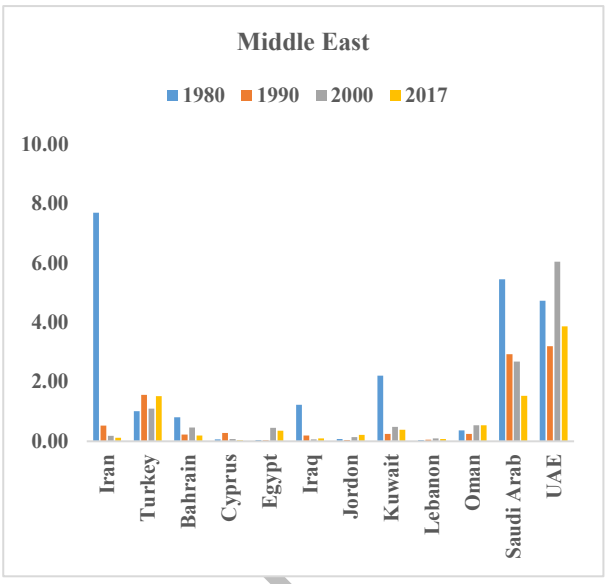
AFRICA, ASEAN, CAR, ECO, EU-EEA, LATIN AMERICA, MIDDLE EAST, NAFTA, SAARC, TRANSITIONAL ECONOMIES

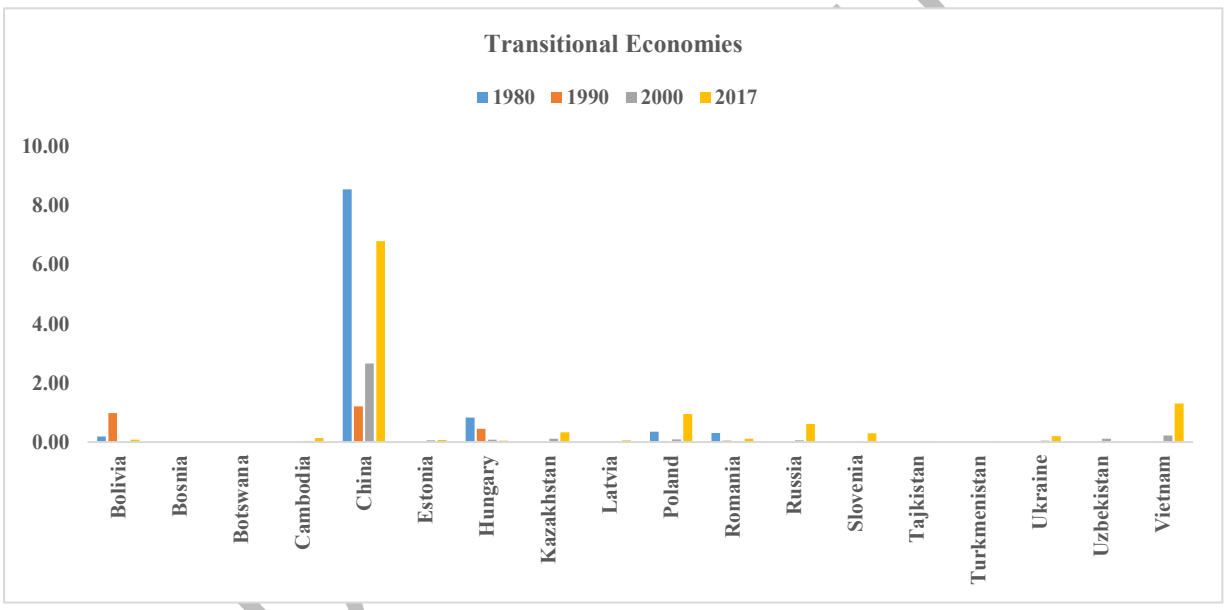
Appendix-II

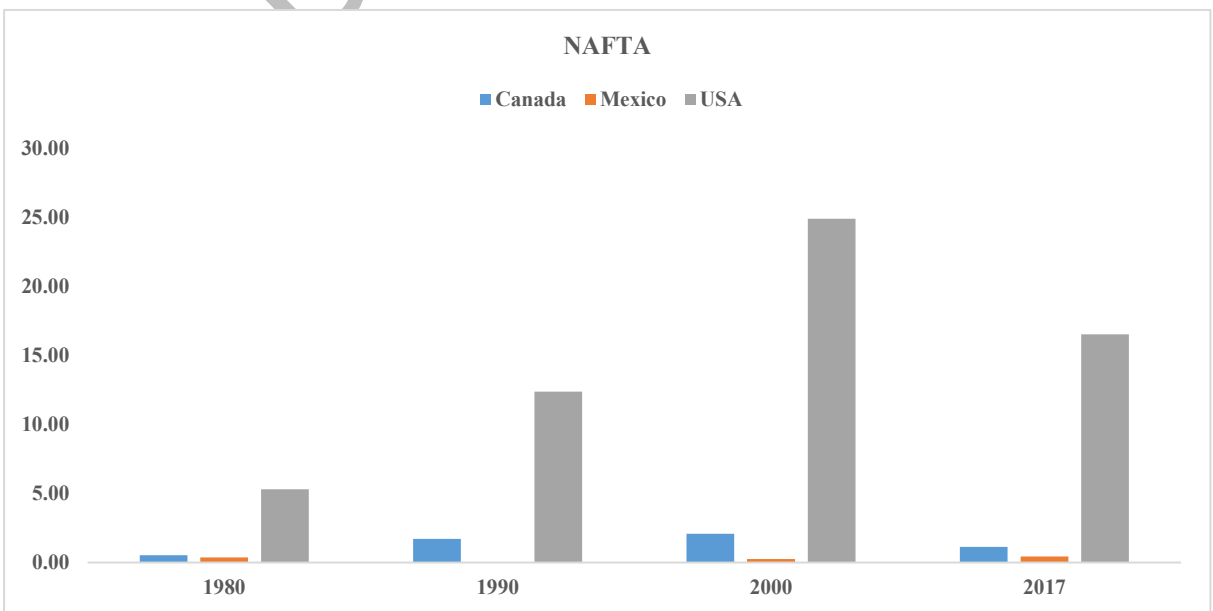
Geographical Representation of Share (%) in Pakistan's Exports (Source: COMTRADE,WITS (2019))




SAARC
1980 1990 2000 2017
3.60
3.00
2.40
1.80
1.20
0.60
0.00
Bangladesh
Bhutan
India
Maldives
Nepal
SriLanka


Middle East
1980 1990 2000 2017
10.00
8.00
6.00
4.00
2.00
0.00
Iran
Turkey
Bahrain
Cyprus
Egypt
Iraq
Jordon
Kuwait
Lebanon
Oman
Saudi Arab
UAE


Transitional Economies
1980 1990 2000 2017
10.00
8.00
6.00
4.00
2.00
0.00
Bolivia
Bosnia
Botswana
Cambodia
China
Estonia
Hungary
Kazakhstan
Latvia
Poland
Romania
Russia
Slovenia
Tajkistan
Turkmenistan
Ukraine
Uzbekistan
Vietnam


NAFTA
Canada Mexico USA
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1980
1990
2000
2017

Appendix –III

Diagnostic tests (Merchandise Trade)

Correlation Matrix

ln	Trade	GDP	Abs GDP	Pop	BER	Trade Openi	Trade Openj	Dist	Border	Lang	RTA	FTA
Trade	1											
GDP	0.8	1										
Abs GDP	0.4	0.5	1									
Pop	0.6	0.7	-0.2	1								
BER	0.1	0.1	0.3	-0.1	1							
Trade Openi	-0.1	-0.3	-0.1	-0.1	0	1						
Trade Openj	0	-0.2	0.2	-0.5	0.1	-0.1	1					
Dist	-0.2	0	0.2	-0.1	0	0	-0.1	1				
Border	0.2	0.2	-0.2	0.3	-0.1	0	-0.2	-0.3	1			
Lang	0	-0.1	-0.1	-0.1	0	0	0	0.3	0	1		
RTA	0	0	-0.2	0.1	-0.1	-0.1	-0.1	-0.5	0.3	-0.1	1	
FTA	0.1	0.1	0	0.1	0	-0.1	0	0	0.2	-0.1	0.1	1

Variance Inflation Factor

Variable	VIF	1/VIF
lnGDPij	12.8	0.1
lnPopij	10.3	0.1
lnABSGDPD	6.7	0.1
lnDistance	1.7	0.6
lnTrade_Openj	1.6	0.6
RTA	1.5	0.7
Border	1.4	0.7
lnTrade_Openi	1.3	0.8
lnBER	1.2	0.9
Comlang_Off	1.1	0.9
FTA	1.1	0.9
Mean VIF	**3.68**	

breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variables: fitted values of lntradeij

Chi2(1) = 375.38

Prob > chi2 =0.0000

Diagnostic tests (Services Trade)

Correlation Matrix																	
ln	**Trade**	**GDP**	**Abs GDP**	**Pop**	**BER**	**Trade Openi**	**Trade Openj**	**Relative Human**	**FDIi**	**FDIj**	**Credit GDPi**	**Credit GDPj**	**Fixed BBi**	**Fixed BBj**	**Distance**	**Border**	**Lang**	**FTA**
Trade	1																	
GDP	0.7	1																
Abs GDP	0.45	0.42	1															
Pop	0.38	0.72	-0.28	1														
BER	0.34	0.2	0.55	-0.25	1													
Trade Openi	0.02	-0.13	0.01	-0.05	0	1												
Trade Openj	0.07	-0.22	0.29	-0.47	0.23	0.02	1											
Relative Human	-0.14	-0.12	-0.45	0.27	-0.35	0.07	-0.21	1										
FDIi	0.01	-0.09	-0.03	-0.02	-0.03	0	-0.02	0.03	1									
FDIj	0.62	0.82	0.45	0.52	0.21	-0.01	0.01	-0.16	0.02	1								
Credit GDPi	0.52	0.43	0.65	-0.08	0.44	-0.05	0.36	-0.46	-0.03	0.45	1							
Credit GDPj	0.02	-0.17	-0.03	-0.05	-0.03	0.57	-0.02	0.07	0.74	0.01	-0.06	1						
Fixed BBi	-0.01	0.16	0.03	0.05	0.03	-0.48	0.02	-0.07	-0.76	-0.01	0.06	-0.94	1					
Fixed BBj	0.38	0.43	0.78	-0.18	0.47	-0.16	0.3	-0.44	-0.12	0.46	0.75	-0.2	0.2	1				
Distance	-0.19	0.04	0.17	-0.1	0.08	0	-0.11	0.14	0	0.08	-0.04	0	0	0.2	1			
Border	0.16	0.25	-0.12	0.35	-0.15	0	-0.13	0.11	0	0.18	0.06	0	0	-0.03	-0.29	1		
Lang	0.05	-0.11	-0.12	-0.07	0.02	0	0.01	0.06	0	-0.04	-0.13	0	0	-0.17	0.29	0.02	1	
FTA	0.21	0.19	0.01	0.21	0.05	0	0.02	0.01	0	0.17	0.15	0	0	0.05	-0.05	0.39	-0.09	1

Variance Inflation Factor		
Variable	**VIF**	**1/VIF**
lnCreditGDPj	13.56	0.07
lnGDPij	10.11	0.1
lnFixedBBi	8.77	0.11
lnPopij	6.96	0.14
lnFixedBBj	5.89	0.17
lnFDIi	5.8	0.17
lnFDIj	3.8	0.26
lnTradeOpeni	3.58	0.28
lnCreditGDPi	2.88	0.35
lnTradeOpenj	1.8	0.56
Border	1.66	0.6
Relative_HumanCapital	1.66	0.6
lnBER	1.61	0.62
lnDistance	1.52	0.66
Comlang_Off	1.36	0.73
FTA	1.33	0.75
Mean VIF	**4.52**	

breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variables: fitted values of lntradeij

Chi2(1) = 49.07

Prob > chi2 =0.0000

Appendix-IV (a)

Merchandise Trade Potential

Trade Potential (Averages)									
	1980-89	1990-99	2000-09	2010-17		1980-89	1990-99	2000-09	2010-17
Algeria	4.7	2.87	1.19	0.96	Malaysia	0.82	0.65	0.99	1.28
Argentina	1.92	1.38	1.12	1.28	Maldives	0.71	0.35	0.5	1.12
Australia	1.03	0.65	0.89	1.3	Mali	113.04	66.15	3.15	10.59
Austria	1.15	1.05	1.06	1	Malta	1.18	0.88	2.16	2.64
Bahamas	6.12	1.96	6.73	12.35	Mauritania	2.32	0.67	3.62	2.17
Bahrain	2.2	0.44	1.09	1.41	Mauritius	0.73	0.74	0.87	1.62
Bangladesh	0.73	0.98	1.28	0.9	Mexico	14.69	2.2	1.02	0.82
Barbados	3.28	2.19	1.39	0.74	Mongolia	1.22	0.27	1.79	3.61
Belgium	0	0.07	0.74	0.74	Morocco	34.01	3.85	1.37	0.74
Bermuda	0	0	0.08	0.75	Myanmar	0	0	0.45	2.27
Bhutan	0.23	0.33	5.18	56.02	Nepal	0.59	0.59	1.17	3.47
Bolivia	16.57	1.07	0.92	1.45	Netherlands	1.21	0.83	1	1.03
Bosnia	0	2.26	0.8	2.22	New Zealand	0.75	0.77	0.96	1.06
Botswana	0	0	1.76	0.83	Nigeria	4.39	1.15	0.77	1.57
Brazil	0.21	1.04	1.78	1.3	Norway	0.56	0.61	1.1	1.53
Brunei	1.56	0.76	1.43	3.93	Oman	3	1.9	2.17	0.87
Bulgaria	0.32	1.58	2.68	2.5	Paraguay	101.88	4.46	1.29	1.23
Cambodia	0	2.48	1.28	0.88	Peru	0.76	2.03	1.37	0.91
Canada	1.24	0.9	0.94	1.1	Philippines	1.76	1.08	1.06	1.03
Cameroon	2.88	12.59	1.6	1.41	Poland	0	0.82	1.57	0.95
China	1.01	1.09	1.26	0.97	Portugal	2.04	0.87	0.97	1.04
Chili	22.72	1.85	0.84	0.98	Romania	0	0.93	1.56	1.19
Colombia	18.94	4.76	1.14	0.81	Russia	0	0.68	0.88	1.21
Cyprus	0.72	0.43	1.47	3.37	Saudi Arab	1.23	1.16	0.76	1.17
Denmark	1.08	0.94	1.37	0.84	Senegal	1.72	7.58	3.45	0.64
Egypt	12.66	1.75	0.84	0.98	Sierra Leone	67.24	85.47	15.38	0.77
El Salvador	196.32	2.34	1.01	3.23	Singapore	0.79	0.8	0.95	1.13
Estonia	0	6.19	0.96	1.15	Slovenia	0	1.42	1.51	0.84
Finland	2.72	1.47	1.27	1.62	South Africa	28.87	6.08	0.96	0.76
France	0.88	0.68	1.03	1.17	Spain	1.49	1.16	1.12	0.84
Germany	0.83	0.75	1.02	1.1	Sri Lanka	0.29	0.48	0.88	1.41
Ghana	158.76	1.08	1.41	1.29	Swaziland	0	0	0	0
Greece	1.23	0.91	0.81	1.33	Sweden	1.01	0.82	1.11	1.21
Hong Kong	0.87	0.5	0.8	2.67	Switzerland	0.67	0.62	0.93	1.59
Hungary	0	0.57	1.05	1.6	Tajikistan	0	0.44	2.44	3.01
Iceland	1.72	1.53	1.32	2.59	Tanzania	0	0.61	1.23	1.05
India	3.36	1.9	1.03	0.97	Thailand	2.06	1.29	0.93	0.93
Indonesia	2.41	1.24	1.03	1.03	Tunisia	20.21	3.74	0.99	1.12
Iran	0.65	0.64	0.71	2.5	Turkey	1.1	0.76	0.93	1.17
Iraq	1.38	0.07	1.15	1.78	Turkmenistan	0	2.94	1.63	1.33

Trade Potential (Averages)									
	1980-89	1990-99	2000-09	2010-17		1980-89	1990-99	2000-09	2010-17
Ireland	0.75	0.66	1.12	1.13	Uganda	3.5	0.57	1.02	2.39
Italy	0.83	0.89	1.01	1.07	Ukraine	0	7.72	1.18	1.12
Jamaica	2.23	51.91	1.41	1.08	UAE	0	0	1.04	0.93
Japan	0.53	0.74	1.32	1.11	United Kingdom	0.74	0.76	1.04	1.09
Jordon	0.91	0.69	0.99	1.35	USA	1.2	0.87	0.84	0.99
Kazakhstan	0	3.28	1.32	2.01	Uruguay	50.3	10.99	1.25	1.36
Kenya	1.26	0.83	1.22	0.91	Uzbekistan	0	0.04	1.26	6.16
Kuwait	1.03	1.33	1.02	1.12	Vietnam	2.59	8.89	1.81	0.79
Latvia	0	47.47	3.63	0.91	Zambia	0	0.4	0.88	1.58
Lebanon	0.08	1.04	0.84	1.32	Zimbabwe	47.2	0.86	1.02	0.99
Macao	2.14	0.56	1.51	13.11					

Trade Potential (Averages)					
	1980-17		1980-17		1980-17
Algeria	**2.51**	Iceland	1.75	Poland	0.83
Argentina	1.43	India	1.86	Portugal	1.24
Australia	0.95	Indonesia	1.45	Romania	0.91
Austria	1.07	Iran	1.05	Russia	0.67
Bahamas	6.5	Iraq	1.06	Saudi Arab	1.07
Bahrain	1.28	Ireland	0.91	Senegal	3.49
Bangladesh	0.98	Italy	0.94	Sierra Leone	44.4
Barbados	1.96	Jamaica	14.85	Singapore	0.91
Belgium	0.37	Japan	0.91	Slovenia	0.95
Bermuda	0.18	Jordon	0.96	South Africa	9.61
Bhutan	13.3	Kazakhstan	1.63	Spain	1.17
Bolivia	5.19	Kenya	1.06	Sri Lanka	0.73
Bosnia	1.27	Kuwait	1.13	Swaziland	0
Botswana	0.64	Latvia	13.64	Sweden	1.03
Brazil	1.07	Lebanon	0.79	Switzerland	0.92
Brunei	1.81	Macao	3.87	Tajikistan	1.39
Bulgaria	1.73	Malaysia	0.92	Tanzania	0.7
Cambodia	1.17	Maldives	0.65	Thailand	1.32
Canada	1.04	Mali	50.22	Tunisia	6.8
Cameroon	4.79	Malta	1.67	Turkey	0.98
China	1.09	Mauritania	2.2	Turkmenistan	1.48
Chili	6.89	Mauritius	0.96	Uganda	1.84
Colombia	6.71	Mexico	4.89	Ukraine	2.58
Cyprus	1.4	Mongolia	1.62	UAE	0.47
Denmark	1.07	Morocco	10.48	United Kingdom	0.9
Egypt	4.22	Myanmar	0.6	USA	0.98
El Salvador	53.22	Nepal	1.35	Uruguay	16.74
Estonia	2.12	Netherlands	1.02	Uzbekistan	1.64
Finland	1.78	New Zealand	0.88	Vietnam	3.66
France	0.93	Nigeria	1.99	Zambia	0.67

Trade Potential (Averages)					
	1980-17		1980-17		1980-17
Germany	0.92	Norway	0.92	Zimbabwe	13.13
Ghana	42.71	Oman	2.04		
Greece	1.06	Paraguay	28.58		
Hong Kong	1.13	Peru	1.28		
Hungary	0.76	Philippines	1.24		

Regional Distribution of Trade Potential

Pak-Africa				
	1980-89	1990-99	2000-09	2010-17
Algeria	4.70	2.87	1.19	0.96
Botswana	0.00	0.00	1.76	0.83
Cameroon	2.88	12.59	1.60	1.41
Egypt	12.66	1.75	0.84	0.98
Ghana	158.76	1.08	1.41	1.29
Kenya	1.26	0.83	1.22	0.91
Mali	113.04	66.15	3.15	10.59
Mauritania	2.32	0.67	3.62	2.17
Mauritius	0.73	0.74	0.87	1.62
Morocco	34.01	3.85	1.37	0.74
Nigeria	4.39	1.15	0.77	1.57
Senegal	1.72	7.58	3.45	0.64
Sierra Leone	67.24	85.47	15.38	0.77
South Africa	28.87	6.08	0.96	0.76
Swaziland	0.00	0.00	0.00	0.00
Tanzania	0.00	0.61	1.23	1.05
Tunisia	20.21	3.74	0.99	1.12
Uganda	3.50	0.57	1.02	2.39
Zambia	0.00	0.40	0.88	1.58
Zimbabwe	47.20	0.86	1.02	0.99

Pak ASEAN				
	1980-89	1990-99	2000-09	2010-17
Brunei	1.56	0.76	1.43	3.93
Cambodia	0.00	2.48	1.28	0.88
Indonesia	2.41	1.24	1.03	1.03
Malaysia	0.82	0.65	0.99	1.28
Myanmar	0.00	0.00	0.45	2.27
Philippines	1.76	1.08	1.06	1.03
Singapore	0.79	0.80	0.95	1.13
Thailand	2.06	1.29	0.93	0.93
Vietnam	2.59	8.89	1.81	0.79

Pak-CAR				
	1980-89	1990-99	2000-09	2010-17
Kazakhstan	0.00	3.28	1.32	2.01
Tajikistan	0.00	0.44	2.44	3.01
Turkmenistan	0.00	2.94	1.63	1.33
Uzbekistan	0.00	0.04	1.26	6.16

Pak-ECO				
	1980-89	1990-99	2000-09	2010-17
Iran	0.65	0.64	0.71	2.50
Kazakhstan	0.00	3.28	1.32	2.01
Tajikistan	0.00	0.44	2.44	3.01
Turkey	1.10	0.76	0.93	1.17
Turkmenistan	0.00	2.94	1.63	1.33
Uzbekistan	0.00	0.04	1.26	6.16

Pak-EU-EEA				
	1980-89	1990-99	2000-09	2010-17
Austria	1.15	1.05	1.06	1.00
Belgium	0.00	0.07	0.74	0.74
Bulgaria	0.32	1.58	2.68	2.50
Cyprus	0.72	0.43	1.47	3.37
Denmark	1.08	0.94	1.37	0.84
Estonia	0.00	6.19	0.96	1.15
Finland	2.72	1.47	1.27	1.62
France	0.88	0.68	1.03	1.17
Germany	0.83	0.75	1.02	1.10
Greece	1.23	0.91	0.81	1.33
Hungary	0.00	0.57	1.05	1.60
Iceland	1.72	1.53	1.32	2.59
Italy	0.83	0.89	1.01	1.07
Latvia	0.00	47.47	3.63	0.91
Malta	1.18	0.88	2.16	2.64
Netherlands	1.21	0.83	1.00	1.03
Norway	0.56	0.61	1.10	1.53
Poland	0.00	0.82	1.57	0.95
Portugal	2.04	0.87	0.97	1.04
Romania	0.00	0.93	1.56	1.19
Slovenia	0.00	1.42	1.51	0.84
Spain	1.49	1.16	1.12	0.84
Sweden	1.01	0.82	1.11	1.21
U.K	0.74	0.76	1.04	1.09

Pak-Latin America				
	1980-89	1990-99	2000-09	2010-17
Argentina	1.92	1.38	1.12	1.28
Bolivia	16.57	1.07	0.92	1.45
Brazil	0.21	1.04	1.78	1.30
Chili	22.72	1.85	0.84	0.98
Colombia	18.94	4.76	1.14	0.81
El Salvador	196.32	2.34	1.01	3.23
Mexico	14.69	2.20	1.02	0.82
Paraguay	101.88	4.46	1.29	1.23
Peru	0.76	2.03	1.37	0.91
Uruguay	50.30	10.99	1.25	1.36

Pak-Middle East				
	1980-89	1990-99	2000-09	2010-17
Bahrain	2.20	0.44	1.09	1.41
Cyprus	0.72	0.43	1.47	3.37
Egypt	12.66	1.75	0.84	0.98
Iran	0.65	0.64	0.71	2.50
Iraq	1.38	0.07	1.15	1.78
Jordon	0.91	0.69	0.99	1.35
Kuwait	1.03	1.33	1.02	1.12
Lebanon	0.08	1.04	0.84	1.32
Oman	3.00	1.90	2.17	0.87
Saudi Arab	1.23	1.16	0.76	1.17
Turkey	1.10	0.76	0.93	1.17

Pak-NAFTA				
	1980-89	1990-99	2000-09	2010-17
Canada	1.24	0.90	0.94	1.10
Mexico	14.69	2.20	1.02	0.82
USA	1.20	0.87	0.84	0.99

Pak-SAARC				
	1980-89	1990-99	2000-09	2010-17
Bangladesh	0.73	0.98	1.28	0.90
Bhutan	0.23	0.33	5.18	56.02
India	3.36	1.90	1.03	0.97
Maldives	0.71	0.35	0.50	1.12
Nepal	0.59	0.59	1.17	3.47
Sri Lanka	0.29	0.48	0.88	1.41

Pak-Transitional Economies				
	1980-89	1990-99	2000-09	2010-17
Bosnia	0.00	2.26	0.80	2.22
Botswana	0.00	0.00	1.76	0.83
Bulgaria	0.32	1.58	2.68	2.50
Cambodia	0.00	2.48	1.28	0.88
China	1.01	1.09	1.26	0.97
Estonia	0.00	6.19	0.96	1.15
Hungary	0.00	0.57	1.05	1.60
Kazakhstan	0.00	3.28	1.32	2.01
Latvia	0.00	47.47	3.63	0.91
Poland	0.00	0.82	1.57	0.95
Romania	0.00	0.93	1.56	1.19
Russia	0.00	0.68	0.88	1.21
Slovenia	0.00	1.42	1.51	0.84
Tajikistan	0.00	0.44	2.44	3.01
Turkmenistan	0.00	2.94	1.63	1.33
Ukraine	0.00	7.72	1.18	1.12
Uzbekistan	0.00	0.04	1.26	6.16
Vietnam	2.59	8.89	1.81	0.79

Regional Distribution of Trade Potential (1980-2017) Averages

Pak-Africa	
	1980-17
Algeria	2.51
Botswana	0.64
Cameroon	4.79
Egypt	4.22
Ghana	42.71
Kenya	1.06
Mali	50.22
Mauritania	2.20
Mauritius	0.96
Morocco	10.48
Nigeria	1.99
Senegal	3.49
Sierra Leone	44.40
South Africa	9.61
Swaziland	0.00
Tanzania	0.70
Tunisia	6.80
Uganda	1.84
Zambia	0.67
Zimbabwe	13.13

Pak-ECO	
	1980-17
Iran	1.05
Kazakhstan	1.63
Tajikistan	1.39
Turkey	0.98
Turkmenistan	1.48
Uzbekistan	1.48

Pak ASEAN	
	1980-17
Brunei	1.81
Cambodia	1.17
Indonesia	1.45
Malaysia	0.92
Myanmar	0.60
Philippines	1.24
Singapore	0.91
Thailand	1.32
Vietnam	3.66

Pak-CAR	
	1980-17
Kazakhstan	1.63
Tajikistan	1.39
Turkmenistan	1.48
Uzbekistan	1.48

Uzbekistan	1.48

Pak-Latin America	
	1980-17
Argentina	1.43
Bolivia	5.19
Brazil	1.07
Chili	6.89
Colombia	6.71
El Salvador	53.22
Mexico	4.89
Paraguay	28.58
Peru	1.28
Uruguay	16.74

Pak-EU-EEA	
	1980-17
Austria	1.07
Belgium	0.37
Bulgaria	1.73
Cyprus	1.40
Denmark	1.07
Estonia	2.12
Finland	1.78
France	0.93
Germany	0.92

Pak-Middle East	
	1980-17
Bahrain	1.28
Cyprus	1.40
Egypt	4.22
Iran	1.05
Iraq	1.06
Jordon	0.96
Kuwait	1.13
Lebanon	0.79
Oman	2.04

Greece	1.06	Saudi Arab	1.07
Hungary	0.76	Turkey	0.98
Iceland	1.75	**Pak-NAFTA**	
Italy	0.94		**1980-17**
Latvia	13.64	Canada	1.04
Malta	1.67	Mexico	4.89
Netherlands	1.02	USA	0.98
Norway	0.92	**Pak-SAARC**	
Poland	0.83		**1980-17**
Portugal	1.24	Bangladesh	0.98
Romania	0.91	Bhutan	13.30
Slovenia	0.95	India	1.86
Spain	1.17	Maldives	0.65
Sweden	1.03	Nepal	1.35
		Sri Lanka	0.73

Pak-Transitional Economies			
	1980-17		**1980-17**
Bosnia	1.27	Poland	0.83
Botswana	0.64	Romania	0.91
Bulgaria	1.73	Russia	0.67
Cambodia	1.17	Slovenia	0.95
China	1.09	Tajikistan	1.39
Estonia	2.12	Turkmenistan	1.48
Hungary	0.76	Ukraine	2.58
Kazakhstan	1.63	Uzbekistan	1.48
Latvia	13.64	Vietnam	3.66

Appendix: IV (b)

Export Potential

Export Potentials									
	1980-89	**1990-99**	**2000-09**	**2010-17**		**1980-89**	**1990-99**	**2000-09**	**2010-17**
Algeria	5.19	3.08	1.10	0.77	Malaysia	2.14	1.04	1.13	0.91
Argentina	14.57	4.65	1.01	0.94	Maldives	1.28	0.32	0.41	1.08
Australia	1.08	0.39	0.97	1.26	Mali	13.25	7.49	9.60	15.15
Austria	0.86	0.55	0.98	1.91	Malta	1.27	0.59	1.28	1.40
Bahamas	12.28	1.37	5.83	25.98	Mauritania	1.98	0.91	3.43	1.73
Bahrain	1.13	0.72	0.88	1.07	Mauritius	0.83	0.86	0.81	1.58
Bangladesh	1.45	1.17	1.23	0.84	Mexico	26.21	4.66	1.03	0.73
Barbados	3.33	1.53	1.77	0.69	Mongolia	1.76	0.53	4.74	1.44
Belgium	0.00	0.08	0.87	0.63	Morocco	8.14	0.98	0.91	1.00
Bermuda	0.00	0.00	0.07	0.65	Myanmar	0.00	0.00	0.38	1.23
Bhutan	4.03	0.22	3.76	134.62	Nepal	5.18	0.85	1.32	3.67
Bolivia	13.89	0.90	0.83	1.27	Netherland	2.11	0.93	0.99	0.91
Bosnia	0.00	1.86	0.92	3.81	New Zealand	1.65	0.61	0.87	1.11

Botswana	0.00	0.00	2.06	0.78	Nigeria	4.79	1.02	0.88	1.58
Brazil	18.35	1.58	2.21	1.00	Norway	1.19	0.59	0.99	1.20
Brunei	4.51	0.76	1.66	3.12	Oman	1.07	1.01	1.05	1.12
Bulgaria	0.51	2.65	3.43	1.97	Paraguay	86.50	7.92	0.96	1.07
Cambodia	0.00	3.27	1.26	0.92	Peru	25.54	8.93	1.48	0.79
Canada	2.07	0.62	0.91	1.17	Philippines	5.23	1.00	1.13	1.04
Cameroon	2.66	11.54	2.16	1.44	Poland	0.00	1.97	1.67	0.91
China	1.00	1.15	1.23	0.98	Portugal	5.25	0.94	1.00	0.99
Chili	35.33	2.03	0.76	1.06	Romania	0.00	1.23	1.36	0.93
Colombia	27.78	7.49	1.09	0.78	Russia	0.00	1.35	2.12	0.76
Cyprus	0.68	0.38	1.65	3.51	Saudi Arabia	0.68	0.58	0.91	1.51
Denmark	1.04	0.80	1.25	0.92	Senegal	1.49	6.78	3.26	0.67
Egypt	15.41	3.80	0.91	0.91	Sierra Leone	147.14	269.44	6.82	0.74
El Salvador	253.25	2.63	1.03	3.21	Singapore	0.37	0.53	1.66	2.14
Estonia	0.00	5.84	0.86	1.08	Slovenia	0.00	3.00	4.65	0.79
Finland	1.99	1.08	1.33	1.11	South Africa	16.57	3.02	0.76	0.86
France	1.21	0.68	0.96	1.14	Spain	2.52	1.39	1.14	0.76
Germany	1.21	0.79	1.10	0.91	Sri Lanka	1.03	0.76	0.92	1.14
Ghana	266.41	1.32	1.28	1.42	Swaziland	0.00	0.00	0.00	0.00
Greece	2.39	1.05	0.83	1.17	Sweden	0.99	0.64	1.15	1.17
Hong Kong	0.85	0.49	0.86	3.11	Switzerland	0.29	0.53	1.37	4.10
Hungary	0.00	0.53	0.82	1.62	Tajikistan	0.00	0.31	5.97	2.54
Iceland	1.02	1.04	1.29	4.72	Tanzania	0.00	0.90	1.67	0.91
India	1.27	1.07	0.99	1.19	Thailand	1.84	0.73	1.07	1.32
Indonesia	1.04	0.45	1.21	1.42	Tunisia	14.36	3.35	0.96	0.73
Iran	0.64	1.55	1.24	4.03	Turkey	6.73	1.38	0.90	1.13
Iraq	2.82	0.27	0.74	1.71	Turkmenistan	0.00	6.54	2.12	2.65
Ireland	1.30	1.09	0.99	0.95	Uganda	3.24	0.49	1.25	8.59
Italy	1.08	1.20	0.99	0.88	Ukraine	0.00	5.59	2.11	0.64
Jamaica	5.13	70.76	1.40	0.87	UAE	0.00	0.00	0.67	1.47
Japan	0.37	0.53	2.40	2.23	UK	1.39	0.91	1.08	0.85
Jordon	3.37	1.45	0.87	0.98	USA	2.70	1.11	0.79	0.86
Kazakhstan	0.00	4.00	1.43	3.14	Uruguay	40.28	7.80	1.09	0.86
Kenya	9.93	1.81	1.42	0.78	Uzbekistan	0.00	0.05	1.44	3.68
Kuwait	0.54	0.82	0.88	1.39	Vietnam	4.29	5.28	1.70	0.80
Latvia	0.00	70.59	2.89	0.78	Zambia	0.00	0.09	2.15	7.04
Lebanon	0.08	0.81	0.89	1.17	Zimbabwe	2.40	2.71	1.07	0.92
Macao	2.81	0.58	2.47	20.06					

Export Potential

	1980-17		1980-17		1980-17
Algeria	2.63	Iceland	1.88	Poland	1.15
Argentina	5.52	India	1.12	Portugal	2.10
Australia	0.96	Indonesia	1.01	Romania	0.88
Austria	1.03	Iran	1.75	Russia	1.07

Bahamas	10.59	Iraq	1.37	Saudi Arabia	0.89
Bahrain	0.94	Ireland	1.09	Senegal	3.18
Bangladesh	1.19	Italy	1.05	Sierra Leone	111.58
Barbados	1.89	Jamaica	20.52	Singapore	1.12
Belgium	0.38	Japan	1.34	Slovenia	2.18
Bermuda	0.16	Jordon	1.71	South Africa	5.54
Bhutan	30.45	Kazakhstan	2.09	Spain	1.49
Bolivia	4.38	Kenya	3.63	Sri Lanka	0.95
Bosnia	1.53	Kuwait	0.88	Swaziland	0.00
Botswana	0.70	Latvia	19.50	Sweden	0.78
Brazil	6.04	Lebanon	0.72	Switzerland	1.44
Brunei	2.48	Macao	5.76	Tajikistan	2.19
Bulgaria	2.15	Malaysia	1.32	Tanzania	0.87
Cambodia	1.38	Maldives	0.76	Thailand	1.23
Canada	1.19	Mali	11.17	Tunisia	5.07
Cameroon	4.61	Malta	1.12	Turkey	2.61
China	1.09	Mauritania	2.03	Turkmenistan	2.84
Chili	10.26	Mauritius	0.99	Uganda	3.12
Colombia	9.73	Mexico	8.55	Ukraine	2.16
Cyprus	1.45	Mongolia	2.15	UAE	0.49
Denmark	1.01	Morocco	2.85	UK	1.07
Egypt	5.49	Myanmar	0.36	USA	1.39
El Salvador	68.29	Nepal	2.71	Uruguay	13.12
Estonia	1.99	Netherland	1.25	Uzbekistan	1.17
Finland	1.39	New Zealand	1.06	Vietnam	3.14
France	0.99	Nigeria	2.09	Zambia	2.07
Germany	1.01	Norway	0.98	Zimbabwe	1.82
Ghana	71.09	Oman	1.06		
Greece	1.37	Paraguay	25.33		
Hong Kong	1.23	Peru	9.62		
Hungary	0.70	Philippines	2.15		

Regional Distribution of Export Potential

Pak-Africa				
	1980-89	**1990-99**	**2000-09**	**2010-17**
Algeria	5.19	3.08	1.10	0.77
Botswana	0.00	0.00	2.06	0.78
Cameroon	2.66	11.54	2.16	1.44
Egypt	15.41	3.80	0.91	0.91
Ghana	266.41	1.32	1.28	1.42
Kenya	9.93	1.81	1.42	0.78
Mali	13.25	7.49	9.60	15.15
Mauritania	1.98	0.91	3.43	1.73
Mauritius	0.83	0.86	0.81	1.58
Morocco	8.14	0.98	0.91	1.00

Nigeria	4.79	1.02	0.88	1.58
Senegal	1.49	6.78	3.26	0.67
Sierra Leone	147.14	269.44	6.82	0.74
South Africa	16.57	3.02	0.76	0.86
Swaziland	0.00	0.00	0.00	0.00
Tanzania	0.00	0.90	1.67	0.91
Tunisia	14.36	3.35	0.96	0.73
Uganda	3.24	0.49	1.25	8.59
Zambia	0.00	0.09	2.15	7.04
Zimbabwe	2.40	2.71	1.07	0.92

Pak ASEAN

	1980-89	1990-99	2000-09	2010-17
Brunei	4.51	0.76	1.66	3.12
Cambodia	0.00	3.27	1.26	0.92
Indonesia	1.04	0.45	1.21	1.42
Malaysia	2.14	1.04	1.13	0.91
Myanmar	0.00	0.00	0.38	1.23
Philippines	5.23	1.00	1.13	1.04
Singapore	0.37	0.53	1.66	2.14
Thailand	1.84	0.73	1.07	1.32
Vietnam	4.29	5.28	1.70	0.80

Pak-CAR

	1980-89	1990-99	2000-09	2010-17
Kazakhstan	0.00	4.00	1.43	3.14
Tajikistan	0.00	0.31	5.97	2.54
Turkmenistan	0.00	6.54	2.12	2.65
Uzbekistan	0.00	0.05	1.44	3.68

Pak-ECO

	1980-89	1990-99	2000-09	2010-17
Iran	0.64	1.55	1.24	4.03
Kazakhstan	0.00	4.00	1.43	3.14
Tajikistan	0.00	0.31	5.97	2.54
Turkey	6.73	1.38	0.90	1.13
Turkmenistan	0.00	6.54	2.12	2.65
Uzbekistan	0.00	0.05	1.44	3.68

Pak-EU-EEA

	1980-89	1990-99	2000-09	2010-17
Austria	0.86	0.55	0.98	1.91
Belgium	0.00	0.08	0.87	0.63
Bulgaria	0.51	2.65	3.43	1.97
Cyprus	0.68	0.38	1.65	3.51
Denmark	1.04	0.80	1.25	0.92
Estonia	0.00	5.84	0.86	1.08

Finland	1.99	1.08	1.33	1.11
France	1.21	0.68	0.96	1.14
Germany	1.21	0.79	1.10	0.91
Greece	2.39	1.05	0.83	1.17
Hungary	0.00	0.53	0.82	1.62
Iceland	1.30	1.09	0.99	0.95
Italy	1.08	1.20	0.99	0.88
Latvia	0.00	70.59	2.89	0.78
Malta	1.27	0.59	1.28	1.40
Netherlands	2.11	0.93	0.99	0.91
Norway	1.19	0.59	0.99	1.20
Poland	0.00	1.97	1.67	0.91
Portugal	5.25	0.94	1.00	0.99
Romania	0.00	1.23	1.36	0.93
Slovenia	0.00	3.00	4.65	0.79
Spain	2.52	1.39	1.14	0.76
Sweden	0.99	0.64	1.15	1.17
U.K	1.39	0.91	1.08	0.85

Pak-CAR

	1980-89	1990-99	2000-09	2010-17
Kazakhstan	0.00	4.00	1.43	3.14
Tajikistan	0.00	0.31	5.97	2.54
Turkmenistan	0.00	6.54	2.12	2.65
Uzbekistan	0.00	0.05	1.44	3.68

Pak-Latin America

	1980-89	1990-99	2000-09	2010-17
Argentina	14.57	4.65	1.01	0.94
Bolivia	13.89	0.90	0.83	1.27
Brazil	18.35	1.58	2.21	1.00
Chili	35.33	2.03	0.76	1.06
Colombia	27.78	7.49	1.09	0.78
El Salvador	253.25	2.63	1.03	3.21
Mexico	26.21	4.66	1.03	0.73
Paraguay	86.50	7.92	0.96	1.07
Peru	25.54	8.93	1.48	0.79
Uruguay	40.28	7.80	1.09	0.86

Pak-Middle East

	1980-89	1990-99	2000-09	2010-17
Bahrain	1.13	0.72	0.88	1.07
Cyprus	0.68	0.38	1.65	3.51
Egypt	15.41	3.80	0.91	0.91
Iran	0.64	1.55	1.24	4.03
Iraq	2.82	0.27	0.74	1.71
Jordon	3.37	1.45	0.87	0.98
Kuwait	0.54	0.82	0.88	1.39

Lebanon	0.08	0.81	0.89	1.17
Oman	1.07	1.01	1.05	1.12
Saudi Arab	0.68	0.58	0.91	1.51
Turkey	6.73	1.38	0.90	1.13

Pak-NAFTA

	1980-89	1990-99	2000-09	2010-17
Canada	2.07	0.62	0.91	1.17
Mexico	26.21	4.66	1.03	0.73
USA	2.70	1.11	0.79	0.86

Pak-SAARC

	1980-89	1990-99	2000-09	2010-17
Bangladesh	1.45	1.17	1.23	0.84
Bhutan	4.03	0.22	3.76	134.62
India	1.27	1.07	0.99	1.19
Maldives	1.28	0.32	0.41	1.08
Nepal	5.18	0.85	1.32	3.67
Sri Lanka	1.03	0.76	0.92	1.14

Pak-Transitional Economies

	1980-89	1990-99	2000-09	2010-17
Bosnia	0.00	1.86	0.92	3.81
Botswana	0.00	0.00	2.06	0.78
Bulgaria	0.51	2.65	3.43	1.97
Cambodia	0.00	3.27	1.26	0.92
China	1.00	1.15	1.23	0.98
Estonia	0.00	5.84	0.86	1.08
Hungary	0.00	0.53	0.82	1.62
Kazakhstan	0.00	4.00	1.43	3.14
Latvia	0.00	70.59	2.89	0.78
Poland	0.00	1.97	1.67	0.91
Romania	0.00	1.23	1.36	0.93
Russia	0.00	1.35	2.12	0.76
Slovenia	0.00	3.00	4.65	0.79
Tajikistan	0.00	0.31	5.97	2.54
Turkmenistan	0.00	6.54	2.12	2.65
Ukraine	0.00	5.59	2.11	0.64
Uzbekistan	0.00	0.05	1.44	3.68
Vietnam	4.29	5.28	1.70	0.80

Regional Distribution of Export Potential (1980-2017) Averages

Pak-Africa		Pak ASEAN	
	1980-17		1980-17
Algeria	2.63	Brunei	2.48
Botswana	0.70	Cambodia	1.38
Cameroon	4.61	Indonesia	1.01
Egypt	5.49	Malaysia	1.32

Ghana	71.09
Kenya	3.63
Mali	11.17
Mauritania	2.03
Mauritius	0.99
Morocco	2.85
Nigeria	2.09
Senegal	3.18
Sierra Leone	111.58
South Africa	5.54
Swaziland	0.00
Tanzania	0.87
Tunisia	5.07
Uganda	3.12
Zambia	2.07
Zimbabwe	1.82

Pak-ECO	
	1980-17
Iran	1.75
Kazakhstan	2.09
Tajikistan	2.19
Turkey	2.61
Turkmenistan	2.84
Uzbekistan	1.17

Myanmar	0.36
Philippines	2.15
Singapore	1.12
Thailand	1.23
Vietnam	3.14

Pak-CAR	
	1980-17
Kazakhstan	2.09
Tajikistan	2.19
Turkmenistan	2.84
Uzbekistan	1.17

Pak-Latin America	
	1980-17
Argentina	5.52
Bolivia	4.38
Brazil	6.04
Chili	10.26
Colombia	9.73
El Salvador	68.29
Mexico	8.55
Paraguay	25.33
Peru	9.62
Uruguay	13.12

Pak-EU-EEA	
	1980-17
Austria	1.03
Belgium	0.38
Bulgaria	2.15
Cyprus	1.45
Denmark	1.01
Estonia	1.99
Finland	1.39
France	0.99
Germany	1.01
Greece	1.37
Hungary	0.7
Iceland	1.88
Italy	1.05
Latvia	19.5
Malta	1.12
Netherlands	1.25
Norway	0.98

Pak-Middle East	
	1980-17
Bahrain	0.94
Cyprus	1.45
Egypt	5.49
Iran	1.75
Iraq	1.37
Jordon	1.71
Kuwait	0.88
Lebanon	0.72
Oman	1.06
Saudi Arab	0.89
Turkey	2.61

Pak-NAFTA	
	1980-17
Canada	1.19
Mexico	8.55
USA	1.39

Poland	1.15	**Pak-SAARC**	
Portugal	2.1		**1980-17**
Romania	0.88	Bangladesh	1.19
Slovenia	2.18	Bhutan	30.45
Spain	1.49	India	1.12
Sweden	0.78	Maldives	0.76
U.K	1.07	Nepal	2.71
		Sri Lanka	0.95

Pak-Transitional Economies			
	1980-17		**1980-17**
Bosnia	1.53	Poland	1.15
Botswana	0.7	Romania	0.88
Bulgaria	2.15	Russia	1.07
Cambodia	1.38	Slovenia	2.18
China	1.09	Tajikistan	2.19
Estonia	1.99	Turkmenistan	2.84
Hungary	0.7	Ukraine	2.16
Kazakhstan	2.09	Uzbekistan	1.17
Latvia	19.5	Vietnam	3.14

Appendix-V (a)

Trade Potential in Services

Trade Potential in Services

Countries	2007-09	2010-13	2014-17		2007-09	2010-13	2014-17
Algeria	1.90	1.28	0.46	Malaysia	0.94	0.94	1.19
Argentina	1.56	2.34	0.53	Maldives	5.20	1.41	0.82
Australia	1.05	1.15	0.88	Mali	0.37	9.67	18.62
Austria	0.78	0.84	0.74	Malta	0.49	4.14	8.19
Bahamas	2.23	0.55	27.88	Mauritania	8.87	4.10	1.11
Bahrain	0.96	0.96	0.59	Mauritius	1.95	1.04	0.87
Bangladesh	0.99	0.81	1.33	Mexico	0.74	1.49	1.76
Barbados	0.86	0.37	4.17	Mongolia	0.87	0.00	1.53
Belgium	1.22	0.65	0.72	Morocco	0.98	0.82	1.65
Bermuda	0.00	0.00	0.00	Myanmar	0.04	2.32	1.73
Bhutan	521.84	61.32	31.13	Nepal	1.53	0.80	1.09
Bolivia	1.74	1.64	1.60	Netherlands	0.78	1.11	1.16
Bosnia	0.79	1.17	79.83	New Zealand	0.56	0.18	0.74
Botswana	0.73	1.46	1.99	Nigeria	0.68	1.77	1.03
Brazil	0.71	1.52	1.12	Norway	1.64	0.85	0.55
Brunei	1.08	1.06	1.15	Oman	2.34	1.02	0.54
Bulgaria	0.95	1.43	0.99	Paraguay	0.79	1.98	1.00
Cambodia	1.64	4.59	0.78	Peru	1.55	1.15	0.81

Cameroon	0.67	0.00	0.00	Philippines	2.03	1.57	0.65
Canada	4.71	7.88	6.64	Poland	0.91	0.95	1.21
Chili	0.92	1.24	0.96	Portugal	0.73	1.29	1.16
China	0.95	0.96	1.59	Romania	1.11	0.93	1.29
Colombia	1.18	1.24	0.85	Russia	0.00	0.00	1.00
Cyprus	0.83	0.57	1.03	Saudi Arabia	1.02	1.10	0.91
Denmark	2.88	0.37	0.85	Senegal	2.50	3.46	1.09
Egypt	1.49	0.58	1.90	Sierra Leonee	5.35	57.55	93.59
El Salvador	0.83	6.90	4.54	Singapore	1.04	0.93	1.06
Estonia	3.12	4.46	1.36	Slovenia	0.58	0.98	2.20
Finland	0.41	0.44	1.88	South Africa	1.19	0.96	0.98
France	0.81	1.05	1.16	Spain	0.96	1.16	0.96
Germany	1.00	0.97	1.04	Sri Lanka	1.32	1.00	0.86
Ghana	1.31	1.38	0.83	Swaziland	0.00	0.00	0.00
Greece	0.96	1.52	0.92	Sweden	0.78	1.20	0.83
Hong Kong	1.04	1.28	1.06	Switzerland	1.09	0.73	0.75
Hungary	0.54	1.48	0.53	Tajikistan	7.52	1.58	0.55
Iceland	0.83	1.89	2.28	Tanzania	1.28	1.10	1.48
India	0.91	1.02	1.15	Thailand	1.35	0.99	0.90
Indonesia	0.98	1.30	0.88	Tunisia	1.27	1.20	0.87
Iran	0.68	3.50	347.49	Turkey	1.83	1.49	0.64
Iraq	4.39	9.23	0.00	Turkmenistan	0.00	0.00	0.00
Ireland	2.28	1.23	0.93	UAE	1.44	2.58	3.06
Italy	0.72	1.01	1.05	Uganda	0.93	1.34	1.18
Jamaica	1.08	2.49	1.27	Ukraine	1.11	1.09	0.91
Japan	0.82	0.82	0.88	United Kingdom	0.85	1.01	1.13
Jordan	1.38	1.29	1.09	Uruguay	1.19	0.98	0.75
Kazakhstan	0.67	1.75	3.02	USA	1.23	1.53	0.61
Kenya	1.20	0.95	0.96	Uzbekistan	0.00	0.00	0.00
Kuwait	0.63	0.79	1.51	Vietnam	1.14	1.09	0.99
Latvia	0.00	13.05	3.61	Zambia	0.40	2.16	2.60
Lebanon	0.60	1.27	1.77	Zimbabwe	0.28	0.82	2.08
Macao	0.45	1.53	3.38				

Regional Distribution of Trade Potential in Services

	Pak-Africa				Pak ASEAN		
	2007-09	2010-13	2014-17		2007-09	2010-13	2014-17
Algeria	1.90	1.28	0.46	Brunei	1.08	1.06	1.15
Botswana	0.73	1.46	1.99	Cambodia	1.64	4.59	0.78
Cameroon	4.71	7.88	6.64	Indonesia	0.98	1.30	0.88
Egypt	1.49	0.58	1.90	Malaysia	0.94	0.94	1.19
Ghana	1.31	1.38	0.83	Myanmar	0.04	2.32	1.73
Kenya	1.20	0.95	0.96	Philippines	2.03	1.57	0.65
Mali	0.37	9.67	18.62	Singapore	1.04	0.93	1.06
Mauritania	8.87	4.10	1.11	Thailand	1.35	0.99	0.90
Mauritius	1.95	1.04	0.87	Vietnam	1.14	1.09	0.99

Morocco	0.98	0.82	1.65
Nigeria	0.68	1.77	1.03
Senegal	2.50	3.46	1.09
Sierra Leonee	5.35	57.55	93.59
South Africa	1.19	0.96	0.98
Swaziland	0.00	0.00	0.00
Tanzania	1.28	1.10	1.48
Tunisia	1.27	1.20	0.87
Uganda	1.44	2.58	3.06
Zambia	0.40	2.16	2.60
Zimbabwe	0.28	0.82	2.08

Pak-ECO

	2007-09	2010-13	2014-17
Iran	0.68	3.50	347.49
Kazakhstan	0.67	1.75	3.02
Tajikistan	7.52	1.58	0.55
Turkey	1.83	1.49	0.64
Turkmenistan	0.00	0.00	0.00
Uzbekistan	0.00	0.00	0.00

Pak-EU-EEA

	2007-09	2010-13	2014-17
Austria	0.78	0.84	0.74
Belgium	1.22	0.65	0.72
Bulgaria	0.95	1.43	0.99
Cyprus	0.83	0.57	1.03
Denmark	2.88	0.37	0.85
Estonia	3.12	4.46	1.36
Finland	0.41	0.44	1.88
France	0.81	1.05	1.16
Germany	1.00	0.97	1.04
Greece	0.96	1.52	0.92
Hungary	0.54	1.48	0.53
Iceland	0.83	1.89	2.28
Ireland	2.28	1.23	0.93
Italy	0.72	1.01	1.05
Latvia	0.00	13.05	3.61
Malta	0.49	4.14	8.19
Netherlands	0.78	1.11	1.16
Norway	1.64	0.85	0.55
Poland	0.91	0.95	1.21
Portugal	0.73	1.29	1.16
Romania	1.11	0.93	1.29
Slovenia	0.58	0.98	2.20
Spain	0.96	1.16	0.96
Sweden	0.78	1.20	0.83
United Kingdom	0.85	1.01	1.13

Pak-CAR

	2007-09	2010-13	2014-17
Kazakhstan	0.67	1.75	3.02
Tajikistan	7.52	1.58	0.55
Turkmenistan	0.00	0.00	0.00
Uzbekistan	0.00	0.00	0.00

Pak-Latin America

	2007-09	2010-13	2014-17
Argentina	1.56	2.34	0.53
Bolivia	1.74	1.64	1.60
Brazil	0.71	1.52	1.12
Chili	0.95	0.96	1.59
Colombia	1.18	1.24	0.85
El Salvador	0.83	6.90	4.54
Mexico	0.74	1.49	1.76
Paraguay	0.79	1.98	1.00
Peru	1.55	1.15	0.81
Uruguay	1.23	1.53	0.61

Pak-Middle East

	2007-09	2010-13	2014-17
Bahrain	0.96	0.96	0.59
Cyprus	0.83	0.57	1.03
Egypt	1.49	0.58	1.90
Iran	0.68	3.50	347.49
Iraq	4.39	9.23	0.00
Jordan	1.38	1.29	1.09
Kuwait	0.63	0.79	1.51
Lebanon	0.60	1.27	1.77
Oman	2.34	1.02	0.54
Saudi Arabia	1.02	1.10	0.91
Turkey	1.83	1.49	0.64
UAE	1.11	1.09	0.91

Pak-NAFTA

	2007-09	2010-13	2014-17
Canada	0.67	0.00	0.00
Mexico	0.74	1.49	1.76
USA	1.19	0.98	0.75

Pak-SAARC

	2007-09	2010-13	2014-17
Bangladesh	0.99	0.81	1.33
Bhutan	521.84	61.32	31.13
India	0.91	1.02	1.15
Maldives	5.20	1.41	0.82
Nepal	1.53	0.80	1.09
Sri Lanka	1.32	1.00	0.86

Pak-Transitional Economies			
	2007-09	2010-13	2014-17
Bosnia	0.79	1.17	79.83
Botswana	0.73	1.46	1.99
Bulgaria	0.95	1.43	0.99
Cambodia	1.64	4.59	0.78
China	0.95	0.96	1.59
Estonia	3.12	4.46	1.36
Hungary	0.54	1.48	0.53
Kazakhstan	0.67	1.75	3.02
Latvia	0.00	13.05	3.61
Poland	0.91	0.95	1.21
Romania	1.11	0.93	1.29
Russia	0.00	0.00	1.00
Slovenia	0.58	0.98	2.20
Tajikistan	7.52	1.58	0.55
Turkmenistan	0.00	0.00	0.00
Ukraine	0.93	1.34	1.18
Uzbekistan	0.00	0.00	0.00
Vietnam	1.14	1.09	0.99

Regional Distribution of Trade Potential in Services (2007-2017)

Pak-Africa	
	2007-17
Algeria	1.15
Botswana	1.45
Cameroon	6.56
Egypt	1.31
Ghana	1.16
Kenya	1.02
Mali	10.39
Mauritania	4.31
Mauritius	1.22
Morocco	1.17
Nigeria	1.20
Senegal	2.33
Sierra Leonee	56.42
South Africa	1.03
Swaziland	0.00
Tanzania	1.29
Tunisia	1.10
Uganda	2.44
Zambia	1.84
Zimbabwe	1.13

Pak ASEAN	
	2007-17
Brunei	1.10
Cambodia	2.40
Indonesia	1.06
Malaysia	1.03
Myanmar	1.48
Philippines	1.36
Singapore	1.01
Thailand	1.06
Vietnam	1.07

Pak-CAR	
	2007-17
Kazakhstan	1.92
Tajikistan	2.83
Turkmenistan	0.00
Uzbekistan	0.00

Pak-Latin America	
	2007-17
Argentina	1.47
Bolivia	1.65

Pak-ECO	
	2007-17
Iran	127.82
Kazakhstan	1.92
Tajikistan	2.83
Turkey	1.27
Turkmenistan	0.00
Uzbekistan	0.00

Brazil	1.15
Chili	1.19
Colombia	1.08
El Salvador	4.39
Mexico	1.38
Paraguay	1.30
Peru	1.14
Uruguay	1.11

Pak-EU-EEA	
	2007-17
Algeria	1.15
Belgium	0.83
Bulgaria	1.14
Cyprus	0.81
Denmark	1.23
Estonia	2.97
Finland	0.96
France	1.02
Germany	1.00
Greece	1.15
Hungary	0.88
Iceland	1.74
Ireland	1.41
Italy	0.94
Latvia	6.06
Malta	4.62
Netherlands	1.04
Norway	0.96
Poland	1.03
Portugal	1.09
Romania	1.11
Slovenia	1.31
Spain	1.03
Sweden	0.95
United Kingdom	1.01

Pak-Middle East	
	2007-17
Bahrain	0.83
Cyprus	0.81
Egypt	1.31
Iran	127.82
Iraq	4.55
Jordan	1.24
Kuwait	1.01
Lebanon	1.27
Oman	1.21
Saudi Arabia	1.01
Turkey	1.27
UAE	1.03

Pak-NAFTA	
	2007-17
Canada	0.18
Mexico	1.38
USA	0.95

Pak-SAARC	
	2007-17
Bangladesh	1.05
Bhutan	175.94
India	1.04
Maldives	2.23
Nepal	1.11
Sri Lanka	1.04

Pak-Transitional Economies	
	2007-17
Bosnia	29.67
Botswana	1.45
Bulgaria	1.14
Cambodia	2.40
China	1.05

Estonia	2.97
Hungary	0.88
Kazakhstan	1.92
Latvia	6.06
Poland	1.03
Romania	1.11
Russia	0.36
Slovenia	1.31
Tajikistan	2.83
Turkmenistan	0.00
Ukraine	1.17
Uzbekistan	0.00
Vietnam	1.07

Appendix-V (b)

Export Potential in Services

Export Potential In Services							
Countries	**2007-09**	**2010-13**	**2014-17**	**Countries**	**2007-09**	**2010-13**	**2014-17**
Algeria	39.44	2.60	0.54	El Salvador	0.15	0.16	0.16
Argentina	2.63	2.08	1.18	Estonia	6.82	3.71	0.67
Australia	1.57	1.62	0.72	Finland	2.34	1.15	2.35
Austria	0.74	1.58	1.22	France	0.83	0.91	1.27
Bahamas	8.36	57.04	85.25	Germany	0.79	1.01	1.17
Bahrain	0.86	1.24	1.34	Ghana	99.43	1.55	1.17
Bangladesh	1.14	1.00	1.89	Greece	0.99	1.34	1.72
Barbados	9.09	2.19	3.41	Hong Kong	1.59	1.63	0.87
Belgium	0.81	0.90	2.01	Hungary	5.41	8.59	1.45
Bermuda	1.98	9.62	0.00	Iceland	1.58	2.11	2.02
Bhutan	0.20	0.16	1.64	India	0.99	0.98	1.06
Bolivia	4.22	5.04	0.51	Indonesia	1.42	1.50	0.88
Bosnia	0.39	1.79	382.44	Iran	0.63	1.45	9.03
Botswana	0.73	1.83	3.93	Iraq	70.00	70.59	1.27
Brazil	2.27	6.72	3.73	Ireland	2.14	1.00	1.14
Brunei	3.38	1.02	1.13	Italy	3.39	1.58	0.73
Bulgaria	10.67	7.55	0.88	Jamaica	6.48	10.09	2.74
Cambodia	2.28	67.57	0.77	Japan	1.03	0.95	1.48
Cameroon	0.81	1.21	1.10	Jordan	2.82	1.70	0.69
Canada	4.39	454.21	40.55	Kazakhstan	1.73	2.45	5.87
Chili	1.46	1.46	0.86	Kenya	1.01	0.92	1.28
China	4.22	2.09	4.60	Kuwait	-4.64	1.18	0.93
Colombia	1.58	1.88	1.56	Latvia	11.97	1.19	0.85
Cyprus	1.16	1.12	2.04	Lebanon	1.27	0.97	1.55
Denmark	3.15	0.82	1.22	Macao	57.41	2.16	10.88
Egypt	0.60	0.98	1.95	Malaysia	1.11	1.34	1.26

Export Potential In Services							
Countries	**2007-09**	**2010-13**	**2014-17**	**Countries**	**2007-09**	**2010-13**	**2014-17**
Maldives	2.23	4.39	0.68	Singapore	1.18	0.94	1.32
Mali	0.00	631.20	198.17	Slovenia	7.78	2.64	1.09
Malta	2.71	0.81	2.16	South Africa	0.98	1.09	0.99
Mauritania	27.03	1.07	5.08	Spain	1.21	1.49	0.82
Mauritius	1.42	0.93	1.16	Sri Lanka	1.07	1.30	1.62
Mexico	0.51	1.39	5.85	Swaziland	3.38	2.48	4.98
Mongolia	0.53	8.01	0.80	Sweden	0.68	1.64	1.10
Morocco	6.00	2.91	5.86	Switzerland	2.26	1.24	0.82
Myanmar	1.84	0.44	0.93	Tajikistan	5.87	2.96	0.57
Nepal	2.58	1.47	0.93	Tanzania	2.86	1.16	1.40
Netherlands	0.72	0.95	1.36	Thailand	2.89	1.29	0.90
New Zealand	1.79	1.99	0.88	Tunisia	2.54	2.67	1.38
Nigeria	1.46	1.30	0.92	Turkey	3.21	1.90	0.69
Norway	2.83	1.18	0.99	Turkmenistan	17.90	4.58	1.18
Oman	7.50	1.15	0.87	UAE	0.75	3.68	1.97
Paraguay	0.68	5.40	31.06	Uganda	3.45	1.39	1.48
Peru	9.54	1.48	2.04	Ukraine	1.44	1.11	0.82
Philippines	8.16	1.62	0.75	United Kingdom	0.80	0.99	1.22
Poland	5.39	2.05	1.31	Uruguay	1.11	1.04	1.07
Portugal	3.89	1.39	0.76	USA	109.29	4.45	1.28
Romania	2.59	1.26	1.47	Uzbekistan	6.63	4.01	1.39
Russia	2.09	2.18	0.69	Vietnam	0.80	1.98	0.96
Saudi Arabia	0.78	1.02	1.12	Zambia	8.08	0.79	7.42
Senegal	2.70	23.88	0.98	Zimbabwe	2.45	1.10	0.97
Sierra Leonee	0.19	179.49	8.17				

Regional Distribution of Export Potential

Pak-Africa				Pak ASEAN			
	2007-09	**2010-13**	**2014-17**		**2007-09**	**2010-13**	**2014-17**
Algeria	39.44	2.60	0.54	Brunei	3.38	1.02	1.13
Botswana	0.73	1.83	3.93	Cambodia	2.28	67.57	0.77
Cameroon	0.81	1.21	1.10	Indonesia	1.42	1.50	0.88
Egypt	0.60	0.98	1.95	Malaysia	1.11	1.34	1.26
Ghana	99.43	1.55	1.17	Myanmar	1.84	0.44	0.93
Kenya	1.01	0.92	1.28	Philippines	8.16	1.62	0.75
Mali	0.00	631.20	198.17	Singapore	1.18	0.94	1.32
Mauritania	27.03	1.07	5.08	Thailand	2.89	1.29	0.90
Mauritius	1.42	0.93	1.16	Vietnam	0.80	1.98	0.96
Morocco	6.00	2.91	5.86				
Nigeria	1.46	1.30	0.92	**Pak-CAR**			

Senegal	2.70	23.88	0.98
Sierra Leonee	0.19	179.49	8.17
South Africa	0.98	1.09	0.99
Swaziland	3.38	2.48	4.98
Tanzania	2.86	1.16	1.40
Tunisia	2.54	2.67	1.38
Uganda	3.45	1.39	1.48
Zambia	8.08	0.79	7.42
Zimbabwe	2.45	1.10	0.97

Pak-ECO

	2007-09	2010-13	2014-17
Iran	0.63	1.45	9.03
Kazakhstan	1.73	2.45	5.87
Tajikistan	5.87	2.96	0.57
Turkey	3.21	1.90	0.69
Turkmenistan	17.90	4.58	1.18
Uzbekistan	6.63	4.01	1.39

	2007-09	2010-13	2014-17
Kazakhstan	1.73	2.45	5.87
Tajikistan	5.87	2.96	0.57
Turkmenistan	17.90	4.58	1.18
Uzbekistan	6.63	4.01	1.39

Pak-Latin America

	2007-09	2010-13	2014-17
Argentina	2.63	2.08	1.18
Bolivia	4.22	5.04	0.51
Brazil	2.27	6.72	3.73
Chili	1.46	1.46	0.86
Colombia	1.58	1.88	1.56
El Salvador	0.15	0.16	0.16
Mexico	0.51	1.39	5.85
Paraguay	0.68	5.40	31.06
Peru	9.54	1.48	2.04
Uruguay	1.11	1.04	1.07

Pak-EU-EEA

	2007-09	2010-13	2014-17
Austria	0.74	1.58	1.22
Belgium	0.81	0.90	2.01
Bulgaria	10.67	7.55	0.88
Cyprus	1.16	1.12	2.04
Denmark	3.15	0.82	1.22
Estonia	6.82	3.71	0.67
Finland	2.34	1.15	2.35
France	0.83	0.91	1.27
Germany	0.79	1.01	1.17
Greece	0.99	1.34	1.72
Hungary	5.41	8.59	1.45
Iceland	1.58	2.11	2.02
Italy	3.39	1.58	0.73
Latvia	11.97	1.19	0.85
Malta	2.71	0.81	2.16
Netherlands	0.72	0.95	1.36
Norway	2.83	1.18	0.99
Poland	5.39	2.05	1.31
Portugal	3.89	1.39	0.76
Romania	2.59	1.26	1.47
Slovenia	7.78	2.64	1.09
Spain	1.21	1.49	0.82
Sweden	0.68	1.64	1.10

Pak-Middle East

	2007-09	2010-13	2014-17
Bahrain	0.86	1.24	1.34
Cyprus	1.16	1.12	2.04
Egypt	0.60	0.98	1.95
Iran	0.63	1.45	9.03
Iraq	70.00	70.59	1.27
Jordan	2.82	1.70	0.69
Kuwait	-4.64	1.18	0.93
Lebanon	1.27	0.97	1.55
Oman	7.50	1.15	0.87
Saudi Arabia	0.78	1.02	1.12
Turkey	3.21	1.90	0.69

Pak-NAFTA

	2007-09	2010-13	2014-17
Canada	4.39	454.21	40.55
Mexico	0.51	1.39	5.85
USA	109.29	4.45	1.28

Pak-SAARC

	2007-09	2010-13	2014-17
Bangladesh	1.14	1.00	1.89
Bhutan	0.20	0.16	1.64
India	0.99	0.98	1.06
Maldives	2.23	4.39	0.68
Nepal	2.58	1.47	0.93

United Kingdom	0.80	0.99	1.22	Sri Lanka	1.07	1.30	1.62

Pak-Transitional Economies			
	2007-09	**2010-13**	**2014-17**
Bosnia	0.39	1.79	382.44
Botswana	0.73	1.83	3.93
Bulgaria	10.67	7.55	0.88
Cambodia	2.28	67.57	0.77
China	4.22	2.09	4.60
Estonia	6.82	3.71	0.67
Hungary	5.41	8.59	1.45
Kazakhstan	1.73	2.45	5.87
Latvia	11.97	1.19	0.85
Poland	5.39	2.05	1.31
Romania	2.59	1.26	1.47
Russia	2.09	2.18	0.69
Slovenia	7.78	2.64	1.09
Tajikistan	5.87	2.96	0.57
Turkmenistan	17.90	4.58	1.18
Ukraine	1.44	1.11	0.82
Uzbekistan	6.63	4.01	1.39
Vietnam	0.80	1.98	0.96

Regional Distribution of Export Potential

Pak-Africa	
	2007-17
Algeria	11.90
Botswana	2.30
Cameroon	1.06
Egypt	1.23
Ghana	28.10
Kenya	1.07
Mali	301.59
Mauritania	9.61
Mauritius	1.15
Morocco	4.83
Nigeria	1.21
Senegal	9.78
Sierra Leonee	68.29
South Africa	1.02
Swaziland	3.64
Tanzania	1.71
Tunisia	2.17
Uganda	1.99
Zambia	5.19

Pak ASEAN	
	2007-17
Brunei	1.70
Cambodia	25.47
Indonesia	1.25
Malaysia	1.25
Myanmar	1.00
Philippines	3.09
Singapore	1.14
Thailand	1.58
Vietnam	1.29

Pak-CAR	
	2007-17
Kazakhstan	3.50
Tajikistan	2.88
Turkmenistan	6.98
Uzbekistan	3.78

Pak-Latin America	
	2007-17

Zimbabwe	1.42

Pak-ECO	
	2007-17
Iran	3.98
Kazakhstan	3.50
Tajikistan	2.88
Turkey	1.81
Turkmenistan	6.98
Uzbekistan	3.78

Algeria	11.90
Bolivia	3.17
Brazil	4.42
Chili	1.24
Colombia	1.68
El Salvador	0.16
Mexico	2.77
Paraguay	13.44
Peru	3.88
Uruguay	1.07

Pak-EU-EEA	
	2007-17
Austria	1.22
Belgium	1.28
Bulgaria	5.97
Cyprus	1.47
Denmark	1.60
Estonia	3.45
Finland	1.91
France	1.02
Germany	1.01
Greece	1.38
Hungary	5.13
Iceland	1.93
Italy	1.76
Latvia	4.01
Malta	1.82
Netherlands	1.04
Norway	1.56
Poland	2.69
Portugal	1.84
Romania	1.70
Slovenia	3.48
Spain	1.17
Sweden	1.18
United Kingdom	1.02

Pak-Middle East	
	2007-17
Bahrain	1.17
Cyprus	1.47
Egypt	1.23
Iran	3.98
Iraq	45.22
Jordan	1.64
Kuwait	-0.49
Lebanon	1.26
Oman	2.78
Saudi Arabia	0.99
Turkey	1.81

Pak-NAFTA	
	2007-17
Canada	181.11
Mexico	2.77
USA	31.89

Pak-SAARC	
	2007-17
Bangladesh	1.36
Bhutan	0.71
India	1.01
Maldives	2.45
Nepal	1.58
Sri Lanka	1.35

Pak-Transitional Economies	
	2007-17
Bosnia	139.83
Botswana	2.30
Bulgaria	5.97
Cambodia	25.47
China	3.58

Estonia	0.16
Hungary	5.13
Kazakhstan	3.50
Latvia	4.01
Poland	2.69
Romania	1.70
Russia	1.61
Slovenia	3.48
Tajikistan	2.88
Turkmenistan	6.98
Ukraine	1.09
Uzbekistan	3.78
Vietnam	1.29

Appendix-VI

Special Section - Sensitivity Analysis

In the present study, we estimated the gravity model through Pooled, FE, RE and PPML estimation method. The coefficient estimated through PPML were then used to calculate the trade/export potential. The specification of gravity model used in this study has included all dummy variables like distance, border, common language etc in order to evaluate their impact on Pakistan's bilateral trade/exports. Magerman "et al" (2015) explained that both distance and border not only capture the geographical barriers between two trading partners, but also account for various costs traders may incur when transporting a good to its final consumer. While Head (2000) is of the view that People of two countries who speak the same language will engage in higher trade against those pairs that do not share a common language. In view of the above, the impact of distance, border and language cannot be ignored as they play an important role in policy formulation. Thus we estimated the gravity model with PPML while accounting the impact of all dummy variables and then calculated the trade/export potential both for goods and services.

Gravity Model of Trade in Goods		
	PPML (1)	**PPML (2)**
VARIABLES	**Tradeij**	**Tradeij**
lnGDPij	0.45***	0.45***
	(0.04)	(0.08)
lnPopij	0.02	0.02
	(0.09)	(0.21)
lnABSGDPD	0.19***	0.19**
	(0.04)	(0.08)
lnBER	-0.07***	-0.07
	(0.02)	(0.07)
lnTrade_Openi	0.58***	0.58**
	(0.16)	(0.27)
lnTrade_Openj	0.20***	0.20
	(0.07)	(0.15)
RTA	0.08	0.08
	(0.13)	(0.43)
FTA	0.30***	0.30**
	(0.08)	(0.13)
lnDistance	-0.47***	
	(0.12)	
Border	5.93***	
	(0.91)	
Comlang_off	-3.36***	
	(0.56)	
Constant	-14.48***	
	(2.24)	
Observations	3,465	3,465
R-squared	0.95	
Number of id		100
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

In order to check the relative robustness of the method, here we have estimated the gravity model by including country paired fixed. Country pair effect" between the trading partners is embedded with the effects of all omitted variables which are cross sectionally specific yet are constant over time e.g., distance, common border and common language(Cheng & Wall, 2005).

Gravity Model of Exports in Goods		
	PPML (1)	**PPML (2)**
VARIABLES	**Exportsij**	**Exportsij**
	0.16**	0.16
lnGDPi	(0.07)	(0.14)
	0.78***	0.78***
lnGDPj	(0.08)	(0.19)
	0.08*	0.08
lnABSGDPD	(0.04)	(0.09)
	0.00	0.00
lnBER	(0.02)	(0.06)
	0.55***	0.55**
lnTrade_Openi	(0.19)	(0.27)
	0.33***	0.33
lnTrade_Openj	(0.10)	(0.24)
	-0.22**	-0.22
RTA	(0.09)	(0.21)
	0.08	0.08
FTA	(0.10)	(0.17)
	-1.31***	
lnDistance	(0.17)	
	0.74***	
Border	(0.27)	
	-2.10***	
Comlang_off	(0.30)	
	-6.79***	
Constant	(2.45)	
Observations	3,467	3,467
R-squared	0.91	
Number of id		100
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

The comparison between the two only reflects the difference in level of significance, while the magnitude of the coefficients are same. Moreover, PPML (1) enable us to know the effect of time invariant variables which play a crucial role in determining the trade between two countries. Going forward, we have calculated the trade/export potential based on specification (1) and (2). We found no difference in the magnitude of trade/export potential. Thus we continue with the specification (1) to estimate the determinants as well as to calculate the potentials.

We have found same results for gravity model of trade/exports in services as presented in the table.

Gravity Model of Trade in Services

	PPML(1)	PPML(2)
VARIABLES	**Trade**	**Trade**
lnGDPij	0.34**	0.34**
	(0.15)	(0.15)
lnBER	0.63***	0.63**
	(0.21)	(0.30)
lnTrade_Openj	0.64***	0.64***
	(0.19)	(0.22)
lnFDIi	0.04	0.04
	(0.07)	(0.07)
lnFDIj	-0.00	-0.00
	(0.02)	(0.02)
lnCredit_GDPi	0.56	0.56**
	(0.39)	(0.27)
lnCredit_GDPj	-0.07	-0.07
	(0.14)	(0.21)
lnFixedBBi	0.01	0.01
	(0.07)	(0.05)
lnDistance	-0.21	
	(0.27)	
Border	1.75***	
	(0.58)	
Comlang_off	1.69***	
	(0.64)	
FTA	2.40***	
	(0.64)	
Constant	-13.85*	
	(7.36)	
Observations	983	983
R-squared	0.96	
Number of id		97

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Gravity Model of Exports in Services

	PPML(1)	PPML(2)
VARIABLES	**Exports**	**Exports**
lnGDPi	-1.81*	-1.81*
	(1.08)	(0.99)
lnGDPj	1.62***	1.62***
	(0.37)	(0.43)
lnBER	-0.28	-0.28
	(0.49)	(0.50)
lnTrade_Openi	-2.32**	-2.32***
	(0.98)	(0.68)
LnTrade_Openj	1.41***	1.41***
	(0.46)	(0.33)
lnFDIi	-0.11	-0.11*
	(0.20)	(0.06)
lnFDIj	0.02	0.02

	(0.03)	(0.03)
	0.52	0.52
lnCredit_GDPi	(0.81)	(0.37)
	0.66***	0.66***
lnCredit_GDPj	(0.22)	(0.24)
	0.38**	0.38***
lnFixedBBi	(0.17)	(0.13)
	-0.06	-0.06
lnFixedBBj	(0.18)	(0.17)
	-2.94***	
lnDistance	(1.03)	
	-11.16***	
Border	(4.01)	
	4.16*	
Comlang_off	(2.47)	
	1.33	
FTA	(1.17)	
	37.74	
Constant	(29.15)	
Observations	957	957
R-squared	0.93	
Number of id		96
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Appendix-VII (a)

Additional Market Access Frontier (AMAF)

Food and Live Animals ($ billion)					Mineral Fuels ($ billion)				Manufactured goods by material ($ billion)			
Year		AMAF		AMAF		AMAF		AMAF		AMAF		AMAF
1980-89	Bahamas	0.13	Kazakhstan	0.00	Bahamas	0.07	Kazakhstan	0.00	Bahamas	0.12	Kazakhstan	0.00
1990-99	Bahamas	0.10	Kazakhstan	0.16	Bahamas	0.06	Kazakhstan	0.07	Bahamas	0.11	Kazakhstan	0.38
2000-09	Bahamas	0.34	Kazakhstan	1.03	Bahamas	0.44	Kazakhstan	0.54	Bahamas	0.37	Kazakhstan	3.68
2010-17	Bahamas	0.36	Kazakhstan	2.97	Bahamas	0.58	Kazakhstan	0.59	Bahamas	0.35	Kazakhstan	6.64
1980-89	Bosnia	-	Mali	0.03	Bosnia	0.00	Mali	0.04	Bosnia	0.00	Mali	0.03
1990-99	Bosnia	-	Mali	0.07	Bosnia	0.00	Mali	0.06	Bosnia	0.00	Mali	0.07
2000-09	Bosnia	0.69	Mali	0.17	Bosnia	0.54	Mali	0.30	Bosnia	1.14	Mali	0.26
2010-17	Bosnia	1.36	Mali	0.28	Bosnia	0.59	Mali	0.59	Bosnia	2.20	Mali	0.43
1980-89	Brunei	0.10	Malta	0.12	Brunei	0.01	Malta	0.07	Brunei	0.16	Malta	0.27
1990-99	Brunei	0.13	Malta	0.19	Brunei	0.01	Malta	0.07	Brunei	0.27	Malta	0.34
2000-09	Brunei	0.18	Malta	0.40	Brunei	0.03	Malta	0.38	Brunei	0.32	Malta	0.41
2010-17	Brunei	0.44	Malta	0.53	Brunei	0.26	Malta	0.59	Brunei	0.60	Malta	0.36
1980-89	Bulgaria	-	Mauritania	0.00	Bulgaria	0.00	Mauritania	0.00	Bulgaria	-	Mauritania	0.00
1990-99	Bulgaria	0.14	Mauritania	0.02	Bulgaria	0.07	Mauritania	0.02	Bulgaria	0.44	Mauritania	0.01
2000-09	Bulgaria	0.88	Mauritania	0.16	Bulgaria	0.54	Mauritania	0.21	Bulgaria	3.56	Mauritania	0.10
2010-17	Bulgaria	2.31	Mauritania	0.28	Bulgaria	0.59	Mauritania	0.57	Bulgaria	5.18	Mauritania	0.29
1980-89	Cyprus	0.16	Myanmar	0.00	Cyprus	0.07	Myanmar	0.00	Cyprus	0.35	Myanmar	-
1990-99	Cyprus	0.28	Myanmar	0.01	Cyprus	0.07	Myanmar	0.01	Cyprus	0.62	Myanmar	0.03
2000-09	Cyprus	0.59	Myanmar	0.01	Cyprus	0.54	Myanmar	0.05	Cyprus	0.91	Myanmar	0.08
2010-17	Cyprus	0.96	Myanmar	0.96	Cyprus	0.59	Myanmar	0.59	Cyprus	0.74	Myanmar	2.59
1980-89	Hong Kong, China	0.56	Nepal	0.03	Hong Kong, China	0.07	Nepal	0.04	Hong Kong, China	1.46	Nepal	0.09
1990-99	Hong Kong, China	0.78	Nepal	0.07	Hong Kong, China	0.07	Nepal	0.07	Hong Kong, China	3.64	Nepal	0.17
2000-09	Hong Kong, China	1.69	Nepal	0.06	Hong Kong, China	0.54	Nepal	0.11	Hong Kong, China	6.04	Nepal	0.15
2010-17	Hong Kong, China	4.10	Nepal	0.81	Hong Kong, China	0.59	Nepal	0.59	Hong Kong, China	8.76	Nepal	1.51

1980-89	Hungary	0.56	Switzerland	0.56	Hungary	0.07	Switzerland	0.07	Hungary	1.51	Switzerland	1.49	
1990-99	Hungary	0.67	Switzerland	0.79	Hungary	0.07	Switzerland	0.07	Hungary	3.26	Switzerland	4.06	
2000-09	Hungary	1.70	Switzerland	1.69	Hungary	0.54	Switzerland	0.54	Hungary	6.52	Switzerland	6.52	
2010-17	Hungary	3.65	Switzerland	4.11	Hungary	0.59	Switzerland	0.59	Hungary	9.03	Switzerland	9.03	
1980-89	Iceland	0.09	Uganda	-	Iceland	0.07	Uganda	0.00	Iceland	0.21	Uganda	1.52	
1990-99	Iceland	0.16	Uganda	0.06	Iceland	0.07	Uganda	0.04	Iceland	0.31	Uganda	0.11	
2000-09	Iceland	0.30	Uganda	0.19	Iceland	0.40	Uganda	0.41	Iceland	0.60	Uganda	0.39	
2010-17	Iceland	0.45	Uganda	0.41	Iceland	0.59	Uganda	0.59	Iceland	0.59	Uganda	0.81	
1980-89	Iran	-0.05	Zambia	-	Iran	0.00	Zambia	0.00	Iran	-	Zambia	0.00	
1990-99	Iran	0.57	Zambia	0.04	Iran	0.07	Zambia	0.05	Iran	0.72	Zambia	0.06	
2000-09	Iran	1.00	Zambia	0.12	Iran	0.54	Zambia	0.32	Iran	3.00	Zambia	0.38	
2010-17	Iran	4.06	Zambia	0.25	Iran	0.55	Zambia	0.59	Iran	7.26	Zambia	1.05	
1980-89	Ireland	0.56			Ireland	0.07			Ireland	1.52			
1990-99	Ireland	0.79			Ireland	0.07			Ireland	3.49			
2000-09	Ireland	1.70			Ireland	0.54			Ireland	5.67			
2010-17	Ireland	4.11			Ireland	0.59			Ireland	5.12			

Beverages					**Animal Fats**				**Machinery and Transport**			
Year		**AMAF**		**AMAF**		**AMAF**		**AMAF**		**AMAF**		**AMAF**
1980-89	Bahamas	0.01	Kazakhstan	0.00	Bahamas	0.00	Kazakhstan	0.00	Bahamas	0.02	Kazakhstan	0.00
1990-99	Bahamas	0.01	Kazakhstan	0.01	Bahamas	0.00	Kazakhstan	0.00	Bahamas	0.03	Kazakhstan	0.03
2000-09	Bahamas	0.02	Kazakhstan	0.02	Bahamas	0.01	Kazakhstan	0.07	Bahamas	0.15	Kazakhstan	0.15
2010-17	Bahamas	0.03	Kazakhstan	0.03	Bahamas	0.01	Kazakhstan	0.12	Bahamas	0.24	Kazakhstan	0.24
1980-89	Bosnia	-	Mali	0.00	Bosnia	0.00	Mali	0.00	Bosnia	0.00	Mali	0.02
1990-99	Bosnia	-	Mali	0.01	Bosnia	0.00	Mali	0.00	Bosnia	0.00	Mali	0.03
2000-09	Bosnia	0.02	Mali	0.02	Bosnia	0.04	Mali	0.02	Bosnia	0.15	Mali	0.15
2010-17	Bosnia	0.03	Mali	0.03	Bosnia	0.09	Mali	0.03	Bosnia	0.24	Mali	0.24
1980-89	Brunei	0.01	Malta	0.01	Brunei	0.00	Malta	0.00	Brunei	0.02	Malta	0.02
1990-99	Brunei	0.01	Malta	0.01	Brunei	0.00	Malta	0.00	Brunei	0.03	Malta	0.03

2000-09	Brunei	0.02	Malta	0.02	Brunei	0.01	Malta	0.01	Brunei	0.15	Malta	0.15
2010-17	Brunei	0.03	Malta	0.03	Brunei	0.01	Malta	0.01	Brunei	0.24	Malta	0.24
1980-89	Bulgaria	0.00	Mauritania	0.00	Bulgaria	0.00	Mauritania	0.00	Bulgaria	0.00	Mauritania	0.00
1990-99	Bulgaria	0.01	Mauritania	0.00	Bulgaria	0.00	Mauritania	0.00	Bulgaria	0.03	Mauritania	0.03
2000-09	Bulgaria	0.02	Mauritania	0.02	Bulgaria	0.06	Mauritania	0.02	Bulgaria	0.15	Mauritania	0.15
2010-17	Bulgaria	0.03	Mauritania	0.02	Bulgaria	0.12	Mauritania	0.04	Bulgaria	0.24	Mauritania	0.24
1980-89	Cyprus	0.01	Myanmar	0.00	Cyprus	0.00	Myanmar	0.00	Cyprus	0.02	Myanmar	-
1990-99	Cyprus	0.01	Myanmar	0.00	Cyprus	0.00	Myanmar	0.00	Cyprus	0.03	Myanmar	0.03
2000-09	Cyprus	0.02	Myanmar	0.00	Cyprus	0.02	Myanmar	0.01	Cyprus	0.15	Myanmar	0.09
2010-17	Cyprus	0.03	Myanmar	0.03	Cyprus	0.03	Myanmar	0.12	Cyprus	0.24	Myanmar	0.24
1980-89	Hong Kong, China	0.01	Nepal	0.00	Hong Kong, China	0.00	Nepal	0.00	Hong Kong, China	0.02	Nepal	0.02
1990-99	Hong Kong, China	0.01	Nepal	0.01	Hong Kong, China	0.00	Nepal	0.00	Hong Kong, China	0.03	Nepal	0.03
2000-09	Hong Kong, China	0.02	Nepal	0.01	Hong Kong, China	0.07	Nepal	0.03	Hong Kong, China	0.15	Nepal	0.14
2010-17	Hong Kong, China	0.03	Nepal	0.03	Hong Kong, China	0.12	Nepal	0.12	Hong Kong, China	0.24	Nepal	0.24
1980-89	Hungary	0.01	Switzerland	0.01	Hungary	0.00	Switzerland	0.00	Hungary	0.02	Switzerland	0.02
1990-99	Hungary	0.01	Switzerland	0.01	Hungary	0.00	Switzerland	0.00	Hungary	0.03	Switzerland	0.03
2000-09	Hungary	0.02	Switzerland	0.02	Hungary	0.07	Switzerland	0.07	Hungary	0.15	Switzerland	0.15
2010-17	Hungary	0.03	Switzerland	0.03	Hungary	0.12	Switzerland	0.12	Hungary	0.24	Switzerland	0.24
1980-89	Iceland	0.01	Uganda	0.00	Iceland	0.00	Uganda	0.00	Iceland	0.02	Uganda	-
1990-99	Iceland	0.01	Uganda	0.00	Iceland	0.00	Uganda	0.00	Iceland	0.03	Uganda	0.03
2000-09	Iceland	0.02	Uganda	0.02	Iceland	0.01	Uganda	0.07	Iceland	0.15	Uganda	0.15
2010-17	Iceland	0.03	Uganda	0.03	Iceland	0.04	Uganda	0.12	Iceland	0.24	Uganda	0.24
1980-89	Iran	0.00	Zambia	0.00	Iran	0.00	Zambia	0.00	Iran	0.00	Zambia	-
1990-99	Iran	0.00	Zambia	0.00	Iran	0.00	Zambia	0.00	Iran	0.03	Zambia	0.03
2000-09	Iran	0.02	Zambia	0.01	Iran	0.07	Zambia	0.05	Iran	0.14	Zambia	0.15
2010-17	Iran	0.03	Zambia	0.03	Iran	0.12	Zambia	0.08	Iran	0.24	Zambia	0.24
1980-89	Ireland	0.01			Ireland	0.00			Ireland	0.02		
1990-99	Ireland	0.01			Ireland	0.00			Ireland	0.03		
2000-09	Ireland	0.02			Ireland	0.07			Ireland	0.15		

2010-17	Ireland	0.03			Ireland	0.12			Ireland	0.24	

Crude Material					**Chemicals**				**Misc Manufacture**			
Year		**AMAF**		**AMAF**		**AMAF**		**AMAF**		**AMAF**		**AMAF**
1980-89	Bahamas	0.01	Kazakhstan	0.00	Bahamas	0.03	Kazakhstan	0.00	Bahamas	0.13	Kazakhstan	0.00
1990-99	Bahamas	0.02	Kazakhstan	0.07	Bahamas	0.04	Kazakhstan	0.04	Bahamas	0.09	Kazakhstan	0.13
2000-09	Bahamas	0.06	Kazakhstan	0.30	Bahamas	0.21	Kazakhstan	0.39	Bahamas	0.30	Kazakhstan	1.10
2010-17	Bahamas	0.05	Kazakhstan	0.78	Bahamas	0.27	Kazakhstan	1.03	Bahamas	0.29	Kazakhstan	3.43
1980-89	Bosnia	0.00	Mali	0.00	Bosnia	0.00	Mali	0.02	Bosnia	0.00	Mali	0.01
1990-99	Bosnia	0.00	Mali	0.00	Bosnia	-	Mali	0.04	Bosnia	-	Mali	0.01
2000-09	Bosnia	0.13	Mali	0.01	Bosnia	0.39	Mali	0.21	Bosnia	0.52	Mali	0.07
2010-17	Bosnia	0.23	Mali	0.02	Bosnia	1.03	Mali	0.35	Bosnia	0.85	Mali	0.10
1980-89	Brunei	0.01	Malta	0.02	Brunei	0.03	Malta	0.03	Brunei	0.07	Malta	0.09
1990-99	Brunei	0.02	Malta	0.03	Brunei	0.04	Malta	0.04	Brunei	0.14	Malta	0.23
2000-09	Brunei	0.01	Malta	0.03	Brunei	0.11	Malta	0.33	Brunei	0.15	Malta	0.43
2010-17	Brunei	0.04	Malta	0.03	Brunei	0.25	Malta	0.49	Brunei	0.33	Malta	0.46
1980-89	Bulgaria	-	Mauritania	0.00	Bulgaria	0.00	Mauritania	0.00	Bulgaria	-	Mauritania	-
1990-99	Bulgaria	0.15	Mauritania	0.00	Bulgaria	0.04	Mauritania	0.00	Bulgaria	0.16	Mauritania	0.00
2000-09	Bulgaria	0.31	Mauritania	0.01	Bulgaria	0.39	Mauritania	0.03	Bulgaria	1.38	Mauritania	0.03
2010-17	Bulgaria	0.79	Mauritania	0.01	Bulgaria	1.03	Mauritania	0.10	Bulgaria	2.08	Mauritania	0.06
1980-89	Cyprus	0.03	Myanmar	0.00	Cyprus	0.03	Myanmar	0.00	Cyprus	0.13	Myanmar	-
1990-99	Cyprus	0.06	Myanmar	0.00	Cyprus	0.04	Myanmar	0.02	Cyprus	0.39	Myanmar	0.01
2000-09	Cyprus	0.09	Myanmar	0.00	Cyprus	0.39	Myanmar	0.03	Cyprus	0.98	Myanmar	0.01
2010-17	Cyprus	0.07	Myanmar	0.13	Cyprus	0.80	Myanmar	1.03	Cyprus	0.98	Myanmar	0.44
1980-89	Hong Kong, China	0.47	Nepal	0.01	Hong Kong, China	0.03	Nepal	0.03	Hong Kong, China	0.49	Nepal	0.02
1990-99	Hong Kong, China	0.39	Nepal	0.07	Hong Kong, China	0.04	Nepal	0.04	Hong Kong, China	2.11	Nepal	0.05
2000-09	Hong Kong, China	0.30	Nepal	0.04	Hong Kong, China	0.39	Nepal	0.08	Hong Kong, China	4.19	Nepal	0.05
2010-17	Hong Kong, China	0.79	Nepal	0.29	Hong Kong, China	1.03	Nepal	0.80	Hong Kong, China	6.98	Nepal	0.39
1980-89	Hungary	0.52	Switzerland	0.52	Hungary	0.03	Switzerland	0.03	Hungary	0.49	Switzerland	0.49

1990-99	Hungary	0.43	Switzerland	0.43	Hungary	0.04	Switzerland	0.04	Hungary	1.98	Switzerland	2.11
2000-09	Hungary	0.31	Switzerland	0.31	Hungary	0.39	Switzerland	0.39	Hungary	4.20	Switzerland	4.20
2010-17	Hungary	0.79	Switzerland	0.79	Hungary	1.03	Switzerland	1.03	Hungary	5.90	Switzerland	6.98
1980-89	Iceland	0.04	Uganda	-	Iceland	0.03	Uganda	-	Iceland	0.17	Uganda	-
1990-99	Iceland	0.04	Uganda	0.02	Iceland	0.04	Uganda	0.04	Iceland	0.31	Uganda	0.05
2000-09	Iceland	0.08	Uganda	0.05	Iceland	0.39	Uganda	0.30	Iceland	0.55	Uganda	0.18
2010-17	Iceland	0.09	Uganda	0.13	Iceland	1.00	Uganda	0.85	Iceland	0.53	Uganda	0.38
1980-89	Iran	0.00	Zambia	0.00	Iran	-0.01	Zambia	0.00	Iran	-	Zambia	-
1990-99	Iran	0.17	Zambia	0.02	Iran	0.04	Zambia	0.04	Iran	0.13	Zambia	0.04
2000-09	Iran	0.30	Zambia	0.16	Iran	0.39	Zambia	0.39	Iran	0.50	Zambia	0.21
2010-17	Iran	0.79	Zambia	0.79	Iran	1.03	Zambia	1.03	Iran	1.49	Zambia	0.30
1980-89	Ireland	0.36			Ireland	0.03			Ireland	0.49		
1990-99	Ireland	0.43			Ireland	0.04			Ireland	2.12		
2000-09	Ireland	0.31			Ireland	0.39			Ireland	4.19		
2010-17	Ireland	0.79			Ireland	1.03			Ireland	6.96		

Appendix-VII (b)

Region Wise AMAF

		Food and Live Animals ($ billion)				Beverages ($ billion)			
		Pak Exports	Partner Imports	Existing Exports	AMAF	Pak Exports	Partner Imports	Existing Exports	AMAF
EU-EEF	1980-89	0.56	79.61	0.06	0.50	0.01	8.89	0.00	0.01
	1990-99	0.79	146.21	0.12	0.67	0.01	20.50	0.00	0.00
	2000-09	1.70	249.42	0.20	1.50	0.02	39.45	0.00	0.02
	2010-17	4.11	398.45	0.26	3.85	0.03	52.77	0.01	0.03
ASEAN	1980-89	0.56	5.23	0.01	0.55	0.01	0.56	0.00	0.01
	1990-99	0.79	12.05	0.05	0.74	0.01	2.03	0.00	0.01
	2000-09	1.70	22.85	0.09	1.61	0.02	2.90	0.00	0.02

	2010-17	4.11	58.90	0.37	3.74	0.03	6.37	0.01	0.02
CAR	1980-89	0.56	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	1990-99	0.79	0.21	0.00	0.21	0.01	0.07	0.00	0.01
	2000-09	1.70	1.05	0.00	1.05	0.02	0.20	0.00	0.02
	2010-17	4.11	2.98	0.02	2.97	0.03	0.42	0.00	0.03
Latin America	1980-89	0.56	4.83	0.01	0.55	0.01	0.20	0.00	0.01
	1990-99	0.79	11.85	0.00	0.79	0.01	0.92	0.00	0.01
	2000-09	1.70	21.68	0.00	1.70	0.02	1.35	0.00	0.02
	2010-17	4.11	44.45	0.01	4.10	0.03	3.24	0.00	0.03
Africa	1980-89	0.56	6.47	0.08	0.48	0.01	0.35	0.00	0.01
	1990-99	0.79	8.88	0.29	0.49	0.01	0.57	0.00	0.01
	2000-09	1.70	18.90	0.61	1.09	0.02	1.37	0.00	0.02
	2010-17	4.11	44.49	1.34	2.77	0.03	3.12	0.00	0.03
ECO	1980-89	0.56	0.26	0.06	0.20	0.01	0.08	0.00	0.01
	1990-99	0.79	1.86	0.04	0.75	0.01	0.37	0.00	0.01
	2000-09	1.70	4.29	0.11	1.59	0.02	0.64	0.00	0.02
	2010-17	4.11	15.60	0.09	4.02	0.03	1.28	0.00	0.03
SAARC	1980-89	0.56	1.34	0.04	0.52	0.01	0.02	0.00	0.01
	1990-99	0.79	1.77	0.08	0.70	0.01	0.06	0.00	0.01
	2000-09	1.70	4.81	0.10	1.60	0.02	0.19	0.00	0.02
	2010-17	4.11	13.04	0.21	3.90	0.03	0.61	0.00	0.03
NAFTA	1980-89	0.56	25.49	0.03	0.53	0.01	4.41	0.00	0.01
	1990-99	0.79	41.68	0.03	0.76	0.01	7.54	0.00	0.01
	2000-09	1.70	78.45	0.04	1.66	0.02	16.89	0.00	0.02
	2010-17	4.11	140.40	0.10	4.01	0.03	27.04	0.00	0.03
Middle east	1980-89	0.56	8.27	0.25	0.31	0.01	0.81	0.00	0.01
	1990-99	0.79	10.16	0.23	0.56	0.01	1.39	0.00	0.00
	2000-09	1.70	21.40	0.62	1.08	0.02	2.13	0.00	0.02
	2010-17	4.11	58.26	0.99	3.12	0.03	4.73	0.01	0.03

		Crude Material ($ billion)				Mineral Fuels ($ billion)			
		Pak Exports	Partner Imports	Exports	AMAF	Pak Exports	Partner Imports	Exports	AMAF
EU-EEF	1980-89	0.52	53.59	0.12	0.40	0.07	134.56	0.00	0.07
	1990-99	0.43	75.24	0.08	0.35	0.07	124.99	0.00	0.07
	2000-09	0.31	125.37	0.06	0.25	0.54	422.29	0.00	0.54
	2010-17	0.79	179.39	0.14	0.65	0.59	715.44	0.00	0.58
ASEAN	1980-89	0.52	3.67	0.06	0.46	0.07	14.76	0.01	0.07
	1990-99	0.43	8.87	0.08	0.35	0.07	21.58	0.02	0.05
	2000-09	0.31	15.03	0.04	0.27	0.54	89.98	0.03	0.51
	2010-17	0.79	31.47	0.10	0.69	0.59	209.40	0.04	0.55
CAR	1980-89	0.52	0.00	0.00	0.00	0.07	0.00	0.00	0.00
	1990-99	0.43	0.08	0.00	0.08	0.07	0.35	0.00	0.07
	2000-09	0.31	0.30	0.00	0.30	0.54	2.20	0.00	0.54
	2010-17	0.79	0.78	0.00	0.78	0.59	3.13	0.00	0.59
Latin America	1980-89	0.52	3.31	0.00	0.52	0.07	10.73	0.00	0.07
	1990-99	0.43	6.64	0.01	0.43	0.07	11.77	0.00	0.07
	2000-09	0.31	12.41	0.00	0.31	0.54	41.79	0.00	0.54
	2010-17	0.79	19.01	0.00	0.79	0.59	101.32	0.00	0.59
Africa	1980-89	0.52	2.27	0.01	0.51	0.07	2.86	0.00	0.07
	1990-99	0.43	3.27	0.07	0.37	0.07	5.04	0.00	0.07
	2000-09	0.31	6.40	0.08	0.23	0.54	24.95	0.00	0.54
	2010-17	0.79	12.84	0.14	0.65	0.59	63.25	0.00	0.59
ECO	1980-89	0.52	0.79	0.00	0.52	0.07	3.44	0.00	0.07
	1990-99	0.43	2.95	0.00	0.43	0.07	5.09	0.00	0.07
	2000-09	0.31	8.50	0.02	0.29	0.54	16.10	0.00	0.54
	2010-17	0.79	18.29	0.02	0.78	0.59	21.08	0.00	0.58

SAARC	1980-89	0.52	1.30	0.03	0.49	0.07	4.62	0.02	0.06
	1990-99	0.43	2.66	0.04	0.39	0.07	9.09	0.01	0.06
	2000-09	0.31	9.24	0.04	0.27	0.54	51.38	0.05	0.49
	2010-17	0.79	24.69	0.13	0.67	0.59	148.57	0.02	0.57
NAFTA	1980-89	0.52	15.86	0.01	0.51	0.07	65.61	0.00	0.07
	1990-99	0.43	26.15	0.01	0.42	0.07	75.22	0.00	0.07
	2000-09	0.31	39.55	0.02	0.30	0.54	291.62	0.00	0.54
	2010-17	0.79	51.73	0.04	0.75	0.59	390.84	0.00	0.59
Middle east	1980-89	0.52	2.07	0.01	0.51	0.07	5.09	0.02	0.05
	1990-99	0.43	4.67	0.01	0.42	0.07	6.27	0.01	0.07
	2000-09	0.31	12.41	0.03	0.28	0.54	24.57	0.25	0.29
	2010-17	0.79	29.46	0.04	0.75	0.59	48.19	0.22	0.36

		Animal Fats ($ billion)				Chemicals ($ billion)			
		Pak Exports	**Partner Imports**	**Exports**	**AMAF**	**Pak Exports**	**Partner Imports**	**Exports**	**AMAF**
EU-EEF	1980-89	0.00	4.00	0.00	0.00	0.03	80.12	0.00	0.03
	1990-99	0.00	7.17	0.00	0.00	0.04	186.73	0.00	0.04
	2000-09	0.07	15.39	0.00	0.07	0.39	479.15	0.12	0.27
	2010-17	0.12	29.19	0.00	0.12	1.03	748.07	0.15	0.88
ASEAN	1980-89	0.00	0.60	0.00	0.00	0.03	7.68	0.00	0.03
	1990-99	0.00	0.83	0.00	0.00	0.04	23.19	0.00	0.04
	2000-09	0.07	1.69	0.00	0.07	0.39	49.30	0.03	0.36
	2010-17	0.12	5.64	0.00	0.12	1.03	109.07	0.10	0.94
CAR	1980-89	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
	1990-99	0.00	0.02	0.00	0.00	0.04	0.25	0.00	0.04
	2000-09	0.07	0.08	0.00	0.07	0.39	1.63	0.00	0.39
	2010-17	0.12	0.15	0.00	0.12	1.03	4.06	0.01	1.03
Latin America	1980-89	0.00	0.46	0.00	0.00	0.03	7.93	0.00	0.03

	1990-99	0.00	1.15	0.00	0.00	0.04	23.15	0.00	0.04
	2000-09	0.07	1.80	0.00	0.07	0.39	57.80	0.00	0.39
	2010-17	0.12	4.12	0.00	0.12	1.03	120.28	0.00	1.03
Africa	1980-89	0.00	0.81	0.00	0.00	0.03	4.38	0.00	0.03
	1990-99	0.00	1.32	0.00	0.00	0.04	8.35	0.01	0.04
	2000-09	0.07	2.66	0.00	0.07	0.39	20.62	0.02	0.37
	2010-17	0.12	5.58	0.00	0.12	1.03	45.60	0.06	0.98
ECO	1980-89	0.00	0.17	0.00	0.00	0.03	1.61	0.01	0.03
	1990-99	0.00	0.64	0.00	0.00	0.04	5.39	0.00	0.04
	2000-09	0.07	1.15	0.00	0.07	0.39	18.10	0.03	0.37
	2010-17	0.12	2.94	0.00	0.12	1.03	38.81	0.10	0.94
SAARC	1980-89	0.00	0.74	0.00	0.00	0.03	2.27	0.01	0.03
	1990-99	0.00	0.99	0.00	0.00	0.04	5.22	0.01	0.04
	2000-09	0.07	3.80	0.00	0.07	0.39	17.07	0.04	0.35
	2010-17	0.12	12.50	0.00	0.12	1.03	50.29	0.10	0.94
NAFTA	1980-89	0.00	0.91	0.00	0.00	0.03	22.46	0.00	0.03
	1990-99	0.00	2.02	0.00	0.00	0.04	61.96	0.00	0.04
	2000-09	0.07	3.95	0.00	0.07	0.39	177.81	0.01	0.38
	2010-17	0.12	8.60	0.00	0.12	1.03	301.67	0.07	0.96
Middle east	1980-89	0.00	0.60	0.00	0.00	0.03	5.09	0.01	0.02
	1990-99	0.00	1.32	0.00	0.00	0.04	10.68	0.01	0.04
	2000-09	0.07	2.38	0.00	0.07	0.39	30.54	0.06	0.33
	2010-17	0.12	5.87	0.00	0.12	1.03	73.82	0.19	0.85

		Manufactured goods ($ billion)				Machinery and Transports ($ billion)			
		Pak Exports	**Partner Imports**	**Exports**	**AMAF**	**Pak Exports**	**Partner Imports**	**Exports**	**AMAF**
EU-EEF	1980-89	1.52	138.64	0.48	1.04	0.02	230.24	0.00	0.02
	1990-99	4.08	282.86	1.01	3.06	0.03	622.02	0.00	0.03

	2000-09	6.53	537.13	1.74	4.80	0.15	1,293.36	0.01	0.14
	2010-17	9.04	676.63	2.36	6.67	0.24	1,671.25	0.02	0.22
ASEAN	1980-89	1.52	12.04	0.04	1.49	0.02	27.56	0.00	0.02
	1990-99	4.08	37.21	0.13	3.95	0.03	132.83	0.00	0.03
	2000-09	6.53	70.21	0.16	6.37	0.15	243.27	0.00	0.14
	2010-17	9.04	144.21	0.26	8.77	0.24	433.30	0.00	0.24
CAR	1980-89	1.52	0.00	0.00	0.00	0.02	0.00	0.00	0.00
	1990-99	4.08	0.45	0.01	0.44	0.03	0.80	0.00	0.03
	2000-09	6.53	3.73	0.00	3.72	0.15	7.31	0.00	0.15
	2010-17	9.04	6.64	0.00	6.64	0.24	13.55	0.00	0.24
Latin America	1980-89	1.52	6.75	0.00	1.52	0.02	18.13	0.00	0.02
	1990-99	4.08	26.35	0.05	4.03	0.03	74.36	0.00	0.03
	2000-09	6.53	59.42	0.15	6.38	0.15	175.66	0.00	0.15
	2010-17	9.04	108.34	0.27	8.77	0.24	350.27	0.00	0.24
Africa	1980-89	1.52	8.25	0.10	1.42	0.02	14.48	0.00	0.02
	1990-99	4.08	12.81	0.77	3.31	0.03	23.09	0.00	0.02
	2000-09	6.53	31.05	0.94	5.60	0.15	59.94	0.01	0.14
	2010-17	9.04	61.87	1.30	7.73	0.24	118.04	0.02	0.22
ECO	1980-89	1.52	1.53	0.08	1.44	0.02	2.96	0.00	0.02
	1990-99	4.08	6.76	0.08	4.00	0.03	14.45	0.00	0.03
	2000-09	6.53	25.66	0.22	6.31	0.15	46.16	0.00	0.14
	2010-17	9.04	50.04	0.28	8.75	0.24	87.76	0.01	0.24
SAARC	1980-89	1.52	4.15	0.03	1.49	0.02	3.82	0.01	0.02
	1990-99	4.08	8.46	0.10	3.98	0.03	7.13	0.00	0.02
	2000-09	6.53	26.84	0.30	6.23	0.15	35.17	0.02	0.13
	2010-17	9.04	72.43	0.83	8.21	0.24	90.16	0.03	0.22
NAFTA	1980-89	1.52	60.07	0.16	1.36	0.02	176.15	0.00	0.02
	1990-99	4.08	121.80	0.50	3.58	0.03	436.02	0.00	0.03
	2000-09	6.53	249.07	1.56	4.97	0.15	840.09	0.01	0.14

	2010-17	9.04	342.76	1.44	7.59	0.24	1,264.85	0.01	0.23
Middle east	1980-89	1.52	13.91	0.25	1.27	0.02	22.32	0.01	0.01
	1990-99	4.08	17.56	0.42	3.66	0.03	34.55	0.01	0.02
	2000-09	6.53	52.92	0.80	5.73	0.15	97.06	0.06	0.08
	2010-17	9.04	112.96	0.77	8.26	0.24	211.64	0.07	0.18

Misc Manufacture ($ billion)

		Pak Exports	Partner Imports	Exports	AMAF
EU-EEF	1980-89	0.49	95.38	0.22	0.27
	1990-99	2.12	245.52	0.86	1.26
	2000-09	4.20	473.12	1.65	2.55
	2010-17	6.99	642.52	3.37	3.61
ASEAN	1980-89	0.49	4.62	0.00	0.49
	1990-99	2.12	21.80	0.01	2.11
	2000-09	4.20	34.93	0.02	4.18
	2010-17	6.99	70.12	0.06	6.93
CAR	1980-89	0.49	0.00	0.00	0.00
	1990-99	2.12	0.15	0.02	0.14
	2000-09	4.20	1.12	0.01	1.11
	2010-17	6.99	3.44	0.00	3.43
Latin America	1980-89	0.49	2.96	0.00	0.49
	1990-99	2.12	18.86	0.01	2.11
	2000-09	4.20	40.11	0.04	4.16
	2010-17	6.99	72.17	0.11	6.88
Africa	1980-89	0.49	2.08	0.03	0.46
	1990-99	2.12	4.64	0.19	1.93
	2000-09	4.20	12.11	0.35	3.86
	2010-17	6.99	22.54	0.54	6.45

ECO	1980-89	0.49	0.26	0.00	0.26
	1990-99	2.12	2.07	0.02	2.05
	2000-09	4.20	8.00	0.04	4.16
	2010-17	6.99	18.35	0.04	6.95
SAARC	1980-89	0.49	0.56	0.00	0.49
	1990-99	2.12	1.53	0.00	1.52
	2000-09	4.20	6.55	0.01	4.19
	2010-17	6.99	17.28	0.03	6.96
NAFTA	1980-89	0.49	62.97	0.14	0.35
	1990-99	2.12	166.13	0.74	1.38
	2000-09	4.20	325.38	1.76	2.45
	2010-17	6.99	429.81	2.30	4.69
Middle east	1980-89	0.49	6.87	0.06	0.43
	1990-99	2.12	7.84	0.12	2.01
	2000-09	4.20	20.53	0.43	3.77
	2010-17	6.99	52.70	0.67	6.31