Dynamic Impacts of Workers' Remittances on Economic Growth: A Case Study of Pakistan

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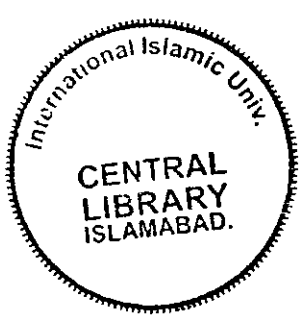

Dynamic Impacts of Workers' Remittances on Economic Growth: A Case Study of Pakistan

Thesis Submitted to
School of Economics
International Islamic University, Islamabad

By

Junaid Ahmed

In partial fulfillment
Of the requirements for the degree of

MS/MPhil
In
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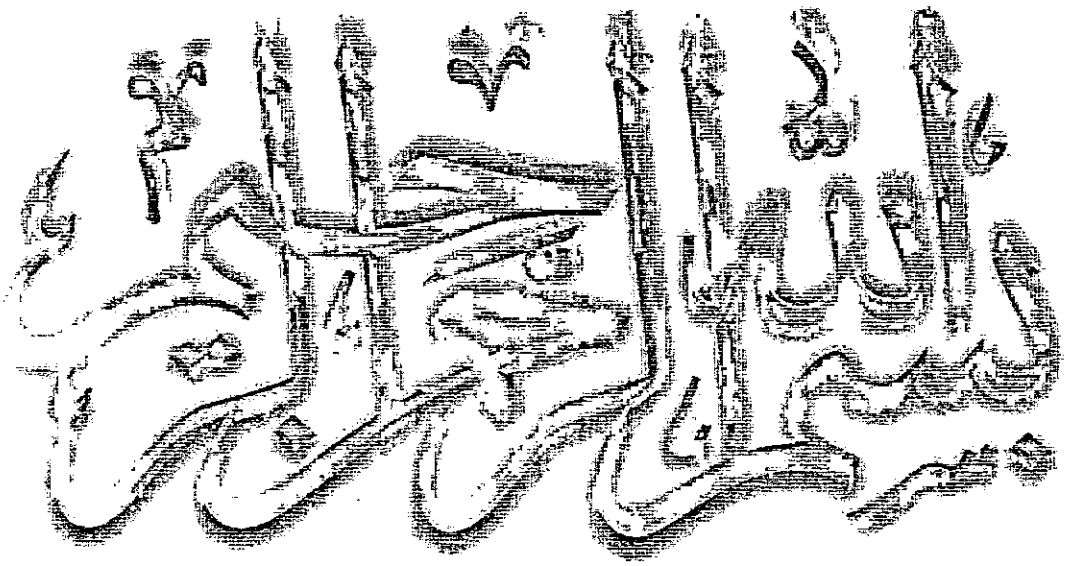

In the Name of Allah,

The Most Beneficent, the Most Merciful

CERTIFICATE

We accept the work contained in the thesis titled "Dynamic Impact of Workers' Remittances on Economic Growth: A Case Study of Pakistan" as confirmation to the required standard for partial fulfillment of the Degree MS/M.Phil in Economics.

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DEDICATION

To my Parents

ACKNOWLEDGMENT

The whole praises and prayers are to Almighty ALLAH, the sovereign power who honored me with the crown of "the best amongst his created", enlightened my darkness with the light of knowledge, and enabled me to complete this research work., and praises due to his last prophet Hazrat Muhammad (S.A.W), who raised the flag of Islam in the universe and is forever a minerate of light, who seek guidance and knowledge. He, who raised the status of humanity and bore all the troubles himself.

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JUNAID AHMED

ABSTRACT

Dynamic Impacts of Workers' Remittances on Economic Growth: A Case Study of Pakistan

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The workers' remittances have been the second largest source of net financial inflow in developing countries. In recent years, it emerged as an important source of external finance for Pakistan. This study examines the dynamic impacts of Workers' remittances on economic growth of Pakistan. For this purpose, a Keynesian type simultaneous econometrics model with a dynamic characteristics having sound theoretical basis is used. The macroeconomic key variables are investigated with an eventual purpose of estimating their contributions to the economic growth of Pakistan. It is found that the highest induced growth rate by remittances to output growth belongs to the start of 1980s particularly 1982-83 which corresponds to the high inflow of remittances from the Middle East. Our analysis shows that, although the workers' remittances used mostly for private consumption and to some extent imports but it contributed to the economy of Pakistan positively through the multiplier effects. In addition to that, the results also suggests a main concern of policies for keeping remittances from falling, as well as a priority of policies for remittances to rise.

Key Words: Workers' Remittances, Dynamic Model, Induced Growth, Output Growth, Middle East, Pakistan

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CHAPTER 1

INTRODUCTION

1.1. Background of the Study

As a consequence of globalization and industrialization, the world has experienced a growing flow of labour and capital across different countries. Due to better working conditions and opportunities at the higher return in developed countries, this movement of labour is skewed from developing countries toward developed countries. It is estimated that about 191 million people of world population lived and worked outside the country of their birth during 2005[1]. Migrants working abroad send their earnings, known as remittance, to support their families or friends in their home countries. Migrant Remittances are financial flows that occur due to cross-border movement of people. Due to its stable and unreturned nature, remittances are different from the other external capital inflows like foreign direct investment, foreign loans and aids (Kapur and Singer, 2006; Shahbaz et, al, 2007). They tend to be more stable than other external flows and may even be counter cyclical for the receiving economy. They tend to go up when the recipient economy suffers an economic recession due to some financial crisis, natural disasters, or political conflicts. Migrants send more during hard time for helping of their families and friends (Orozco, 2003b; World Bank, 2005; Ratha, 2007). In contrast, other private capital flows, frequently move pro-cyclically, raising incomes in booms and decreasing in recessions (Ratha, 2003). For example, Workers' remittances as percent of private consumption expenditure rose in Indonesia, Mexico and Philippines following financial crisis. Likewise, remittances increased sharply in the late 1990s when Ecuador suffered a fabulous economic crisis (Jokisch and Pribilsky, 2002). The IMF (2005) relates remittances and macroeconomic stability, and finds lower volatility of aggregate output, consumption and investment in countries with larger remittance inflows. Thus Remittances smoothen consumption and contribute to the stability of recipient economies by cushioning the business shocks.

[1] UN Population Division International Migration 2006

International migration plays an important role in economic development of both sending and receiving countries (Todaro and Smith, 2003). As a major source of foreign exchange in many developing nations, workers' remittance flows are an increasingly important source of global economic integration. Remittances not only reflect the contribution of home labour working abroad but also show the connection between growth in home country and its integration with the world economy. In other words, remittances enhance the integration of countries into the global economy (Addison, 2004). The remittance inflow has experienced a significant increase in developing countries over the past decades. For many developing countries of Asia, Africa and Latin America, such remittances constitute the largest source of foreign exchange earnings, even exceeding export revenues, FDI, foreign aids, and other private capital flows (World Bank, 2005). Therefore, remittances become a comparatively attractive and one of the largest sources of external finance for developing countries. In 2007 the recorded remittances sent by home migrant reached to $ 265 billion from $229 billion in 2006 and more than double the level reached in 2002 (Ratha, 2008). Remittances are almost as large as FDI, and more than twice as large as the official aid received by developing countries (Gammeltoft, 2002; Ratha, 2007). Neyapti (2003) also reach the conclusion that, workers' remittance receipts in many developing countries have been many-fold of other forms of foreign exchange inflows during 1990's.

Remittances accrue directly to households. In contrast other external sources such as foreign aid goes to public agencies in recipient of countries, the effectiveness of which may therefore be hampered by corruption of government officials (Kapur, 2005). Remittances can improve a nation's creditworthiness and there by enhance its access to international capital markets for financing infrastructure and other development projects (Ratha, 2005a; Woodruff, Zenteno and Yang, 2004). When workers' remittances are included in the exports, the ratio of debt to exports, a main indebtedness indicator, decreases considerably (IMF, 2005). At the macro level, remittances can be used to make up for shortfall in the balance of payments, to promote investment and to deal with problems of poverty. At the micro-level, remittance can be used for smoothing the food consumption level of the recipients, providing capital for investment purposes and providing the old-age security (Schrieder & Knerr, 2000).

However, the rapid increase in such inflows may also have unfavorable effects on whole

economy, and may retard the economic growth, known as "Dutch Disease Problem [2] (McCormick and Wahba, 2000; chami 2003; Kapur, 2004). The constant migration of the working age people may decrease the likelihood of investment by the government or by foreigners because of an unreliable workforce in the home country (Pastor and Rogers, 1985; Pastor, 1990; Itzigsohn, 1995). Remittances may also cause growing inequality among local population in labour exporting countries. Remittances are often spent on imported luxury consumer goods, rather than locally produced or investment goods. This may reduce the potential multiplier effect of the money and rising imports demand and inflation (Russell, 1986; Martin, 1990). Even if the remittances are used unproductively, mostly on consumption, still it can contribute to the economy through multiplier effects. (Van Doorn, 2002) found that remittances positively affected GDP of Bangladesh. Nishat and Bilgrami (1991) found that the major share of workers' remittances was spent on private consumption, but still it contributed to the economy of Pakistan positively through multiplier process.

The issue of workers' remittances has been widely discussed in the second half of the 20th century, about the contribution to economic growth in the recipient countries. The relevant literature about this issue includes significant number of studies. However, a large part of these studies is qualitative, summarize the general situation and try to analyze the impact of remittances based on surveys data. On the other hand, few studies have tried to analyze the macroeconomic impact of remittances on the recipient's countries by building an econometric model. For the case of Pakistan, considering the uses of workers' remittances in home economy, several surveys studies are available (e.g. Amjad, 1986; Burki, 1991; Idris and Sofranko, 1999; Siddiqui and Kemal, 2002; Suleri, A. & Savage, K, 2006 etc.). Although these studies can be valuable in determining the uses of remittances and forming a general idea, but they are not sufficient in assessing the macroeconomic impact. However, in this study a macro-econometric dynamic simultaneous equation model developed by Glytsos (2002) is used for investigating the impact of remittances on economic growth of Pakistan through consumption, investment and imports covering the period from 1972-73 o 2006-07. Short-

[2] Large and sustained remittances inflows could cause an appreciation of the real exchange rate and make the production of tradable goods sector less competitive. Remittances might b e used for unproductive purpose rather than investment or conspicuous consumption in practice.

Run and Long-Run multipliers of exogenous shock of remittances are estimated, these multipliers are used to find out the effects of workers' remittances on economic growth.

1.2 Research Design

1.2.1 Motivation of the Study

The workers' remittances have played a significant role in the economies of labour exporting developing countries. It constitutes an increasingly important mechanism for the transfer of resources from developed to developing countries (Russell, 1992). For numerous developing countries the flow of remittances has increased the gross domestic product (GDP) to a significant proportion. Remittances are the second-largest source after foreign direct investment of external finance for developing countries (Ratha, 2003). In recent years, the exponential increase, both in rate and volume of remittances inflow are observed in Pakistan. According to State Bank of Pakistan (2008) workers' remittances arrive at the level of $ 6.5 billion, which is larger than the foreign direct investment, i.e. at $ 5.1 billion and more than mutual assistance received by Pakistan in 2007-08. On global scale remittances have become vital factor in global external finance. Our main concern in this study is to see the macroeconomics effects of workers' remittances on economic growth. Thus there exists a need for comprehensive analysis of the subject. A better understanding of this impact could help the policy-maker to design appropriate policies related to remittances.

1.2.2 Objective of the Study

The developing nations like Pakistan are mainly concerned with growth and structural change. The main goal of labour exporting developing countries is to widen the sources of economic activities, increase competitiveness and to decrease their reliance on the injection of resources coming from outside the country. The changing in remittances flow has both short-run and long-run implications. The foremost objective of our study is to examine the effects of demand created through workers' remittances on key macroeconomic variables that are linked to short-run economic changes, and then to find out how these changes move the economy to long-run growth and development.

1.3. Limitations of the Study:

- The data on unrecorded remittances have become one of the most critical issues about current account in labour exporting economies. Recorded remittances probably in all cases underestimate the real flows of money remitted by migrant. The greatest source of bias of the data about workers' remittances that we not included in our study, are remittances transferred through unofficial channels, remittances transferred by emigrants themselves, and remittances in kind. These items constitute in certain cases a substantial proportion of remittance inflows.
- Export of labour also brings losses to native countries in form of brain-drain (Bhagwati and Dellafar, 1973) and they support brain-drain tax but this brain drain loss is uncertain in its very nature (Bhagwati and Hamada 1974, 1975) At the same time recent literature has emphasized the important gains for developing countries from high-skilled migration, which may arise from the resulting remittances and increased technology transfers (Stark and Wang, 2002). The reason to not include brain drain cost in our study is that costing out the impact of brain drain and quantifying it is so complex that is beyond the scope of our study.

1.4. Organization of Study

The rest of the thesis is organized, as followings. In chapter 2 a historical account of international migration and workers' remittances in the developing world as well as Pakistan is presented .The literature review about workers' remittances is presented in chapter 3. In chapter 4 a macro econometric model, data and estimated results are provided. The conclusions based on the empirical results are presented in chapter 5.

CHAPTER 2

HISTORICAL ACCOUNT OF INTERNATIONAL MIGRATION AND WORKERS' REMITTANCES

2.1. International Migration and Workers' Remittances

After the Second World War international migration flow has become one of the most important features of western European countries. During the Second World War, about 3 million people died and most of the cities were destroyed in Europe (Goksu, 2000). Population dislocations that occurred during the Second World War, led to major resettlement flows once the war was over. About 6 million migrants were resettled, 4 million of whom moved to the immigration countries of the time (Argentina, Australia, Brazil, Canada, Israel, New Zealand, South Africa, the United States and Venezuela). In addition, about 1 million persons moved within Europe[3]. Further more, the process of decolonization also resulted in a major population movements between the newly independent States. The partition of India, for instance, led to the mass movement of, 7 million to 8 million persons between India and Pakistan in 1949 (Thomas, 1959). Moreover, several international organizations adopted the economic prescription for free labour migration for liberalizing the movement of people across borders after the Second World War parallel to the trade liberalization. It was reflected in the International Labour Organization (ILO) migration for employment recommendation 1949 (No.86):

"It must be the general policy of Members to develop and use all possibilities of employment, and for this purpose to facilitate the international distribution of labour force and in particular the movement of manpower from nations which have a surplus of manpower to those nations that have a shortage" (Martin, 1991:12).

During 1950s, the economies of Western Europe nations had begun to get well from the damage of war. As a result, demand for workforce grew and was initially met by the entrance

[3] World Economic and Social Survey 2004

of workers from Southern European countries like Greece, Portugal and Spain, or from the colonies/former colonies like Algeria in the case of France; India and Pakistan in the case of Great Britain.

In the start of the 1960s, numerous countries liberalized their entrance policies, by allowing the immigration of people from labour exporting countries (Zlotnik H, 1999). By the end of 1960s, both the labour-importing countries of Europe and overseas countries of immigration had become the major attraction poles in the world. By that time, the greater availability of census data on the foreign-born people made it possible to account the number of international migrants in the world (World Economic and Social Survey, 2004). The process of mass migration continued till the enrollment bans by the European countries on non-European labours. Similar to the change in the world economic situation, due to oil shocks, labour-exporting nations turned towards Middle East.

During 1970s, Japan also became part of the international migration process with workers come mostly from South American and Asian countries (Massey, 2003). In addition to Japan, in the 1980s, international migration came into the agenda of the newly industrialized countries such as Singapore, Taiwan, Hong Kong, Thailand., Korea and Malaysia. In 2000, 175 million people were living outside of their origin countries making 1 in every 35 people on globe an international migrant (WESS, 2004). In 2005 the stocks of international migrant reached to 191 million increases from 175 million in 2000 (United Nation, 2006).

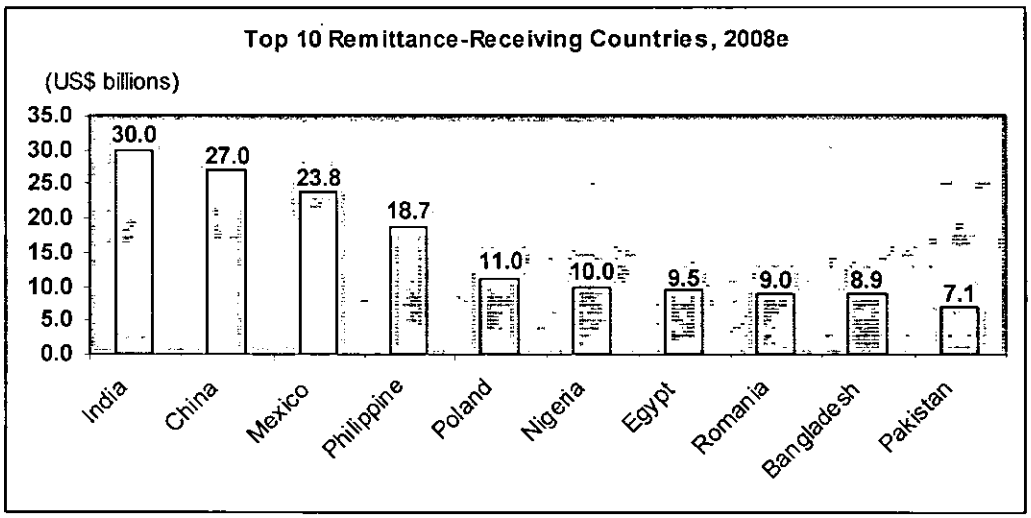
To summarize, the stock of international migrants rose from 76 million in 1965 to 188 million in 2005 having more than doubled over the span of 45 years.

These international migrants send some fractions of their earnings to their origin countries called remittances. Thus, as a fundamental aspect of international labour migration, workers' remittances have become a very important source of external finance for many developing countries. The data on remittances for different nations is presented in the Development Prospects published by the World Bank. However, these figures miscalculate the actual flow of remittances, as large fraction of remittance flows arise through informal channels such as Hundi/Hawala etc.

Remittances are more evenly distributed between the developing countries than other external capital flows. In 2007, the top three recipients of remittance are India, China, and Mexico,

each received over $25 billions. While Pakistan received $6.1 billions and being the 12th recipient of remittances. In 2008, India, China and Mexico are likely to maintain their positions as the top three recipients of remittances among developing countries as shown in following figure 2.1.

Figure 2.1 Top Remittances Receiving countries in US$ billions

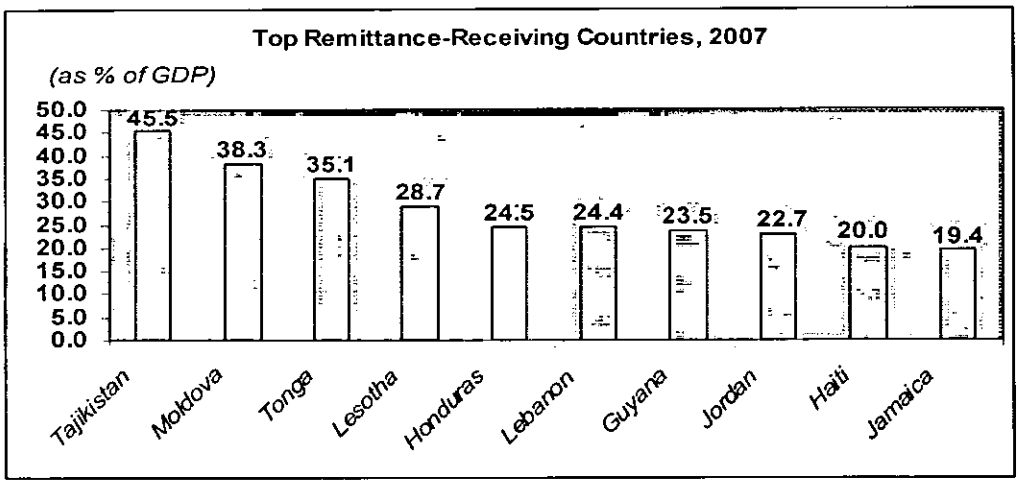


Source: Migration and Development Brief 8, World Bank.

The top ten recipients list also includes Philippine, Poland, Nigeria, Romania, Egypt, Bangladesh and Pakistan respectively. Pakistan brings its position from 12th to 10th and received $7.1 billions in 2008.

In contrast, the top recipients of workers' remittances in term of percentage of GDP comprise smaller economies such as Tajikistan (45.5), Moldave (38.3), Tonga (35.1), Lesotho (28.7), Honduras (24.5), and Lebanon (24.4), as shown in Figure 2.2 below:

Figure 2.2. Top Remittances receiving countries as % of GDP

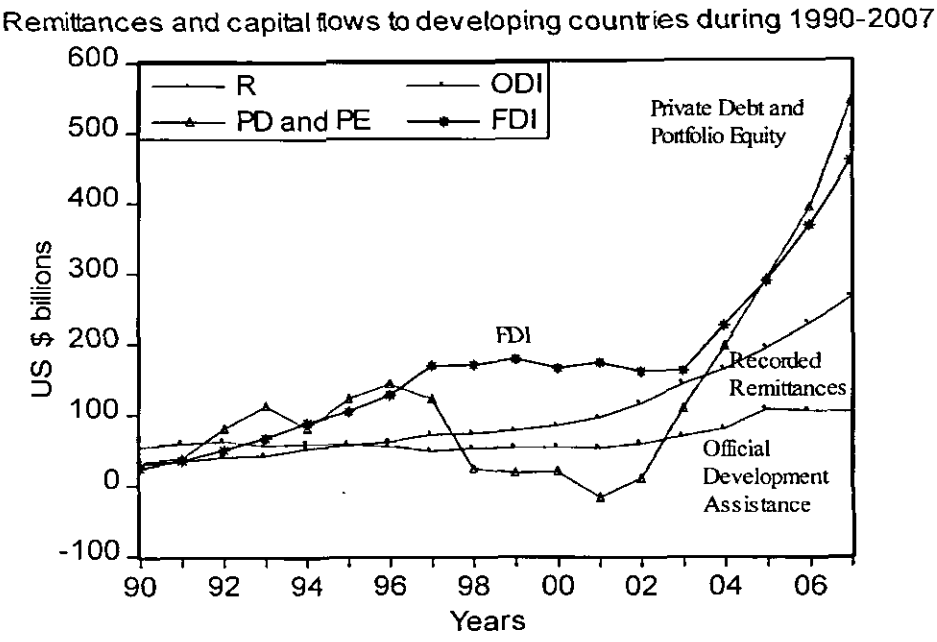


Source: Migration and Development Brief 8, World Bank.

Migrant remittances become a focus of keen attention in recent years, because of its growing into developing countries as shown in figure 2.1 and 2.2. In 2006 the recorded remittances sent home migrant are $229 billion. It reached to $ 265 billion in 2007 which is more than double the level reached in 2002 (Ratha, 2008), However, this amount reflects only transfers recorded in the balance of payments. The unrecorded flows through unofficial channels are supposed to be at least 50% higher than recorded flows (IMF, 2005). Migrant Remittances are almost as large as FDI, and more than twice as large as the official aid received by developing nations. In 2007, gross flows to developing countries amounted to US$ 265 billion, compared to US$ 31 billion in 1990 (see figure 2.3), about nine time increases over the past 18 years (Gammeltoft, 2002; Ratha, 2007). Rapid increase in remittances in the years between 2002 and 2007 is because of; growth in the migrants and income, improved inspection of flows after 9/11, reduction in remittances costs and the depreciation of US$, which encouraged higher remittances flows to compensate for the loss of purchasing power appreciating home currencies and growing costs of living in the origin countries[4].

[4] Dilip Ratha, Sanket Mohapatra and Zhimei Xu1 (2008)

Figure 2.3 Remittances and other capital flow to developing countries during 1990-2007



Source: World Development Indicator Database, World Bank

After several years of strong growth, workers' remittances were decelerated in the end of 2008, and are likely to persist in early 2009 in response to global financial crises. However, this decline is smaller than the other capital flows, implying that remittances are expected to remain resilient relative to other external flows to the developing countries[5].

2.2 Trends of International Migration and Remittances in Pakistan

Pakistan is a labour rich country. According to neoclassical theory, if labours are incapable to find jobs to satisfy their needs, they will look in another place. There are many factors such as economic, political and religious, which generate these human flows. Pakistan, being a former British colony has close ties with Britain, thus during the Second World War, when Britain's heavy industries were suffering a labour shortage, Pakistani seamen often left their ships to take industrial jobs on shore, and soon their fellow villagers goes after them (Arif, 1997). Thus the Process of international migration began.

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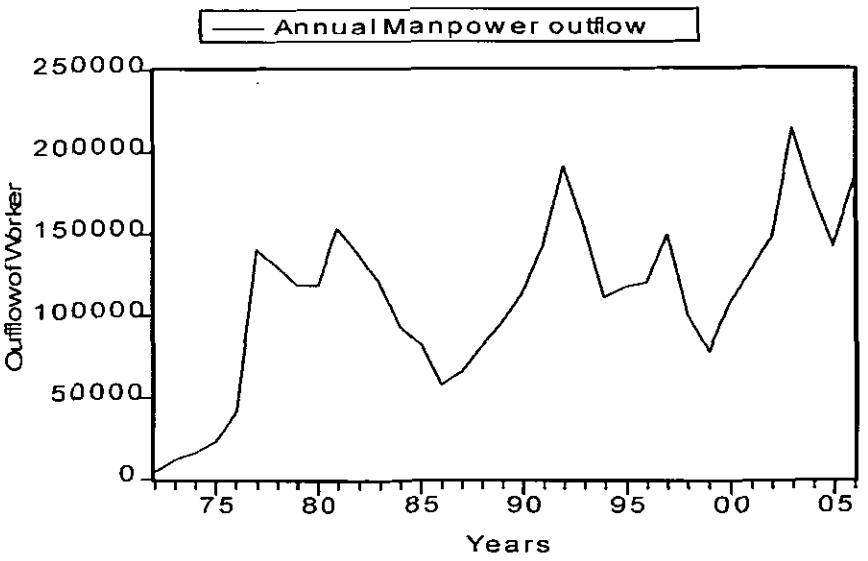
[5] Ratha, Outlook for Remittance Flows 2008 - 2010: World Bank

Figure 2.4 Annual Outflow of worker from Pakistan during 1972-2006



Source: Govt of Pakistan, Bureau of Emigration and Overseas Employment Islamabad.

According to 1961 British census, 32,000 Pakistanis were enumerated as residents of Britain; Where as, in 1971 this number was increased at about 170,000. 75% of the British Pakistanis belong to the Mirpur district of Azad Kashmir. This was considered the first stream: the movement of unskilled and semi-skilled Pakistanis to Britain. The second stream consisted of the emigration of human resource, often termed as "Brain Drain" to Britain, USA, Middle East, Canada and West Germany during 1960s and 1970s (Arif and Irfan,1997). However, researchers are uncertain to the effects of the emigration of highly skilled workers to the origin country. The third stream comprised of the temporary migration of mainly semi-skilled people to the Middle East who migrated for a fixed period of time to earn sometimes as much as they earn for the same job in Pakistan. In the Middle East, job opportunities created for foreign workers after 1973 oil crises. Pakistan both, because of its religious similarity as well as its geographic closeness with the Arab became one of the major supplier of labour (Arif and Irfan, 1997). In 1975, Pakistan had considerable number of contract worker's in the Middle East (Charles, et.al). During 1980's two millions of Pakistani were estimated, employed in the Gulf States (Gazdar, 2003). Deeply research has taken place on the third stream, as it is estimated that these workers remit up to 78% of their income (Arif, 1998) and thus, the influence of such

inflow are enormous. This stream led to an enormous amount of remittances flowing into the country, as its peak in 1982-83, the official flow of remittances was equivalent to 70% of the country's total export (Jamal, 2004).

The recent movement of skilled Pakistanis to the USA, UK, European countries, Middle East and Canada can be considered the fourth migratory stream. The demand for skilled and qualified workers is higher in the global market as compared to the demand for unqualified workers. In 2007, about 47.76% professional and skilled workers migrated to different nations[6]. During the period of 1971-2007 the migration flows from Pakistan recorded to be 4.16 million. The oil rich countries e.g., Saudi Arabia and the United Arab Emirates continue to remain destination for the majority of migrating workers[7].

To summarize, international migrant helping in reducing the unemployment rate, which is one of the growing problems of Pakistan? However, the surge of skilled labour results shortage of labour in several sectors of labour market in Pakistan.

Workers' remittances sent by the migrants had played a vital role in the economy of Pakistan. A comparison of workers' remittance inflow with key economic indicators provides an evaluation of the significance of remittances at the micro and macro levels. Recent surge of remittances in Pakistan has pushed the growth impetus of the economy along with macro economic stability. In addition to that, more remittances are possible to have impact on economic planning and human development, lead to institutional strengthening. It is commonly thought that flow of remittances has significantly stabilized Pakistan's financial sector that is initial level of development (Shahbaz, et, al, 2008).

The remittance of workers abroad has remained one of the most important components of the balance of payments (BoP) since late 1970's (Nishat et.al, 1991). In 1972-73, the workers remittances stood at $136 million. Oil shocks of 1973, increased the import bill and thus worsened the balance of payments problem on one hand but on the other hand, the emergence of Middle East market and remittances contributed significantly in improving the balance of trade (Afzal, 2008). During 1975-82 Pakistan experienced large scale labour migration to the countries experiencing rapid economic growth particularly to the Middle East. Before

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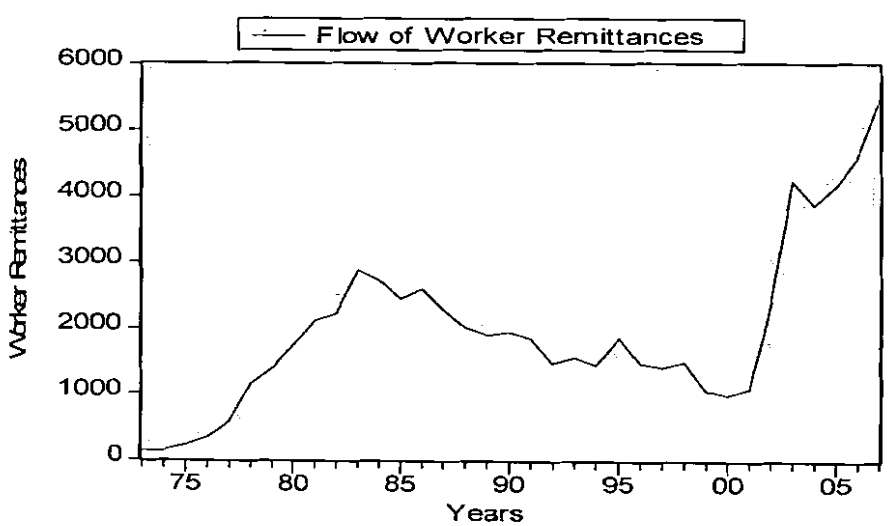
[6] Bureau of Emigration and Overseas Employment (BE&OE), 2008

[7] See appendix's table E.1

migration about half of these workers from rural and urban areas were engaged in low paid jobs (Arif, 1995). They left their home countries with the major objectives to improve their income by exploiting better work opportunities abroad. A significant increase in the migrant's household income was predicted when remittances were included and considerable decrease when remittances were excluded (Adam & Richard, 1992).The skilled workers earnings were considerably higher than unskilled. These workers frequently transferred a major share of their income to the families left behind in Pakistan. Migrants have transferred about 75% of their earnings as remittances to their origin countries (Gianni *et al.*, 1981; Addle ton, 1992). The large part of this money is used to pay for consumer goods, house construction, to pay-off debts, and to purchase land. During 1980s, remittances had positive social and economic effects on household's recipient from Middle East. Similarly, results showed that 42% of remittances were used to cover basic family needs, 29% spent on other consumer goods, and 13% were used in some type of business investment (Iris and Soprano, 1999). During this period it was also associated to a rapid decline in poverty levels (Anwer, 2004). In 1982-83 when remittances were at their maximum point, at 10.06 percent of GDP, they financed 84.8 percent of the current account balance and 96.6 percent of the trade deficit. Remittances through formal channels accounted for 14 percent of the growth in GNP and it was 24 percent when informal channels were also included from the Middle East (Burney, 1988).

Figure 2.5 Annual flows of Workers' Remittances to Pakistan during 1973-2007



Source: State Bank of Pakistan, Various Issues

The boom of 1980's reversed in the beginning of 1990's, partially due to return of the Pakistanis migrants from Iraq and Kuwait, due to the Gulf crisis. By 1990-91, the inflow of remittances declined to US $1848 million which reduced the proportion of Middle East from 86% to 67% in 1983-84. Although in 1996-97 the share of Middle East increased to 73% but total remittances decreases to Rs.1409 million (Government of Pakistan, 1998).

The remittances again experienced a setback during 1998-99 and 1999-00, this was mainly due to sanctions imposed, and seizing of foreign accounts caused by nuclear explosions (Asghar, 2004), caused a declined in confidence of many Pakistanis migrants on banking system(Haq, 2001). During the 1990's, decline in remittance inflows is a major contributor in increasing poverty in Pakistan (Siddiqui et.al, 2002).

Since, After September 11, 2001, remittances have increased very sharply and reached 4 billion dollars due to the additional external support provided by the United States (which several studies termed as "the September 11 windfall") helped increase the cushion of external reserves (World Bank, 2007). During this period the share of remittances increased from 13% to 30% from Pakistani migrant in United States (Azam, 2005).

In 2005–06 (the year of the earthquake), official remittances reached some $4.6 billion, an increase of 10% over the previous year (State Bank of Pakistan, 2006). In 2006-07 Pakistan received $ 5.493 billion as remittances increases by 19.42 % from the last year (Govt of Pakistan, 2007). In 2007-08 the remittances were estimated at record of $6.5 billion (SBP, 2008). Whereas, the other external flows such as foreign direct investment and portfolio investment from abroad have decreased due to volatile political situation and shortage of energy. Foreign direct investment decreased from $4.52 billion to $3.881 from 2006-07 to 2007-08 Meanwhile, portfolio investment decreased from $1.760 billion to $62.2 million (Ahmad, 2008). Remittances sent home by overseas Pakistanis continued to show a rising trend in the months of July and August of the year 2008-09, showing an increase of 23% over the last year (State Bank of Pakistan, 2008).

In Pakistan, remittances have more than doubled over the past five years. These remittances channeled into Pakistan both through formal and informal way. The share of informal is always increasing because of their efficient and speedy service, as bank transaction requires complex paper work (Hyder, 2003). The cost of remittance transfer through official channels

at both sending and receiving ends are high. The government has taken steps to refresh the banking system by reducing the remittances costs. But the cost of transferring money through banking is still high and should be rationalized. Reducing remittance costs would increase the disposable income of poor migrants, as well as their incentives to send more money home through formal channels (Nusrat, 2008). In the present scenario, the only positive news for the economy emanating these days is that the amount of remittances being sent by the migrants has increased. Whereas, the government despite all the efforts could not bring a sizeable amount of foreign exchange, Pakistanis migrant constantly demonstrate their confidence in the economy of Pakistan. The main sources of workers' remittances are United States, United Kingdom, Saudi Arabia, United Arab Emirates (UAE), GCC countries (including Bahrain, Kuwait, Qatar and Oman), the European Union, Australia, Canada and Japan[8].

[8] See appendix's table E.2

CHAPTER 3

LITRATURE REVIEW

There is a vast body of theoretical and empirical literature explaining the motivation of migrant to remit to their relatives at home and the impact of remittances on the receiving communities. Many of these contributions have microeconomic focus based on survey data. On the other hand, only few studies have tried to analyze the macroeconomic impact of remittances on the origin country by building a macro-econometric model.

3.1 Workers' Remittances and Economic Growth in Developing Countries

Talafha (1985) analyzed the effects of remittances on macroeconomic variables for Jordanian economy by using the Keynesian income determination model. They estimated the effects of workers' remittances on macroeconomic variable such as consumption, investment and imports. By using relevant multipliers his results demonstrate that remittances have significant impacts on these variables.

Kandil and Metwally (1990) analyzed the impact of emigrant remittances on the Egyptian economy in the context of the standard Keynesian macroeconomic model. They aimed at identifying the factors determining the magnitude of the remittances multiplier and the impact of remittances on the key components of the aggregate demand such as consumption, investment and imports. The study concluded that remittances have positive impacts on the economic growth of Egypt.

El-Sakka and McNabb (1999) estimated a macro model for total inflow of remittances through official channels in Egypt. They used the data from 1967-1991 for remittances and 1974-1991 for imports financed using remittances. They found that levels of income in both host and home countries have a positive impact on the inflow of remittance to the origin county. They also found that remittance flows are highly receptive to black market premiums. The results also support the idea that interest differentials at home and abroad have a negative impact on the inflow of remittances through official channels. They also found that imports financed by remittances have higher income elasticity and relatively lower price elasticity as compared to other imports.

Leon-Ledesma and Piracha (2001) analyzed the impact of remittances on employment performance, for the Central and East European (CEE) countries' A productivity equation, an investment-output equation and a consumption-output equation were estimated using a set of 11 transition countries during the period 1990-1999. The study established that the impact of remittances on unemployment depends on its effect on productivity growth and investment. An estimations result implies that the average elasticity of consumption-output ratio with respect to remittances for all countries is 0.0326, which is lower than that for investment-output ratio (0.0541). The study determined that remittances have positive effects on productivity and employment through its effects on investment and consumption, but the effect of consumption were not as strong as investment opposing some earlier results.

Glytsos (2002) estimated a dynamic, simultaneous Keynesian type model for investigating the impact of remittances on consumption, investment, imports and output for eight countries; Algeria, Egypt, Greece, Jordan, Morocco, Portugal, Syria and Tunisia for the period of 1969-1993. The findings of the study point out a rather unstable situation in all countries, with fluctuating positive and negative effects of remittances. The growth of the economies of Jordan and Egypt are found to be strongly reliant on remittances. For the other countries, the effect of remittances on growth is partial and in several years negative impact of remittances to growth is observed. However, Glytsos (2005) extended his previous study, covers the period of 1969-1998. In this study he applied a macroeconomic model for; Egypt, Greece, Jordan and Morocco. Results of this study were similar to the preceding one.

Chami et al. (2003) analyzed "Remittances as a source of capital for Development." They construct a model of remittances that incorporated both micro and macroeconomic variables. Using data of 113 countries for the period 1970 to 1998.The study founds that remittances have negative impact on growth in per capita incomes. The study reported three stylized facts: first, that a "significant proportion, and often the majority," of remittances are spent on consumption; second, that a smaller part of remittance funds goes into saving or investment; and third, the ways in which remittances are typically saved or invested - in housing, land and jewelry - are "not necessarily productive" to the economy as a whole.

Guilano and Ruiz-Arranz (2005) criticized Chami et al. study, for not taking into account endogeneity problem. They found that remittances improve credit constraints on the poor,

improve the allocation of capital, substitute for the lack of financial development and thus accelerate economic growth.

Stahl and Fred (1986), Ratha (2003) concluded that there is a positive relationship between remittances and economic growth through accelerating private investment and consumption expenditures. Remittances generate positive effects on the economy if they are used for consumption expenditure; and remittance will contribute to output growth if they are spent on investment.

Quartey (2005) analyzed Remittances and their role in growth for Ghana, using survey data. The study concluded that workers' remittances facilitate transfer of income from rich to poor country households not only for private consumption but also for investment purposes which promotes economic growth and reduces poverty.

Cattaneo (2005) found that remittances are typically spent on investment in physical assets as well as investment on human capital such as education and health, which promotes growth. They also found that workers' remittances can move the economy through consumption multiplier and create indirect effects.

Woodruff, et al. (2004) ascertained that workers' remittances can positively affect growth through a number of channels. Firstly, remittances may reduce credit constraint of receiving household, improve basic education for children, reduce child labour, and facilitate investment. Secondly, remittances can improve a country's creditworthiness and thus enhance its access to international capital markets.

Natalia C, et.al (2006), investigated the impacts of remittances and economic growth by using the Dynamic Panel Data analysis, which correctly accounts for the unspecified dynamics and endogeneity problems that plagued previous research, results positive and significant estimators of remittances in most of the considered specifications. They concluded that remittances have positive impacts on economic growth and reject the existence of negative impacts of remittances on growth. They also concluded that a sound institutional environment can affect the volume and efficiency of investment. As in the existence of good institutions remittances could be invested in larger amount, and more efficiently, leads to higher output.

Habib and Nourin (2006) have analyzed the relationship between worker remittances on economic development in the framework of South and South East-Asian economies by using

simultaneous econometrics panel data least square dummy variable regression model. They found positive impact of remittances on real investment for Bangladesh, Pakistan and Philippine and negative impact for Thailand, Sri Lanka, Indian and Indonesia.

Jongwanich (2007) examined the impact of workers' remittances on growth and poverty reduction in developing Asia-Pacific. The study used panel system Generalized Method of Moments (GMM) for the period 1993-2003. The results suggested that, while workers' remittances have a significant impact on poverty reduction through increasing income, smoothing consumption and easing capital constraints of the poor, but they have marginal impact on growth working through domestic investment and human capital development.

Bichalea Fayissa (2008) has investigated the impact of remittances on economic growth within the conventional neo-classical framework using an unbalanced panel data from 1980 to 2004 for 37 African countries. The study concluded that workers' remittances as well as institutional variable have positive impacts on economic growth.

3.2. Remittances and Economic Growth in Pakistan

3.2.1 Micro Studies

Remittances are considered to be influenced by a number of micro factors, such as wage rates, health, education, level of income, number of dependants and future planning for business investment, like mainly studies examined the use and effect of workers' remittances mainly through a descriptive analysis.

Gilani et.al (1981) founds that 62 percent of remittances were used up on consumption. Whereas 35 percent of the remittances be either invested or saved by the recipients. Thus it is concluded that the majority of shares used up on consumption

Amjad (1986) founds that remittances finance significant portions of consumption and investments. The study also determines that growth rates in small-scale manufacturing, construction, transport and communication, as well as wholesale and retail trade were affected positively by raising the flow of workers' remittances. Remittances can be equality enhancing and have a positive impact on the development of poor regions, particularly if they are invested in productive activities.

Burki (1991) emphasized that remittances enable the remittance-receiving households to

improve their human capital by meeting their basic health, education, nutrition and shelter needs, while evaluating the migration from Pakistan to the Middle East; the study determined that workers' remittances have both positive economic and social effects on household's recipients.

Nishat and Bilgrami (1993) analyzed the determinants of workers' remittances received from the Gulf States, using data from Overseas Pakistani Foundation (OPF) through a sample of 7,061 migrants. The main determinants were found to be family support, self-interest, income, behavior of accumulation, education, level of skills, living without relatives, future planning for business and incentive of migrants to remit more.

Arif (1999) examined remittances and investments at the household's level, using survey data of ILO/ARTEP (1986) of Return Migrant. The study found that about 68% of total workers' remittances were invested and saved by migrants.

Adams.Jr (1998) investigated the impacts of remittances, investment and rural assets accumulation. Using panel data sets from 1986-87 to1990-91, the study found that workers' remittances are mainly used for consumption. The results also suggested that external remittances have significant affects on the accumulation of rural assets.

Idris and Sofranko (1999) investigated the use of remittances in business investment in Pakistan. The study determines that 42 per cent of remittances are used for basic requirements, 29 per cent are used up on other consumer goods, and 13 per cent are used in various kind of business investment. Thus, minute shares of remittances go to business investment.

Siddiqui et.al (2002), by using 1993 (HIES) data, the study concluded that the decline in remittance inflows is a foremost contributor in growing poverty in Pakistan during the nineties.

Suleri, A. et.al (2006), carried out a study to examine the role of remittances for Pakistan during emergencies after the earthquake in 2005. This research was survey type. The households were selected randomly, 60 remittances receiving and 20 non-receiving households were interviewed at each site of earthquake affected areas for comparative analysis. Before the earthquake, saving money for an emergency was the responsibility of the remittance-sender, rather than the recipient, and most recipients spent everything they were sent. What savings they had, were typically in valuables (jewelry, household items), rather

than cash. About half of recipients (43%) revealed that remittances were used for daily household expenditures (food, clothing, healthcare, school fees). One third (32%) revealed that, in addition, they used remittance money to pay off debts, refurnish the home, pay wedding expenses and arrange dowries for their children. About 20% of respondents showed that they used the remittances for housing construction and investment in real estate. Several households who had been receiving remittances for the previous five or more years revealed that they had used a portion of remittances to finance a pilgrimage to Mecca. This study concluded that a large number of people from the earthquake affected areas of the North-West Frontier Province (NWFP) and Azad Kashmir were living abroad have played a significant role in livelihoods of these region in the wake of the earthquake 2005 by remitting money.

3.2.2. Macro Studies

Burney (1987) investigated the impact of workers' remittances from the Middle East on Pakistan's GNP growth, balance of payments, and domestic savings, using time-series data from 1969-70 to 1985-86. The study showed that the contribution of remittances from the Middle East to GNP growth was highest i-e 13.6% of GNP growth during the sub-period 1973-74 to 1976-1977. When remittances through informal channel are included, their contribution to GNP growth account 24% of GNP growth. The study also revealed that if in the future the foreign remittances continue to fall, other things remain the same; it will be difficult to maintain a high rate of growth. The foreign exchange made available because of the workers' remittances from the Middle East, not only helped in reducing the current account deficit, but also reduced the external debt burden, has also improved debt servicing ability and has decreased the need for additional foreign loans.

Nishat and Bilgrami (1991) analyzed the impacts of worker remittances for the economy of Pakistan, by using a simple Keynesian structural model to estimate the remittances multiplier for Pakistan, for the period 1959-60 to 1987-88.The result showed strong positive impacts on GNP, consumption, investment and imports. The study determined a multiplier of 2.4, which operates mainly through consumption. The remittances indicate the largest impacts on private consumption and the smallest on investment. The study concluded that however, the major share of remittances spent on private consumption, but it contributed to the economic growth positively through multiplier effects.

Iqbal and Sattar (2005), using the simple growth model, attempted to capture the impacts of worker remittances on real GDP growth for the period 1972-73 to 2002-03. The results showed that workers' remittances appeared to be the vital source of economic growth. The results suggested that in the absence of worker remittances, it was likely that exchange rate, monetary and fiscal policies will come under pressure.

Rukshana et.al (2008), has investigated the relationship between poverty and workers' remittances for the period 1973-2006. They used Fully Modified Ordinary Least square (FMOL) technique for establishing short-run and long-run relationship between poverty and its determinants. Their study shows that remittances bring a decline in poverty for the said period.

Shahbaz et.al (2008), analyzed the relationship between the flow of workers' remittances and government spending for the period 1971-2006. They incorporated Fully Modified Ordinary Least square (FMOL) and Error Correction Method (ECM) for establishing short-run and long-run relationship between remittances and government spending. The result suggests linear relationship exists between workers' remittances and government spending, while the other variables such as CPI and GDP per capita reduce the government expenditures in the long-run.

The present study differs from the existing literature due to the use of dynamic model rather than static model for Pakistan. As an initial effort, we focused on the time distribution impact of workers' remittances on economic growth through private consumption, investment and import for Pakistan. We used dynamic model for our analysis. As the effects of an increase in workers' remittances are distributed over a number of years, has the implication that a fall of workers' remittances would not essentially affect current growth correspondingly, as the growth is also affected by the previous changes of remittances. This will give governments some time to react and design appropriate policies to keep the level of remittances from falling without affecting economy adversely[9].

[9] Glytsos 2002

CHAPTER 4

Theoretical and Empirical Analysis

4.1. Theoretical Framework

A main objective of the study is to find short and long-run impacts of remittances on key economic variables and thereby on economic growth. To empirically test these effects Glytsos (2002)'s model is used in this study. Author constructed a linear demand oriented simultaneous equation macro econometric model in order to determine the effects of workers' remittances on private consumption, investment, imports and the level of income. This model estimated the relative effects of remittances and their time distribution for different macroeconomic variables that affect economic growth. In this model, there are three behavioral equations, consumption function, investment function and import function. A national income identity is also included. The main point of the model is to determine the short-run and long run effects of an exogenous shock of remittances on these key macro variables and thus to show the effects of workers' remittances on economic growth.

Structure of the model

$$Cp_t = \theta_0 + \theta_1 Y_t + \theta_2 Cp_{t-1} \quad (1)$$

$$Inv_t = \lambda_0 + \lambda_1 Y_t + \lambda_2 K_{t-1} \quad (2)$$

$$M_t = \delta_0 + \delta_1 Y_t + \delta_2 M_{t-1} \quad (3)$$

$$Y_t = Cp_t + Cg_t + Inv_t + (Ex_t - M_t) + WR_t \quad (4)$$

Where,

Cp = Private Consumption Expenditures, Y = Gross Domestic Product + Workers'

remittances, Inv = Gross Fixed Capital Formation (Public and Private) plus Changes in Stocks, M = Imports of Goods and Non-Factor Services, Ex = Exports of Goods and Non-Factor Services, K = Cumulative Gross Domestic Investment (used as a proxy for capital stocks), Cg = Government Consumption Expenditures and WR = Workers' remittances

In the above model private final consumption expenditures, gross fixed capital formation, imports of goods and non-factor services and a kind of income together with GDP and workers' remittances are endogenous variables. The other variables are exogenous.

Equation (1) is the dynamic long-run consumption equation. In this equation, the level of income, which also includes remittances, and lag of private final consumption expenditures are used as explanatory variables. The coefficients of these explanatory variables are likely to be positive. The equation based on partial adjustment model. The equation (1) looks to satisfy our criterion for a model suitable for developing nations, where numerous uncertainties are present about income changes, with the part of remittances generating. Equation (2) is the investment equation. It is assumed that investment is a positive function of income (Y) and a negative function of a lagged capital stock (K_{t-1}) allowing some time for investment to adjust to the stock[10]. Equation (3) is the imports equation[11]. In this equation the level of income and lag of imports used as explanatory variables. Both coefficients are likely to be positive. Equation (4) is income identity which includes workers' remittances[12] as exogenous variable.

[10] Capital Stock is approximated by cumulative investment (Pavlopoulos,1966)

[11] In Glytsos (2002)'s study, lag of income in the imports function, used as an explanatory variable. However, in our study adding lag of income as an explanatory variable in imports function makes insignificant results.

[12] Workers' remittances are tried to be directly included from equation (1) to (3). But, we founds both statistically and economically baseless results

4.1.1. Impact Multipliers

After making necessary substitution in equation (1), we derive the following reduced form equation for consumption function[13]:

$$ZCp_t = \theta_0(1-\lambda_1+\delta_1)+\theta_1(\lambda_0-\delta_0)+\theta_1 Cg_t+\theta_1 Ex_t+\theta_1 WR_t+ \theta_2(1-\lambda_1+\delta_1)Cp_{t-1}+\theta_1\lambda_2 K_{t-1}-\theta_1\delta_2 M_{t-1} \quad (5)$$

Where

$$Z = 1-\theta_1-\lambda_1+\delta_1$$

From the reduce form (5), the short-run or impact multiplier is equal to θ_1/Z.

After making necessary substitution in equation (2), we derive following reduced form equation for investment function[14]:

$$ZInv_t = \lambda_0(1-\theta_1+\delta_1)+\lambda_1(\theta_0-\delta_0)+\lambda_1 Cg_t+\lambda_1 Ex_t+\lambda_1 WR_t + \lambda_1\theta_2 Cp_{t-1}+\lambda_2(1-\theta_1+\delta_1)K_{t-1}-\lambda_1\delta_2 M_{t-1} \quad (6)$$

Where,

$$Z = 1-\lambda_1-\theta_1+\delta_1$$

λ_1/Z represents impact or short run multiplier.

After making necessary substitutions in equation (3) we derive following reduced form equation for import function[15]:

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[13] For details, see appendix A

[14] For details, see appendix B

[15] For details, see appendix C

$$ZM_t = \delta_0(1-\theta_1-\lambda_1)+\delta_1(\theta_0+\lambda_0)+\delta_1 Cg_t+\delta_1 Ex_t+\delta_1 WR_t$$
$$+\delta_1\theta_2 Cp_{t-1}+\delta_1\lambda_2 K_{t-1}+\delta_2(1-\theta_1-\lambda_1)M_{t-1} \quad (7)$$

Where,

$Z = 1-\lambda_1-\theta_1+\delta_1$ and δ_1/Z represents impact or short run multiplier

Finally, the reduced form equation for income is as follows[16]:

$$Y_t = \Phi+\left(\left(\theta_1+\lambda_1-\delta_1\right)/Z+1\right)Cg_t+\left(\left(\theta_1+\lambda_1-\delta_1\right)/Z+1\right)Ex_t$$
$$+\left(\left(\theta_1+\lambda_1-\delta_1\right)/Z+1\right)WR_t+\left(\theta_2/Z\right)Cp_{t-1}+\left(\lambda_2/Z\right)K_{t-1}+\left(\delta_2/Z\right)M_{t-1} \quad (8)$$

Where,

$$Z = 1-\lambda_1-\theta_1+\delta_1$$

The short-run or impact multiplier for the income $\left(\left(\left(\theta_1+\lambda_1-\delta_1\right)/Z\right)+1\right)$ is equal to impact multiplier for consumption θ_1/Z plus impact multiplier for investment λ_1/Z minus impact multiplier for imports δ_1/Z and plus one.

4.1.2. Dynamic Multipliers

It is valuable to find out the dynamic effects of workers' remittances on endogenous variables. For example a change in remittances by one unit in year 1 with no further increase in the following years 2, 3 ....n, the dynamic multipliers can be obtained[17].From the reduced form consumption equation (5), by making required substitutions, the dynamic multipliers can be found:

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[16] For details, see appendix D

[17] Glytsos 2002

$$ZCp_t = \theta_0(1-\lambda_1+\delta_1)+\theta_1(\lambda_0-\delta_0)+\theta_1 Cg_t+\theta_1 Ex_t+\theta_1 WR_t$$
$$+\theta_2(1-\lambda_1+\delta_1)Cp_{t-1}+\theta_1\lambda_2 K_{t-1}-\theta_1\delta_2 M_{t-1}$$

One period ahead function can be written as

$$ZCp_{t+1} = \theta_0(1-\lambda_1+\delta_1)+\theta_1(\lambda_0-\delta_0)+\theta_1 Cg_{t+1}+\theta_1 Ex_{t+1}+\theta_1 WR_{t+1}$$
$$+\theta_2(1-\lambda_1+\delta_1)Cp_t+\theta_1\lambda_2 K_t-\theta_1\delta_2 M_t$$

Let Suppose That

$$\theta_0(1-\lambda_1+\delta_1)+\theta_1(\lambda_0-\delta_0)=C_0$$

Then one period function becomes

$$ZCp_{t+1} = C_0+\theta_1 Cg_{t+1}+\theta_1 Ex_{t+1}+\theta_1 WR_{t+1}+\theta_2(1-\lambda_1+\delta_1)Cp_t$$
$$+\theta_1\lambda_2 K_t-\theta_1\delta_2 M_t \qquad (9)$$

By substituting (5) into (9) we get:

$$Cp_{t+1} = C_0+\left(\theta_1/Z\right)Cg_{t+1}+\left(\theta_1/Z\right)Ex_{t+1}+\left(\theta_1/Z\right)WR_{t+1}+\left(\theta_1\lambda_2/Z\right)K_t-\left(\theta_1\delta_2/Z\right)M_t$$
$$\left(\theta_2(1-\lambda_1+\delta_1)/Z\right)*\left(\begin{array}{l}\left(\theta_1/Z\right)Cg_t+\left(\theta_1/Z\right)Ex_t+\left(\theta_1/Z\right)WR_t+\left(\theta_2(1-\lambda_1+\delta_1)/Z\right)Cp_{t-1}\\+\left(\theta_1\lambda_2/Z\right)K_{t-1}-\left(\theta_1\delta_2/Z\right)M_{t-1}\end{array}\right)$$
(10)

It can be observed from equation (10) that any change of remittances in the current year has the following effects on private consumption in the following period:

$$\frac{\partial Cp_{t+1}}{\partial WR_t}=\left(\theta_2(1-\lambda_1+\delta_1)/Z\right)*\left(\theta_1/Z\right)$$

Let suppose that,

$$\left(\theta_2(1-\lambda_1+\delta_1)/Z\right)=A$$

Then,

$$\frac{\partial Cp_{t+1}}{\partial WR_t} = A * \left(\theta_1 / Z\right)$$

By continuing the process of iteration the dynamic multipliers can be found for the next years as.

$$\frac{\partial Cp_{t+2}}{\partial WR_t} = A^2 * \left(\theta_1 / Z\right)$$

$$\frac{\partial Cp_{t+3}}{\partial WR_t} = A^3 * \left(\theta_1 / Z\right)$$

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$$\frac{\partial Cp_{t+n}}{\partial WR_t} = A^n * \left(\theta_1 / Z\right)$$

Similarly from the reduced form Investment equation (6), by making necessary substitutions, the dynamic multipliers can be found:

$$ZInv_t = \lambda_0(1-\theta_1+\delta_1) + \lambda_1(\theta_0-\delta_0) + \lambda_1 Cg_t + \lambda_1 Ex_t + \lambda_1 WR_t + \lambda_1\theta_2 Cp_{t-1} + \lambda_2(1-\theta_1+\delta_1)K_{t-1} - \lambda_1\delta_2 M_{t-1}$$

One period ahead investment equation can be written as:

$$ZInv_{t+1} = \lambda_0(1-\theta_1+\delta_1) + \lambda_1(\theta_0-\delta_0) + \lambda_1 Cg_{t+1} + \lambda_1 Ex_{t+1} + \lambda_1 WR_{t+1} + \lambda_1\theta_2 Cp_t + \lambda_2(1-\theta_1+\delta_1)K_t - \lambda_1\delta_2 M_t$$

Where,

$$\lambda_0(1-\theta_1+\delta_1) + \lambda_1(\theta_0-\delta_0) = C_1$$

Then,

$$ZInv_{t+1} = C_1 + \lambda_1 Cg_{t+1} + \lambda_1 Ex_{t+1} + \lambda_1 WR_{t+1} + \lambda_1\theta_2 Cp_t + \lambda_2(1-\lambda_1+\delta_1)K_t - \lambda_1\delta_2 M_t \qquad (11)$$

$$K_t = K_{t-1} + Inv_t \qquad (P)$$

Substituting (6) into (11) by using the identity (P)

$$\begin{aligned} Inv_{t+1} = C_1 &+ \left(\lambda_1/Z\right)Cg_{t+1} + \left(\lambda_1/Z\right)Ex_{t+1} + \left(\lambda_1/Z\right)WR_{t+1} + \left(\lambda_1\theta_2/Z\right)Cp_{t-1} - \left(\lambda_1\delta_2/Z\right)M_{t-1} \\ &+ \left(\lambda_2(1-\theta_1+\delta_1)/Z\right)K_{t-1} \\ &+ \left(\lambda_2(1-\theta_1+\delta_1)/Z\right)*\begin{pmatrix} \left(\lambda_1/Z\right)Cg_t + \left(\lambda_1/Z\right)Ex_t + \left(\lambda_1/Z\right)WR_t + \left(\lambda_1\theta_2/Z\right)Cp_{t-1} \\ + \left(\lambda_2(1-\theta_1+\delta_1)/Z\right)K_{t-1} + \left(\lambda_1\theta_2/Z\right)Cp_{t-1} - \left(\theta_1\delta_2/Z\right)M_{t-1} \end{pmatrix} \end{aligned} \qquad (12)$$

From equation (12) it is found that any change of workers' remittances in the current year has following effects on investment in the subsequent period.

$$\frac{\partial Inv_{t+1}}{\partial WR_t} = \left(\lambda_2(1-\theta_1+\delta_1)/Z\right)*\left(\lambda_1/Z\right)$$

Let consider that,

$$\left(\lambda_2(1-\theta_1+\delta_1)/Z\right) = B$$

Then,

$$\frac{\partial Inv_{t+1}}{\partial WR_t} = B*\left(\lambda_1/Z\right)$$

By continuing the process of iteration the dynamic multipliers can be found for next coming years as.

$$\frac{\partial Inv_{t+2}}{\partial WR_t} = B^2*\left(\lambda_1/Z\right)$$

$$\frac{\partial Inv_{t+3}}{\partial WR_t} = B^3*\left(\lambda_1/Z\right)$$

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$$\frac{\partial Inv_{t+n}}{\partial WR_t} = B^n * \left(\lambda_1 / Z\right)$$

Finally, from reduced form of import equation (7) by making necessary substitution we obtained the dynamic multiplier for import.

$$ZM_t = \delta_0(1-\theta_1-\lambda_1)+\delta_1(\theta_0+\lambda_0)+\delta_1 Cg_t+\delta_1 Ex_t+\delta_1 WR_t + \delta_1\theta_2 Cp_{t-1}+\delta_1\lambda_2 K_{t-1}+\delta_2(1-\theta_1-\lambda_1)M_{t-1}$$

For the next coming year import equation ca be written as

$$ZM_{t+1} = \delta_0(1-\theta_1-\lambda_1)+\delta_1(\theta_0+\lambda_0)+\delta_1 Cg_{t+1}+\delta_1 Ex_{t+1}+\delta_1 WR_{t+1} + \delta_1\theta_2 Cp_t+\delta_1\lambda_2 K_t+\delta_2(1-\theta_1-\lambda_1)M_t$$

Let Suppose That,

$$\delta_0(1-\theta_1-\lambda_1)+\delta_1(\theta_0+\lambda_0)=C_2$$

Then,

$$ZM_{t+1} = C_2+\delta_1 Cg_{t+1}+\delta_1 Ex_{t+1}+\delta_1 WR_{t+1}+\delta_1\theta_2 Cp_t + \delta_1\lambda_2 K_t+\delta_2(1-\theta_1-\lambda_1)M_t \qquad (13)$$

Substituting (7) into (13) yields:

$$ZM_{t+1} = C_2+\left(\delta_1/Z\right)Cg_{t+1}+\left(\delta_1/Z\right)Ex_{t+1}+\left(\delta_1/Z\right)WR_{t+1}+\left(\delta_1\theta_2/Z\right)Cp_t+\left(\delta_1\lambda_2/Z\right)K_t$$
$$\left(\delta_2(1-\theta_1-\lambda_1)/Z\right)*\left(\begin{array}{l}\left(\delta_1/Z\right)Cg_t+\left(\delta_1/Z\right)Ex_t+\left(\delta_1/Z\right)WR_t+\left(\delta_1\theta_2/Z\right)Cp_{t-1}\\ +\left(\delta_1\lambda_2/Z\right)K_{t-1}-\left(\delta_2(1-\theta_1-\lambda_1)/Z\right)M_{t-1}\end{array}\right) \qquad (14)$$

From equation (14) it is found that any change of remittances in the current year has the following effects on import in the subsequent period.

That is

$$\frac{\partial M_{t+1}}{\partial WR_t} = \left(\delta_2(1-\theta_1-\lambda_1)/Z\right) * \left(\delta_1/Z\right)$$

Let,

$$\left(\delta_2(1-\theta_1-\lambda_1)/Z\right) = C$$

Then,

$$\frac{\partial M_{t+1}}{\partial WR_t} = C * \left(\delta_1/Z\right)$$

By continuing the process of iteration the dynamic multipliers can be found for subsequent periods as.

$$\frac{\partial M_{t+2}}{\partial WR_t} = C^2 * \left(\delta_1/Z\right)$$

$$\frac{\partial M_{t+3}}{\partial WR_t} = C^3 * \left(\delta_1/Z\right)$$

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$$\frac{\partial M_{t+n}}{\partial WR_t} = C^n * \left(\delta_1/Z\right)$$

For the income identity, dynamic multipliers can be calculated by summing the multipliers for consumption and investment and then subtracting multiplier for imports from their sum.

The effect of any change of workers' remittances in the current year on private consumption, investment and imports in the subsequent years are summarized in the following table 4.1.

Table 4.1. Dynamic Multipliers

	Private Consumption	Investment	Imports
Year 2	$A*\left(\theta_1/Z\right)$	$B*\left(\lambda_1/Z\right)$	$C*\left(\delta_1/Z\right)$
Year 3	$A^2*\left(\theta_1/Z\right)$	$B^2*\left(\lambda_1/Z\right)$	$C^2*\left(\delta_1/Z\right)$
Year 4	$A^3*\left(\theta_1/Z\right)$	$B^3*\left(\lambda_1/Z\right)$	$C^3*\left(\delta_1/Z\right)$
Year n	$A^n*\left(\theta_1/Z\right)$	$B^n*\left(\lambda_1/Z\right)$	$C^n*\left(\delta_1/Z\right)$
	$\left(\theta_2(1-\lambda_1+\delta_1)/Z\right)=A$	$\left(\lambda_2(1-\theta_1+\delta_1)/Z\right)=B$	$\left(\delta_2(1-\theta_1-\lambda_1)/Z\right)=C$

Where, $Z=1-\lambda_1-\theta_1+\delta_1$

4.2. Data Description

Data plays an imperative role in the economic research, precise and most relevant form of data is the basic part of the research, the analytical view of the data and their understanding can help in reaching the concrete results. The data used in the model and their sources are presented in detail.

Private Final Consumption Expenditures (Cp): Private consumption expenditures in terms of million of rupees at current factor cost, as a component of Gross Domestic Product (GDP) from the expenditure side is available from 1973-2007 in State Bank of Pakistan and Federal Bureau of Statistics Pakistan. For the same period Consumer Price Index is obtained from Federal Bureau of Statistics Then, the data of Private Final Consumption Expenditures in terms of PKR is deflated by Consumer Price Index, so we obtained real private consumption expenditure at constant prices of 2001.

Government Final Consumption Expenditures (Cg): Government Final consumption expenditures in terms of million of rupees at current factor cost, as a component of Gross

Domestic Product (GDP) is available from 1973-2007 in State Bank of Pakistan and Federal Bureau of Statistics Pakistan. For the same period Consumer Price Index is obtained from Federal Bureau of Statistics Then, the data of Government Final Consumption Expenditures in terms of PKR is deflated by Consumer Price Index, thus we obtained real Government Final consumption expenditures at constant prices of 2001.

Gross Fixed Capital Formation (Inv): Gross fixed capital formation includes both private and public sector investments. Moreover, the change in stocks is reflected in this item. The data of gross fixed capital formation at current prices in terms of PKR for the period of 1973-2007 is obtained from State Bank of Pakistan and Federal Bureau of Statistics Pakistan. For the same period Consumer Price Index is obtained from Federal Bureau of Statistics Then, the data of Gross Fixed Capital Formation in terms of PKR is deflated by Consumer Price Index; therefore we obtained Gross Fixed Capital Formation at constant prices of 2001.

Capital Stock (K): As a proxy to capital stock, the cumulative gross fixed capital formation is used for the period of 1973-2007.

Exports of Goods and Non-Factor Services (Ex): The data of exports of goods and non factor services at current prices in terms million of PKR for the period of 1973-2007 is obtained from State Bank of Pakistan and Federal Bureau of Statistics Pakistan. Then, the data of Exports of Goods and Non-Factor Services in terms of PKR is deflated by Consumer Price Index at constant prices of 2001.

Imports of Goods and Non Factor Services (M): The data of import of goods and non factor services at current prices in terms million of PKR for the period of 1973-2007 is obtained from State Bank of Pakistan and Federal Bureau of Statistics Pakistan. Then, the data of Imports of Goods and Non-Factor Services in terms of PKR is deflated by Consumer Price Index at constant prices of 2001.

Gross Domestic Product (GDP): The data of gross domestic product at current factor prices in terms of million PKR for the period of 1973-2007 are obtained from Federal Bureau of Statistics Pakistan Then; the data of GDP in terms million of PKR is deflated by Consumer Price Index at constant prices of 2001.

Workers' remittances (WR): The data of workers' remittances received from official channels for the period of 1973-2007 is available in State Bank of Pakistan; the data is given

in millions of current US Dollars. For the same period, average exchange rates and Consumer Price Index are obtained from Federal Bureau of Statistics. Firstly, by using average exchange rates, workers' remittances are converted into millions of Rupees (PKR). Then, the data of workers' remittances in terms of PKR is deflated by Consumer Price Index[18]. Therefore, real workers' remittances in terms of millions of PKR are obtained at constant prices of 2001.

Income (Y): This data is derived from GDP and workers' remittances. The level of income is defined as the summation of GDP and workers' remittances.

4.3. Methodology

Our basic equations, which we are going to estimates, are (1), (2) and (3). There are at least two problems in these equations. If these problems are not handled, it will result in inconsistent estimates of the parameters.

The first problem is the endogeniety between private consumption and income variables in the first equation, between investment and income variables in second equation and between imports and income variables in the third equation. If endogeniety is present, then OLS estimates will be biased and inconsistent.

The second problem which rose in our equations is the autocorrelation due to the imposition of time aggregation on variables and presence of lagged values of dependent variables as explanatory variables.

To solve these problems and obtain consistent estimators and standard error we use Generalized Method of Moments (GMM). GMM estimates report autocorrelation – hetroskedasticity consistent standard error and t- values.

J-Test

To handle the problem of endogeniety, instrumental variables are used. Instrumental variables are used in such a way that these are strongly correlated with the explanatory variables and uncorrelated with the disturbance term.

In GMM estimates we can use the number of instruments greater than the number of

[18] Base year for consumer price index is 2001

regressors. So the number of restrictions $(P), E[Z_t f(X_t, \phi_0)] = 0$ exceeds the number of parameters (K), to be estimated. This makes the equations over identified. Generally in the case $\frac{1}{T}\sum_{t=1}^{T} Z_t f(X_t, \phi) \neq 0$, that the sample moment condition is not equal to zero. However, if the population moment condition $E[Z_t f(X_t, \phi_0)] = 0$ holds, then $\frac{1}{T}\sum_{t=1}^{T} Z_t f(X_t, \phi) \approx 0$.

To test over identifying restrictions and model specification Hansen's J test is used. This can be calculated as:

$J = T J_T(\phi_T)$

Where T is the number of observations $J_T(\phi_T)$ is the minimized value of the GMM objective function. J statistics converges in distribution to $\chi^2_{(p-k)}$ where p is the no of instruments and k is the number of parameter to be estimated. Null of $E[Z_t f(X_t, \phi_0)] = 0$ is accepted if the calculated value of the J statistics is less than critical value of $\chi^2_{(p-k)}$.

4.4. Empirical Results

In this section, first estimation results of the model are presented. Secondly, derivation of impact multipliers and their values are provided. Thirdly, derivation of dynamic (interim) multipliers and their values are explained. Finally, estimated macroeconomic effects of remittances on output growth are discussed.

4.4.1. Estimation Results

Generalized Method of Moments (GMM) estimates of equations (1), (2) and (3) are given in table 4.2 below:

Table 4.2 GMM estimates of the macroeconomic model

Explanatory Variables	Private Consumption Equation	Investment Equation	Imports Equation
Y	0.378* (4.090)	0.210* (3.598)	0.132* (3.954)
CP (-1)	0.541* (4.116)	------	------
K(-1)	------	-0.0018 (-0.0998)	------
M(-1)	------	------	0.339** (2.063)
Constant	15573.92 (0.791)	-30462.57 (-0.599)	12128.80 (0.934)
Adjusted R^2	0.99	0.95	0.94
J-Statistics	2.97	1.65	2.64
J-Statistics Critical	9.48	9.48	9.48
Number of observations	33	33	33
Instrumental Variables	CP(-2) Y(-1) Y(-2) CG(-1) M(-2) WR C	Y (-1) CP (-1) CP (-2) CG (-2) EX (-1) EX (-2) C	IM(-2) Y(-1) Y(-2) CP(-1) CG (-2) WR C

Values of the t-statistics (autocorrelation-hetroscedasticity consistent) are given in the parentheses. J test used for the validity of over identifying restrictions.

* Significant at 1%, ** Significant at 5%, *** Significant at 10%

From the above results, it is clearly seen that all the coefficients except capital stock are significant. The expected signs are achieved as predicted. The lagged dependent variable in equation (1) and (3), expressing the dynamic nature of the model, are statistically significant. In equation (2) investment behaves as expected, with highly significant coefficient of the income variable, reflect profits, representing a quick response in investing them. The investment restraining factor of the capital stock has the right behavior but statistically insignificant.

After estimating the structural equation using GMM we get the estimated short-run and long-run Marginal Propensities to Consume and Marginal Propensities to Import as.

$$MPC_S = \frac{\partial C_{pt}}{\partial Y_t}, \quad MPC_L = \frac{\partial \bar{C}_{pt}}{\partial Y_t} = \frac{\partial C_{pt}}{\partial Y_t} * \left(\frac{1}{1 - \partial C_{pt} / \partial C_{pt-1}} \right)$$

$$MPM_S = \frac{\partial M_t}{\partial Y_t}, \quad MPM_L = \frac{\partial \bar{M}_t}{\partial Y_t} = \frac{\partial M_t}{\partial Y_t} * \left(\frac{1}{1 - \partial M_t / \partial M_{t-1}} \right)$$

Where, C_{pt} is Private Consumption, M_t is Import, $\bar{C}_{pt}$, $\bar{M}_t$ are the private consumption and imports under the condition that $\bar{C}_{pt} = C_{pt-1}$, $\bar{M}_t = M_{t-1}$ and Y = Income (Glytsos, 2002).

Results are given in table 4.3 below:

Table 4.3. Estimated Short-Run and Long-Run MPC and MPM for Pakistan

SHORT-RUN (1)		LONG-RUN (2)		Proportion (%) of total effects of an increase income in the first year (3) = (1)/(2) * 100	
MPC_S	MPM_S	MPC_L	MPM_L	On Consumption	On Import
0.378	0.132	0.823	0.200	45.9	66.0

Table 4.3 Provides the Short-Run and Long-Run marginal propensities to consume (MPC) and marginal propensities to import (MPM). The Short-Run and Long-Run marginal propensities to consume (MPC) are found to be 0.378 and 0.823 respectively. The Short-Run and Long-Run marginal propensities to Import (MPM) are found to be 0.132 and 0.200 respectively.

4.4.2. Impact (Short-Run) and Dynamic (Long-Run) Multipliers:

Using equation (8) and multipliers summarized in table 4.1 we compute impact and dynamic multipliers from our GMM estimates of table 4.2. Results are summarized below in table 4.4.

Table 4.4. Impact and Dynamic (Interim) Multipliers[19]

	Impact Multipliers (Short-Run Multipliers)	Dynamic Multipliers			Truncated[20] Multipliers (long-run impacts) (total of the 4 years)
		Years			
	Year 1	2	3	4	
Consumption	0.696	0.638	0.585	0.536	2.46
Investment	0.386	-.000963	0.000002	-0.000000005	0.385
Imports	0.243	0.0623	0.0160	0.00413	0.325
Income	1.838	0.575	0.569	0.532	3.51

From the reduce form equation (5), the short-run or impact multiplier for private consumption is equal to $\left(\theta_1/Z\right)$ and computed to be 0.70 implying that one unit increase in remittances in the current year leads to a 0.70 unit increase in private consumption expenditures. From the reduce form equation (6), the short-run or impact multiplier is equal to $\left(\lambda_1/Z\right)$ and computed to

[19] The dynamic (interim) multipliers are calculated for 3 years, since the dynamic multipliers for investment converges to zero in 3 years.

[20] Truncation error is the difference between the true result and the result obtained by a given method. It is due to terminating an iterative sequence before convergence (Michael.H, 2002).

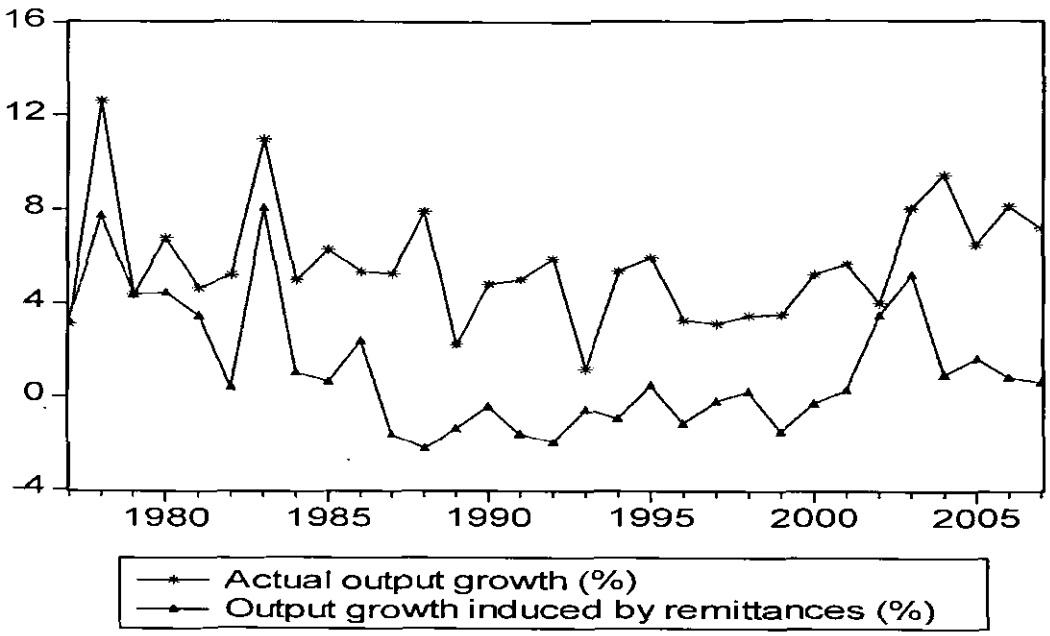
be 0.39 implying that one unit increase in remittances in the current year leads to be 0.39 unit increase in investment .From the reduce form equation (7), the short-run or impact multiplier for investment is equal to $\left(\delta_1/Z\right)$ and computed to be 0.24 implying that one unit increase in remittances in the current year leads to be 0.24 unit increase in import .Finally, The short-run or impact multiplier for the income is equal to $\left((\theta_1+\lambda_1-\delta_1)/Z+1\right)$ obtained from the reduce form equation (8) and computed to be 1.84, implying that one unit increase in remittances in the current year leads to be 1.84 unit increases in the level of income through the multiplier effects.

Dynamic multipliers which demonstrate the impact of one unit change in remittances in the current year without any change in subsequent years on the endogenous variables are found for the three years. The dynamic multiplier for private consumption in year 2, 3 and 4 are 0.638, 0.585 and 0.536. The effect of remittances on private consumption converges gradually toward zero. The dynamic multiplier for investment in year 2, 3 and 4 are -.000963, 0.000002 and -0.000000005. The effects of remittances on investment wear out in the second year. The dynamic multiplier for imports in year 2, 3 and 4 are 0.0623, 0.0160 and 0.00413. It is clear that the effect of remittances on investment wears out in the second year but the effect of remittances on private consumption reduces gradually. The effects of remittances on imports reduce in the second year but not as much as investment. For the income identity, dynamic multipliers can be calculated by adding the multipliers for consumption and investment and then subtracting the multiplier for imports from their sum, which is found to be 0.575, 0.569 and 0.532 for second, third and fourth period respectively.

Finally for calculating the quantities impacts on current and future growth rate of output the estimated dynamic multipliers are applied to the actual annual changes of remittances. For this purpose, for four years time distribution of remittances effects on output growth through the changes in private consumption, investment, and import, the following analytical expression is applied.

$$(Y_t - Y_{t-1}) = \Delta Y_t = \frac{\partial Y_t}{\partial WR_t} * dWR_t + \frac{\partial Y_t}{\partial WR_{t-1}} * dWR_{t-1} + \frac{\partial Y_t}{\partial WR_{t-2}} * dWR_{t-2} + \frac{\partial Y_t}{\partial WR_{t-3}} * dWR_{t-3}$$

Figure 4.1 Actual Rates of Output Growth and Rate of Output Growth Induced by Remittances, 1977-2007



The outcome of calculations for output in each year of the period 1977-2007[21] together with the corresponding actual growth rates are presented in appendix Table E.3.

According to the results of our study, workers' remittances affect output growth positively, thus it is clear that remittances contribute to output growth through multiplier effects. However, in numerous years the decline in remittances inflows lead to a positive induced growth rate that is due to the dominant impact of preceding high increases in remittances arising from the dynamic nature of the study. As it is seen from Figure 4.1 that the highest induced growth rate by remittances (8.09%) belongs to the year 1982-83, in that year remittances contributed about 10.06% of GDP, account 96.6% of the trade deficit and 84.8 percent of the current account balance (Burney, 1988) . It is clearly observed that an induced

[21] Because of the lags we loose 4 years from our original period.

growth rate in the year 1977 was 3.31 reach to maximum levels in the early 1980s, but it declined in 1990's and mostly with a negative induced growth rate, it is partially due to return of the Pakistanis from Kuwait and Iraq, Gulf crisis and seizing of foreign accounts caused by nuclear explosions, which declined the confidence on banking system of many Pakistanis (Haq, 2001).. Alike to the early 1980s, the induce growth rate in the beginning of the century tend to increase and reaches to the maximum in 2003 due to September 11, 2001, remittances have increased very sharply to Pakistan.

In table 4[22] long-term elasticities of induced output growth with respect to positive, negative and overall growth of remittances are shown. The results demonstrate about the same elasticities in the year of rising and the years of falling remittances. It's Suggests a main concern of policies for keeping remittances from falling, as well as a priority of policies for remittances to rise.

[22] See appendixs table E.4

CHAPTER 5

CONCLUSION

The workers' remittances have played a vital role in the economies of labour exporting developing countries. It constitutes an increasingly important means for the transfer of funds from developed to developing nations.

The issue of workers' remittances has come into the agenda of Pakistan after the starting of migration of worker's from Pakistan to the Middle East in 1970's. Before 1970's the inflow remittances were minute and not recorded in the balance of payment of Pakistan. During 1972-73 to 1979-80 it indicating an increasing trend but later during 1980-81 and 1981-82 it was almost stagnant. The remittances were the highest during 1982-83 contributed about 10.06 of GDP. After that, it has started declining in 1990's due to the return migrants from Middle East, because of decline in oil prices, Gulf crises (i.e. invasion of Kuwait by Iraq) and freezing of foreign currency account due to explosion of nuclear weapon. After experiencing a slump in the 1990s, remittances to Pakistan are again increasing. In the start of the century remittances have increased very sharply from 2001-02.to 2002-03 then it decreases in 2003-04. Afterward, remittances sent home by migrants showed a rising trends.

The study focused mainly on the dynamic impact of workers' remittances on economic growth through consumption, investment and imports in Pakistan. The analysis is based on using time series data for the period 1972-73 to 2006-07. A Keynesian macro-econometric demand-oriented simultaneous equation model with a dynamic perspective consisting of three behavioral equations (private consumption, investment and import), national income identity is also included. We have followed the Glytsos model (2002) with a few modifications[23] for our analysis. First, we estimated the consumption, investment and imports equations by employing "Generalized Method of Moments (GMM)" and obtained short and long-run marginal

[23] In Glytsos (2002)'s study, lag of income is used as an explanatory variable in the imports function. However, in our study adding lag of income as an explanatory variable in imports function produces insignificant results.

propensities to consume (MPC) and marginal propensities to import (MPI). From the reduced form equations of consumption, investment and imports short-run multipliers are obtained, which are used to find the short-run (impact) multiplier for income. These findings demonstrate that one unit increase in workers' remittances in the current year leads to a 1.84 unit increase in the level of income through multiplier effects.

Dynamic multipliers which demonstrate the impact of one unit change in workers' remittances in the current year without any change in subsequent years on the endogenous variables are also found for the following 3 years. In order to find out the long-run multiplier effects of exogenous shocks of workers' remittances on private consumption, investment, import and therefore output growth. The effect of remittances on investment wears out in the second year but the effect of remittances on private consumption reduces gradually. Finally, the estimated dynamic multipliers are applied to the actual annual changes of remittances for calculating the quantitative impact of current remittances on current and future growth rates of output. For this purpose, 4 year time distribution of remittance effect on economic growth through the changes in consumption, investment and imports is analyzed.

The results point out that workers' remittances effect economic growth in a positively through multiplier process. As in several years, the reduction in remittances leads to a positive induced growth rate due to the dominant impact of preceding high increases in remittances. It is remarkable that the highest induced growth rate by remittances, accounts 8.09% to the output growth belongs to the early 1980s especially 1982-83. But it declined after it, and mostly with a negative induced growth rate. The induce growth rate at the start of the century tends to increase and reached the maximum in 2003.

Our analysis shows that, although the workers' remittances used mostly for private consumption and imports but it contributed to the economy of Pakistan positively through multiplier process. In addition to that, the results also suggests a main concern of policies for keeping remittances from falling, as well as a priority of policies for remittances to rise.

Policy Recommendation:

- To promote the flow of workers' remittances, it is important to encourage the development of consumer oriented money transfer infrastructure in order to increase the amount of remittances returning through formal channels. Reduce transfer costs, innovative remittance methods; greater security and efficiency may attract people to remit more.
- Government needs to explore new markets for the export of unskilled and semi skilled worker's in order to get sustainable remittances.
- Imports generated by remittances do not constitute only a leakage of resources from the recipient country, but they also assist growth by providing capital goods for domestic production. So, policy makers must plan carefully import policies associated to remittances, with a main concern not so much to decrease imports and turn remittance spending to locally produced goods, which may increase inflation, but to shift imports from consumption goods to investment goods.
- As a number of destination countries mostly in the West and the Middle East have stopped or imposed restrictions on new admissions or migrants for employment. International Labour Organization (ILO) claims that as many as 200 millions workers could be pushed into extreme poverty, with more than fifty million jobs set to be lost worldwide (Hardev K, 2009). The countries experiencing the greatest impact will be those with slowing economies and rapid Labour force growth, such as Cambodia, Pakistan and the Philippines (ILO, 2008a). It is estimated that the level of remittances to developing countries may fall between -1% or large- 6% (Ratha et.al 2008). Policy makers should make an effort to understand the nature of worldwide economic and financial crisis and adopt the accommodative policies for both short and the long-term.

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Appendix A

Derivation of Impacts Multipliers for Private Consumption

$$Cp_t = \theta_0 + \theta_1 Y_t + \theta_2 Cp_{t-1} \quad (1)$$

$$Inv_t = \lambda_0 + \lambda_1 Y_t + \lambda_2 K_{t-1} \quad (2)$$

$$M_t = \delta_0 + \delta_1 Y_t + \delta_2 M_{t-1} \quad (3)$$

$$Y_t = Cp_t + Cg_t + Inv_t + (Ex_t - M_t) + WR_t \quad (4)$$

Putting the values of equation (4) in (1) we get

$$C_{pt} = \theta_0 + \theta_1 \left(C_{pt} + Cg_t + Inv_t + E_{xt} - M_t + WR_t\right) + \theta_2 Cp_{t-1}$$

$$C_{pt} = \theta_0 + \theta_1 C_{pt} + \theta_1 Cg_t + \theta_1 Inv_t + \theta_1 E_{xt} - \theta_1 M_t + \theta_1 WR_t + \theta_2 Cp_{t-1}$$

$$C_{pt} = \theta_0 + \theta_1 C_{pt} + \theta_1 Cg_t + \theta_1(\lambda_0 + \lambda_1 Y_t + \lambda_2 K_{t-1}) + \theta_1 E_{xt} - \theta_1(\delta_0 + \delta_1 Y_t + \delta_2 M_{t-1}) + \theta_1 WR_t + \theta_2 Cp_{t-1}$$

$$Cp_t = \theta_0 + \theta_1 C_{pt} + \theta_1 Cg_t + \theta_1(\lambda_0 + \lambda_1 Y_t + \lambda_2 K_{t-1}) + \theta_1 E_{xt} - \theta_1(\delta_0 + \delta_1 Y_t + \delta_2 M_{t-1}) + \theta_1 WR_t + \theta_2 Cp_{t-1}$$

$$Cp_t - \theta_1 C_{pt} = \theta_0 + \theta_1 Cg_t + \theta_1 \lambda_0 + \theta_1 \lambda_1 Y_t + \theta_1 \lambda_2 K_{t-1} + \theta_1 E_{xt} - \theta_1 \delta_0 - \theta_1 \delta_1 Y_t - \theta_1 \delta_2 M_{t-1} + \theta_1 WR_t + \theta_2 Cp_{t-1}$$

$$Cp_t(1-\theta_1) = \theta_0 + \theta_1 Cg_t + \theta_1 \lambda_0 + \theta_1 \lambda_1 Y_t + \theta_1 \lambda_2 K_{t-1} + \theta_1 E_{xt} - \theta_1 \delta_0 - \theta_1 \delta_1 Y_t - \theta_1 \delta_2 M_{t-1} + \theta_1 WR_t + \theta_2 Cp_{t-1} \quad (5)$$

As

$$C_{pt} - \theta_0 - \theta_2 C_{pt-1} = \theta_1 Y_t$$

Or

$$(C_{pt}/\theta_1 - \theta_0/\theta_1 - \theta_2/\theta_1 C_{pt-1}) = Y_t \quad (6)$$

By putting the values of equation (6) in (5)

$$Cp_t(1-\theta_1) = \theta_0 + \theta_1 Cg_t + \theta_1\lambda_0 + \theta_1\lambda_1(C_{pt}/\theta_1 - \theta_0/\theta_1 - \theta_2/\theta_1\, C_{pt-1}) + \theta_1\lambda_2 K_{t-1}$$
$$+ \theta_1 E_{xt} - \theta_1\delta_0 - \theta_1\delta_1(C_{pt}/\theta_1 - \theta_0/\theta_1 - \theta_2/\theta_1\, C_{pt-1}) - \theta_1\delta_2 M_{t-1} + \theta_1 WR_t + \theta_2 Cp_{t-1}$$

$$Cp_t(1-\theta_1) = \theta_0 + \theta_1 Cg_t + \theta_1\lambda_0 + \lambda_1(C_{pt} - \theta_0 - \theta_2 C_{pt-1}) + \theta_1\lambda_2 K_{t-1} + \theta_1 E_{xt} - \theta_1\delta_0$$
$$- \delta_1(C_{pt} - \theta_0 - \theta_2 C_{pt-1}) - \theta_1\delta_2 M_{t-1} + \theta_1 WR_t + \theta_2 Cp_{t-1}$$

$$Cp_t(1-\theta_1) = \theta_0 + \theta_1 Cg_t + \theta_1\lambda_0 + \lambda_1 C_{pt} - \lambda_1\theta_0 - \lambda_1\theta_2 C_{pt-1} + \theta_1\lambda_2 K_{t-1} + \theta_1 E_{xt} - \theta_1\delta_0$$
$$- \delta_1 C_{pt} + \delta_1\theta_0 + \delta_1\theta_2 C_{pt-1} - \theta_1\delta_2 M_{t-1} + \theta_1 WR_t + \theta_2 Cp_{t-1}$$
$$Cp_t(1-\theta_1) - \lambda_1 C_{pt} + \delta_1 C_{pt} = \theta_0 - \lambda_1\theta_0 + \delta_1\theta_0 + \theta_1 Cg_t + \theta_1\lambda_0 - \theta_1\delta_0 - \lambda_1\theta_2 Cp_{t-1}$$
$$+ \theta_1\lambda_2 K_{t-1} + \theta_1 E_{xt} + \delta_1\theta_2 C_{pt-1} - \theta_1\delta_2 M_{t-1} + \theta_1 WR_t + \theta_2 Cp_{t-1}$$
$$Cp_t(1-\theta_1-\lambda_1+\delta_1) = \theta_0 - \lambda_1\theta_0 + \delta_1\theta_0 + \theta_1\lambda_0 - \theta_1\delta_0 + \theta_1 Cg_t + \theta_1 E_{xt} + \theta_1 WR_t$$
$$+ \theta_2 Cp_{t-1} - \lambda_1\theta_2 C_{pt-1} + \delta_1\theta_2 C_{pt-1} + \theta_1\lambda_2 K_{t-1} - \theta_1\delta_2 M_{t-1}$$

Lets $Z = (1 - \theta_1 - \lambda_1 + \delta_1)$

Then,

$$ZC_{pt} = \theta_0(1-\lambda_1+\delta_1) + \theta_1(\lambda_0 - \delta_0) + \theta_1 C_{gt} + \theta_1 E_{xt} + \theta_1 WR_t + \theta_2(1-\lambda_1+\delta_1)C_{pt-1}$$
$$+ \theta_1\lambda_2 K_{t-1} - \theta_1\delta_2 M_{t-1} \qquad (7)$$

Appendix B

Derivation of Impacts Multipliers for Investment:

Putting the values of equation (4) in (2) we get

$$Inv_t = \lambda_0 + \lambda_1(C_{pt} + Cg_t + Inv_t + E_{xt} - M_t + WR_t) + \lambda_2 K_{t-1}$$

$$Inv_t = \lambda_0 + \lambda_1 C_{pt} + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt} - \lambda_1 M_t + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t = \lambda_0 + \lambda_1(\theta_0 + \theta_1 Y_t + \theta_2 C_{pt-1}) + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt}$$
$$- \lambda_1(\delta_0 + \delta_1 Y_t + \delta_2 M_{t-1}) + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t = \lambda_0 + \lambda_1\theta_0 + \lambda_1\theta_1 Y_t + \lambda_1\theta_2 C_{pt-1} + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt} - \lambda_1\delta_0$$
$$- \lambda_1\delta_1 Y_t - \lambda_1\delta_2 M_{t-1} + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t = \lambda_0 + \lambda_1\theta_0 + \lambda_1\theta_1 Y_t + \lambda_1\theta_2 C_{pt-1} + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt} - \lambda_1\delta_0$$
$$- \lambda_1\delta_1 Y_t - \lambda_1\delta_2 M_{t-1} + \lambda_1 WR_t + \lambda_2 K_{t-1} \qquad (8)$$

As $Y_t = (Inv_t - \lambda_0 - \lambda_2 K_{t-1})\frac{1}{\lambda_1}$ derived from equation (2) (9)

Put the values of equation (9) in (8) we will gets

$$Inv_t = \lambda_0 + \lambda_1\theta_0 + \lambda_1\theta_1((Inv_t - \lambda_0 - \lambda_2 K_{t-1})\frac{1}{\lambda_1}) + \lambda_1\theta_2 C_{pt-1} + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt} - \lambda_1\delta_0$$
$$- \lambda_1\delta_1((Inv_t - \lambda_0 - \lambda_2 K_{t-1})\frac{1}{\lambda_1}) - \lambda_1\delta_2 M_{t-1} + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t = \lambda_0 + \lambda_1\theta_0 + \theta_1 Inv_t - \theta_1\lambda_0 - \theta_1\lambda_2 K_{t-1} + \lambda_1\theta_2 C_{pt-1} + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt} - \lambda_1\delta_0$$
$$+ \delta_1 Inv_t + \delta_1\lambda_0 + \delta_1\lambda_2 K_{t-1}) - \lambda_1\delta_2 M_{t-1} + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t - \theta_1 Inv_t - \lambda_1 Inv_t + \delta_1 Inv_t = \lambda_0 - \theta_1\lambda_0 - \delta_1\lambda_0 + \lambda_1\theta_0 - \lambda_1\delta_0 - \theta_1\lambda_2 K_{t-1}$$
$$+ \lambda_1\theta_2 C_{pt-1} + \lambda_1 Cg_t + \lambda_1 Inv_t + \lambda_1 E_{xt} + \delta_1\lambda_2 K_{t-1} - \lambda_1\delta_2 M_{t-1} + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t(1 - \theta_1 - \lambda_1 + \delta_1) = \lambda_0(-\theta_1\lambda_0 - \delta_1\lambda_0 + \lambda_1\theta_0 - \lambda_1\delta_0 - \theta_1\lambda_2 K_{t-1} + \lambda_1\theta_2 C_{pt-1} + \lambda_1 Cg_t$$
$$+ \lambda_1 Inv_t + \lambda_1 E_{xt} + \delta_1\lambda_2 K_{t-1} - \lambda_1\delta_2 M_{t-1} + \lambda_1 WR_t + \lambda_2 K_{t-1}$$

$$Inv_t(1 - \theta_1 - \lambda_1 + \delta_1) = \lambda_0(1 - \theta_1 - \delta_1) + \lambda_1(\theta_0 - \delta_0) + \lambda_1 Cg_t + \lambda_1 E_{xt} + \lambda_1 WR_t + \lambda_1\theta_2 C_{pt-1}$$
$$+ \lambda_2 K_{t-1} - \theta_1\lambda_2 K_{t-1} + \delta_1\lambda_2 K_{t-1} - \lambda_1\delta_2 M_{t-1}$$

Now Lets $(1 - \theta_1 - \lambda_1 + \delta_1) = Z$

Then,

$$ZInv_t = \lambda_0(1 - \theta_1 + \delta_1) + \lambda_1(\theta_0 - \delta_0) + \lambda_1 C_{gt} + \lambda_1 E_{xt} + \lambda_1 WR_t + \lambda_1\theta_2 C_{pt-1}$$
$$+ \lambda_2(1 - \theta_1 + \delta_1)K_{t-1} - \lambda_1\delta_2 M_{t-1} \qquad (10)$$

Appendix C

Derivation of Impacts Multipliers for Imports

Putting the values of equation (4) in (3) we get

$$M_t = \delta_0 + \delta_1(C_{pt} + Cg_t + Inv_t + E_{xt} - M_t + WR_t) + \delta_2 M_{t-1}$$

$$M_t = \delta_0 + \delta_1 C_{pt} + \delta_1 Cg_t + \delta_1 Inv_t + \delta_1 E_{xt} - \delta_1 M_t + \delta_1 WR_t + \delta_2 M_{t-1}$$

$$M_t = \delta_0 + \delta_1(\theta_0 + \theta_1 Y_t + \theta_2 C_{pt-1}) + \delta_1 Cg_t + \delta_1(\lambda_0 + \lambda_1 Y_t + \lambda_2 K_{t-1}) + \delta_1 E_{xt} - \delta_1 M_t + \delta_1 WR_t + \delta_2 M_{t-1}$$

$$M_t = \delta_0 + \delta_1\theta_0 + \delta_1\theta_1 Y_t + \delta_1\theta_2 C_{pt-1} + \delta_1 Cg_t + \delta_1\lambda_0 + \delta_1\lambda_1 Y_t + \delta_1\lambda_2 K_{t-1} + \delta_1 E_{xt} - \delta_1 M_t + \delta_1 WR_t + \delta_2 M_{t-1}$$

$$M_t = \delta_0 + \delta_1\theta_0 + \delta_1\theta_1 Y_t + \delta_1\theta_2 C_{pt-1} + \delta_1 Cg_t + \delta_1\lambda_0 + \delta_1\lambda_1 Y_t + \delta_1\lambda_2 K_{t-1} + \delta_1 E_{xt} - \delta_1 M_t + \delta_1 WR_t + \delta_2 M_{t-1} \qquad (11)$$

As

$$M_t - \delta_0 - \delta_2 M_{t-1} = \delta_1 Y_t$$

Or

$$\frac{1}{\delta_1}(M_t - \delta_0 - \delta_2 M_{t-1}) = Y_t \text{ Derived from equation (3)} \qquad (12)$$

Putting the values derived from equation (12) in (10) we will get

$$M_t = \delta_0 + \delta_1\theta_0 + \delta_1\theta_1\left(\frac{1}{\delta_1}(M_t - \delta_0 - \delta_2 M_{t-1})\right) + \delta_1\theta_2 C_{pt-1} + \delta_1 Cg_t + \delta_1\lambda_0 + \delta_1\lambda_1\left(\frac{1}{\delta_1}(M_t - \delta_0 - \delta_2 M_{t-1})\right) + \delta_1\lambda_2 K_{t-1} + \delta_1 E_{xt} - \delta_1 M_t + \delta_1 WR_t + \delta_2 M_{t-1}$$

$$M_t - \theta_1 M_t - \lambda_1 M_t + \delta_1 M_t = \delta_0 - \theta_1\delta_0 - \lambda_1\delta_0 + \delta_1\theta_0 + \delta_1\lambda_0 - \theta_1\delta_2 M_{t-1} + \delta_1\theta_2 C_{pt-1} + \delta_1 Cg_t - \lambda_1\delta_2 M_{t-1} + \delta_1\lambda_2 K_{t-1} + \delta_1 E_{xt} + \delta_1 WR_t + \delta_2 M_{t-1}$$

$$M_t(1-\theta_1-\lambda_1+\delta_1) = \delta_0(1-\theta_1-\lambda_1) + \delta_1(\theta_0+\lambda_0) + \delta_1 Cg_t + \delta_1 E_{xt} + \delta_1 WR_t + \delta_1\theta_2 C_{pt-1} + \delta_1\lambda_2 K_{t-1} + \delta_2 M_{t-1} - \theta_1\delta_2 M_{t-1} - \lambda_1\delta_2 M_{t-1}$$

Lets $(1-\theta_1-\lambda_1+\delta_1) = Z$

Then:

$$ZM_t = \delta_0(1-\theta_1-\lambda_1) + \delta_1(\theta_0+\lambda_0) + \delta_1 C_{gt} + \delta_1 E_{xt} + \delta_1 WR_t + \delta_1\theta_2 C_{pt-1} + \delta_1\lambda_2 K_{t-1} + \delta_2(1-\theta_1-\lambda_1)M_{t-1} \qquad (13)$$

Appendix D

Derivation of Impacts Multipliers for Income:

Putting the values of equation (7), (10) and (13) in equation (4) we will get

$$\begin{aligned} ZY_t = {} & \theta_0(1-\lambda_1+\delta_1)+\theta_1(\lambda_0-\delta_0)+\theta_1 C_{gt}+\theta_1 E_{xt}+\theta_1 WR_t+\theta_2(1-\lambda_1+\delta_1)C_{pt-1} \\ & +\theta_1\lambda_2 K_{t-1}-\theta_1\delta_2 M_{t-1}+Cg_t+\lambda_0(1-\theta_1+\delta_1)+\lambda_1(\theta_0-\delta_0) \\ & +\lambda_1 C_{gt}+\lambda_1 E_{xt}+\lambda_1 WR_t+\lambda_1\theta_2+\lambda_2(1-\theta_1+\delta_1)K_{t-1}-\lambda_1\delta_2 M_{t-1} \\ & +E_{xt}-\delta_0(1-\theta_1-\lambda_1)-\delta_1(\theta_0+\lambda_0)-\delta_1 C_{gt}-\delta_1 E_{xt}-\delta_1 WR_t-\delta_1\theta_2 C_{pt-1}-\delta_1\lambda_2 K_{t-1} \\ & -\delta_2(1-\theta_1-\lambda_1)M_{t-1}+WR_t \end{aligned}$$

By doing simple arithmetic's we will get

$$\begin{aligned} Y_t = {} & \Phi+\left((\theta_1+\lambda_1-\delta_1)/Z+1\right)C_{gt}+\left((\theta_1+\lambda_1-\delta_1)/Z+1\right)E_{xt}+\left((\theta_1+\lambda_1-\delta_1)/Z+1\right)WR_t \\ & +\left(\theta_2/Z\right)C_{pt-1}+\left(\lambda_2/Z\right)K_{t-1}+\left(\delta_2/Z\right)M_{t-1} \end{aligned}$$

Appendix E: The Tables

Table E.1 Country Wise Labour Migration from Pakistan.

Country	1971-2000	2001	2002	2003	2004	2005	2006	2007
Saudi Arabia	1,648,279	97,262	104,783	126,397	70,896	35,177	45,594	84,587
UAE	626,705	18,421	34,113	61,329	65,786	73,642	100,207	139,405
Oman	212,131	3,802	95	6,911	8,982	8,019	12,614	32,474
Qatar	50,481	1,633	480	367	2,383	2,175	2,247	5,006
Bahrain	65,987	1,173	1,022	809	855	1,612	1,630	2,615
Kuwait	106,307	440	3,204	12,087	18,498	7,185	10,545	14,544
Libya	63,701	713	781	1,374	375	261	67	450
Yemen	3,796	25	73	85	157	81	127	163
Malaysia	1,993	64	59	114	65	7,690	4,757	1,190
South Korea	3,634	271	564	2,144	2,474	1,970	1,082	434
UK	1,059	800	703	858	1,419	1,611	1,741	1,111
USA	802	788	310	140	130	238	202	297
Italy	405	824	48	128	581	551	431	2,765
Spain	159	362	389	202	254	290	183	176
Others	96,578	1,351	798	1,094	969	1,633	1,764	1,816
Total	**2,882,017**	**127,929**	**147,422**	**214,039**	**173,824**	**142,135**	**183,191**	**287,033**

Source: Bureau of Emigration and Overseas Employment (BE&OE), 2008

Table E.2. Migrant Remittances (Million US $) received from Overseas Pakistanis during 1996-97 to 2007-08

COUNTRY	FY97	FY98	FY99	FY00	FY01	FY02
USA	146.25	166.29	81.95	79.96	134.81	778.98
UK	97.94	98.83	73.59	73.27	81.39	151.93
Saudi Arabia	418.44	474.86	318.49	309.85	304.43	376.34
UAE	164.39	207.7	125.09	147.79	190.04	469.49
GCC Countries	123.33	160.85	197.28	224.32	198.75	224.29
EU Countries	56.19	51.2	35.34	33.89	31.48	51.56
Australia	5.39	4.78	3.23	3.69	4.15	5.47
Canada	3.59	4.14	3.46	3.86	4.9	20.52
Japan	3.05	2.65	3.09	1.58	3.93	5.97
Other Countries	59.48	66.38	34.03	35.28	67.71	256.24
a) Total cash flow	1,078.05	1,237.68	875.55	913.49	1,021.59	2,340.79
b) Encashment*	331.42	251.87	184.64	70.24	64.98	48.26
Grand Total(a+b)	**1,409.47**	**1,489.55**	**1,060.19**	**983.73**	**1,086.57**	**2,389.05**
Country	**FY03**	**FY04**	**FY05**	**FY06**	**FY07**	**FY08**
USA	1237.52	1225.9	1294.8	1242.9	1459.6	1762.3
UK	273.83	333.94	371.86	438.65	430.04	458.87
Saudi Arabia	580.76	565.29	627.19	750.44	1,023.56	1,251.32
UAE	837.8	597.48	712.61	716.3	866.49	1,090.30
GCC Countries	474.02	451.54	512.14	596.46	757.33	983.39
EU Countries	97.09	113.84	142.52	156.94	189.1	228.14
Australia	8.26	13.66	19.64	25.1	31.24	39.03
Canada	15.19	22.9	48.49	81.71	87.2	100.62
Japan	8.14	5.28	6.51	6.63	4.26	4.75
Other Countries	658.05	497.14	417.25	573.31	642.11	530.39
a) Total cash flow	4,190.73	3,826.16	4,152.29	4,588.03	5,490.97	6,448.84
b)Encashment *	46.12	45.42	16.5	12.09	2.68	2.4
Grand Total(a+b)	**4,236.85**	**3,871.60**	**4,168.80**	**4,600.12**	**5,493.70**	**6,451.20**

*Encashment and Profit in Pak Rs. of Foreign Exchange Bearer certificate (FEBCs) & Foreign Currency Bearer Certificates (FCBCs)

Source: State Bank of Pakistan

Table E.3 Long-Term effects of current changes in remittances on output

Fiscal Year	Rate of Growth of Output (%Y)	Rate of Growth of Remittances	Induce Changes in Output	Elasticity
1977	3.13	52.49	3.31	0.06
1978	12.63	86.48	7.77	0.09
1979	4.40	12.90	4.39	0.34
1980	6.81	12.87	4.47	0.35
1981	4.67	7.80	3.48	0.45
1982	5.22	-5.35	0.42	-0.08
1983	10.98	58.87	8.09	0.14
1984	5.03	-6.19	1.05	-0.17
1985	6.33	-4.98	0.67	-0.14
1986	5.39	8.33	2.44	0.29
1987	5.31	-9.82	-1.63	0.17
1988	7.98	-14.86	-2.23	0.15
1989	2.28	-6.76	-1.36	0.20
1990	4.88	7.76	-0.40	-0.05
1991	5.06	-11.70	-1.59	0.14
1992	5.94	-20.46	-1.96	0.10
1993	1.21	1.30	-0.54	-0.42
1994	5.38	-3.39	-0.94	0.28
1995	5.95	16.84	0.47	0.03
1996	3.27	-23.10	-1.17	0.05
1997	3.12	0.21	-0.21	-0.97
1998	3.47	8.58	0.21	0.02
1999	3.51	-27.07	-1.51	0.06
2000	5.24	-0.89	-0.30	0.33
2001	5.69	19.42	0.28	0.01
2002	4.00	123.22	3.48	0.03
2003	8.04	63.81	5.23	0.08
2004	9.45	-14.01	0.94	-0.07
2005	6.50	1.57	1.63	0.94
2006	8.14	3.15	0.83	0.26
2007	7.23	12.24	0.62	0.05

Source: State Bank of Pakistan, Pakistan Economic Survey and Federal Bureau of Statistics
Table 4.4

Table E.4 Long-term Elasticities of Induced Output Growth Rates with respect to Positive and Negative Growth Rates of Worker's Remittances

NUMBER OF YEARS		MEAN GROWTH RATE OF REMITTANCES			MEAN GROWTH RATE OF INDUCE OUTPUT			ELASTICITY WITH RESPECT TO		
With Rising Remittances (1)	With Falling Remittances (2)	Positive (3)	Negative (4)	Overall (5)	Positive (6)	Negative (7)	Overall (8)	Rising Remittances (9)= (6)/(3)	Falling Remittances (10)=(7)/(4)	Overall (11)=(8)/(5)
18	13	24	-11.8	7.49	2.59	-1.2	1.13	0.108	0.102	0.151

Source: Table E.3