The macroeconomics of remittance inflows: The case of Tajikistan

SULTONOV MIRZOSAID

博　士　論　文

平成 24 年 12 月

神戸大学大学院経済学研究科

経済学専攻

指導教員　吉井　昌彦

Sultonov Mirzosaid

博　士　論　文

The macroeconomics of remittance inflows: The case of Tajikistan

本国送金のタジキスタン経済に対する影響の分析

平成 24 年 12 月

神戸大学大学院経済学研究科

経済学専攻

指導教員　吉井　昌彦

Sultonov Mirzosaid

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

CHAPTER I
INTRODUCTION

1.1 Preface

In 2011, the World Bank estimated the total global remittance flows to be at $483 billion, which included remittances of $351 billion to developing countries. Remittance flows into developing countries increased by 8.0% in 2011 over the previous year. India, China, Mexico, the Philippines, Pakistan and Bangladesh were the top remittance-receiving countries in 2011. Further, the top remittance-receiving countries as a share of GDP were Tajikistan, Lesotho, Nepal, Samoa and Tonga.

This research focuses on macroeconomics of remittance flows into Tajikistan – a top remittance-receiving country of the world as a percentage of GDP. The macroeconomic determinants of remittances and the impacts of remittances on relevant macroeconomic variables such as real domestic income, import, private consumption and private savings are addressed.

This chapter is an introductory part, and it starts with background information about Tajikistan including short political and economic history of the country. The presented information will help better understanding of different features of the changes in macroeconomic variables and relationship between them. Furthermore, the chapter describes how far the macroeconomic impact of remittances for the case of Tajikistan is studied and explains the importance of conduction of this research.

1.2 Short Political History

Tajikistan obtained independence in 1991 after the disintegration of the Soviet Union. The independence occasion was followed by a difficult period of civil war, internal conflicts and political unsteadiness. In June of 1997, the National Peace Agreement was signed between the government and armed opposition. Political situation stabilized during the period of 1997–2000. Political and diplomatic relations with foreign countries were strengthened for the period of 2000–2005. 2005–2010 was the period of economic and political disagreements with Uzbekistan and partly with Russia. Construction of dams for electric hydro-power stations on internal rivers of Tajikistan flowing to Uzbekistan[1] and actions of Tajikistan's government related with restriction of military presence of Russia in the country were the reasons of the conflicts. Uzbekistan's government restricted free movement of citizens of Tajikistan and transit of goods to Tajikistan through its territory. Russia made pressure on labour migrants from Tajikistan and restricted imports of agricultural products from Tajikistan.

Tajikistan is a sovereign democratic and secular state according to its constitution.

---

[1] For more information, see Sultonov (2012).

However, the country is headed by the same person since 1992. The level of centralization is remarkably high. Consolidation of power into the hands of a small number of individuals for a long period (two decades) has led to lack of transparency in the legislative process, weakness of civil society and high level of corruption.

1.3 Short Economic History

1.3.1 Evolution of GDP

Tajikistan chose the way to market economy after independence. Two decades of transition period finished beyond satisfactory economic achievements. Tajikistan remains the poorest country in the post-Soviet territory. Disintegration of the Soviet Union and internal conflicts of the 1990s resulted in a decrease in GDP by an annual average of 17.5% for 1990–1996[2]. Post-war stabilization and international assistance encouraged recovery in the national economy. In 1997, 1998 and 1999 the growth rate of GDP made 1.7%, 5.3% and 3.7%, respectively. Strict fiscal and monetary policy, and attraction of investment for major infrastructure projects managed by the government led to economic stability and full recovery of the economy in the 2000s. GDP had an annual growth rate of 8.2% for the period of 2000–2010. Despite of decline to 3.9% in 2009, as the result of international financial crises of 2008, growth rate of GDP increased again to 6.5% in 2010 and 7.4% in 2011.

1.3.2 International Economic Relations

Tajikistan established economic relations with more than 100 countries of the world within 20 years of independence[3]. The share of foreign trade with countries of the Commonwealth of Independent States (CIS) decreased from 80.3% in 1991 to 63.9% in 2000, and to 44.7% in 2010. On the contrary, the share of foreign trade with other countries of the world increased from 19.6% of 1991 to 36.0% in 2000 and to 55.2% in 2010[4].

The trade balance of Tajikistan was positive only in 1990–1992, 1996, and 1999–2000 during the period of 1990–2010. It was negative in all other years. The negative trade balance made 4.8–30.6% of GDP for 2002–2010. It was especially high for the period of 2006–2010[5].

The share of exports to the CIS member countries decreased from 78.8% in 1991 to 47.7% in 2000, and to 13.5% in 2010. Consequently, the share of exports to other countries of the world increased from 21.2% of 1991 to 52.3% in 2000, and to 86.5% in

---

[2] TAJSTAT.
[3] The Ministry of Foreign Affairs of the Republic of Tajikistan.
[4] TAJSTAT.
[5] TAJSTAT.

2010[6].

The imports share of the CIS remained high for all 20 years. It made 82.0% of total imports in 1991 and 83.0% of total imports in 2000. The share of imports from the CIS reduced to 58.8% of the total imports in the 2000s. The share of imports from other countries of the world was unchanged in 1990s, but increased from 17.0% in 2000 year to 41.2% in 2010.

Aluminium, cotton, fruits and vegetables were the main exported products. Alumina for production of aluminium, oil, gas and wheat were main imported products. Kazakhstan, Russia, Uzbekistan and Ukraine were the main trade partners among the CIS member countries. China, Germany, Iran, Italy, the Netherlands, Switzerland, Turkey, UAE and USA were the main trade partners among the countries other than the CIS.

1.3.3 Geography and Natural Resources

Tajikistan is located in the south-east part of Central Asia in a territory of 143.1 thousand square kilometres. It borders with Afghanistan, China, Kyrgyzstan and Uzbekistan. 93.0% of territory of Tajikistan consists of mountains with height of 300–7495 metres.

The relief of the country has made it rich in water and mineral resources. From 400 discovered deposits of minerals only some fossil fuel, gold, silver, antimony, strontium, salt, lead, zinc, fluorspar, mercury and uranium are under utilisation[7].

More than 8.4 thousand square kilometres glaciers and 7.05 square kilometres lakes located in height of 3,500 metres have formed 947 rivers with a total length of 28,500 kilometres, which are the source of 62.0% of water resources of Central Asia and a huge capacity for production of hydroelectric power energy. The climate in the western part of the country is suitable for planting cotton.

Mountainous relief has limited communication possibilities of the country. Most of automobile roads connecting the capital of the country with north and east regions and further to Kyrgyzstan and China are in bad conditions and partly closed in the winter period. Functional automobile and railroads pass through Uzbekistan.

1.3.4 Emergence of Migration and Remittances Issue

Civil war (1992–1997) brought about death of 50–150 thousand people and displacement of more than 1 million[8] individuals. Net emigration made 169.4 thousand persons, including representatives of different ethnic groups[9], who left Tajikistan in

---

[6] Services are excluded.
[7] The World Factbook.
[8] United Nations.
[9] TAJSTAT.

1992–1993. Annual migration from Tajikistan was high in 1994–1997, but the majority were labour migrants looking for job opportunities in other countries of the CIS (mainly in Russia). The post-war economy of Tajikistan was not able to provide population with jobs and beginning from 1997 migration became a prominent feature of its economy and society.

In December 1999, Tajikistan passed a law "On migration". In 2001, Tajikistan ratified the United Nations International Convention on the Protection of the Rights of All Migrants Workers and Members of Their Families accepted in December of 1990.

In the 1990s, remittances were either sent via agents or taken by the migrants themselves to Tajikistan because of lack of confidence in the banking system, absence of appropriate money transfer services, and high taxes on remittances. At the end of 2001, a 30.0% tax levied on remittances was abolished, leading to increased use of the official money transfer services. Thus, from 2002, for the first time, the official statistics started to contain data on remittances. The annual amount of remittances increased from $78.6 million in 2002 to $2.96 billion in 2011. The scale of remittances was enormous in terms of the small economy of Tajikistan: 6.4% of GDP in 2002; 9.4% of GDP in 2003; 12.1% of GDP in 2004; 20.8% of GDP in 2005; and in following three years, 36.0%, 45.5%, and as high as 49.3% of GDP, respectively. In 2009, the inflow of remittances decreased slightly (35.1% of GDP), but then increased again to 40.0% of GDP in 2010 and 44.2% of GDP in 2011. For remittances as a percentage of GDP, Tajikistan was included in the list of top remittances-receiving countries since 2004; in 2007, 2008, 2010 and 2011 Tajikistan was the top country for remittances as a share of GDP[10] (see Table 1.1).

Table 1.1 Value and Scale of Remittances

Year	Value		Scale	
	Million USD	World ranking	% of GDP	World ranking
2002	78.6	104	6.4	33
2003	146.0	94	9.4	23
2004	252.0	87	12.1	22
2005	466.7	84	20.8	8
2006	1018.8	62	36.0	2
2007	1690.8	49	45.5	1
2008	2544.0	43	49.3	1
2009	1748.2	50	35.1	2
2010	2254.5	43	40.0	1

Source: WB and GDF

---

[10] WB and GDF.

1.4 Research Questions and Importance of the Study

This research focuses on macroeconomics of remittances, including the macroeconomic determinants of remittances, the impact of aggregate remittances on economic growth, aggregate imports, private consumption and savings. The paper uses aggregate time series (quarterly) and econometric models for estimation of the macroeconomic impact of remittances for the case of Tajikistan for the first time.

The study applies macroeconomic data of the national statistics of Tajikistan (the Statistical agency under the president of the Republic of Tajikistan (TAJSTAT) and the National Bank of Tajikistan (NBT)), the World Bank (WB), Organisation for Economic Co-operation and Development (OECD), the Central Bank of Russian Federation (CBRF) and Russian Federal State Statistic Service (RFSSS).

Lack of data and poor quality of the data of national statistics were of the main barriers for conduction of macroeconomic analyses in the past. In this work from the available raw data quarterly time series are arranged for application in econometric models and regression analyses. The prepared time series are helpful for future macroeconomic researches. The results of the research are the first insight into macroeconomics of remittances for the case of Tajikistan. This study is also a good sample of the small and open economies highly dependent on migrants' remittances from abroad.

1.5 Related Literature

Migration issues of Tajikistan were included in the researches on international migration like Zayonchovskaya (2001), IOM (2001) and IOM (2002) until 2002. Tajikistan's Living Standards Measurement Surveys (TLSS) conducted by WB in 2003, 2007 and 2009 made available good informative data about households and remittances. For more information related with migration and remittances, the International Organization for Migration (IOM) conducted other surveys in 2002, 2003 and 2008. A similar survey was conducted by the International Labour Organization (ILO) in 2009. The available information promoted emergence of the researches on remittances and their social and economic impacts for the case of Tajikistan like Olimova and Bosc (2003), Jones et al. (2007), Mughal (2007), Brown et al. (2008), Hakimov and Mahmadbekov (2009), Justino and Shemyakina (2009), Umarov (2010), Danzer and Ivaschenko (2010), ILO (2010), Ogawa and Nakamura (2010), Clément (2011) and Kumo (2012).

The conducted researches were survey based and focused on microeconomics of remittances. Some papers like Olimova and Bosc (2003), Brown et al. (2008), Hakimov and Mahmadbekov (2009) and Umarov (2010) have compared remittances with some macroeconomic variables. The only paper directly addressing macroeconomic impact of remittances for the case of Tajikistan is Kireyev (2006). However, the paper was

published in 2006, and the data available in 2006 for remittances were not enough to estimate macroeconomics of remittances properly.

1.6 Summary of the Chapter

This chapter supports the suggestion that remittances as share of GDP are enormous and significant for Tajikistan. Hence all macro- and micro-economic variables are influenced either directly or indirectly by remittances. Relaying on surveys of WB and other international organizations (such as IOM and ILO) microeconomics of remittances is largely addressed. On the contrary, macroeconomics of remittances for Tajikistan is not properly studied yet. This paper will be the first study of macroeconomics of remittances for the case of Tajikistan.

CHAPTER II
REVIEW OF TAJIKISTAN'S LABOUR MARKET WITH FOCUS ON MIGRATION AND REMITTANCES

2.1 Preface

This chapter reviews Tajikistan labour market for the last decade including changes in population, labour resources, employment, wages, migration and remittances. Explanation of pre-conditions for labour migration from Tajikistan, description of the main features of migration and remittances, and demonstration of the significance of migration and remittance for Tajikistan's economy are of the main purposes of the chapter.

2.2 Population Growth

Population of Tajikistan has increased considerably over the last two decades. According to TAJSTAT, the permanent population increased from 5,505.6 thousand persons of 1991 to 7,616.4 thousand persons in 2010 (Table 2.1).

Table 2.1 Permanent Population

	1991	2000	2005	2010
Total, ths. persons	5505.6	6250.0	6920.3	7616.4
Urban, % of total	30.8	26.6	26.4	26.5
Rural, % of total	69.2	73.4	73.6	73.5
Growth, % of 1991	100.0	113.5	125.7	138.3
Average annual growth for 1991–2010		1.7%		
Average annual growth for 1991–2000		1.4%		
Average annual growth for 2000–2010		2.0%		

Source: TAJSTAT

Population growth made an annual average of 1.7% for 1991–2010. For the 1990s, the average annual growth of the population was lower (1.4%). For the 2000s, the annual growth of the population made an average of 2.0%. Consequently, from 1991 to 2010 population of Tajikistan increased by 38.3%. Population growth made 21.9% for 2000–2010. Lower growth in the 1990s was related with the civil war and emigration of ethnic groups.

About 73.5% of the population live in rural areas. Urban population make 26.5% of total population[11]. Urban population made 30.8% of total population in the early 1990s. Proportion of males and females is almost equal.

---

[11] In 2010 year.

2.3 Labour Resources

2.3.1 Labour Force Participation

Population growth has resulted in the increase of labour resources, but a large share of labour resources does not participate in domestic labour force. Labour resources made 45.9% of total population in early 1990s and 51.0–59.0% of population in the 2000s[12].

Table 2.2 Labour Resources

	1991	2000	2002	2004	2006	2008	2010
Total labor recourses, ths. persons	2526	3186	3463	3777	4048	4310	4435
Economically active population	1971	1794	1904	2132	2185	2217	2264
Employed	1971	1745	1857	2090	2137	2168	2219
Unemployed	0	49	47	42	48	49	45
Economically inactive population	555	1392	1559	1645	1863	2093	2171
Students	237	343	386	463	506	524	534
Discouraged	318	1049	1173	1182	1357	1569	1637
Total labor recourses, %	100	100	100	100	100	100	100
Economically active population	78.0	56.3	55.0	56.4	54.0	51.4	51.0
Employed	78.0	54.8	53.6	55.3	52.8	50.3	50.0
Unemployed	0.0	1.5	1.4	1.1	1.2	1.1	1.0
Economically inactive population	22.0	43.7	45.0	43.6	46.0	48.6	49.0
Students	9.4	10.8	11.1	12.3	12.5	12.2	12.0
Discouraged	12.6	32.9	33.9	31.3	33.5	36.4	36.9
Official unemployment rate	0.0	2.7	2.5	2.0	2.2	2.2	2.0

Source: TAJSTAT

Children under the age of 14 years make 35.0% of population[13]. The remained persons who are older than the able-bodied age make about 6.0% of population[14]. Only 51.0–56.4% of total labour resources has participated in domestic labour force in the 2000s (Table 2.2), although, the participants' share was 78.0% in early 1990s. The concern is the share of labour resources other than students who are not interested in

---

[12] Labour resources or able-bodied persons' age has changed many times: in 1991–1994 it was 16–59 years for men and 16–54 for women, in 1995–2001 it was 15–59 for men and 15–54 for women, in 2002 it was 15–60 for men and 15–55 for women, in 2003 it was 15–61 for men and 15–56 for women, in 2004–2005 15–62 for men and 15–57 for women. That is why the increase in total labour resources up to 4% might be related with the calculations methods. This fact can affect the share of labour resources out of labour force up to 8.0 %.

[13] Data is for the beginning of 2010.

[14] Data is for the beginning of 2010.

domestic labour market. The share of this group, marked as "discouraged" in Table 2.2, largely increased to 31.3–36.9% of labour resources in the 2000s from 12.6% in the early 1990s.

Official unemployment rate was only 2.0–2.7% in the 2000s. The reason of the absence of motivation for registration as unemployed is low possibility of being compensated and low amount of unemployment compensation. For example, in 2005 only 8.5% of officially registered unemployed persons were paid a monthly compensation of $7.3.

2.3.2 Employment

In the early 1990s, the share of employment in the state-owned enterprises made 59.7% and in the private sector only 19.0% of the total employment (Figure 2.1). Now most of the workforce are employed in the private sector, mainly in agriculture, where the average wage is remarkably low. The share of employment in the private sector increased from 43.1% of 2000 year to 63.0% in 2010[15]. On the contrast, the share of employment in the state-owned sector reduced from 32.0% to 19.4% of total employment in the 2000s.

Figure 2.1 Employed by Ownership Type
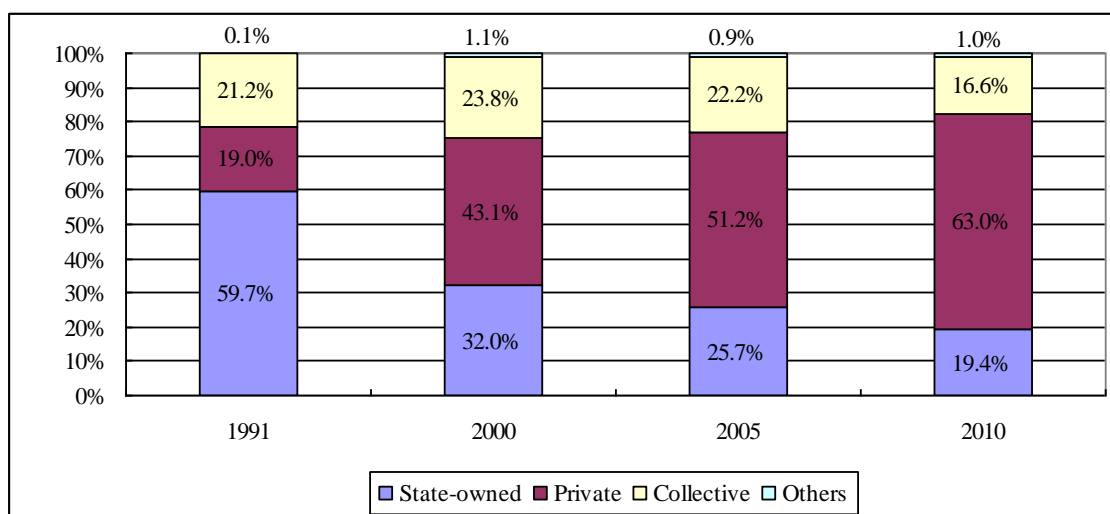
The proportion of employment in industry and agriculture also has changed over the last decade. Employment in industry and construction made 7.7–9.0% of the total employment in the 2000s, decreasing from 20.5% in early 1990s. The share of employment in agriculture fluctuated between 65.0% and 67.6% in the 2000s,

---

[15] The data for 2010 is for the beginning of the year.

increasing from 44.7% in the early 1990s (Figure 2.2).

Figure 2.2 Employed by Branches of Economy
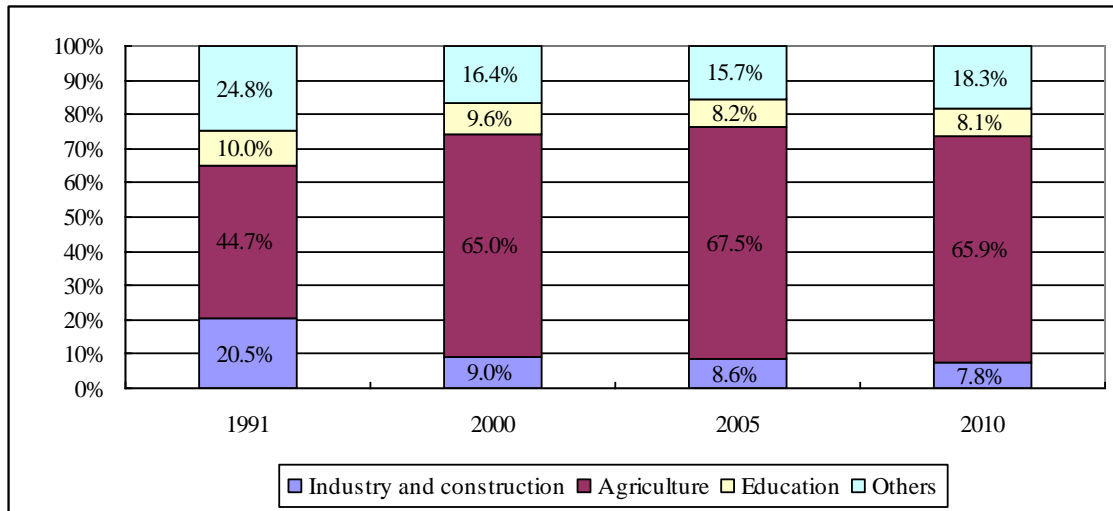
2.4 Labour Supply and Labour Demand

The decline in the labour force participation rate might be explained by low wages and lack of job opportunities. As Figure 2.3 shows, the domestic labour market is not able to supply jobs enough for the persons who are interested in finding jobs in domestic labour market.

Figure 2.3 Labour Supply and Labour Demand
(thousand persons)
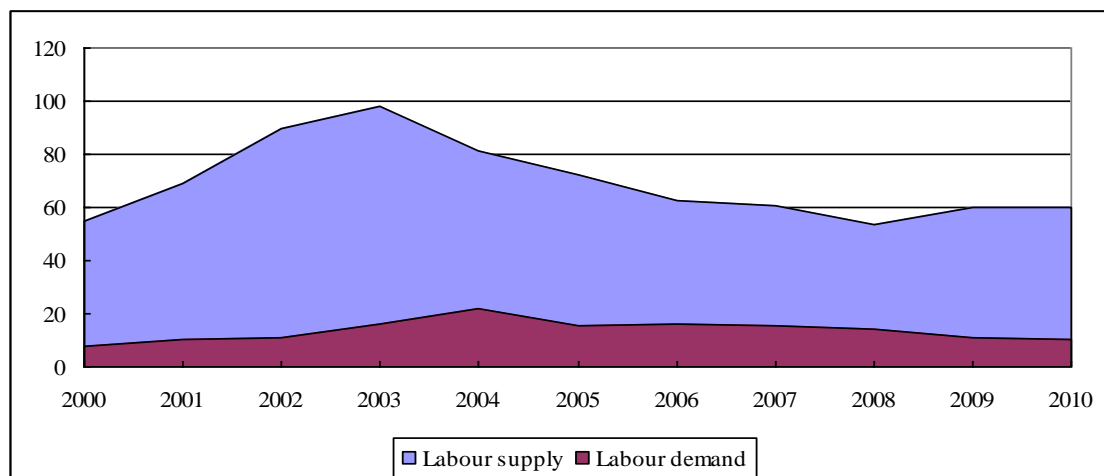
Weak labour demand is preconditioned by the poor business environment in the

10

country. Limited access to financial recourses, high taxes, corruption, additional obligatory payments, interference of government authorities in private business and monopolisation of the market by small groups supported by some officials in higher levels of the government are of the main features of the local business environment[16].

The average monthly wage is remarkably low in agriculture which employs 65.0–67.6% of the total employed persons. Despite of the increasing trend in the current value of average wages, wages in agriculture remain extremely low. In 2010, the average wage made $26.5 in agriculture, $140.8 in industry and $88.8 in the overall economy (Figure 2.4).

Figure 2.4 Average Wages
(current USD)
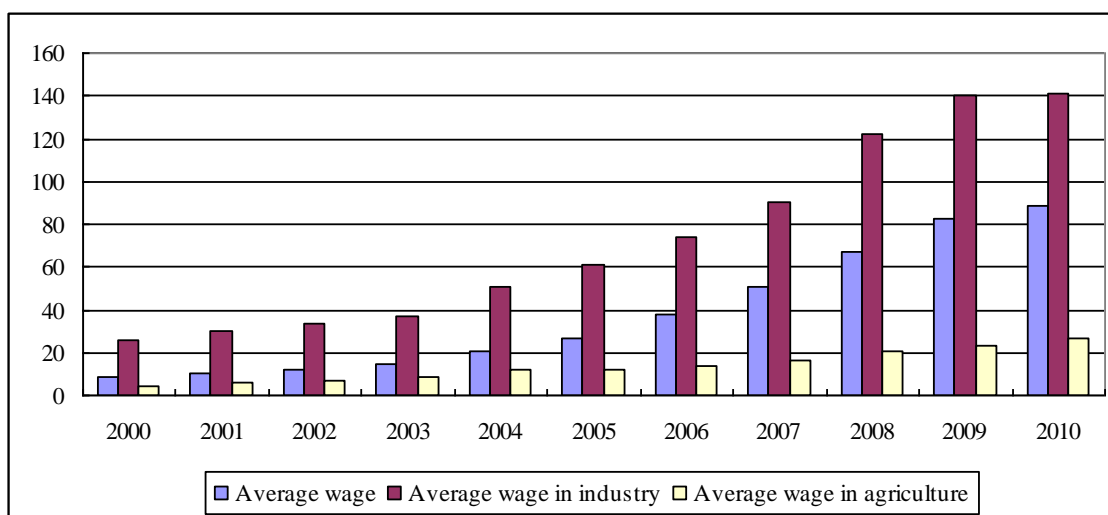
Source: TAJSTAT

2.5 Income and Expenditure of Population

Analysis of monthly income and expenditure per household member shows that the share of other incomes, including remittances, is increasing and households are slightly increasing consumption of non-food goods and services. The share of wages in total income per family member increased from 33.7% in 2000 to 40.8% in 2010. Income per family member from the sale of agricultural products decreased from 50.2% of total income per family member in 2000 to 22.7% in 2010. The share of other incomes per family member, including remittances, increased from 14.3 % of total income per family member in 2000 to 31.8% in 2010. Social security related payments are not considerable. Pensions, scholarships, allowances, property income and income from the sale of real estate per one family member made less than 6.0% of total monthly income

---

16 For more information, see EBRD (2012) and IFC (2009).

per one family member for the 2000s (Table 2.3).

Table 2.3 Monthly Income per Household Member

	2000	2002	2004	2006	2008	2010
In Somoni	16.90	29.70	43.40	75.90	153.20	190.20
In USD	10.21	11.17	14.78	23.43	44.48	52.36
Total, %	100	100	100	100	100	100
Earned (labour) income	33.7	43.2	44.3	43.4	42.6	40.8
Pensions, scholarships, allowances	1.2	1.7	2.2	3.5	2.7	3.9
Compensation income	0.3	3.7	2.2	0.7	0.1	0.5
Property income	0.1	0.1	0.0	0.1	0.1	0.1
Income from sales of real estate	0.2	0.3	0.2	0.3	1.7	0.2
Sales of agricultural products	50.2	42.4	31.3	25.8	21.8	22.7
Others	14.3	8.6	19.8	26.2	31.0	31.8

Source: TAJSTAT

Monthly expenditure per one family member has increased from $10.52 of 2000 to $48.75 in 2010. The share of expenditure on food decreased from 81.6% of total expenditure per one family member in 2000 to 59.0% in 2010. The share of expenditure on non-food goods and services increased, respectively, from 9.6% and 2.8% of the total expenditure per one family member in 2000 to 22.6% and 10.4% in 2010. Taxes also increased from 6.0% of per one family member expenditure in 2000 to 8.0% in 2010 (Table 2.4).

The changes in income and expenditure of households show that the increase in income has improved consumption of non-food goods and services.

Table 2.4 Monthly Expenditure per Household Member

	2000	2002	2004	2006	2008	2010
In Somoni	17.41	29.65	42.6	75.38	150.1	177.71
In USD	10.52	11.15	14.5	23.27	43.58	48.75
Total, %	100	100	100	100	100	100
Goods and services	94.0	92.3	91.6	92.3	90.6	92.0
food	81.6	74.7	67.4	61.6	59.6	59.0
non-food goods	9.6	12.1	16.4	20.8	21.2	22.6
services	2.8	5.5	7.8	9..9	9.8	10.4
Taxes, dues, payments	6.0	7.7	8.4	7.7	9.4	8.0

Source: TAJSTAT

2.6 Migration and Remittances

2.6.1 Migration Trends

Lack of jobs, low wages and poor social protection discouraged a large share of labour resources from participation in the domestic labour force. Considering the possibility of free movement to other CIS countries (such as Russia, Kazakhstan and Ukraine) and comparatively high income levels in those countries most of the discouraged persons have preferred to migrate. In the 2000s, migration from Tajikistan was done mainly for the sake of job and earning, however, in the 1990s migration was preconditioned by war and absence of earning possibilities.

The number of migrants from Tajikistan is estimated to be 0.5–1.5[17] million persons. As there are different types of migrants depended on the duration of their stay and the frequency of migration, it is difficult to find reliable data. Monitoring of the number of migrants is difficult as some migrants enter or re-enter the host country from other countries.

According to TAJSTAT, the number of annual migration from Tajikistan for the last decade was 28–39 thousand persons, annual immigration 14–30 thousand persons, resulting annual net emigration 6–14 thousand persons. Year by year the number of the persons who do not come back is increasing. For example, in 2010, 36.1 thousand persons have migrated to abroad. On the same time, the sum of cumulative net emigration since 1990 made 478.6 thousand persons (Table 2.5).

Table 2.5 Foreign Migration (thousand persons)

	2000	2002	2004	2006	2008	2010
Emigration	28.188	30.219	24.663	30.554	37.651	36.134
Immigration	14.482	17.735	15.244	19.646	24.419	29.637
Net emigration	13.706	12.484	9.419	10.908	13.232	6.497
Net emigration (since 1990)	367.159	392.060	412.490	432.750	460.460	478.628

Source: TAJSTAT

There are two mostly referred sources of data on migration from Tajikistan. One is TAJSTAT, which was presented above. The other source is the Population Division of Department of Economic and Social Affairs of the United Nations (UNDESA). According to Figure 2.5, data from the both sources are similar only for the period of 1990–1995. Beginning from 1995 five-year net emigration data are different. Considering the number of the discouraged labour recourses, which makes more than one million persons and low wages, especially in agriculture, where more than 60.0%

---

[17] Umarov (2010).

of employed persons work, data presented by UNDESA seem more accurate. Furthermore, in the 2000s labour migration was used as a mean of political pressure on Tajikistan by Russia, which can affect the credibility of data on migration by national statistics of Tajikistan.

In 2000, the total number of migrants from Tajikistan has made 367.2 thousand persons according to TAJSTAT and 629.4 thousand persons according to the UN data. According to TAJSTAT, emigration (net cumulative since 1990) has made 421.8 thousand persons in 2005 and 478.6 thousand persons in 2010. According to UNDESA, net cumulative emigration since 1990 made 1,051.1 thousand persons in 2005 and 1,347.2 thousand persons in 2010.

Figure 2.5 Net Cumulative Emigration

(thousand persons)
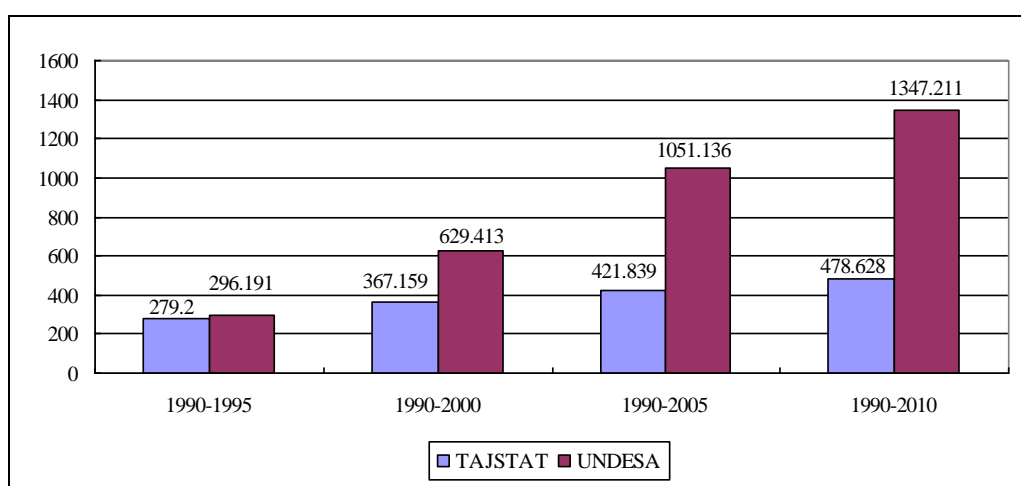
Source: TAJSTAT and UNDESA

2.6.2 Remittances Trends

Remittances have become a prominent consisting element of the political, social and economic systems of Tajikistan, but national statistics of Tajikistan still do not present proper data on them. The two most referred sources of data on remittances for the case of Tajikistan are WB and CBRF. WB presents the annual amount of workers' remittances and compensation of employees received in USD. CBRF presents the annual and quarterly amount of remittances sent from Russia to Tajikistan via money transfer operations. WB's data on remittances is available since 2002 year. Data of CBRF on remittances is available since 2006 (Table 2.6).

The data offered by WB and CBRF are similar. Furthermore, according to the surveys on remittances and migration for the case of Tajikistan, 95.0–99.0% of migrants from Tajikistan migrate to Russia (WB, 2007; IOM, 2008; ILO, 2009). According to IOM's survey in 2008 and ILO's survey in 2009 82.0% and 87.0%,

respectively, of remittances are transferred via the official money transfer services. It means the real volume of remittances may be even bigger.

Table 2.6 Remittance Inflows (million USD, current value)

Data Source	2002	2003	2004	2005	2006	2007	2008	2009	2010
WB	78.6	146.0	252.0	466.7	1018.8	1690.8	2544.0	1748.2	2254.5
CBRF	-	-	-	-	999.3	1632.0	2516.0	1724.0	2216.0

Source: WB WDI and CBRF

2.6.3 Main Characteristics of Migrants

The Tajikistan Living Standards Measurement Survey 2007 (TLSS 2007), a household survey conducted in Tajikistan by WB, was one of the most comprehensive surveys that included information on migration and remittances.

Figure 2.6 Migrants' Destination and Gender
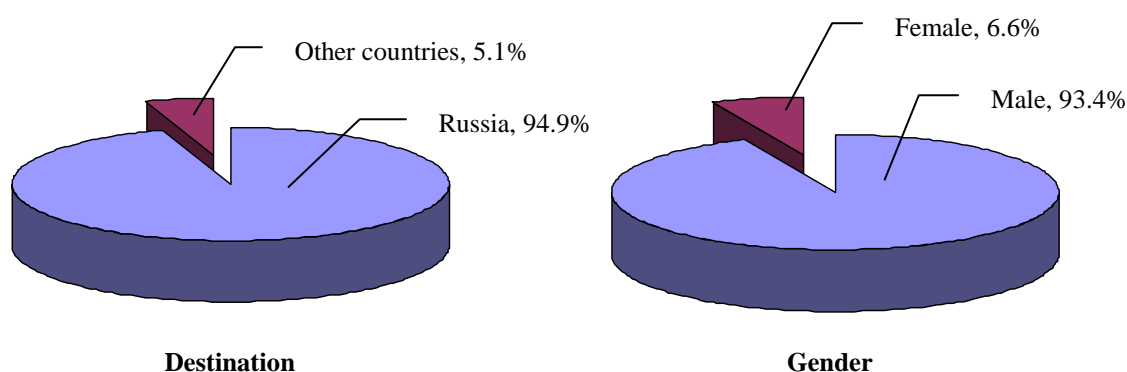
Source: TLSS 2007, WB

According to TLSS 2007, 94.9% of migrants from Tajikistan have chosen Russia as the destination country. 93.4% of migrants are male and 6.6% female (Figure 2.6). The average age of migrants is 28 years; 38.8% of migrants are young persons of age 16–24 years. Persons of age 25–34 years make 43.3% of migrants. The remained 13.6% are of age of 35–44 years and only 4.3% are of the age 45 and over. 11.3% of them have primary education, 77.7% secondary education and only 10.2% undergraduate degree or higher[18] (Figures 2.7).

Before migration 32.1% of migrants did building and construction works, 28.9% worked in trade sphere, 13.3% did unskilled job and the remained 25.7% other kinds of jobs. In the host country 52.1% of migrants from Tajikistan do building and constructions works, 13.3% work in trade sphere, 22.7% do unskilled job and the

---

[18] In this section TLSS 2007 data is only for the migrants, who are abroad during conduction of the survey; the migrants who already came back to Tajikistan are not included.

remained 11.9% other kinds of works (Figure 2.8).

Figure 2.7 Migrants' Age and Education Level

35-44, 13.6%
45-54, 4.3%
16-24, 38.8%
25-34, 43.3%

Undergraduate degree, 10.2%
Primary, 11.3%
Secondary, 77.7%

Age

Education
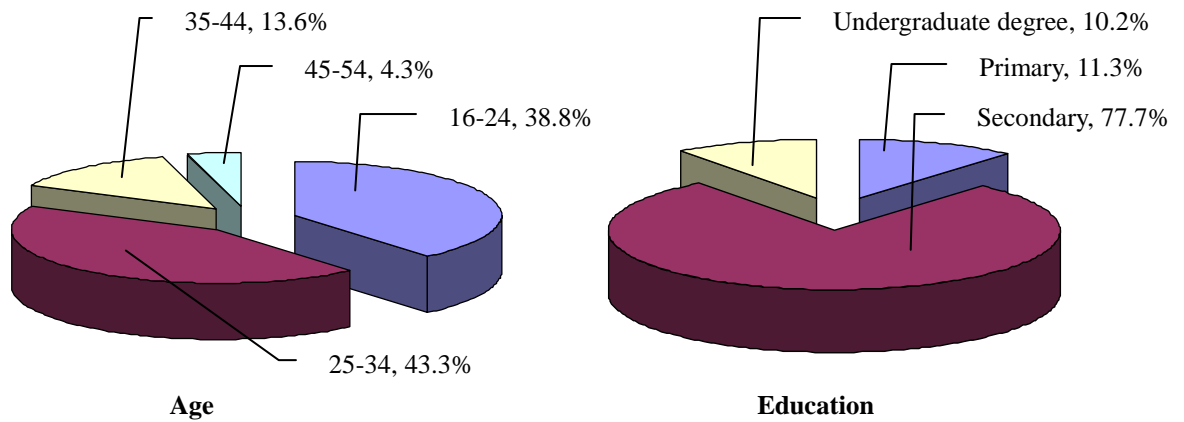
The average duration of stay of migrants in the host country is approximately three years, which may be one of the main reasons for the increasing net cumulative migration. Younger migrants have shorter duration of stay. 74.3% of the migrants were unemployed before migration. Unemployment was higher for younger migrants.

Figure 2.8 Occupation Before and After Migration
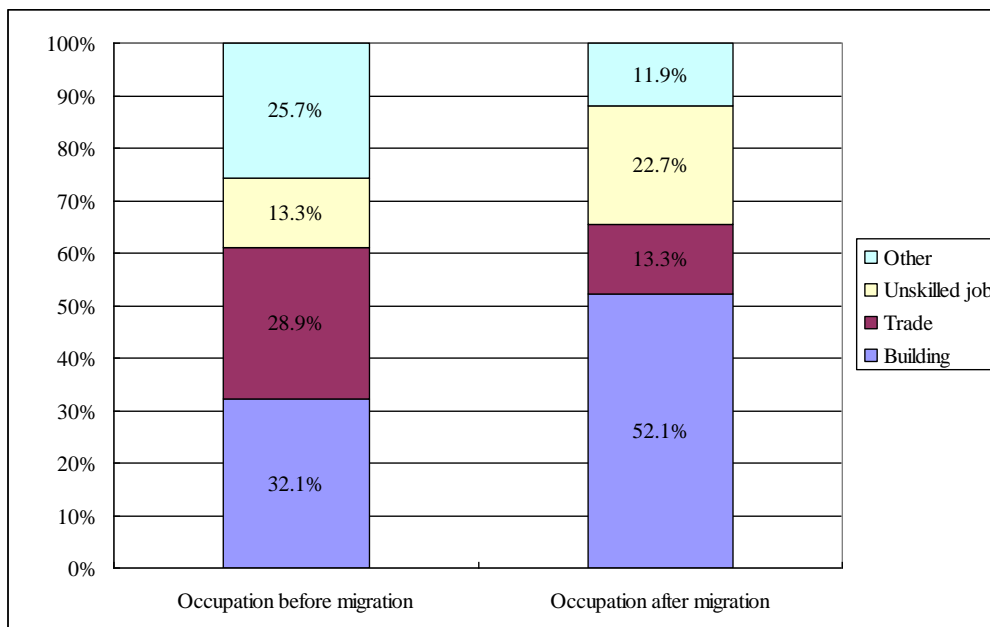
On average, a migrant earns $321.80 per month and remits $2,123.24 per year to his or her family – that is 54.9% of his or her annual income. Younger migrants have

comparatively lower wages and lower amount of remittances.

2.6.4 Remittances and Macro-indicators

Comparison of remittances with the related macroeconomic indicators demonstrates that many macroeconomic indicators are affected by the inflow of remittances. In 2002 and 2003, remittances made 6.4% and 9.4% of GDP, respectively. In 2004, the percentage increased to 12.1% and Tajikistan entered the list of the top remittance-receiving countries of the world as a percentage of GDP. During the period of 2005–2010, remittances as a percentage of GDP fluctuated between 20.8–49.3%.

Table 2.7 Main Economic Indicators

	2000	2002	2004	2006	2008	2010
GDP, current, mln. USD	965.8	1214.2	2076.5	2820.3	5162.4	5640.3
GDP per capita, current USD	154.5	186.6	306.3	399.3	700.1	740.6
Industrial output and construction, % of GDP	35.2	35.1	31.1	27.4	24.5	22.8
Agricultural output, % of GDP	25.1	22.2	19.2	21.4	19.8	18.7
Internal trade, % of GDP	10.8	11.7	16.5	16.9	19.4	19.2
Imports of goods and services, % of GDP	76.5	65.6	62.0	62.9	65.5	49.2
Exports of goods and services, % of GDP	86.9	66.4	48.7	58.1	34.9	28.0
Foreign trade balance, % of GDP	10.4	0.7	-13.4	-4.8	-30.6	-21.2
Capital investment, % of GDP	5.8	4.7	8.9	10.7	22.8	17.8
Expenditures of state budget, % of GDP	14.4	15.5	17.6	17.5	28.7	26.1
Remittances, % of GDP	-	6.4	12.1	36.0	49.3	40.0
FDI, net inflows, % of GDP	2.7	3.0	13.1	12.0	7.3	0.3
Portfolio equity, net inflows, % of GDP	-	0.1	0.0	-	0.0	0.0
Gross savings, % of GDP	-	9.3	7.8	2.5	13.4	2.5
Public foreign debt, % of GDP	87.7	73.8	38.7	29.7	26.6	32.0
Net ODA and official aid, % of GDP	14.4	13.8	12.2	8.5	5.6	7.6
M2, growth, in %	-	43.8	103.8	53.5	38.7	23.5
CPI, annual inflation, %	24.0	10.2	6.8	11.9	11.8	9.8
Exchange rate per 1 USD, annual	1.9	2.8	3.0	3.3	3.4	4.4

Source: TAJSTAT, NBT and WB

The increase in remittances as a share of GDP coincided with the increase in GDP, internal trade, expenditures of the state budget and negative foreign trade balance. The shares of public foreign debt and net foreign official aid in the economy decreased with the increase in the share of remittances. Money supply also was remarkably high for all the period of increase in remittances. That is why nominal exchange rate of national currency – somoni also was depreciating. CPI based inflation level became lower for

the period of increase in remittances as compared with pre-remittances period.

Remittances sharply increased for 2002–2010. For the same period, GDP had the average annual growth of 8.2%. The GDP share of industrial output and construction decreased from 35.1% of 2002 to 22.8% in 2010. The share of agricultural output in GDP decreased from 22.2% of 2002 to 18.7% in 2010. The share of internal trade in GDP increased from 11.7% of 2002 to 19.2% of 2010. The increase in remittances and GDP coincided with the fall in the share of industrial and agricultural output and increase in the share of internal trade.

Export of goods and services as a percentage of GDP was continuously decreasing for the period of increase in remittances and GDP (2002–2010). Import of goods and services as a percentage of GDP was fluctuating. The concerned point was an increase in the negative trade balance which fluctuated between 4.8–30.6% of GDP for 2003–2010.

Capital investment and state budget expenditures as a percentage of GDP increased for 2002–2010 while the share of foreign public debt and foreign aid decreased. It seems the economy of the country became less dependent on foreign debt and aid; however, dependence on remittance inflows increased.

In 2000 and 2001, CPI based annual inflation made 24.0% and 36.5% appropriately. For the period 2002–2010, annual CPI inflation fluctuated between 5.0–19.7%.

In 2010, remittances were enormous – equal to 40.0% of growth domestic product. Except import of goods and services, which were equal to 49.2% of GDP, all other macroeconomic indicators of the country were less than remittances. For example, industrial output made only 22.8% of GDP, agricultural output 18.7% of GDP, internal trade 19.2% of GDP, exports of goods and services 28.0% of GDP, capital investment 17.8% of GDP, the state budget expenditures 26.1% of GDP, FDI 0.3% of GDP, public foreign debt 32.0% of GDP and net foreign official aid 7.6% of GDP (Table 2.7).

2.7 Summary of the Chapter

Lack of jobs, the low wages and the poor social security made a large share of labour resources of Tajikistan to challenge migration. While seasonal migration makes only less than 40 thousand[19] persons per year, the total number of migrants out of the country (including net emigration in past years) is more than 508 thousand persons according to the national statistics and more than 1.3 million persons according to UN data. Remittances sent by migrants are equal to an enormous portion of GDP and have affected all macro- and micro-economic indicators.

Households are better off increasing income and expenditures. Economy of the country also is increasing and becoming less dependent on foreign debt and aid. On the

---

[19] TAJSTAT.

contrary, industrial and agricultural outputs are decreasing that has resulted in the decrease of export share of GDP. Domestic demand supported by the remittance inflows is increasing and causing imports to increase. As the result, negative trade balance as share of GDP has increased.

Regardless of an increase in the economy for the last decade, the economy of Tajikistan has become dependent on remittances and imports. If in the previous decade the country relied on foreign debt and foreign aid, in the 2000s it has relied on remittances. That is why still it remains vulnerable.

CHAPTER III
THE MACROECONOMIC DETERMINANTS OF REMITTANCE INFLOWS FROM RUSSIA TO TAJIKISTAN

3.1 Preface

Referring to the theoretical and empirical literature this chapter defines the macroeconomic determinants of remittance inflows from Russia to Tajikistan and applying an econometric model to empirical data estimates the impact of each determinant. Russia is considered the host country taking into account the fact that about 95.0% to 99.0% of migrants from Tajikistan have chosen Russia as their country of destination[20].

3.2 Literature Review

Empirical literature has mostly addressed the microeconomic issues of remittances using survey data. These studies mainly focused on the migrants and their households' preferences and behaviour as the main determinants of remittances at the microeconomic level. Another group of studies attempted to investigate how the macroeconomic environment affects remittances. Some of the outstanding studies on the macroeconomic determinants of remittances are Swamy (1981), Straubhaar (1986), Katseli and Glytsos (1986), Wahba (1991), Elbadawi and Rocha (1992), Faini (1994), El-Sakka and Mcnabb (1999) and Higgins et al. (2004).

Applying a model and using the macroeconomic variables of the host and home countries, and 18-year data sets for Greece, Turkey, and Yugoslavia, Swamy (1981) shows that variations in remittances are mainly explained by differences in the number of migrants in the host country and their earnings. According to that study, other macroeconomic variables such as the relative deposit interest rates of the host and home countries, the relative real estate investment's real return rate of the host and home countries, the difference between the official and unofficial exchange rates (black market premium) in the home country, and the difference between the preferential exchange rate for remittances and the official exchange rate in the home country have no significant impacts on remittances[21].

Straubhaar (1986) examines the effectiveness of the Turkish policies to attract migrants' remittances from Germany for the period 1963–1982. The empirical model shows that variations in the exchange rates reflecting the Turkish government's intent to attract remittances through foreign currency accounts by offering higher yields did not impact inward transfers. Rather, the inflow of remittances was determined by the economic situation in Germany, including the wages level in Germany and the

---

[20] WB (2007), Hakimov and Mahmadbekov (2009) and ILO (2010).
[21] Swamy (1981).

possibility of the Turkish migrants joining the labour force in Germany[22].

Focusing on determinants of international labour migration and remittances, Katseli and Glytsos (1986) carried out empirical tests with Greek data for the period 1961–1983. They found that remittances were positively related to the income per capita in the host country (Germany) and negatively related to the income and real interest rate in the home country (Greece). Despite the fact that higher German interest rates make it more attractive for the migrants to hold their funds in German deposit accounts, their study shows that an increase in the German interest rate led to the increase in remittance outflows from Germany to Greece[23].

In a study based on remittances data over the period 1974–1989 for Egypt, Wahba (1991) examines the growth of the flow of remittances to the Middle East countries. The study suggests that black market premium, the difference between the interest rates in the host and home countries, political stability, and the stability in government policies and financial institutions significantly affect the flow of remittances[24].

Elbadawi and Rocha (1992), using data from the five major labour-exporting countries of North Africa and Europe (Morocco, Portugal, Tunisia, Turkey, and the former Yugoslavia) hypothesized an empirical model that took into account the macroeconomic factors that determined official remittances. According to their study, the number of labour migrants has a positive and significant impact on real remittances, and, furthermore, remittances are negatively affected by black market premium and the domestic inflation rate, although the effects of interest rate differential and domestic inflation on remittances are not significant[25].

Faini (1994), developing a simple model of altruistic transfers, shows that the real exchange rate affects the remittance behaviour of migrants. According to the estimations of the paper for five Mediterranean countries, the real exchange rate is a significant determinant of remittances[26].

El-Sakka and Mcnabb (1999), using data for Egypt, demonstrate that exchange rate and interest rate differentials are important factors in attracting remittances through official channels from the host country to the home country[27].

Higgins et al. (2004) used a panel estimation method for nine Western Hemisphere nations to test how remittances respond to certain risk variables such as exchange rate uncertainty. Their study found that exchange rate uncertainty in the home country and unemployment in the host country are significant determinants of remittances[28].

---

[22] Straubhaar (1986).
[23] Katseli and Glytsos (1986).
[24] Wahba (1991).
[25] Elbadawi and Rocha (1992).
[26] Faini (1994).
[27] El-Sakka and Mcnabb (1999).
[28] Higgins et al. (2004).

Some survey-based studies on remittances for the case of Tajikistan have suggested unemployment in the home country as one of the main preconditions for migration and remittances[29]. According to Umarov (2010), the demographic growth and low wages in Tajikistan are also main factors for migration[30].

According to the above literature the main macroeconomic determinants of remittance inflows are the number of migrants[31], unemployment[32], earnings of migrants[33], and the income per capita in the host country[34]; the real exchange rate[35], the real interest rate, and inflation in the home country[36]; the exchange and interest rate differentials between the host and home countries[37]; and the stability in government policies and financial institutions[38].

3.3 The Model

Based on the literature mentioned above and the available data for Tajikistan unemployment in the host country; the real exchange rate and inflation in the home country; per capita GDP, the real average wages, and the real interest rates of the host and home countries; and per capita income, the real interest rate and real average wage differentials between the home country and the host country are incorporated into the econometric model as explanatory variables. Taking into account the sudden increase in growth rate of remittances in the first quarter of 2006 and impact of the global financial crises of 2008 on remittances[39] two dummy variables are included into the model.

Although the number of migrants in the host country is believed to be an important determinant of remittances[40], it cannot be included in the model, since reliable annual or quarterly data on the number of migrants from Tajikistan is not available. Nevertheless, based on the available information on Tajikistan's huge net migration, we consider the number of migrants in the host country also a significant determinant for the case of Tajikistan.

Unemployment in the host country will make it difficult for migrants to find jobs. The employed migrants also may lose their jobs as the unemployment level increases. Furthermore, considering the labour surplus situation, employers may decrease the

---

[29] Olimova and Bosc (2003) and Umarov (2010).
[30] Umarov (2010).
[31] Swamy (1981), Elbadawi and Rocha (1992).
[32] Higgins et al. (2004).
[33] Swamy (1981) and Straubhaar (1986).
[34] Katseli and Glytsos (1986), Chamon et al. (2005), Browne and Mineshima (2007) and Lin (2011).
[35] Swamy (1981), Wahba (1991), Elbadawi and Rocha (1992), Faini (1994), El-Sakka and Mcnabb (1999) and Higgins et al. (2004).
[36] Katseli and Glytsos (1986), Elbadawi and Rocha (1992), El-Sakka and Mcnabb (1999).
[37] Katseli and Glytsos (1986), Wahba (1991), El-Sakka and Mcnabb (1999).
[38] Wahba (1991).
[39] Danzer and Ivaschenko (2010) and Umarov (2010).
[40] Swamy (1981), Elbadawi and Rocha (1992) and Umarov (2010).

payments for their employees. On the other hand, the migrants with lower wages who are aware of the high level of unemployment may give up their search for high income jobs.

A higher level of unemployment in the host country is predicted to decrease the volume of remittances. The level of unemployment directly affects the earnings of migrants, as most of them work under short-term contracts. The host country's unemployment data used in calculations are from survey-based data[41].

Unemployment in the home country is an important precondition for migration of labour force[42]. However, considering the absence of survey-based data on unemployment in Tajikistan and the unrealistic nature of the official unemployment data, the home country's unemployment data is not included in the model.

Inflation in the home country is considered an important determinant of remittances[43]. According to Katseli and Glytsos (1986) and Elbadawi and Rocha (1992), the home country's inflation can affect the inflow of remittances negatively, while El-Sakka and Mcnabb (1999) argue for a positive effect of inflation on remittances. For the case of Tajikistan a positive impact of the home country's inflation on remittances might be predicted. Keeping the other variables fixed, an increase in the price of consumer goods decreases the real consumption of households. In order to maintain the same level of consumption for their households, the migrants have to transfer more money to their families.

The income available for the migrants in the host country is the most important determinant of remittances and the main factor contributing to labour force migration. Earnings by migrants were included as an important determinant of remittances with a positive impact in almost all of the studies mentioned above. The average available wage of migrants[44], the per capita income in the host country[45], and the average wage in the host country[46] may be used as proxies for the earnings of migrants. Economic growth or changes in GDP may substitute for income per capita, especially in studies using monthly or quarterly data and where reliable per capita data are not available[47]. Economic growth in the host country is suggested to have a positive and statistically significant impact on remittances[48]. In this chapter per capita income and the real average monthly wage in the host country are used as substitutes for the migrants' earnings. An increase in earnings is expected to increase remittances.

Difference between the interest rates of the home and host countries is suggested to

---

[41] The source is OECD statistics.
[42] Olimova and Bosc (2003) and Umarov (2010).
[43] Katseli and Glytsos (1986), Elbadawi and Rocha (1992), El-Sakka and Mcnabb (1999).
[44] Swamy (1981).
[45] Katseli and Glytsos (1986).
[46] Straubhaar (1986).
[47] Lin (2011).
[48] Chamon et al. (2005), and Browne and Mineshima (2007).

be an important determinant of remittances. While some studies argue that real interest rate differential attracts more remittances from the host country to the home country[49], other studies have found the impact of real interest rate differential on remittances insignificant[50] or negative[51]. Taking into account the lack of motivation for the migrants from Tajikistan to have deposits or investments in the host country, the home country's real interest rate is used in calculation. The real interest rate or rate of return to investment describes the investment condition as well as the demand for financial resources. For the case of Tajikistan, where the country's inward remittances are used mainly for supporting households' consumption[52], the impact of the real interest rate may be insignificant.

Another important determinant of remittances is the real exchange rate of the home country's currency. According to Faini (1994) and Higgins et al. (2004), the real exchange rate is a significant determinant of remittances. In some studies, the exchange rate is substituted by black market premium[53] and the exchange rate differential between the home country and the host country[54]. Depreciation of the real exchange rate of the home country is expected to increase remittances[55]; black market premium is expected to have a negative effect[56] and the exchange rate differential has a positive effect[57] on remittance inflows. This study uses the real bilateral exchange rate of national currency of Tajikistan against Russian ruble as well as its real effective exchange rate against a basket of currencies of its major trade partners.

This study uses the above information in a multiple regression analysis to build a regression equation of the form

$$\Delta lnR_t = \beta_0 + \beta_1 \Delta U_{jt} + \beta_2 \Delta P_{it} + \beta_3 \Delta lnY_{jt} + \beta_4 \Delta IR_{it} + \beta_5 \Delta REER_{it} + \beta_6 D_t$$

(3.1)

where R is the inflow of remittances from Russia to Tajikistan, U is the unemployment rate in the host country, P the price level in the home country, Y per capita income in the host country, IR the real interest rate in the home country, REER the real effective exchange rate of the home country's currency, and D the dummy variable; βo is constant, and βn (where n = 1, 2 …) the change in the dependent variable from a unit change in explanatory variables. Subscripts t, j, and i represent the current period, the

---

[49] Wahba (1991), El-Sakka and Mcnabb (1999).

[50] Elbadawi and Rocha (1992).

[51] Katseli and Glytsos (1986).

[52] Brown et al. (2008) and Clément (2011).

[53] Swamy (1981), Wahba (1991), Elbadawi and Rocha (1992).

[54] El-Sakka and Mcnabb (1999).

[55] Faini (1994) and Higgins et al. (2004).

[56] Elbadawi and Rocha (1992).

[57] El-Sakka and Mcnabb (1999).

host country and the home country, respectively.

In the special forms of the equation, per capita income will be substituted with the real average wage of the host country and the real exchange rate of the home country will be substituted with the real bilateral exchange rate (RBER) of the home country against the host country's currency. Furthermore, the real interest rate of the host country, the real average wage and the real GDP per capita of the home country, and per capita income differential, the real average wage differential, and interest rate differential will be included in the model.

Considering the large standard deviation and the non-stationarity of levels of some variables, a logarithmic form and the first differences will be used in estimations.

3.4 Data Specification

3.4.1 General Features

The data used in the estimation are from the quarterly time series data for the first quarter of 2003 to the last quarter of 2011. NBT and TAJSTAT are the sources of the home country's data. The sources of the host country data are CBRF and RFSSS. The remittances data for the period of 2006–2011 are from the data presented by CBRF. The data for the period of 2003–2005 are based on the WB data, and the quarterly proportions are predicted according to the structure of the quarterly data presented by CBRF. The unemployment rate of the host country is from the survey-based data presented by the OECD statistics.

The data for remittances, GDP, and average wages are real data based on constant prices for the first quarter of 2010. All the data are adjusted by season[58].

3.4.2 Evolution of the Variables

The data on remittances show a moderately increasing trend until 2006 (Figure 3.1). After an initial rapid increase in the first quarter of 2006, the growth rate of remittances increased in comparison with the pre-2006 period.

The increase in remittances beginning from the first quarter of 2006 coincided with the increase in average wages and the economic growth of the host country. The Russian economy as well as the global economy had a favourable economic environment in 2006. According to the WB's World Development Indicators data, the world's output grew by 4.8% in 2006. Low- and middle-income economies experienced a faster economic growth on average than the high-income economies. The low- and middle-income economies' global output share increased from 34.0% to 41.0%. The slight fall in remittances in the second quarter of 2006 as compared with the first

---

[58]   Census X12, multiplicative is used for seasonal adjustment.

quarter is related with appreciation of Russian currency (ruble) in the first quarter and high rate of inflation in Tajikistan for the second quarter.

Figure 3.1 Model Variables

Remittances

Unemployment (RUS)

Price (TJ)

GDP per capita (RUS)

Interest rate (TJ)

REER (TJ)
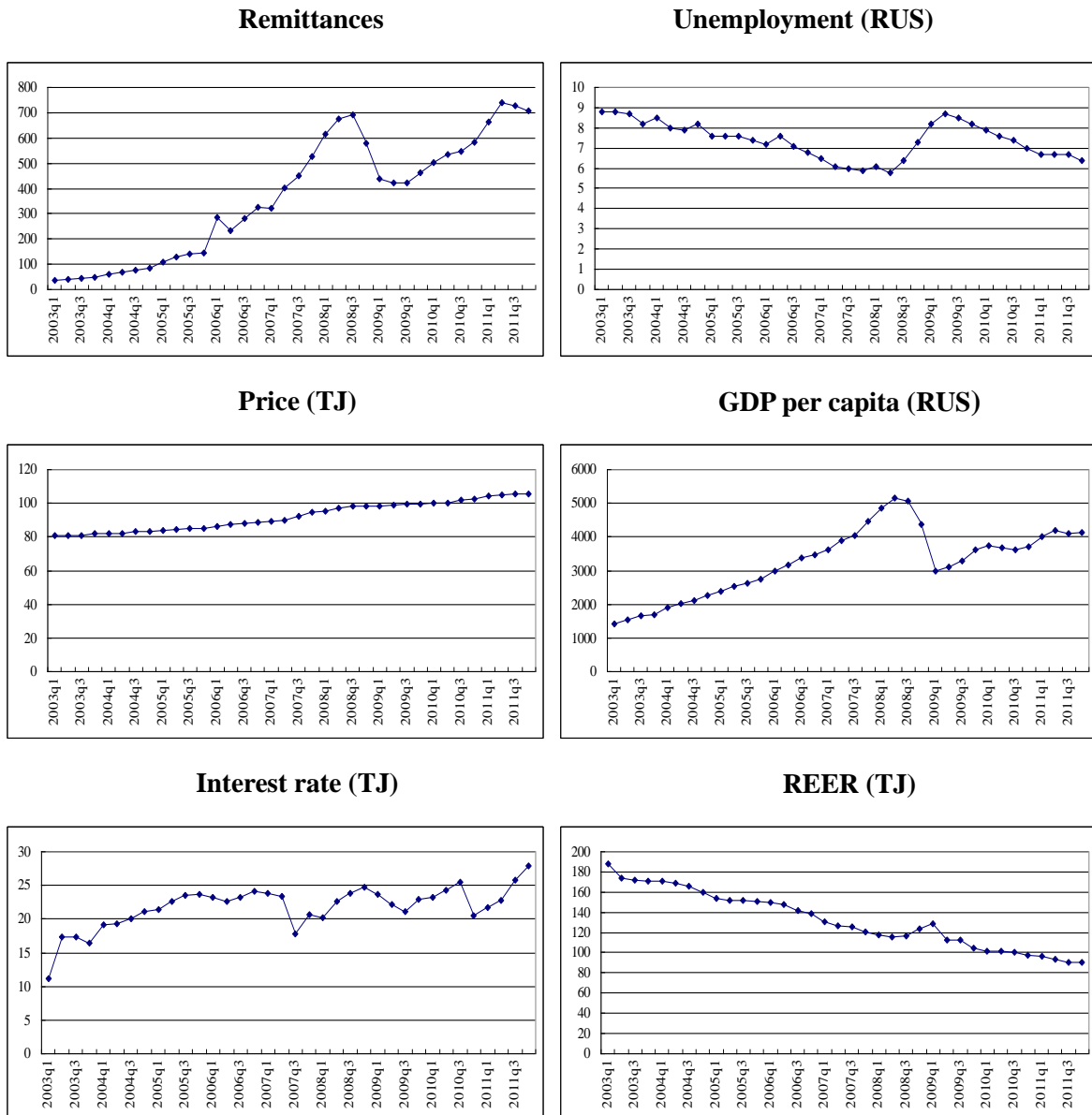
Source: TAJSTAT, NBT, CBRF, RFSSS, WB and OECD

Note: TJ – Tajikistan; RUS – Russia; The graphs show quarter on the horizontal axis for all variables; million USD on the vertical axis for remittances, USD for GDP per capita, percent for unemployment and interest rate, and indices for price and REER

The fast growth in remittances continued until the third quarter of 2008. In the fourth quarter, the inflow of remittances dramatically decreased on account of the global financial crises. The relative macroeconomic variables in the host and home countries also were significantly affected. The GDP and wages fell and unemployment

rate increased. The fall in remittances continued until the second quarter of 2009. In the third quarter, the situation normalized, and beginning from the last quarter of 2009, remittances started to re-increase. The growth tempo after 2009 was slightly slower than the pre-crises period tempo. The trends of other relevant macroeconomic variables also normalized during this period. Later, the slowdown in the global economy caused a slight decrease in remittances during the second half of 2011.

The flow of remittances increased significantly before and after the global crisis of 2008. The home country's economy and migrants' households benefited from these huge financial inflows. However, the growth in remittances coincided with the increase in food price indices in the world market[59]. Considering the fact that Tajikistan's economy depends on the import of consumer goods and approximately 60.0% of food is imported[60], the positive impacts of the remittances could be weakened.

The remittance inflows used in calculations consist of the money transfers of migrants sent via the official channels (e.g. bank transfers, money transfer services), which is about 85.0% of the total remittances[61]. The remaining 15.0% (which are sent via agents, carried by the migrants themselves, or spent on consumer goods brought by the migrants to the home country) are not included in the data.

The survey-based unemployment rate in the host country (Figure 3.1) shows a restrained decreasing trend, except during the global financial crisis period. Beginning from the third quarter of 2008, the unemployment rate increased, and continued to rise until the second quarter of 2009. A comparative study of the host country's unemployment rate and remittances shows that in the third quarter of 2008, with a rise in unemployment, the growth rate of remittances falls, and in the fourth quarter of 2008, with an increase in unemployment, remittances decrease. Hence, the effect of the current quarter's unemployment rate might be bigger in the following quarter's remittances than on the current period's remittances.

Prices in the home country show a moderately increasing trend (Figure 3.1). The increase is comparatively larger during the pre- and post-crises periods that can be explained by the increase in the food price indices in the world market.

The per capita GDP of the host country also showed fluctuations, with an increasing trend, except during global crises period (Figure 3.1); it decreased rapidly during the second half of 2008 and the first quarter of 2009. The increasing trend came back to its past path only during the second quarter of 2009.

The home country's per capita GDP also had increasing trend until 2009, fell in the first quarter of 2009 and fluctuated with an increasing trend thereafter. The shape of the

[59] According to FAO data, food price index was increasing for the whole period of 2002–2011 excluding a rapid fall during the financial crises of 2008 and a slight decline after February of 2011.
[60] CIA World Factbook.
[61] Hakimov and Mahmadbekov (2009) and ILO (2010).

curve for GDP per capita differential is similar to GDP per capita of the host country.

The real average wage in the host country showed an increasing trend, except during the last quarter of 2008 and the first quarter of 2009 when it fell significantly. In the post-crises period the real average wage showed a slightly fluctuating trend, but increasing on average. The average real wage in the home country showed a slightly increasing trend, except for a short period of fall during the first half of 2009. The real average wage data used in the calculations are from the average monthly wage data for each quarter. The shape of the wage differential is similar to the real average wage trend of the host country.

The average weighted real interest rate on loans in the home country fluctuates between 11.1% and 27.8% per annum. The rates were comparatively low during the period 2003–2004. After 2004, the real interest rate has been fluctuating, but generally in a flat path (Figure 3.1). The average weighted real interest rate on loans in the host country shows a fluctuating trend, floating between 5.5% and 14.0% per annum. The rates are especially increasing during the crisis period. The interest rate differential between the home and host countries is derived from the average weighted interest rates. That is why it is rather high and fluctuating between 0.4–20.3%. The difference was comparatively smaller during the period 2003–2004 as well as the post-crisis period.

The exchange rate of the home country's national currency shows a fluctuating trend, but mainly depreciating against the Russian ruble and the currencies of the main trading partners, except for a two-quarter period of significant appreciation at the end of 2008 and the beginning of 2009 (Figures 3.1). It seems that the enormous amount of foreign currency (remittances) injected into the economy keeps the home country's national currency from further depreciation, but has not led to appreciation of the currency so far. The reason might be explained by the monetary policy of NBT that increased money supply during the observed period.

3.4.3 Summary Statistics

The summary statistics of the time series used in estimation are presented in Table 3.1. Remittances are in million USD and wages are in units of USD. The interest rates are annual percentages for the given quarter. The real exchange rate (RBER and REER) is the index of the base period. The big standard deviation of some variables is the main reason of use of their logarithms in the model.

Table 3.1 Summary Statistics

Variables	Measure	Observations	Mean	Std. Dev.	Min.	Max.
Remittances	mln. USD	36	364.2959	238.2263	34.358	737.812
Unemployment (RUS)	Percent	36	7.39	0.90	5.80	8.80
Price (TJ)	Index	36	92.22	8.43	80.50	105.87
GDP per capita (RUS)	USD	36	3266.39	1018.17	1431.40	5165.32
GDP per capita (TJ)	USD	36	138.29	45.98	60.99	223.10
GDP per capita differential	USD	36	3128.10	980.33	1370.41	4989.23
Average wage (RUS)	USD	36	558.28	181.05	234.19	865.64
Average wage (TJ)	USD	36	55.97	27.24	15.33	104.19
Average wage differential	USD	36	502.31	157.22	218.86	761.45
Interest rate (RUS)	Annual %	36	8.87	2.09	5.49	14.03
Interest rate (TJ)	Annual %	36	21.79	3.09	11.11	27.82
Interest rate differential	Annual %	36	12.92	3.89	0.44	20.27
RBER (TJ)	Index	36	150.01	49.01	89.23	256.63
REER (TJ)	Index	36	132.27	28.24	90.08	187.77

Sources: TAJSTAT, NBT, WB, CBRF, RFSSS and OECD

3.4.4 Correlation Matrix

The correlation matrix for remittances and all the relevant variables is presented in Table 3.2. According to the matrix, remittances are negatively correlated with unemployment and the real interest rate in the host country, and the real exchange rate of the home country's currency against the host country's currency and main partner countries' currencies. The correlation of remittances with the real interest rate of the host country is comparatively weak. All the other variables have positive correlation with remittances.

The derived results of correlation are similar to the predictions in the theoretical and the empirical literature. Only the home country's real average wage and per capita GDP show unexpected behaviour. Both variables are positively and highly correlated with remittances. It seems that an increase in the average wages and per capita income in the home country does not lead to decreases in migration and remittances. The reason might be that a huge share of the labour resources do not participate in the home labour force (31.3%−36.9% of labour resources), and wages in agriculture, in which more than 65.0% of the resources are employed, are very low. The average wage in agriculture is about 20.0% of the average wage in industry.

The positive correlation with per capita GDP growth might be explained by relationship between remittances and GDP. According to the results of estimations in the next chapter, remittances affect GDP growth in the home country positively. GDP or GDP per capita in the home country is not an important determinant for remittance

inflows as home country's GDP itself is determined by remittances.

Table 3.2 Correlation of Remittances with Explanatory Variables

Variables	Remittances	Unemployment (RUS)	Price (TJ)	GDP per capita (RUS)	GDP per capita (TJ)	GDP per capita differential	Average wage (RUS)	Average wage (TJ)	Average wage differential	Interest rate (RUS)	Interest rate (TJ)	Interest rate differential	RBER (TJ)	REER (TJ)
Remittances	1													
Unemployment (RUS)	-0.651	1												
Price (TJ)	0.944	-0.425	1											
GDP per capita (RUS)	0.920	-0.815	0.778	1										
GDP per capita (TJ)	0.956	-0.485	0.981	0.830	1									
GDP per capita differential	0.911	-0.823	0.762	0.999	0.816	1								
Average wage (RUS)	0.966	-0.722	0.886	0.970	0.927	0.964	1							
Average wage (TJ)	0.943	-0.439	0.995	0.785	0.986	0.769	0.893	1						
Average wage differential	0.949	-0.755	0.848	0.981	0.897	0.977	0.997	0.855	1					
Interest rate (RUS)	-0.142	0.659	0.023	-0.240	0.023	-0.251	-0.135	0.023	-0.160	1				
Interest rate (TJ)	0.568	-0.430	0.586	0.585	0.634	0.578	0.630	0.630	0.617	-0.096	1			
Interest rate differential	0.528	-0.695	0.453	0.594	0.491	0.594	0.574	0.488	0.576	-0.612	0.846	1		
RBER (TJ)	-0.937	0.594	-0.943	-0.881	-0.945	-0.871	-0.939	-0.944	-0.917	0.103	-0.695	-0.607	1	
REER (TJ)	-0.940	0.527	-0.974	-0.829	-0.961	-0.816	-0.914	-0.970	-0.885	0.085	-0.650	-0.562	0.985	1

Sources: TAJSTAT, NBT, CBRF, RFSSS, OECD and WB

3.4.5 Unit Root Test

Remittances are highly correlated with most of the presented macroeconomic variables. The high correlation between the dependent variable and independent variables might be a sign of the presence of unit root and autocorrelation in time series. The results of unit root test are presented in Table 3.3.

Considering the presence of unit root in the levels, the first differences of all the variables are used in OLS regression. The results of Augmented Dickey-Fuller test for unit root reject the null hypothesis of the existence of unit root and show stationary of first differences of time series.

Table 3.3 Unit Root Test

Variables	Levels		First differences	
	ADF	ADF	ADF	ADF
	Lags (0)	Lags (1)	Lags (0)	Lags (1)
ln Remittances	-2.391	-2.384	-5.817***	-3.162**
Unemployment (RUS)	-1.508	-2.041	-4.003***	-2.745**
Price (TJ)	0.729	0.083	-4.010***	-3.565**
ln GDP per capita (RUS)	-2.351	-2.133	-3.821***	-3.481**
ln GDP per capita (TJ)	-1.617	-1.582	-8.162***	-4.361***
ln GDP per capita differential	-2.328	-2.165	-3.886***	-3.464**
ln Average wage (RUS)	-2.072	-1.422	-3.691***	-3.027**
ln Average wage (TJ)	-2.782*	-2.715*	-4.621***	-4.486***
ln Average wage differential	-1.997	-1.457	-3.814***	-3.006**
Interest rate (RUS)	-1.605	-2.442	-3.783***	-2.774*
Interest rate (TJ)	-3.683***	-1.955	-7.209***	-4.311***
Interest rate differential	-3.178**	-1.556	-7.459***	-3.956***
RBER (TJ)	-2.651*	-2.030	-5.505***	-3.962***
REER (TJ)	-1.430	-0.617	-6.656***	-4.345***

Sources: TAJSTAT, NBT, CBRF, RFSSS, OECD and WB

Note: "***" Smaller than the critical value at 1% significant level, "**" Smaller than the critical value at 5% significant level, "*" Smaller than the critical value at 10% significant level

3.5 Empirical Findings

The OLS regression results for the model are presented in Table 3.4. In order to define the determinants properly, different versions of the main equation are examined. Based on the autocorrelation and specification error tests, six specific forms of the regression equation for the model are estimated.

The results show that unemployment in the host country has a negative impact on remittance flows, which is statistically significant at the 1–5% level. A unit increase in unemployment is associated with an average of 11.7–15.7% decrease in real amount of remittances.

Inflation in the home country has a positive impact on remittances, but the impact is insignificant.

Per capita GDP in the host country and per capita GDP differential have a positive impact on remittances, significant at the 5% level. A 1% increase in per capita GDP in the host country is associated with 0.66–0.76% increase in remittances. Difference in real per capita income of the host country and the home country is one of the main motivations for migration of labour and a statistically significant determinant of

remittances. A 1% increase in real per capita GDP differential is associated with an average of 0.75% increase in remittances.

Table 3.4 Regression Results, Dependent Variable – Remittances

Independent variables	Equations					
	1	2	3	4	5	6
Δ Unemployment (RUS)	-0.1254 (-2.69**)	-0.1170 (-2.75***)	-0.1309 (-2.39**)			-0.1567 (-3.26***)
Δ Price (TJ)				0.0082 (0.27)	0.0087 (0.30)	0.0119 (0.42)
Δ ln GDP per capita (RUS)	0.7560 (2.29**)	0.6629 (2.53**)				
Δ ln GDP per capita (TJ)		-0.0015 (-0.01)				
Δ ln GDP per capita dif.			0.7514 (2.13**)		0.7508 (2.11**)	
Δ ln Average wage (RUS)						0.0460 (0.13)
Δ ln Average wage (TJ)						0.1900 (0.59)
Δ ln Average wage different.				0.0353 (0.10)		
Δ Interest rate (RUS)			-0.0012 (-0.06)			
Δ Interest rate (TJ)			0.0058 (0.81)			
Δ Interest rate differential	0.0060 (0.94)	0.0060 (0.94)		0.0096 (1.19)	0.0081 (1.09)	0.0091 (1.20)
Δ RBER (TJ)	0.0007 (0.26)	0.0008 (0.30)	0.0021 (0.39)	-0.0008 (-0.26)	0.0017 (0.58)	-0.0034 (-1.26)
Δ REER (TJ)			-0.0025 (-0.32)			
D2006	0.5347 (6.73***)	0.5387 (6.79***)	0.5522 (5.98***)	0.5634 (5.88***)	0.5441 (6.09***)	0.5498 (6.13***)
D2008	0.0520 (0.43)		0.0479 (0.38)	-0.2584 (-2.26**)	-0.7778 (-0.63)	
Constant	0.0365 (1.62)	0.0435 (2.44**)	0.0368 (1.56)	0.0687 (1.87*)	0.0501 (1.47)	0.0180 (0.58)
R-Squared	0.7890	0.7876	0.7896	0.6928	0.7350	0.7417
F-statistics	17.45	17.30	12.20	10.53	12.94	11.08
DW d-statistics	1.91	1.83	1.85	1.82	2.08	1.91
RESET (F value)	0.90 (0.4560)	0.71 (0.5536)	0.80 (0.5090)	0.12 (0.9499)	0.64 (0.5977)	1.25 (0.3135)
Observations	35	35	35	35	35	35

Note: "***" significant at 1% level, "**" significant at 5% level, "*" significant at 10% level

Per capita GDP growth in the home country has no significant impact on the trend of remittances. The impacts of average wages in both countries and the wage differential are not statistically significant. The real interest rates and the interest rate differential also have no statistically significant impact on remittances. The real exchange rate of the home country's currency against the host country's currency and the main trade partners' currencies has insignificant impact.

The effect of the dummy variable for the first quarter of 2006 is positive and significant for all equations while the effect of the dummy variable for the 2008 year crises is significant (with negative impact) only in one out of four equations in which it

was used.

The dummy variable for the 2008 year crises is not significant for the equations in which the host country's per capita GDP and GDP per capita differential are included. During the financial crises, there was a rapid fall in economic growth in the host country. The 2008 crises had an indirect impact on remittances by dramatically impacting the host country's economy.

Durbin-Watson d-statistics show that all values are close to 2 and the time series used in the equations do not suffer by reason of autocorrelation.

The Ramsey Regression Equation Specification Error Test (RESET) results show that no equation in the model has any misspecification problem, and the model has no omitted variables.

3.6 Summary of the Chapter

The conducted analysis shows that the main determinants of the trend of remittances for Tajikistan are the host country's per capita GDP growth and unemployment rate; the per capita GDP differential between the host and home countries; and the overall environment in the host and home countries.

The host country's unemployment rate and per capita GDP growth indicate changes in the possibility of engaging of migrants in the labour market of the host country and the income available for the migrants. Hence, a better environment for migrants to engage in labour activity has a significant impact on their money transfers. Decreasing population and more favourable economic development in Russia compared to other countries of the CIS in the 2000s made the amount of immigrants and remittances to increase.

The dummy variables for the first quarter of 2006 year and the financial crises of 2008 year demonstrate the dependence of remittance flows on international economic environment, which influencing the economy of the host and home countries may affect the migrants' incomes and their financial behaviour.

The impact of the other variables on remittances is not significant. The insignificant impact of the average wage and the wage differential may be explained by the fact that these variables do not correctly illustrate the income of the migrants.

The interest rates and interest rate differential also have not significant effect, as migrants and their households use remittances mainly for consumption, and the savings are kept out of banks, because of lack of financial knowledge, mistrust in the banking system and religious attitude.

Impact of the host country's unemployment on remittances is similar to the results derived by Higgins et al. (2004). However, unlike Katseli and Glytsos (1986), Elbadawi and Rocha (1992), El-Sakka and Mcnabb (1999) inflation in the home country is not an important determinant of remittance inflows. Impact of GDP growth in the host country

is the same as predicted by other literature[62]. In this chapter positive and statistically significant impact of GDP per capita differential on remittances is found that makes the estimation results more informative.

Average wages, average wage differential, interest rates, interest rate differential and real exchange rate do not seem to be the important determinants of remittance inflows for the case of Tajikistan. However, the estimation results are different in the literature.

The special point of the model is the inclusion of two dummy variables, which demonstrates the dependence of remittance inflows on the economic situation in the host and home countries as well as the global economic environment. Furthermore, unlike the most of the literature quarterly time series are used in estimation, which made monitoring and estimation of changes within the year possible.

---

[62] Chamon et al. (2005), Browne and Mineshima (2007).

CHAPTER IV
THE IMPACT OF REMITTANCE INFLOWS ON ECONOMIC GROWTH

4.1 Preface

Despite of the fact that remittances constitute a large source of foreign exchange for many developing economies and promote private consumption significantly, the impact of remittances on economic growth is argued. This chapter focuses on the impact of remittances on economic growth for the case of Tajikistan. Referring to the theoretical and empirical studies an econometric model is formed and applied to empirical data. Considering the availability of the data and economic features of the country different forms of the main equation of the model are estimated.

4.2 Literature Review

Relationship between remittances and economic growth was addressed by many theoretical and empirical studies so far. Some of the distinguished researches are Faini (2002), Chami et al. (2003), Glytsos (2005), Giuliano and Ruiz-Arranz (2005), IMF (2005), Catrinescu et al. (2006), Ang (2007) and Mundaca (2009).

Faini (2002) applying panel data analysis finds a positive impact of remittances on economic growth in developing countries. According to the paper accumulation of assets by remittance receiving households positively affects economic growth, and a good political environment increases this effect[63].

Based on the data for 113 countries Chami et al. (2003) suggest that remittances are compensatory transfers and have a negative correlation with economic growth. Developing a model with panel data on remittances, the paper concludes that remittances may not serve as a source of capital for economic development. Furthermore, inflow of remittances may reduce labour force participation in the home country's labour market[64].

Glytsos (2005) builds a Keynesian type econometric model for investigating the impact of remittances on output as well as on consumption, investment and imports for five Mediterranean countries. The data used in calculations is annual data for the period 1969–1998. The paper suggests that impact of remittances on the economic growth depends on the use of remittances and expectations of remittance recipients. Based on their expectations and dependence on the amount of remittances, households may use them on consumption or investment[65].

Giuliano and Ruiz-Arranz (2005) based on panel data for 73 countries for the period of 1975–2002 relate the interaction between remittances and financial development to

---

[63] Faini (2002).
[64] Chami et al. (2003).
[65] Glytsos (2005).

their impact on economic growth. Given the difficulty of borrowing in developing countries, the paper explores the suggestion that remittances can solve the problem of shortage of financial development and promote economic growth. The study shows positive impact of remittances on economic growth in financially less-developed countries[66].

IMF (2005) using a standard cross-country growth regression framework for 101 remittance receiving countries for the period 1970–2003 finds no statistically significant and direct link between per capita GDP growth and remittances. However, the study proves strong impact of remittance flows on certain sectors, like construction[67].

Catrinescu et al. (2006) applying data for 114 countries during the period of 1991–2003 and panel data analysis find weak but positive impact remittances on long-term macroeconomic growth. The paper suggests that good economic policy may increase long-term development impact of remittance flows[68].

Ang (2007) has attempted to show the relationship between remittances and economic growth for the case of the Philippines at the national and regional levels. Regardless of lack of consistent data sets the paper finds that at the national level remittances influence economic growth positively and significantly. However, analysis at the regional level found mixed results[69].

Mundaca (2009) assessing the impact of remittances and financial intermediation on growth for remittance receiving countries of Latin America and the Caribbean finds that remittances can have significant and positive long-run effects on economic growth. The paper concludes that available financial services lead to better use of remittances and increase positive impact of remittances on economic growth[70].

The impact of remittances on growth for the case of Tajikistan is not researched properly yet. The reason is the shortage of data on remittances and poor quality of national statistics.

Some survey based papers comparing trends in macroeconomic indicators have suggested the possibility of positive or negative impact of remittances on economic growth.

Hakimov and Mahmadbekov (2009) suggest that remittances appreciating national currency have led to "Dutch disease" and should have a negative effect on economic growth[71]. Though, they did not confirm their suggestion by empirical data. On the other hand, the real exchange rate of national currency is depreciating for the period of

---

[66] Giuliano and Ruiz-Arranz (2005).

[67] IMF (2005).

[68] Catrinescu et al. (2006).

[69] Ang (2007).

[70] Mundaca (2009).

[71] Hakimov and Mahmadbekov (2009).

increase in remittances, not appreciating.

Umarov (2010) considers that remittances have direct and positive effect on households' consumption and savings and indirect and positive effects on economic growth[72]. However, the paper did not use data for estimation and theoretically has suggested that increasing private demand has a multiplicative effect on the economy which leads to economic development. The paper notes the presence of "Dutch disease" in the economy referring to decrease of production of some agricultural products domestically and increase in imports of those products.

4.3 The Model

Based on the theoretical and empirical studies reviewed above and availability of data an econometric model for the case of Tajikistan is proposed in this section. Per capita GDP growth is used as dependent variable like Chami et al. (2003), Giuliano and Ruiz-Arranz (2005), IMF (2005) and Catrinescu et.al. (2006). Glytsos (2005) and Ang (2007) used GDP growth as dependent variable. The mentioned dependent variables are regressed on remittances, controlling for capital investment, FDI, inflation, labour[73], trade liberalization [74], government consumption, private consumption, financial development (credits to economy, money supply[75]), real effective exchange rate, trade deficit, ODA and the lagged value of the dependent variable.

Capital investment and the lagged value of the dependent variable were included as a control variable in many researches[76].

Capital investment revealed to have a positive and significant impact on economic growth almost for all studies.

The impact of the lagged value of the dependent variable is estimated to be negative and significant by Catrinescu et al. (2006), and Giuliano and Ruiz-Arranz (2005). However, Chami et al. (2003) demonstrates a positive and significant relationship between the initial and current values of the dependent variable.

Some studies have included trade liberalization, inflation, labour and financial development into the model[77]. The impact of inflation on economic growth seems to be negative in general while the impact of other variables is not similar for all cases.

The main equation used in calculation has the form of

$$\Delta lnY_t = \beta_0 + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta lnR_t + \beta_3 \Delta lnI_t + \beta_4 \Delta X_t \qquad (4.1)$$

---

[72] Umarov (2010).

[73] Ratio of economically active population to permanent population.

[74] Ratio of foreign trade to GDP.

[75] M2.

[76] Chami et al. (2003), Giuliano and Ruiz-Arranz (2005) and Catrinescu et al. (2006).

[77] Ang (2007), Mohamed (2009), Ramirez and Sharma (2009).

Y is GDP per capita or GDP, Y_{t-1} is the initial value of the dependent variable, R stands for remittances, and I is capital investment. X stands for other control variables. βo is the intercept and βn (where n = 1, 2, 3…) shows a change in the dependent variable from a unit change in an explanatory variable. Subscript t is for the time.

4.4 Data Specification

4.4.1 General Features

Data used in calculations are quarterly time series for 2003q1–2011q4. All data are real values in constant prices of the first quarter of 2010. The data are seasonally adjusted (with Census X12, multiplicative). For the labour, ratio of economically active population to all population is used. WB and the CBRF are the sources of data on remittances. The ODA data is also from WB WDI. The remained data is based on raw data of national statistics of Tajikistan[78].

4.4.2 Summary Statistics

Summary statistics for the data used in calculations are presented in Table 4.1.

Table 4.1 Summary Statistics

Variable	Measure	Observations	Mean	Std. Dev.	Min	Max
GDP	mln. USD	36	1008.19	381.55	398.84	1742.42
GDP per capita	USD	36	138.29	45.98	60.99	223.10
Remittances	mln. USD	36	364.30	238.23	34.36	737.81
Investment	mln. USD	36	154.97	103.57	20.06	386.52
FDI	mln. USD	36	44.95	78.66	-16.88	291.34
Prices	Index	36	92.22	8.43	80.50	105.87
Labour	Rate	36	0.286	0.006	0.278	0.299
Trade liberalization	Rate	36	0.922	0.192	0.558	1.202
Government consumption	mln. USD	36	243.68	134.24	57.42	476.46
Private consumption	mln. USD	32	319.21	101.86	148.09	454.26
M2	mln. USD	36	345.98	259.35	2.07	63.79
REER	Index	36	132.27	28.24	90.08	187.77
Trade deficit	mln. USD	36	257.42	169.59	6.58	539.47
ODA	mln. USD	32	75.48	20.50	39.70	109.22

Source: TAJSTAT, NBT, WB and CBRF

GDP, remittances, capital investment, FDI, government consumption, aggregate

---

[78] TAJSTAT and NBT.

private consumption, M2, trade deficit and ODA are in million USD. GDP per capita is in units of USD. Prices and real exchange rate are the indices of the base period. Trade liberalization and labour are rates. All date are the average monthly data for the given quarter, except for the M2, which is the data for the end of each quarter.

Considering the large standard deviation of some variables logarithmic forms of them are used in calculations. Furthermore, taking into account the non-stationarity of the levels the first differences are used in estimation.

Correlation matrix for the times series is presented in Table 4.2. According to the matrix GDP and GDP per capita are positively correlated with remittances. Their correlation with capital investment, prices, government consumption, private consumption, M2, trade deficit and ODA is also positive.

Table 4.2 Correlation of GDP and GDP per Capita with Explanatory Variables

	GDP	GDP per capita	Remittances	Investment	FDI	Prices	Labour	Trade liberalization	Govern. consumption	Private consumption	M2	REER	Trade Deficit	ODA
GDP	1													
GDP per capita	0.999	1												
Remittances	0.940	0.947	1											
Investment	0.947	0.951	0.930	1										
FDI	-0.007	0.015	0.119	0.032	1									
Prices	0.989	0.983	0.924	0.920	-0.054	1								
Labour	-0.273	-0.255	-0.145	-0.271	0.216	-0.299	1							
Trade liberalization	-0.762	-0.743	-0.549	-0.660	0.297	-0.781	0.393	1						
Govern. consumption	0.952	0.953	0.927	0.945	-0.027	0.946	-0.250	-0.707	1					
Private consumption	0.994	0.994	0.948	0.937	0.009	0.984	-0.235	-0.735	0.947	1				
M2	0.962	0.953	0.891	0.915	-0.119	0.975	-0.407	-0.793	0.939	0.949	1			
REER	-0.958	-0.954	-0.919	-0.868	-0.021	-0.966	0.176	0.715	-0.906	-0.957	-0.918	1		
Trade deficit	0.910	0.917	0.894	0.923	0.000	0.893	-0.299	-0.636	0.934	0.923	0.905	-0.818	1	
ODA	0.755	0.738	0.528	0.617	-0.205	0.774	-0.385	-0.834	0.660	0.747	0.744	-0.739	0.623	1

Source: TAJSTAT, NBT, WB and CBRF

Correlation of depended variables with trade liberalization and real effective exchange rate appreciation is negative. The dependent variables are weakly and negatively correlated with FDI and labour.

Positive correlation of GDP and GDP per capita with remittances is a sign of positive impact of remittances on economic growth. However, applying econometric model to empirical data this relationship should be verified.

Correlation of GDP and GDP per capita with capital investment, private consumption and ODA is as expected. All other explanatory variables have questionable correlation with GDP and GDP per capita. In order to analyse the

relationship of the dependent variables with the independent variables properly the time series are adjusted for application in OLS regressions; first, the trends in the main variables are compared, and then, the time series are tested for presence of unit root.

Figure 4.1 Evolution of Remittances, GDP and GDP per Capita
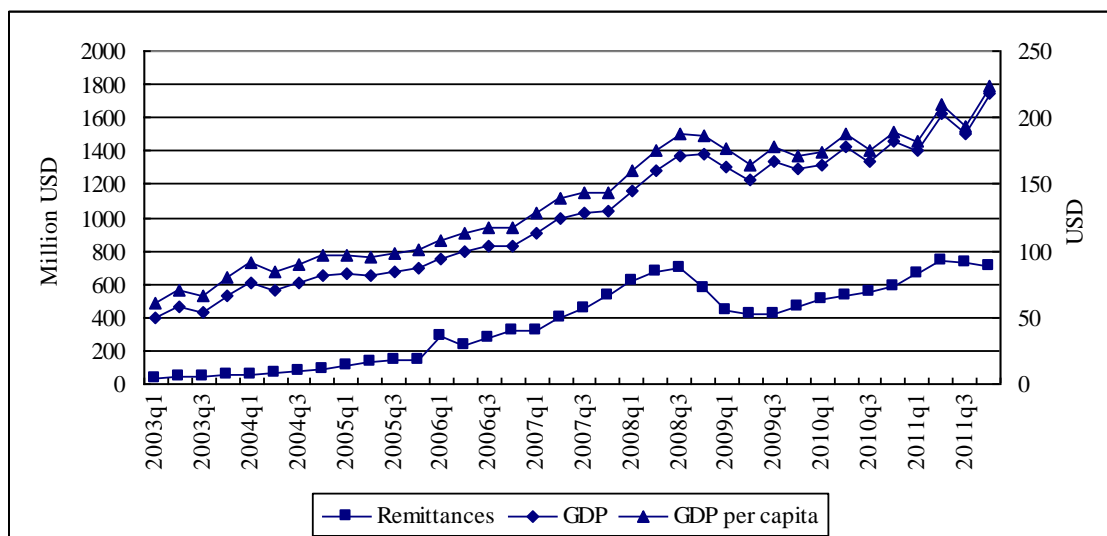
Evolution of GDP, GDP per capita and remittances is shown in Figure 4.1. GDP and remittances are measured by the left side vertical axis. GDP per capita is measured by the right side axis. As GDP and GDP per capita have similar trends, the impact of explanatory variables on them will be similar. That is why only the impact of explanatory variables on GDP per capita is explained in this chapter. The regression results for GDP as a dependent variable are presented in Table A4 of Appendix.

Remittances explain a great percentage of GDP. The trend of remittances is similar to GDP and GDP per capita. The similarity in trends demonstrates certain relationship between remittances and GDP and GDP per capita. Remittances, GDP and GDP per capita fell from the fourth quarter of 2008 to the second quarter of 2009 because of the international financial crisis. For the same period most of the explanatory variables like capital investment, FDI, trade liberalization, government consumption, private consumption and trade deficit also fell. That is why dummy variable for the financial crises of 2008 is not included into the model.

Comparison of remittances with FDI and ODA (Figure 4.2) shows that remittance inflows are significantly large and sustained. FDI and ODA were equal to 23.0% and 44.8% of remittances in average for 2002–2011 and 12.5% and 18.9% of remittances for 2006–2011 appropriately. That is why the impact of remittances on economic growth is expected to be stronger than the impacts of FDI and ODA.

Figure 4.2 Remittances, FDI and ODA

(million USD)
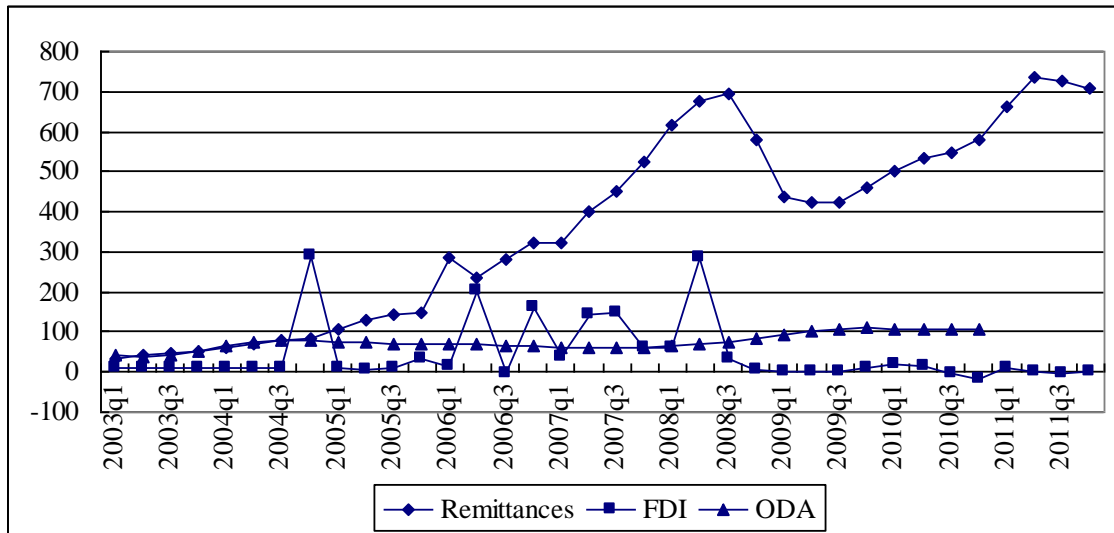
4.4.3 Unit Root Tests

Considering the presence of unit root in the levels, the first differences are used in regression analysis. The first differences are cointegrated and do not surfer by autocorrelation. The results of the Augmented Dickey–Fuller test for unit root are presented in Table 4.3.

Table 4.3 Unit Root Test

Variables	Levels		First differences	
	ADF	ADF	ADF	ADF
	Lags: 0	Lags: 1	Lags: 0	Lags: 1
ln GDP	-1.542	-1.546	-8.155***	-4.356***
ln GDP per capita	-1.617	-1.582	-8.162***	-4.361***
ln Remittances	-2.391	-2.384	-5.817***	-3.162**
ln Investment	-2.097	-2.009	-5.832***	-4.158***
ln FDI	-3.832***	-2.292	-9.934***	-6.105***
Prices	0.729	0.083	-4.010***	-3.565**
Labour	-2.354	-1.955	-6.891***	-5.764***
Trade liberalization	-1.178	-0.617	-7.097***	-4.870***
ln Govern. consumption	-1.834	-1.633	-6.744***	-3.815***
ln Private consumption	-3.154**	-2.236	-3.384**	-2.507
ln M2	-0.339	-0.547	-6.152***	-4.421***
REER	-1.430	-0.617	-6.656***	-4.345***
ln Trade deficit	-2.074	-3.132**	-12.291***	-3.599**
ln ODA	-1.790	-4.185***	-1.638	-3.636**

Note: ***Smaller than the critical value at 1% significant level; **Smaller than the critical value at 5% significant level; *Smaller than the critical value at 10% significant level

4.5 Empirical Findings

The results of the regression are presented in Table 4.4. Four special forms of the main equation of the model are estimated. The same estimations are done for GDP as a dependent variable, too. The results are presented in Table A4 of Appendix. The regression results for the both cases are remarkably similar to each other.

Initial value of the dependent variable has a negative and statistically significant impact on per capita GDP. The impact is strong for the equations without aggregate private consumption (significant at 1% level) and weak in the equations with aggregate private consumption (significant at 10% level).

The first two equations show a positive and statistically significant (at 5% level) impact of remittances on per capita GDP (equations 1 and 2). A 1% increase in remittances is associated with a 0.13–0.15% increase in per capita GDP. The third and fourth equations include aggregate private consumption. Inclusion of the aggregate private consumption into the model makes the impact of remittances insignificant. It can be explained by the fact that remittances are private money transfers and affect other variables mainly through their impact on private consumption[79]. The impact of

---

[79] Positive impact of remittances on private consumption is demonstrated in Chapter 6.

private consumption on GDP per capita is positive and strongly significant (at 1% level). A 1% increase in aggregate private consumption is associated with 1.28–1.29% increase in per capita GDP (equations 3 and 4).

Table 4.4 Regression Results, Dependent Variable – GDP per Capita

Independent Variables	Equations			
	1	**2**	**3**	**4**
Δ ln GDP per capita lagged	-0.3749 (-3.11***)	-0.3749 (-2.98***)	-0.2969 (-1.70*)	-0.2965 (-1.73*)
Δ ln Remittances	0.1502 (2.57**)	0.1344 (2.29**)	0.0054 (0.09)	
Δ ln Investment	0.1381 (3.34***)	0.1368 (3.14***)		
Δ ln FDI	0.0075 (0.85)			
Δ Prices		0.0115 (0.68)		
Δ Labour		-0.8960 (-0.50)		
Δ Trade liberalization	-0.3890 (-4.44***)	-0.3707 (-4.05***)		
Δ ln Government consumption		0.0398 (0.69)		
Δ ln Private consumption			1.2792 (4.75***)	1.2883 (5.28***)
Δ ln M2	0.0890 (1.49)			
Δ REER		0.0035 (1.59)		
Δ ln Trade deficit			-0.0419 (-2.18**)	-0.0420 (-2.23**)
Δ ln ODA			0.0675 (0.47)	0.0635 (0.48)
Constant	0.0138 (1.21)	0.0197 (1.18)	0.0028 (0.23)	0.0031 (0.26)
R-squared	0.6349	0.6490	0.5748	0.5747
F statistics	7.83	5.78	6.49	8.45
LM test chi2 (P>chi2)	0.000 (0.9996)	0.199 (0.6557)	1.328 (0.2491)	1.343 (0.2465)
RESET (F value)	1.35 (0.2830)	1.16 (0.3490)	0.99 (0.4158)	1.05 (0.3893)
Observations	34	34	30	30

Note: "***" significant at 1% level, "**" significant at 5% level, "*" significant at 10% level

Gross capital formation has positive and statistically significant impact (at 1% level) on GDP per capita.

Other variables with statistically significant impacts are trade liberalization and trade deficit. Both variables affect per capita GDP negatively. The impact of trade liberalization is significant at 1% level and the impact of trade deficit at 5% level.

The impact of other variables on economic growth is not statistically significant. The point that should be noticed is the impact of FDI and ODA on economic growth. According to the literature the impact of FDI on economic growth is mostly positive

and significant[80] while the impact of ODA is mixed[81]. Estimation results for the case of Tajikistan show that both variables have positive, but insignificant impact on economic growth. The impact of ODA is stronger as compared with FDI. Figure 4.2 shows that FDI inflow is not continuous, and the volume of ODA is not large. These may be of the reasons explaining the insignificancy of their impacts. On the other hand, the form and the way of use of FDI and ODA are different as compared with remittances. Unlike FDI and ODA, remittances are international currency sent to households and increase the domestic demand affecting private consumption.

Breusch-Godfrey test shows that the time series in the equations do not suffer by autocorrelation.

The Ramsey Regression Equation Specification Error Test (RESET) results show that no equation in the model is mis-specified, and the model has no omitted variables.

4.6 Summary of the Chapter

Regardless of the poor quality of the data presented by national statistics, for the first time the impact of remittances on economic growth for Tajikistan is assessed.

The empirical results show positive and significant impact of remittances on economic growth. The significant and positive effect of aggregate private consumption on economic growth demonstrates the indirect and multiplier effect of remittances on the overall economy. An increase in the marginal propensity to import decreases multiplier effect of remittances on the economy, while an increase in the marginal propensity to consumption and investment increases their overall effect[82].

The positive and statistically significant impact of capital formation shows the increasing return to capital investment in the country. The insignificancy of FDI in the model is probably related with the small size of FDI for most of the quarters under estimation. ODA also is not so large as compared with remittances or GDP. Furthermore, the high level of corruption in the country may influence the development capacity of this assistance.

The main contribution of this section is demonstration of stronger and significant impact of remittances on economic growth as compared with FDI and ODA. Considering an indirect impact of remittances on GDP through private consumption, the impact of remittances on economic growth may be even stronger. However, taking into account a negative impact of trade liberalization and trade deficit, which are caused by an increase in remittances and further increase in import, the negative impact of remittances growth in the previous quarter on the economic growth in the current

---

[80] For literature on impact of FDI on economic growth, see Agrawal and Khan (2011).
[81] For literature on impact of ODA on economic growth, see Ekanayake and Chatrna (2010).
[82] Glytsos (2005).

quarter is found out[83]. On the other hand, the impact of one quarter lagged economic growth on the current quarter's economic growth also is negative, which increases the negative impact of the previous quarter's remittances growth on the current quarter's economic growth. Considering all direct and indirect impact of the current and the previous quarters' remittances' growth on economic growth of the current quarter, the impact of remittances on economic growth may be weaker.

---

[83] A positive impact of previous quarter's remittances growth on import growth of the current quarter is demonstrated in the next chapter.

CHAPTER V
LABOUR MIGRATION AND IMPORT DEMAND: THE IMPACT OF REMITTANCE INFLOWS

5.1 Preface

Tajikistan's small and open economy is highly dependent not only on remittance inflows from migrants, but also on imports. The volume of remittances and imports that flow into the country has climbed steadily in the last 10 years, and the share of these remittances and imports in the economy has increased.

Since the post-war economy of Tajikistan, characterized by poor business conditions and migration of the most active part of the labour force, was not able to meet a majority of the domestic demand, the huge inflow of international currency (remittances) and growth in domestic demand led to a large increase in imports.

During the period of increasing inward remittances, the value of imports for both consumer and industrial goods continued to increase, but the share of consumer goods continued to increase and that of industrial goods decreased. According to TAJSTAT data, the share of consumer goods in imports increased from 18.9% to 26.4% during the period 2002–2007, which was the period of rapid increase in remittances.

This chapter examines the impact of remittance inflows on imports. As remittances constitute private money inflows that increase domestic demand, an increase in remittances may cause an expansion of imports. In order to estimate the impact, the trends of imports and the related macroeconomic variables are reviewed; the time series are analyzed and a multiple regression analysis is conducted. The derived results will help better understanding of the impacts of remittances on other macroeconomic variables like economic growth, private consumption and savings.

5.2 Literature Review

Most of the econometric studies of import demand such as Leamer and Sterm (1970), Murray and Ginmam (1976), Goldstein and Khan (1985), Dornbusch (1988), Hooper and Marquez (1993), Bertola and Faini (1991), Faini et al. (1988) and Carone (1996) have defined aggregate imports as a function of the relative price of imports and real domestic income. Mathematically, this function can be written as

$$M_t = f(Y_t, RP_t) \qquad (5.1)$$

where M is the quantity of real import, Y the real domestic income, and RP the relative price or the ratio of the imports prices to the domestic price level. t stands for time.

Usually, the log-linear form of equation 5.1 is used in the calculation as shown below:

$$ lnM_t = \beta_0 + \beta_1 lnY_t + \beta_2 lnRP_t + \varepsilon_t \qquad (5.2) $$

Based on the purpose of their research, some studies have incorporated additional variables into the model, such as lagged value of the variables[84], GNP[85], foreign exchange inflows[86], foreign exchange reserves[87], real exchange rate[88] and import tariffs[89].

Most of researches related with macroeconomics of remittances have used simple Keynesian type multiplier to estimate the impact of remittances on consumption, investment, imports; and remittances multiplier effect on the overall economy[90]. Unlike the existed researches, this chapter incorporating remittances into the import demand function and applying the function to quarterly time series focuses on the impact of remittances on imports.

5.3 The Model

The main equation of the model is constructed extending equation 5.2 by inclusion of remittances and other related macroeconomic variables like the ratio of foreign trade to domestic income (trade openness) as a proxy for import tariffs and the real effective exchange rate (REER). Considering the presence of unit root in the levels and the non-stationarity of the levels, the first differences are used in estimations. The model has the following form

$$ \Delta lnM_t = \beta_0 + \beta_1 \Delta lnY_t + \beta_2 \Delta RP_t + \beta_3 \Delta lnR_t + \beta_4 \Delta OP_t + \beta_5 \Delta REER_t \quad (5.3) $$

The real domestic income (Y), remittances (R), REER and trade openness (OP) are expected to have a positive impact on imports (M). The expected impact of an increase in the relative price of imports (RP) should be negative; however, for some developing countries like Tajikistan it can be positive. Since one quarter is not enough for remittances to show an impact on other macroeconomic variables, the one-period lagged value of remittances is incorporated into the model, too.

---

[84] Leamer and Sterm (1970) and Faini et al. (1988).
[85] Leamer and Sterm (1970), Murray and Ginmam (1976).
[86] Faini et al. (1988).
[87] Leamer and Sterm (1970) and Faini et al. (1988).
[88] Dornbusch (1988), Bertola and Faini (1991).
[89] Bertola and Faini (1991).
[90] Stahl and Habib (1989), Nishat and Bilgrami (1991) and Glytsos (1993).

5.4 Data Specification

The data used in calculations are quarterly time series data for 2003q1–2011q4. TAJSTAT and NBT are the main sources of data. WB and CBRF are the sources of data on remittances. The data for imports, GDP and remittances are the real data at constant prices of the first quarter of 2010. REER, trade openness and relative imports price are also based on the first quarter of 2010. All data are seasonally adjusted (with Census X12, multiplicative).

Table 5.1 Summary Statistics

Variables	Measure	Observations	Mean	Std. Dev.	Min.	Max.
Import	mln. USD	36	564.733	187.681	233.854	889.18
GDP	mln.USD	36	1008.193	381.552	398.84	1742.421
Relative price	Rate	36	0.9334	0.0564	0.8328	1.0309
Remittances	mln. USD	36	364.2959	238.2263	34.3583	737.8116
Openness	Rate	36	0.9224	0.1916	0.5576	1.2024
REER	Index	36	132.26	28.24	90.08	187.77

Source: TAJSTAT, NBT, CBRF and WB

Summary statistics for the data are presented in Table 5.1. Import, GDP and remittances are in million USD. Relative price of imports and trade openness are rates. REER is index. Considering large standard deviation for import, GDP and remittances the logarithmic form of them will be used in estimations.

Table 5.2 Correlation of Import with Explanatory Variables

Variables	Import	GDP	Relative price	Remittances	Openness	REER
Import	1.000					
GDP	0.888	1.000				
Relative price	0.727	0.928	1.000			
Remittances	0.951	0.952	0.835	1.000		
Openness	-0.498	-0.815	-0.868	-0.644	1.000	
REER	-0.866	-0.965	-0.941	-0.940	0.767	1.000

Source: TAJSTAT, NBT, CBRF and WB

Correlation matrix for import and other variables used in the model is presented in Table 5.2. Import is positively correlated with GDP, the relative prices of imports and remittances and negatively correlated with trade openness and real effective exchange rate.

Increase in GDP will increase import demand. That is why the correlation of imports

with remittances is similar to the theoretical expectations.

Positive correlation of imports with the relative price of imports is arguable.

Table 5.3 Import of the Main Industrial and Consumer Goods

Goods	Imports Share		Price		Imported Volume	
	2005	2010	2005	2010	2005	2010
Alumina	27.20%	11.90%	453.0$	450.0$	798691	708218
Oil	9.48%	16.30%	409.4$	691.9$	308069	627687
Grain	2.30%	3.07%	106.3$	184.8$	288577	442811
Flour	3.41%	3.68%	131.2$	264.5$	346334	370292

Source: TAJSTAT

Note: Imported volume is in tons

Theoretically increase in the relative price of imports should affect import negatively. However, the information about changes in volume and prices of the main imported products (Table 5.3) show that the imported volume of some products has increased despite the increase in the price.

Positive correlation of imports with remittances may demonstrate a positive impact of remittances on imports. Confirmation of this suggestion with empirical data is of the main purposes of this chapter.

Negative correlation between imports and trade openness may be related with an increase in GDP and decrease in exports for the period of increase in imports. Trade openness is defined as the ratio of foreign trade to GDP. The fact that trade openness falls while import is increasing may mean that GDP increases much more or export decreases.

While REER appreciates the import is expected to increase. That is why the correlation between these variables should be positive.

In order to estimate the impact of remittances and other explanatory variables on imports properly, as in the past chapters, the trends in the variables are compared, the time series are checked for the presence of unit root, autocorrelation, and adjusted for OLS estimation.

Figure 5.1 shows the evolution of the variables used in the model. All variables show increasing trends, except REER, which has a decreasing trend and trade openness, which is fluctuating and decreasing slightly after 2008.

Import, GDP and remittances fell in the second half of 2008 and the first half of 2009 as the result of the world financial crises. Considering the decline in imports caused by financial crises of 2008 a dummy variable is incorporated into the model.

Figure 5.1 Model Variables

Imports

GDP

Relative price

Remittances

REER

Trade openness
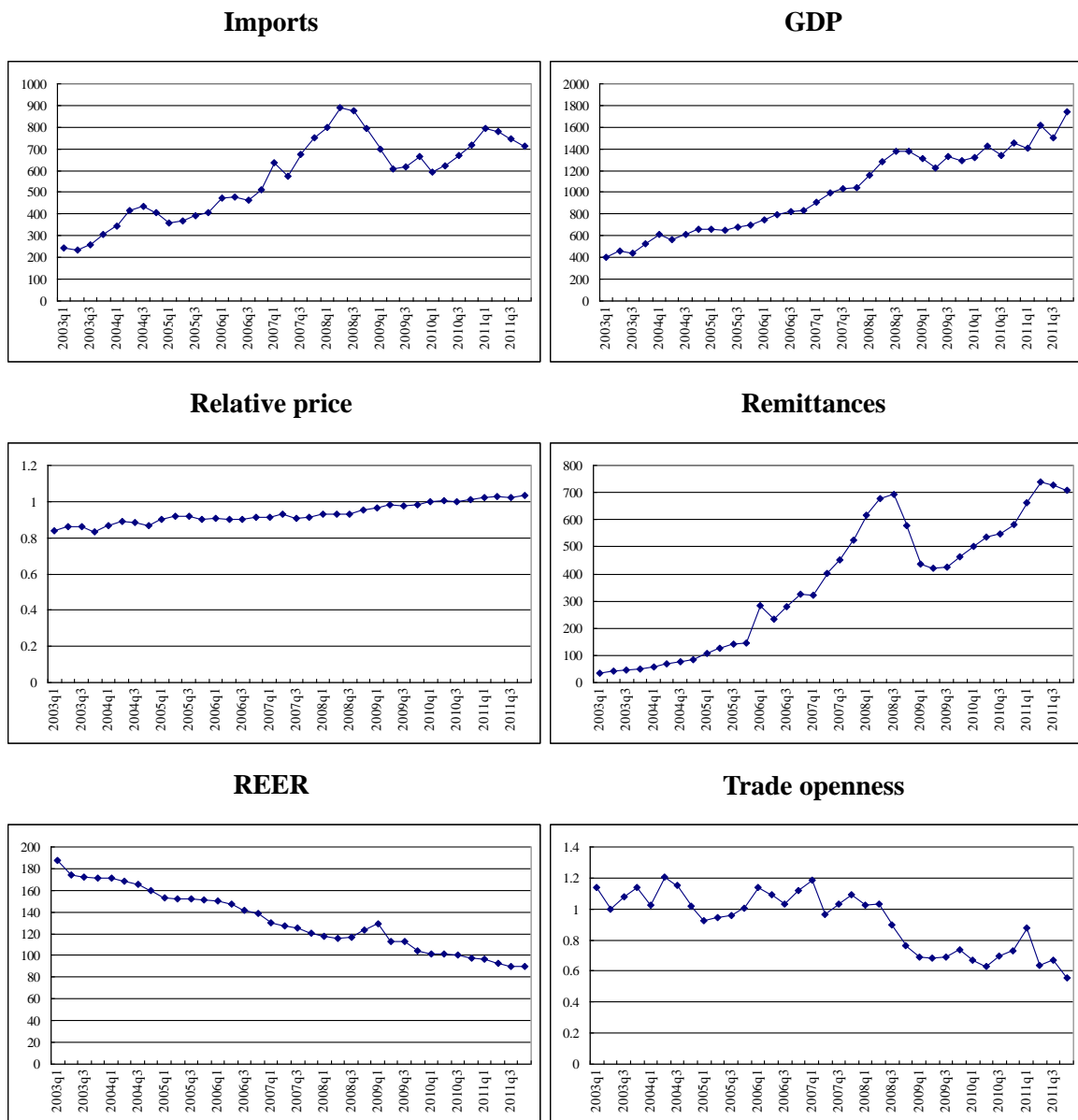
Note: The graphs show quarter on the horizontal axis for all variables; million USD on the vertical axis for imports, GDP and remittances; index for REER; rates for relative price and openness

As it was mentioned above, considering the presence of unit root in the levels, the first differences of all variables are used in ordinary least square (OLS) regression. The first differences are co-integrated and stationary. The results of the Augmented Dickey-Fuller (ADF) test for unit root reject the null hypothesis of the existence of unit root and show that the series are stationary (Table 5.4).

Table 5.4 Unit Root Test

Variables	Levels		First differences	
	ADF	ADF	ADF	ADF
	Lags: 0	Lags (1)	Lags (0)	Lags (1)
ln Import	-2.064	-2.570	-4.395***	-3.417**
ln GDP	-1.542	-1.546	-8.155***	-4.356***
Relative price	-0.602	-0.203	-6.642***	-7.214***
ln Remittances	-2.391	-2.384	-5.817***	-3.162**
Openness	-1.178	-0.617	-7.097***	-4.870***
REER	-1.430	-0.617	-6.656***	-4.345***

Note: ***Smaller than the critical value at 1% significant level; **Smaller than the critical value at 5% significant level; *Smaller than the critical value at 10% significant level

5.5 Empirical Findings

OLS regression is run in order to test the influence of each explanatory variable on the dependent variable. Ultimately, the regression model is tested for serial correlation and presence of heteroskedasticity. The results of the regression for the model are presented in Table 5.5.

Ignorance of stationarity of the data shows that income and relative price significantly affect imports. However, the co-integration approach shows that the impact of the real income on imports is positive and statistically significant at the 1% level while that of the relative price of imports is positive and insignificant. A 1% increase in GDP growth is associated with 0.70%–0.77% increase in imports.

The impact of the present-period remittances on imports is positive and statistically insignificant. This can be explained by the fact that it takes time for remittances to be exchanged, become available to foreign trade agents and to be used. Consequently, the impact of one-period lagged remittances on imports is positive and statistically significant (at the 10% level). According to the regression results, a 1% increase in remittances growth in the previous quarter increases the imports in the current quarters at least by 0.10%.

Trade openness has affected imports positively. The impact is statistically significant at the 1% level. A unit increase in trade openness is associated with an average of 86.1%–91.7% percent increase in imports. The positive impact of trade openness implies that while the domestic economy is not able to meet a significant share of domestic demand and there are no considerable barriers restricting imports, the increasing domestic demand will lead to a considerable increase in imports. Trade openness is a good proxy for import tariffs, especially for the case of Tajikistan, where import of the main industrial and consumer goods is monopolised, and the officially reported tariffs do not illustrate the reality.

Table 5.5 Regression Results, Dependent Variable – Import

Independent Variables	Equations					
	1	2	3	4	5	6
	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients
	(t value)	(t value)	(t value)	(t value)	(t value)	(t value)
Δ ln GDP	0.7252 (4.44***)	0.7455 (4.49***)	0.6996 (4.37***)	0.7707 (5.28***)	0.7751 (5.41***)	0.741 (5.36***)
Δ Relative price	0.3487 (0.47)	0.3690 (0.49)		0.4942 (0.70)	0.4954 (0.71)	
Δ ln Remittances	0.0438 (0.65)	0.0394 (0.53)	0.0551 (0.78)			
Δ ln Remittances (lagged)	0.1171 (1.93*)	0.1259 (1.88*)	0.1170 (1.70*)	0.1140 (1.91*)	0.1181 (2.04*)	0.1097 (1.86*)
Δ Openness	0.8826 (7.34***)	0.8885 (7.21***)	0.8605 (7.59***)	0.9174 (8.60***)	0.914 (8.73***)	0.8914 (9.00***)
Δ REER	0.0012 (0.53)		0.0013 (0.54)	0.0009 (0.39)		0.0009 (0.39)
D2008		0.0050 (0.13)	0.0024 (0.06)			
Constant	0.0031 (0.22)	-0.0018 (-0.11)	0.0044 (0.24)	0.0040 (0.29)	0.0013 (0.11)	0.0077 (0.61)
R-squared	0.7846	0.7825	0.7829	0.7812	0.7801	0.7774
F-statistics	16.39	16.19	16.23	20.00	25.71	25.32
DW d-statistics	1.93	1.90	1.90	1.96	1.93	1.93
RESET (F value)	0.94 (0.4355)	0.88 (0.4636)	1.06 (0.3832)	0.33 (0.8053)	0.34 (0.7955)	0.40 (0.7529)
Observations	36	36	36	36	36	36

Note: "***" significant at 1% level, "**" significant at 5% level, "*" significant at 10% level

The impact of REER is not significant. It seems the fluctuations in imports are not affected by the changes in the real effective exchange rate of the national currency. It might be related with a high level of money supply for the period 2003–2011.

Despite of the fact that imports fell when the 2008 year financial crisis occurred, the effect of the dummy variable for the crises is not significant. This can be explained by the fact that there was a similar fall in other macroeconomic variable, like GDP and remittances, for the crises period. That is why the effect of the dummy variable for the 2008 financial crises on imports became insignificant.

The value of R-squared is equal to 0.77–0.78, thereby indicating that the percentage of variance in imports, which is explained by the independent variables, is sufficiently high, and the outcomes are well predicted by the model. Moreover, F-statistics are significant.

The Durbin-Watson d-statistics show that all values are remarkably close to 2, and the time series used in the equations are not affected by autocorrelation.

The results of the Ramsey Regression Equation Specification Error Test (RESET) show that all the equations in the model have no misspecification problem, and the model has no omitted variables.

5.6 Summary of the Chapter

This chapter demonstrates that an increase in the real amount of imports and remittances against a small increase in exports causes the economy to become more dependent on imports and remittances, and hence vulnerable to external shocks. Imports increase following a rise in domestic demand, which is caused by an increase in the real domestic income and remittance inflows. A comparative study and regression analyses prove that remittances have significant impacts on imports. The impact of remittances on imports might be stronger if the impact of remittances on the real domestic income and its indirect impact on imports via the increase in the real domestic income are taken into account.

An increase in imports caused by remittances can be interpreted in different ways. An increase in import of industrial goods promotes development of the domestic economy, while an increase in import of consumer goods enables meeting of domestic demand. On the contrary, increase in the marginal propensity to import decreases the multiplier effect of remittances on the overall economy. Increasing negative foreign trade balance has an unfavourable effect on the economy in the long run. Furthermore, the economic policy of Tajikistan does not protect local producers against foreign competitors. The poor business conditions in the country, characterized by a high level of taxes and additional administrative obligatory payments, make the local producers less interested in economic activities. This is the reason for the overall increase in the share of imported industrial and consumer goods in the economy while the share of domestically produced products decreases.

In order to maximize the positive impacts of remittance inflows on the overall economy, the government should establish a long-run policy on stimulating private savings and supporting the domestic production of goods and services. Such a policy would increase the profitability of remittances and might be a key solution to the gradual decrease of the negative foreign trade balance.

CHAPTER VI
THE IMPACT OF REMITTANCE INFLOWS ON PRIVATE CONSUMPTION AND SAVINGS

6.1 Preface

Remittances are private money transfers and support consumption and savings of remittance-receiving households. This chapter demonstrates how the households' expenditure structure changed for the period of 2002–2010 – the period of increase in remittance inflows. First, using the annual data of the national statistics the trends in aggregate expenditure and aggregate savings of the population are analysed. Then, with use of WB surveys consumption expenditures and investment expenditures for households with remittances and households without remittances are compared. Unlike the past chapters, quarterly data is not available for conduction of time series analysis.

6.2 Literature Review

As the overall impacts of remittances on an economy depend on behaviours and preferences of the remittance-receiving households, the effect of remittances on households' expenditure and savings is widely addressed by the literature. An increase in overall consumption, a decrease in consumption expenditures share and an increase in investment expenditures share, including expenditures on education and health, are of the main results of impact of remittance inflows determined by the literature.

Adams (2005) analysing impact of internal and international remittances for the case of Guatemala shows that households with international remittances spend relatively less on food consumption, and households with either internal or international remittances expend more on education and housing in comparison with households without remittances[91].

Castaldo and Reilly (2007), investigating the impact of domestic and international remittances on consumption patterns of Albanian households, have found that the consumption pattern of households with and without remittances is not statistically different. However, households with international remittances have a lower share of food expenditure and a higher share of durables goods expenditure[92].

Acosta et al. (2008), conducting a comparative analysis for Latin-American countries, demonstrate that households with remittances have reduced food expenditures and increased expenses for nondurable goods, durable goods, housing, education and health[93].

Some studies have focused primarily on the impact of remittances on human capital

---

[91] Adams (2005).
[92] Castaldo and Reilly (2007).
[93] Acosta et al. (2008).

investment – education and health expenditures of households. According to Adams (2005), Kifle (2007) and Acosta et al. (2008) households with remittances have comparatively more expenditure on education. However, Cattaneo (2010) argues for absence of a significant impact of remittances on education expenditure[94]. The studies like Adams (2005), Cardona Sosa and Medina (2006), and Amuedo-Dorantes et al. (2007) demonstrate the increase in health expenditures caused by remittances.

There are some researches related with impact of remittances on households' expenditures for the case of Tajikistan, too. Mughal (2007), analysing migration, remittances and living standards based on a Living Standards Measurement Survey conducted by IOM in Khatlon region of Tajikistan, shows that 86.0% of remittances are used for basic current consumption[95]. According to Brown et al. (2008) households receiving remittances use 91.9% of their expenditures for payment of basic current consumption[96].

A comprehensive study of impact of remittances on household expenditure patterns for the case of Tajikistan is Clément (2011). Applying propensity score matching to the 2003 Tajikistan Living Standards Measurement Survey (TLSS 2003) the paper shows that external remittances have not a positive effect on investment expenditures of households and are used mainly for the provision of a basic level of consumption[97].

This chapter partly follows Clément (2011), but comparison analyses include the 2007 Tajikistan Living Standards Measurement Survey (TLSS 2007), too.

Relationship between remittances and education (school attendance) for the case of Tajikistan is researched by Nakamuro (2010). Applying an econometric model to Living Standards Measurement Survey of Tajikistan and Albania, the paper shows that children in households with remittances from abroad are more likely to attend school as compared with children from the households without remittances[98].

6.3 Evolution of Population's Expenditure Structure

The structure of population expenditures has considerably changed for the period of increase in remittances inflows. The real value of aggregate annual expenditure has increased by 3.6 times for the period of 2002–2010, including an increase in the purchase of goods and services by 2.9 times and compulsory payments and taxes by 7.1 times. For the same period the real value of annual changes in deposits and securities of population increased by 18.3 times (Table 6.1).

Population's total expenditures have increased from 42.2% of GDP in 2002 to 47.1% of GDP in 2010. The share of the private consumption (as % of GDP) has

---

[94] Cattaneo (2010).
[95] Mughal (2007).
[96] Brown et al. (2008).
[97] Clément (2011).
[98] Nakamuro (2010).

decreased by 4.9%, and the share of compulsory payments and taxes has increased by 8.3%.

**Table 6.1** Expenditure and Savings of Population

	2002	**2004**	**2006**	**2008**	**2010**
Total expenditures, million USD	737.735	1276.562	1645.245	2705.233	2644.728
on goods and services	616.829	1066.596	1301.602	1905.318	1790.023
compulsory payments and taxes	120.906	209.966	343.643	799.915	854.705
Increase in deposits and securities, million USD	12.377	28.800	128.605	108.119	226.841
Total expenditures, % of GDP	42.2	43.0	44.7	46.5	47.1
on goods and services	35.3	36.0	35.4	32.8	31.9
compulsory payments and taxes	6.9	7.1	9.3	13.8	15.2
Increase in deposits and securities, % of GDP	0.7	1.0	3.5	1.9	4.0

Source: TAJSTAT

Note: Constant prices of 2010

Figure 6.1 demonstrates the same data as population's budget share. According to the figure, purchase of goods and payment for services made 82.2% of budget of population in 2002 and 62.3% of it in 2010. The share of compulsory payments, taxes and gatherings increased from 16.1% in 2002 to 29.8% in 2010. Increase in savings (deposits and securities) made 1.7% of population's budget in 2002 and 7.9% of it in 2010.

Figure 6.1 Expenditure Shares of Population
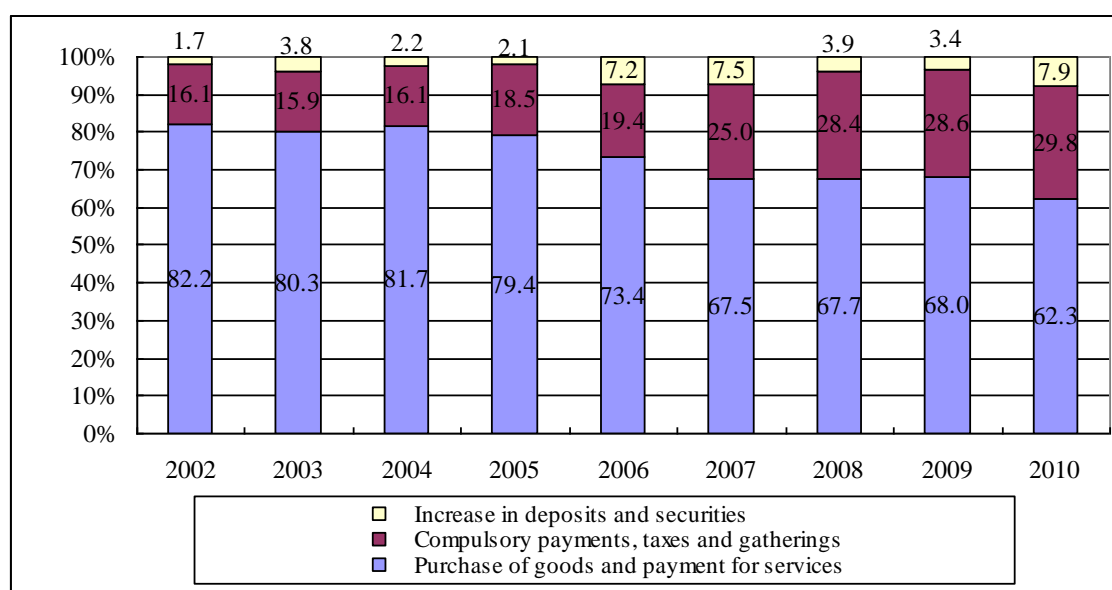
Source: TAJSTAT

Population have decreased consumption share of goods and services and has increased savings share. The burden of taxes and compulsory payments has increased.

The bad point is a continuous increase in share of taxes, payments and gatherings. Furthermore, the increase in share of savings was higher than 4.0% only for 2006, 2007 and 2010.

The real value of outstanding deposits of individuals in credit institutions increased by 35.2 times for 2002–2010, which was equal to 0.5% of GDP in 2002 and 5.9% of it in 2010. In 2002, 27.5% of deposits were saved in domestic currency and 72.5% of them in foreign currency. In 2010, the share of deposits saved in domestic currency made 18.2% and the share of deposits in foreign currency 81.9% (Table 6.2).

Table 6.2 Outstanding Volume of Deposits of Individuals in Credit Institutions

	2002	**2004**	**2006**	**2008**	**2010**
Total, million USD	9.485	52.221	110.728	237.777	333.573
in domestic currency (%)	27.50	17.24	16.39	16.55	18.22
in foreign currency (%)	72.50	82.76	83.61	83.45	81.78
Total as % of GDP	0.54	1.76	3.01	4.09	5.94

Source: NBT

The above analysis demonstrates an increase in real value of population expenditure and savings for the period of increase in international remittances. Furthermore, the data show an increase of the burden of compulsory payments, taxes and gatherings. Taking into account the fact that not all households receive remittances from abroad, it is difficult to consider that the changes in expenditures pattern were caused by remittance inflows from abroad. In order to assess the impact of remittances on households' expenditure and savings a two-sample t-test is conducted for households with remittances from abroad (treatment group) and households without remittances from abroad (control group). The data used for the comparative analysis is specified, and the tests results are presented in the next section of this chapter.

6.4 The Impact of Remittances on Consumption and Investment expenditures

This section applying two-sample t-test to TLSS 2003 and TLSS 2007 compares the differences in average monthly consumption expenditures and average monthly investment expenditures of households with remittances and without remittances. A similar comparison for TLSS 2003 was conducted by Clément (2011). But use of both TLSS 2003 and TLSS 2007 in estimation makes the study more informative. Furthermore, this chapter focuses only on remittances from abroad and compare changes in expenditure patterns of households for 2003 and 2007.

TLSS was conducted by WB in 1999, 2003, 2007 and 2009. This chapter uses TLSS 2003 and TLSS 2007 considering the size of the surveys and data related with migration and remittances. TLSS 2003 was conducted between June and July of 2003.

It includes 4160 households, and 388 of them (9.3%) have received remittances from abroad in the last 12 months. TLSS 2007 was conducted between September and November months of 2007. It includes 4860 households, and 1246 of them (25.6%) have received remittances from abroad in the last 12 months. TLSS 2007 contains more information related migration and remittances issues than TLSS 2003.

According to TLSS 2003 36.5% of 4160 interviewed households are living in urban areas and 63.5% in rural areas. 36.6% of households with foreign remittances live in urban areas and the remained 63.4% in rural areas. 35.2% of 4860 households included into TLSS 2007 are urban households and 64.8% rural households. From households with remittances only 30.5% live in urban areas. Comparison of the percentage of urban and rural households with remittances for 2003 and 2007 demonstrates 6.1% decrease in the share of urban remittance-receiving households.

Table 6.3 Consumption and Investment Expenditures of Households (2003, Somoni)

	Households with remittances	Households without remittances	Difference	Two-sample t-test
Consumption	**272.0049**	**237.0655**	**34.9394**	**3.597*****
food	216.4392	190.7814	25.6578	3.364***
non-food	55.5664	46.2841	9.2823	2.637***
Investment	**60.2377**	**56.5455**	**3.6922**	**0.938**
education	16.1759	13.4129	2.7630	1.545*
health	15.4205	16.8413	-1.4208	-0.585
agriculture	5.7485	6.8681	-1.1196	-0.954
others	22.8928	19.4232	3.4696	2.423***

Source: TLSS 2003

Note: Average monthly data**;** 3.06 Somoni = 1 USD; *** significant at 1%; ** significant at 5%; * significant at 10%

In 2003, households with remittances had more consumption and investment expenditures than the households without remittances. The difference in consumption expenditures is statistically significant (at the 0.01 critical alpha level). Remittance-receiving households had food and non-food expenditures significantly more than households without remittances. The difference in investment expenditures is not statistically significant. Households with remittances expended less than households without remittances on health and agriculture. However, education expenditure of remittance-receiving households is comparatively more (Table 6.3).

The number of household members in remittance-receiving households was bigger

(7 persons) than the number of household members in households without remittances (6 persons) in 2003. That is why per member consumption and investment expenditures are quite different. Remittance receiving households have less per member consumption and investment expenditures than the household without remittances. Households with remittances have less per member expenditures on food, non-food goods, health and agriculture. Only per member education expenditure of households with remittances is more (Table 6.4). Differences in per member expenditures on education and agriculture are significant at the 0.05 critical alpha level.

Table 6.4 Per Member Consumption and Investment Expenditures of Households (2003, Somoni)

	Households with remittances	Households without remittances	Difference	Two-sample t-test
Consumption	**42.1558**	**44.2184**	**-2.0626**	**-1.062**
food	33.7393	35.7426	-2.0033	-1.301*
non-food	8.4165	8.4758	-0.0593	-0.089
Investment	**9.8803**	**9.9528**	**-0.0725**	**-0.091**
education	3.2322	2.3483	0.8839	1.715**
health	2.4363	2.9819	-0.5456	-1.245
agriculture	0.6873	0.9790	-0.2917	-1.901**
others	3.5245	3.6436	-0.1191	-0.371

Source: TLSS 2003

Note: Average monthly data; 3.06 Somoni = 1 USD; *** significant at 1%; ** significant at 5%; * significant at 10%

In order to evaluate the households' consumption and investment preferences the expenditure shares in households' budget are compared (Table 6.5). According to TLSS 2003, households with remittances expended 82.5% of their budget on consumption (food and non-food goods) and invested only 17.5% of it. Households without remittances expended 81.9% of their budget on consumption and 18.1% of it on investment.

Remittance-receiving households spend more on food and less on non-food goods as compared with households without remittances. The difference in non-food expenditure shares is significant at the 0.05 critical alpha level. Households with remittances spend more on education and less on health and agriculture as compared with households without remittances. The difference in agriculture expenditure shares is significant at the 0.05 critical alpha level (Table 6.5).

Table 6.5 Consumption and Investment Expenditures Share of Households (2003)

	Households with remittances	Households without remittances	Difference	Two-sample t-test
Consumption	**0.8250**	**0.8185**	**0.0065**	**0.908**
food	0.6765	0.6799	-0.0034	-0.418
non-food	0.1485	0.1386	0.0099	1.798**
Investment	**0.1750**	**0.1815**	**-0.0065**	**-0.9075**
education	0.0450	0.0434	0.0016	0.4353
health	0.0446	0.0482	-0.0036	-0.6978
agriculture	0.0145	0.0192	-0.0047	-2.1810**
others	0.0709	0.0707	0.0002	0.0548

Source: TLSS 2003

Note: Average monthly data; Share of monthly expenditures; *** significant at 1%; ** significant at 5%; * significant at 10%

Comparison of households' expenditures, per member expenditure and expenditures as budget share shows that remittances caused an increase in consumption and investment expenditures of the remittance-receiving households in 2003 year (Table 6.3). However, per member consumption and investment expenditures are less than per member consumption and investment expenditures of the control group (Table 6.4). Remittance-receiving households consume comparatively more and invest less (Table 6.5). Households with remittances expend on non-food goods significantly more and have expenditure on agriculture significantly less.

In 2007, average monthly consumption expenditures of households with remittances are still more as compared with households without remittances. The difference is significant at the 0.01 critical alpha level. However, the structure of investment expenditures has changed (Table 6.6). In 2007 households with remittances had comparatively less expenditure on education (in 2003 it was significantly more) and comparatively more expenditures on health and agriculture (in 2003 less expenditures). The difference in health expenditures is significant at the 0.01 critical alpha level.

Table 6.6 Consumption and Investment Expenditures of Households
(2007, Somoni)

	Households with remittances	Households without remittances	Difference	Two-sample t-test
Consumption	**924.5266**	**850.0400**	**74.4866**	**4.354*****
food	695.4544	647.3081	48.1463	4.273***
non-food	229.0722	202.7319	26.3403	2.464***
Investment	**167.3764**	**150.1706**	**17.2058**	**0.965**
education	50.6771	62.2694	-11.5923	-0.942
health	63.6368	32.3270	31.3098	2.580***
agriculture	22.4030	19.8505	2.5525	1.639*
others	30.6595	35.7237	-5.0642	-1.389*

Source: TLSS 2007

Note: Average monthly data; 3.44 Somoni = 1 USD; *** significant at 1%; ** significant at 5%; * significant at 10%

In 2007, average monthly per member consumption and investment expenditures of households with remittances are more as compared with households without remittances (in 2003 less).

Table 6.7 Per Member Consumption and Investment Expenditures of Households
(2007, Somoni)

	Households with remittances	Households without remittances	Difference	Two-sample t-test
Consumption	**158.1094**	**156.4326**	**1.6768**	**0.442**
food	119.1180	118.8760	0.2420	0.099
non-food	38.9914	37.5566	1.4348	0.593
Investment	**29.4451**	**27.8044**	**1.6407**	**0.473**
education	8.4148	10.9477	-2.5329	-0.973
health	11.2438	5.8122	5.4316	2.604***
agriculture	3.3705	3.0322	0.3383	1.260
others	6.4160	8.0123	-1.5963	-1.913**

Source: TLSS 2007

Note: Average monthly data; 3.44 Somoni = 1 USD; *** significant at 1%; ** significant at 5%; * significant at 10%

Households with remittances had less per member expenditure on education and more per member expenditure on health in 2007 (Table 6.7). The difference in per member health expenditure is significant at the 0.01 critical alpha level.

Comparison of the average monthly consumption and investment expenditures of households as a percentage of total monthly expenditure shows that the expenditure pattern of households with remittances has changed in 2007.

Households with remittances have expended comparatively less on consumption and more on investment. The share of education expenditure has decreased, but health and agriculture expenditures increased (Table 6.8).

Table 6.8 Consumption and Investment Expenditures Share of Households (2007)

	Households with remittances	Households without remittances	Difference	Two-sample t-test
Consumption	**0.8754**	**0.8772**	**-0.0018**	**-0.446**
food	0.6869	0.6941	-0.0072	-1.332*
non-food	0.1885	0.1831	0.0054	1.271
Investment	**0.1232**	**0.1214**	**0.0018**	**0.454**
education	0.0389	0.0416	-0.0027	-1.076
health	0.0352	0.0269	0.0083	3.409***
agriculture	0.0200	0.0190	0.0010	0.632
others	0.0291	0.0339	-0.0048	-1.643*

Source: TLSS 2007

Note: Average monthly data; Share of monthly expenditures; *** significant at 1%; ** significant at 5%; * significant at 10%

The above comparative analysis shows that the consumption expenditure budget share of households with remittance is less and investment expenditure budget share more as compared with households without remittance in 2007.

Food expenditure share of households with remittances was comparatively less and their health expenditure share more. The difference in health expenditure shares is statistically significant (at the 0.01 critical alpha level).

Increase in health expenditure as share of the total monthly expenditures of remittance-receiving households seems to be of the main results of increase in remittance inflows.

Sultonov (2011) applying Data Envelopment Analysis in the efficiency assessment of health sectors for the CIS for 2007 year shows that Tajikistan, Moldova, Kyrgyzstan and Uzbekistan have better efficiency scores as compared with the other member

countries. Assessment of the data used by Sultonov (2011) shows that the mentioned countries are remittance-receiving countries and have comparatively more private health expenditure and less public expenditure (on health). Furthermore, for the given level of public and private expenditures these countries have better health indicators.

Combination the results of assessment in this chapter with estimations in Sultonov (2011) support the authenticity of positive and significant impact of remittance inflows on health expenditures in Tajikistan.

6.5 Summary of the Chapter

The conducted analyses indicate that in 2003 remittances increased remittance receiving household's consumption and investment expenditures, but the households preferred to expend them mostly on consumption (especially on non-food goods). Based on the number of household members, households with remittances had less per member expenditures.

In 2007, remittance-receiving households are better off as compared with households without remittances. Household with remittances increased the investment expenditures (especially on health and agriculture). The only problem could be the decreased share of expenditure on education. In 2007 households with remittances expended less share of their budget on education as compared with 2003 year.

In 2003 households with remittances had more consumption expenditures and less investment expenditures than households without remittances. In 2007 households with remittances had less consumption expenditures and more investment expenditures than households without remittances. However, in both cases the differences were not statistically significant.

Remittances increased the percentage of consumption expenditure of remittance-receiving households on non-food goods and decreased the share of investment expenditure of them on agriculture significantly in 2003; and increased the share of health expenditure of remittance-receiving households significantly in 2007.

CHAPTER VII
CONCLUSION

7.1 Contributions and Impacts

The purpose of this study was to assess the macroeconomic impact of remittance inflows for the case of Tajikistan. Applying comparative analyses, time series analyses and regression analyses the scale of remittances in the economy, macroeconomic determinants of remittances, the impacts of remittances on economic growth, on imports, on private consumption and private savings were addressed. Furthermore, the preconditions for migration of a huge share of labour resources were defined.

Unlike the most researches on macroeconomics of remittances, quarterly time series were used in the calculation that made an assessment of the changes within a year possible. Moreover, the time series were seasonally adjusted; and checked for co-integration and autocorrelation that makes the derived results more reliable.

The study is the first comprehensive research of macroeconomics of remittances for the case of Tajikistan. Considering the top ranking of Tajikistan for remittances as a share of GDP, this study will be an ideal sample for small and open economies highly dependent on inflow of remittances from abroad. As remittance dramatically increased for the period under research, this study will properly demonstrate the macroeconomic impact of them.

The results of the estimations in all chapters are consistent, which one more time demonstrates the credibility of the derived results.

The introductory chapter described political and economic backgrounds of formation of migration and remittances issues. Furthermore, the dramatic increase of remittances as share of the economy was demonstrated.

The main changes in the labour market of Tajikistan were presented in the second chapter. Unfavourable business condition, low labour demand and low wages were of the main pre-conditions for migration of a large share of labour resources to abroad.

Unemployment in the host country, per capita income in the host country, per capita income differential and the overall economic conditions in the host and home countries were defined as the main macroeconomic determinants of remittance inflows (from Russia) to Tajikistan in the third chapter.

The fourth chapter showed positive and statistically significant impact of remittances on economic growth. However, considering a negative impact of trade deficit and trade liberalization on the economy; and a positive impact of the previous quarter's remittances on the both variables, it was considered that the long run impact of remittances on economic growth will be weaker.

The fifth chapter demonstrated that while the domestic economy is not able to meet the increasing domestic demand, an increase in remittance inflows and further increase

in domestic demand will increase import.

Impact of remittances on expenditure pattern of households was addressed in the sixth chapter. It was defined that remittances significantly increased the share of consumption expenditures on non-food goods in 2003 and the share of investment expenditures on health in 2007. Remittance-receiving households expended more on consumption and less on investment in 2003, but less on consumption and more on investment in 2007 as compared with households without remittances. However, the difference in total consumption and investment expenditures were not significant.

7.2 Limitations and Future Work

Shortage of data and poor quality of data presented by national statistics of Tajikistan are of the main barriers for conductiing macroeconomic researches. This study arranging time series at least enough for time series analyses and OLS regressions addressed some fundamental macroeconomic issues related with remittance inflows.

The work presented in this dissertation concludes that Tajikistan needs a rational remittance policy to maximize the benefits of remittances in economic development through a migration and remittance policy at national level with an extensive set of reforms aimed at modernization of the financial system. It should be a long-run policy on stimulation of private savings and supporting of the domestic production of goods and services. Such a policy would increase the profitability of remittances and might be a key solution to the gradual decrease of dependency of the economy on remittance inflows.

Further research on a policy toward maximisation of development impact of remittances will be a logical continuation of this dissertation in future.

Table A 4 OLS Regression Results, Dependent Variable – GDP

Independent Variables	Equations			
	1	2	3	4
Δ ln GDP lagged	-0.3742 (-3.11***)	-0.3743 (-2.98***)	-0.2965 (-1.70*)	-0.2960 (-1.73*)
Δ ln Investment	0.1385 (3.36***)	0.1372 (3.15***)		
Δ ln Remittances	0.1503 (2.58**)	0.1344 (2.30**)	0.0052 (0.09)	
Δ ln FDI	0.0074 (0.85)			
Δ Prices		0.0115 (0.68)		
Δ Labour		-0.8958 (-0.50)		
Δ Trade liberalization	-0.3895 (-4.45***)	-0.3710 (-4.06***)		
Δ ln Government consumption		0.0401 (0.70)		
Δ ln Private consumption			1.2803 (4.75***)	1.2893 (5.29***)
Δ ln M2	0.0892 (1.50)			
Δ REER		0.0036 (1.59)		
Δ ln Trade deficit			-0.0419 (-2.19**)	-0.0420 (-2.24**)
Δ ln ODA			0.0685 (0.48)	0.0646 (0.49)
Constant	0.0207 (1.78*)	0.0266 (1.57)	0.0094 (0.75)	0.0097 (0.82)
R-squared	0.6356	0.6495	0.5751	0.5750
F	7.85	5.79	6.50	8.46
LM test chi2 (P>chi2)	0.000 (0.9874)	0.214 (0.6434)	1.327 (0.2493)	1.342 (0.2467)
RESET (F value)	1.35 (0.2830)	1.17 (0.3437)	0.98 (0.4229)	1.03 (0.3972)
Observations	34	34	30	30

Note: "***" significant at 1% level, "**" significant at 5% level, "*" significant at 10% level.

Bibliography

Acosta, P., Fajnzylber, P. and Lopez, J. (2008). Remittances and household behaviour: Evidence from Latin America. In Fajnzylber, P. and J. H. Lopez, eds., Remittances and development. Lessons from Latin America. World Bank, Washington, D.C.

Adams, R. (2005). Remittances, household expenditure and investment in Guatemala. World Bank Policy Research Working Paper No 3532, Washington, D.C.

Agrawal, G. and Khan, M. (2011). Impact of FDI on GDP: A comparative study of China and India. *International Journal of Business and Management,* Vol. 6, No 10, pp. 71–79.

Amuedo-Dorantes, C. and Pozo, S. (2009). New evidence on the role of remittances on healthcare expenditures by Mexican households. *Review of Economics of the Household,* Vol. 9, No 1, pp. 69–98.

Amuedo-Dorantes, C., Sainz, T. and Pozo, S. (2007) Remittances and healthcare expenditure patterns of population in origin communities: Evidence from Mexico. INTAL-ITD Working Paper No 25, Inter-American Development Bank, Buenos-Aires.

Ang, P. (2007). Workers' remittances and economic growth in the Philippines. DEGIT Conference Papers c012_029, DEGIT, Dynamics, Economic Growth and International Trade.

Bertola, G. and Faini, R. (1991). Import demand and non-tariff barriers: The impact of trade liberalization. *Journal of Development Economics,* Vol. 34, pp. 269–286

Browne, C. and Aiko, M. (2007). Remittances in the Pacific Region. IMF Working Paper, No 07/35.

Brown, R., Olimova, S. and Boboev, M. (2008). A study on international migrants' remittances in Central Asia and South Caucasus. Country report on remittances of international migrants in Tajikistan. ADB, Tajikistan.

Cardona Sosa, L., and Medina, C. (2006). Migration as a safety net and effects of remittances on household consumption: The case of Colombia. Borradores de Economia 414, Banco de la Republica de Colombia, Bogota.

Carone, G. (1996). Modeling the U.S. demand for imports through cointegration and error correction. *Journal of Policy Modeling*, Elsevier, Vol. 18, No 1, pp. 1–48.

Castaldo, A. and Reilly, B. (2007). Do migrant remittances affect the consumption patterns of Albanian households? *South-Eastern Europe Journal of Economics,* Vol. 1, pp. 25–54.

Catrinescu, N., Leon-Ledesma, M., Piracha, M. and Quillin, B. (2006). Remittances, institutions and economic growth. IZA Working paper No 2139.

Cattaneo, C. (2010). Migrants' transfers and educational expenditure: Empirical evidence from Albania. FEEM Working Paper No 2010.001, Fondazione Eni Enrico

Mattei, Milano.

CBRF (2012). Cross-border remittances via money transfer operators in breakdown by countries. The Central Bank of Russian Federation. Moscow.

Chami, R., Fullenkamp, C. and Jahjah, S. (2003). Are immigrant remittance flows a source of capital for development? IMF Working Paper No 03/189.

Clément, M. (2011). Remittances and household expenditure patterns in Tajikistan: A propensity score matching analysis. Cahiers du GREThA 2011-09, Groupe de Recherche en Economie Théorique et Appliquée.

Danzer, A. and Ivaschenko, O. (2010). Migration patterns in a remittances dependent economy: Evidence from Tajikistan during the global financial crisis. *Migration Letters*, Vol. 7, No 2, pp.190–202.

Dornbusch, R. (1988). Exchange rates and inflation. Cambridge: MIT Press.

EBRD (2012). Strategy for Tajikistan. Document of the European Bank for Reconstruction and Development. As approved by the Board of Directors at its meeting on 13 March 2012.

Ekanayake, E. and Chatrna, C. (2010). The effect of foreign aid on economic growth in developing countries. *Journal of International Business and Cultural Studies,* Vol. 3, No 2.

Elbadawi, I. and Rocha, R. (1992) Determinants of expatriate workers' remittances in North Africa and Europe. Working Paper WPS 1038, Country Economics Department, the World Bank, Washington, D.C.

El-Sakka, M. and Mcnabb, R. (1999). The macroeconomic determinants of emigrant remittances. *World Development,* Vol. 27, No 8, pp. 1493–1502.

Engle, R. and Granger, C. (1987). Co-integration and error correction: Representation, estimation and testing. *Econometrica,* Vol. 55, No 2, pp. 251–276.

Faini, R. (1994). Workers' remittances and the real exchange rate: A quantitative framework. *Journal of Population Economics*, Springer, Vol. 7, pp. 235–245.

Faini, R. (2002). Development, trade, and migration. Proceedings from the ABCDE Europe Conference, 1-2, pp. 85–116.

Faini, R., Pritchett, L. and Clavijo, F. (1988). Import demand in developing countries. Policy Research Working Paper Series 122, the World Bank.

Giuliano, P. and Ruiz-Arranz, M. (2005). Remittances, financial development and growth. IMF Working Paper No 05/234.

Glytsos, N. (2005). Dynamic effects of migrant remittances on growth: An econometric model with an application to Mediterranean Countries. Discussion Paper No. 74, KEPE, Athens, 2002, Labor and Demography 0505014, EconWPA.

Goldstein, M. and Khan, M. (1985). Income and price effects in foreign trade, Handbook of International Economics, edition 1, volume 2, chapter 20, pages 1041-1105, Elsevier.

Hakimov, P. and Mahmadbekov, M. (2009). Economic dynamics of labour migrants' remittances in Tajikistan. Report based on the study of remittances and living standard measurement survey (TLSMS, 2008). IOM, Tajikistan.

Higgins, M., Hysenbegasi, A. and Pozo, S. (2004). Exchange-rate uncertainty and workers' remittances. *Applied Financial Economics*, Vol. 14, pp. 403–411.

IFC (2009). Business environment in Tajikistan as seen by small and medium enterprises. International Finance Corporation. Tajikistan.

ILO (2010). Migrant remittances to Tajikistan: The potential for savings, economic investment and existing financial products to attract remittances. ILO sub-regional office for Eastern Europe and Central Asia.

IMF (2005). World economic outlook: Globalization and external imbalances, Washington, D.C.

IOM (2001). Migration in CIS countries in 2000. IOM, Vienna.

IOM (2002). Migration trends in Eastern Europe and Central Asia: Review of 2001–2002. IOM, Vienna.

IOM (2005). Migration, development and poverty reduction in Asia. IOM. Geneva.

IOM (2009) Abandoned wives of Tajik labor migrants. IOM study on the socio-economic characteristics of abandoned wives of Tajik labour migrants and their survival capabilities. IOM, Tajikistan.

Jones, L., Black, R. and Skeldon, R. (2007). Migration and poverty reduction in Tajikistan. Working Paper No C11, Development Research Centre on Migration, Globalisation and Poverty, University of Sussex, Brighton.

Justino, P. and Shemyakina, O. (2009). Migrant remittances and household labour supply in the post-conflict Tajikistan, mimeo.

Katseli, L. and Glytsos, N. (1986). Theoretical and empirical determinants of international labour mobility: A Greek-German perspective. Centre for Economic Policy Research, Working Paper No 148.

Kazuhiro, K. (2012). Tajik labour migrants and their remittances: Is Tajik migration pro-poor? *Post-Communist Economies*, Vol. 24, No 1, pp. 87–109.

Kifle, T. (2007). Do remittances encourage investment in education? Evidence from Eritrea. *Journal of African Studies* (GEFAME)*, Vol. 4, No 1.

Kireyev, A. (2006). The macroeconomics of remittances: The case of Tajikistan. IMF Working Paper. No 06/2.

Leamer, E. and Stern, R. (1970). Quantitative International Economics. Boston: Allyn and Bacon.

Lin, H. (2011). Determinants of remittances: Evidence from Tonga. IMF working paper No 11/18.

Mohamed, S. (2009). Workers' remittances and growth in MENA labor exporting countries. Working Papers 2009.10, International Network for Economic Research –

INFER.

Mughal, A. (2007). Migration, remittances and living standards in Tajikistan. A report based on Khatlon remittances and living standards measurement survey (KLSS 2005). IOM, Tajikistan.

Mundaca, G. (2009). Remittances, financial markets development and economic growth: The case of Latin America and Caribbean. *Review of Development Economics*, Vol. 13, No 2, pp. 288–303.

Murray, T. and Ginman, P. (1976). An empirical examination of the traditional aggregate import demand model. *The Review of Economics and Statistics*, MIT Press, Vol. 58, No1, pp. 75–80.

Nakamuro, M. (2010). School attendance and migrant remittances in transition economies: The case of Albania and Tajikistan. *International Development Planning Review*, Liverpool University Press. Vol. 32, No 3-4, pp. 333–361.

Nishat, M. and Bilgrami, N. (1991) The impact of migrant worker's remittances on Pakistan economy. *Pakistan Economic and Social Review*, Vol. 29, pp. 21–41.

Ogawa, K. and Nakamura, M. (2010). Effects of migrant remittances on school attendance: The empirical study with household surveys in Tajikistan (in Japanese), Kokumin Keizai Zasshi, Vol. 201, No 66, pp. 67–84.

Olimova, S. and Bosc I. (2003). Labour migration from Tajikistan. International Organization for Migration in Cooperation with the Sharq Scientific Research Center. IOM, Tajikistan.

Olimova, S. and Kuddusov, J. (2007). Families of migrants in Tajikistan: Problem and ways for their solution. Analytical survey report. Dushanbe. Irfon.

Ramirez, M. and Sharma, H. (2009). Remittances and growth in Latin America: A Panel Unit Root and Panel Cointegration Analysis. *Estudios Economicos de Desarrollo Internacional,* Euro-American Association of Economic Development, Vol. 9, No 1.

Straubhaar, T. (1986). The determinants of workers' remittances: The case of Turkey. *Weltwirtschaftliches Archiv*, Vol. 122, pp. 728–740.

Sultonov, M. (2011). Health expenditure efficiency in the Commonwealth of Independent States: A Data Envelopment Analysis approach. *Transition Studies Review*, Springer, Vol. 18, No 2, pp. 384–404.

Sultonov, M. (2012). An application of dynamic games with complete and perfect information in Central Asian water conflict resolution, *Rokko dai Ronshu*, Vol. 58, No 2, pp. 23–34.

Swamy, G. (1981). International migrant workers' remittances: Issues and   prospects: A background study for World Development Report 1981. World Bank, Working Paper No 481.

TAJSTAT (2011). Tajikistan in figures. The Statistical Agency under the President of

the Republic of Tajikistan. Dushanbe.

Umarov, K. (2010). Tajik labour migration during the global economic crisis: Causes and consequences. Research report. IOM, Tajikistan.

Wahba, S. (1991). What determines workers' remittances. *Finance and Development*, Vol. 28, No 4, pp. 41–44.

World Bank (2003). Tajikistan Living Standards Measurement Survey (TLSS). The World Bank. Washington, D.C.

World Bank (2007). Tajikistan Living Standards Measurement Survey (TLSS). The World Bank. Washington, D.C.

World Bank (2009). Migration and remittances: Eastern Europe and the Former Soviet Union. The World Bank. Washington, D.C.

World Bank (2011). Migration and Development Brief 17. Washington, D.C.

World Bank (2011). Migration and Remittances Factbook. Washington, D.C.

World Bank (2011). Workers' remittances and compensation of employees. World Development Indicators. Washington, D.C.

Zayonchovskaya, Z. (2001). Labour migration in the CIS from the position of society, families and individuals. Labour migration in Russia, Population migration series, 2nd ed. Vorobyova Editions, Moscow.