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Migrants' Remittances and the Dutch Disease Phenomenon in Developing Countries

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DECLARATION OF AUTHORSHIP

I, Lela Kankadze, hereby declare in lieu of oath that this master thesis is my original work completed under the supervision of professor Giovanni Vaggi. All the sources used in this research have been duly cited and referenced. I also confirm that this work has not been submitted for any other degree or qualification before.

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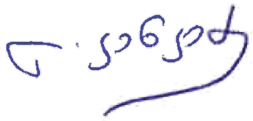
Signature: 

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Zásady pro vypracování

Developing countries and emerging economies largely depend on external sources of financing, such as official development assistance (ODA), foreign direct investments (FDI), portfolio investments, and personal remittances. According to the *OECD 2019 report on Financing for Sustainable Development*, remittance flows are steadily growing while other essential sources of financing for sustainable development are declining. However, those developing countries that are highly dependent on remittances for economic growth and are characterized by high remittances-to-GDP ratios may face problems, such as phenomenon known in economic theory as the Dutch Disease. Migrant workers' remittances have the potential to appreciate the real exchange rate in the receiving economies, subsequently shifting the resources from the traded to the nontraded sectors of the economy, which consequently leads to reducing the competitiveness of exported goods on the international trading market *(Amuedo-Dorantes & Pozo, 2004).* This thesis aims to explore the impact of remittances on the real exchange rate in small open economies that outstand with high remittances-to-GDP ratios and to test for the Dutch Disease existence.

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Abstract:

Along with the rising importance of remittances as the major source of external financing for low- and middle-income countries, the concern of its macroeconomic consequences has also increased over the last two decades. As economic theory suggests, remittances are positively correlated with the real exchange rate (RER) appreciation and the consequent loss of external competitiveness, leading to Dutch disease effects in recipient countries. This thesis focuses on the case of Georgia, a small open economy with high remittances-to-GDP ratio, and checks whether Georgia's RER has appreciated as a result of remittance inflows, consequently harming the external competitiveness. For this purpose, the research employs the Johansen cointegration and Vector Error Correction Model (VECM) estimation technique for annual data from 1997 to 2018. The main finding from both short- and long-run models suggests that remittances have no significant impact on the RER, thus rejecting the remittance-induced Dutch disease hypothesis for Georgia. This finding is further supported by Impulse Response Functions (IRF). On the other hand, other international transfers, FDI and ODA jointly depreciate the REER in the short run, but have a reverse impact in the long run, appreciating the domestic currency and possibly contributing to the deterioration of Georgia's trade competitiveness.

Keywords: Remittances, Dutch disease, Georgia, RER, Cointegration, VECM

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List of Abbreviations

Abbreviation	Definition
ADF	Augmented Dickey-Fuller
CAB	Current Account Balance
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GEL	Georgian Lari
GEOSTAT	National Statistics Office of Georgia
GNI	Gross National Income
IRF	Impulse Response Function
LCU	Local Currency Unit
NER	Nominal Exchange Rate
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
REER	Real Effective Exchange Rate
RER	Real Exchange Rate
SDG	Sustainable Development Goal
VAR	Vector Autoregression
VECM	Vector Error Correction Model
WDI	World Development Indicators
WTO	World Trade Organization

CHAPTER I. INTRODUCTION

International financial flows to developing countries and emerging economies have increased rapidly over the last two decades. Mainly, low- and middle-income countries largely depend on external sources of financing for development, namely private capital flows such as foreign direct investment (FDI) and portfolio investment, public external funding such as official development assistance (ODA) and foreign aid, and personal remittances sent by migrant workers. According to the latest OECD report, remittance flows are steadily growing, while other essential sources of financing for sustainable development are declining. There was a 30% drop in FDI to developing countries over 2016-17, while remittances have remained on an upward trend. On the other hand, ODA remains steady but fails to meet international commitments (OECD, 2018).

According to the World Bank database, the total amount of officially recorded worldwide remittances increased by 7% over 2017 and reached $624.5 billion in 2018. Moreover, 76.7% of the total remittance flows ($479.3 billion) are directed to low- and middle-income countries (World Bank, 2019). Furthermore, remittances to low- and middle-income economies are estimated to reach $551 billion in 2019 and $597 billion by 2021 (KNOMAD, 2019), making remittances the largest external source of financing in developing countries. Moreover, among other external sources of financing development, remittance inflows tend to be much more stable and are characterized by a steady annual increase. On the other hand, other external flows, such as FDI and portfolio investments, are characterized by high volatility and fluctuations. For instance, while FDI and portfolio investment flows experienced a sharp decrease during the 2008 global financial crisis, remittance flow remained relatively unresponsive to the crisis.

2030 Agenda for Sustainable Development also emphasizes the importance of remittances. For instance, target 10.c of SDG 10 on reducing inequality within and among countries, aims to reduce the transaction costs of migrant remittances to less than 3% and eliminate remittance corridors with costs higher than 5%, by 2030. Moreover, the volume of remittances as a proportion of total GDP is included as one of the indicators for the Target 17.3 to mobilize additional financial resources for developing countries from multiple sources (UN Economic and Social Council, 2016).

However, along with the increasing importance of emigrant workers' remittances, the concern for its macroeconomic consequences also rises and those countries highly depend on remittances for economic growth and are characterized by high remittances-to-GDP ratios, may face problems, such as a phenomenon known in economic theory as the Dutch disease. Although remittances may be contributing to the improvement of the balance of payments in developing economies, empirical evidence suggests that remittances are positively correlated with the real exchange rate (RER) appreciation and the consequent loss of external competitiveness, leading to Dutch disease effects in recipient countries (Chami et al., 2008). Therefore, the harmful effects of remittances raise policy-making issues and need to be addressed during the decision-making process.

It is no surprise that for Georgia, as a small open economy in transition, remittances largely constitute a source of external financing. As of 2019, Georgia's international migrant stock comprised 79 thousand people, which is 2% of the total population (UN DESA, 2019). Therefore, for such a small country as Georgia, whose population is 3.7 million, remittances from emigrants make a significant difference when it comes to financing development and economic growth, and it should not be overlooked. In 2019, the remittances-to-GDP ratio reached a record value of 14.2% (World Bank, 2020). These facts give the first signs of the Dutch disease phenomenon. Moreover, the received remittances give way to an additional demand for goods and services, consequently increasing the prices in a non-tradable sector. On the other hand, according to the "small country hypothesis," Georgia is unable to influence the world prices in international trade, and prices in the tradable sector thus remain unchanged. This pattern, consequently, shifts resources from tradable sectors (industry and agriculture) to non-tradable sector (services), making the country's exports less competitive which increases the trade deficit and puts pressure on current account balance (Lopez, Molina, and Bussolo, 2007; Makhlouf and Mughal, 2013).

Despite its theoretical relevance, the remittance-induced Dutch disease phenomenon remains yet unexplored for Georgia. Among those panel studies discussed in the literature review of this master thesis, Georgia was not included in samples. As for time series analyses, there is only one study dedicated to the topic by Ito (2019), who used quarterly data. Therefore, the innovative part of this research is in its main objective to test for the existence of the remittance-induced Dutch disease in Georgia based on annual data. The main research questions of this master thesis are whether

Georgia's RER has appreciated as a result of remittance inflows and, if so, whether Georgia's external competitiveness has suffered consequently.

The rest of the text is organized as follows: Chapter II brings together two subchapters of theoretical and empirical literature review. The first subchapter explores the origin of the Dutch disease and the famous underlying economic theories behind it, while the second one discusses the outstanding empirical works of the last two decades, testing the remittance-induced Dutch disease based on panel and time series data for developing countries. Chapters III and IV introduce the context of Georgia as a small open economy in a transition process and discuss the migration and remittance inflow patterns since the beginning of the transition, as well as the structure of the economy and main macroeconomic indicators. Chapter V investigates different mechanisms behind constructing the RERs and possible connection between the movements in RERs and dynamics of remittances for Georgia, followed by Chapter VI, which describes various external and domestic as well as policy and non-policy related fundamental determinants of the RER. Chapter VII describes the data and variables used in the research; this chapter also specifies the econometric model and discusses the estimation technique. Chapter VIII examines the estimation results of the remittance-induced Dutch disease phenomenon in the Georgian context, and lastly, Chapter IX provides the conclusion of the research's main findings and some policy implications.

CHAPTER II. LITERATURE REVIEW

2.1. Origin of the Dutch disease: The Theoretical Literature Review

The origin of the term Dutch disease dates back to the year of 1977 when the Economist dedicated an article to the deterioration of the Dutch economy after the discovery of the Groningen gas field in 1959. [1] The article argued that after enjoying the benefits of having large amounts of natural gas resources for many years, the Dutch economy started to experience a great recession expressed by lagging industrial production and falling employment rates, especially in the manufacturing sector. Despite this, externally, the Dutch economy appeared strong, having one of the world's hardest currencies and a current account stably in surplus. Therefore, the article dubbed these contradicting features as the symptom of "the Dutch disease" (The Economist, 1977).

This article was a starting point to rising literature on a booming tradable sector in an economy and the Dutch disease phenomenon. Since then, scholars have been using this term to describe the loss of competitiveness due to any large capital inflows in a country.

One of the earliest attempts to model the Dutch disease phenomenon was by Corden and Neary (1982). The authors present a small open economy model producing two traded goods (energy and manufacturing) and one non-traded good (services) to analyze the effects of technological progress in one of the tradable sectors. Assuming that all the three sectors use a single specific factor (capital) and one perfectly mobile factor (labor) between them, Corden and Neary observe the resource movement and spending effects. The *resource movement effect* occurs when the technological improvement of the tradable goods sector raises the marginal product of the labor employed there and draws resources out of other sectors, forcing the rest of the economy to adjust through the RER. On the other hand, *the spending effect* occurs when the higher real income in the technologically now advanced sector leads to extra spending on non-traded goods and raises their price, causing a real appreciation and leading to further reallocation of resources towards the non-tradable sector at the expense of tradable sector.

[1] The Groningen field lies in the northern part of the Netherlands, and it remains as the largest natural gas field in Europe and the tenth largest in the world (Whaley, 2009)

Corden (1984) further discusses the resource movement and spending effects and suggests that the resource movement effect alone gives rise to the *direct de-industrialization* caused by the movement of labor out of lagging sector (manufacturing) into the booming sector and consequent fall in manufacturing output. On the other hand, the de-industrialization process is reinforced though the spending effect, as the increased demand for services brings about additional real appreciation, and the manufacturing output falls even more. Therefore, the combination of resource movement and spending effects gives rise to *indirect de-industrialization*.

Different economic theories, however, also raise a question if Dutch disease is a disease at all. For example, according to the Ricardian model of trade, countries should specialize in those sectors that are their comparative advantage. Therefore, if a country gains a comparative advantage by oil or gas discovery, it should bring only benefits and not a "disease." Nevertheless, the case of the Netherlands and other examples in history have proved that the shrinkage of the manufacturing sector has irreversible adverse effects. As Krugman (1987) puts it, "the worry seems to be that when the natural resources run out, the lost manufacturing sectors will not come back" (p. 49).

Van Wijnbergen (1984) further strengthens Krugman's statement by an argument that most post-World War II success stories largely attribute to those countries that vigorously promoted their manufacturing sectors, and refers to a known "stylized fact" that technological progress is faster in traded sectors than it is in a non-traded sector of an economy. Based on the hypothesis that technological progress is a function of accumulated experience, van Wijnbergen incorporates industry-specific, Learning by Doing (LD) technological progress in his research and studies the potential effects of Dutch disease on economic growth. Due to the real appreciation pressure and the consequent decline in the production of the traded goods, the Dutch disease will ultimately reduce an economy's long-term growth, and one of the tools to mitigate such consequences is government intervention and providing production subsidies to the tradable goods sector.

Another famous theoretical framework that captures the long-run movements in exchange rates is the famous Balassa-Samuelson hypothesis (BSH), which originated from the works of Balassa (1964) and Samuelson (1964). BSH explains the long-run RER behavior based on differential productivity growth between traded and non-traded goods in economies with freely adjusting wages and prices. The argument implies that if the productivity of the traded sector is higher than

that of the non-traded sector, then non-traded goods are characterized by higher relative prices, and the RER appreciates. Furthermore, "with international differences in productivity being smaller in the service sector than in the production of traded goods, and wages equalized within each country, services will be relatively more expensive in countries with higher levels of productivity" (Balassa, 1964, p. 586).

From a theoretical point of view, we can now establish the main symptoms of Dutch disease: RER appreciation; a rise in real wages and other factor costs and a decline of output in tradable sectors; loss in external competitiveness; decline in exports; and faster growth of non-tradable industries.

2.2. Remittance-Induced Dutch disease: The Empirical Literature Review

Comprehensive scholarly literature is dedicated to the – primarily positive – effects of remittances on a micro-level. For example, many studies illustrate that remittances not only play an essential role in increasing school attendance and the likelihood of university enrolment among low-income households (Görlich, Mahmoud, and Trebesch, 2007; Mansour, Chaaban, and Julie, 2011; Zhunio, Vishwasrao, and Chiang, 2012) but also in increasing expenditures on health (Valero-Gil, 2008; Amuedo-Dorantes and Pozo, 2009; Drabo and Ebeke, 2011). Several studies also provide evidence that remittance inflows enhance the human capital accumulation and promote entrepreneurial activities on a household level (Woodruff and Zenteno, 2007; Yang, 2008) and have a positive impact on poverty and inequality reduction in low-income countries (Bracking and Sachikonye, 2006; Portes, 2009).

On a macro-level, remittances also seem to have a positive impact on economic growth and financial sector development through alleviating credit constraints and improving the allocation of capital (Giuliano and Ruiz-Arranz, 2006; Aggarwal, Demirgüç-Kunt, and Peria, 2011; Nyamongo et al., 2012). Furthermore, according to Capelli and Vaggi (2016), a high level of remittances improves the balance of payments deficit, and therefore very often current account shows a much rosier picture than the trade account in many developing countries. The authors bring a stark example of Nepal whose trade deficit was 26% of GDP in 2012, coupled with a current account surplus of 3% and the remittances-to-GDP ratio of 25%. Besides, there is robust evidence that

remittances are much less volatile than other capital inflows, and more importantly, they are countercyclical to the recipient country's income. Therefore, remittances provide a stable consumption smoothing mechanism for developing countries (Frankel, 2011).

However, during the last two decades, attention has been shifted toward the adverse effects of remittances. In fact, extensive empirical literature indicates that migrant workers' remittances behave like any other capital inflow in an economy and have the potential to cause spending and resource movement effects and consequently appreciate the RER – one of the main symptoms of Dutch disease described by Corden and Neary (1982). Therefore, a majority of studies use RER appreciation as a proxy for the Dutch disease effect.

The article by Amuedo-Dorantes and Pozo (2004) is one of the earliest works to discuss the macroeconomic aspects of remittances, and especially the remittance-induced Dutch disease. Using the panel data of 13 Latin American and Caribbean countries, the authors find that a doubling in per capita migrants' remittances results in about 22% appreciation of the RER. This, subsequently, creates unintended costs on exporting goods for the producers in remittances receiving countries, which results in a loss of external competitiveness, hence the paradox of the generosity of the immigrants and "private" gifts to their family members.

Lopez, Molina, and Bussolo (2007) find similar results but lower estimates than Dorantes and Pozo for Latin American countries in their policy research working paper, however, they use remittances-to-GDP ratio instead of per capita measure to illustrate better the volume of remittance flows compared to the size of the economy. According to their findings, the doubling of the remittances-to-GDP ratio appreciates the RER by 5%.

Other panel studies provide analogous findings. For example, Beja (2010) investigates the 20 top international remittances recipient economies and learns that remittance-induced Dutch disease is only a middle-income country problem, and the upper-income and low-income countries are not afflicted by it. This result mainly depends on structural transformation – those countries that manage to handle the changes brought by international remittances efficiently are able to move up the industrialization ladder, while those who cannot, experience the Dutch disease. Hassan and Holmes (2012) assess the long-run relationship between remittances and the RER for 24

developing countries for the 1987-2010 period using a panel cointegration approach and find a small but significant Dutch disease type effect.

Futhermore, Lartey, Mandelman, and Acosta (2012) estimate a dynamic panel model with a GMM (Generalized Method of Moments) estimator for 109 developing and transition countries for the 1990-2003 period and study the relationship between the remittances and production sectors of the emerging economies. The results of their research are consistent with the characteristics of the Dutch disease, i.e., high levels of remittance flows are associated with the increased spending effect which consequently results in rising the price levels of non-tradables and RER appreciation, and with the resource movement effect that generates a resource allocation from the tradable to the non-tradable sector. Lartey et al. find that an increase in remittances leads to a decline in the share of manufacturing (tradable) in GDP, and a 1% increase in remittances is coupled with a 0.37% increase in the share of services (non-tradable) in GDP. They also observe that the resource movement effect is stronger under fixed exchange rate regimes.

A series of one-country studies and comparative analyses also provide similar results. For instance, Bourdet and Falck (2006) examine the impact of migrants' remittances on the international competitiveness of Cape Verde, a small open economy which highly depends on external sources of capital inflows for its well-being. The authors find results analogous to previous studies, indicating that the inflow of remittances indeed has an appreciating effect on the RER which consequently deteriorates competitiveness in Cape Verde; however, the effect gets smaller in the long run as workers' remittances boost capital accumulation through higher domestic saving and investment and the spending effect relatively fades.

Another notable work by Lartey (2008) analyses the effects of the level and share of capital inflow on resource reallocation and RER movement in a two-sector small open economy model within the Dutch disease framework. The author discovers a trade-off between resource allocation and the degree of RER appreciation. Namely, the less labor is reallocated from tradable to the non-tradable sector, the higher is the RER appreciation. Lartey ascribes this result to the share of foreign capital used in the domestic production process – if an emerging market economy utilizes a greater share of foreign capital relative to domestic capital, then it will be more exposed to Dutch disease

induced by an increase in capital inflows. The author brings Argentina and the Philippines as reference cases.

Acosta, Lartey, and Mandelman (2009) similarly base their study on a two-sector small open economy model. They use data for El Salvador and Bayesian estimation techniques to analyze the effects of remittances on emerging market economies. The authors differentiate three types of remittances: *exogenous altruistic remittances* that are independent of domestic economic conditions; *endogenous altruistic remittances* that are countercyclical; and *self-interested remittances* that behave as any other capital inflow. The results obtained by Acosta et al. generally suggest that the rise in remittances eventually culminates in an increased household income and, consequently, in higher consumption inclined towards non-tradables; therefore, remittance inflows lead to the Dutch disease effects, whether altruistically motivated or not. Moreover, Acosta et al. also prove that remittances lead to a fall in labor supply, resulting in higher production costs of the labor-intensive non-tradable sector. Consequently, prices of the non-tradables increase, i.e., the RER appreciates, and as a result, the non-tradable sector expands at the expense of the tradable sector.

The following examples of South Asian economies provide comparable evidence. For instance, Makhlouf and Mughal (2013) explore the international remittance-induced Dutch disease symptoms in the Pakistani economy. The authors carry out the IV Bayesian analysis using the 1980-2008 annual and 2001-2009 monthly data to study the short and long-run role of foreign remittances on the country's external and internal competitiveness. Their findings provide the evidence for spending and movement effects in both cases, which made Pakistan's exports less competitive in the foreign markets and the imports more attractive. Likewise, Chowdhury and Rabbi (2014) incorporate Johansen cointegration and Vector Error Correction Model (VECM) and analyze the 1971-2008 period data for Bangladesh, which is characterized by one of the largest outflows of workers and inflows of remittances. According to their empirical results, a high flow of remittances appreciates the RER, which weakens the international competitiveness of the country's exportable sector.

Table 1: Summary of selected studies on the Dutch disease phenomenon

STUDY	SAMPLE	FOCUS OF THE STUDY	METHODOLOGY	DUTCH DISEASE
		TIME SERIES		
BOURDET & FALCK (2006)	Cape Verde (1980-2000)	The macroeconomic impact of remittances on the RER	Engle-Granger two-step cointegration	Yes
ISSA & OUATTARA (2008)	Syria (1965-1997)	The foreign aid and the Dutch disease	Auto Regressive Distributed Lag (ARDL)	No
ACOSTA, LARTEY & MANDELMAN (2009)	El Salvador (1991:Q1-2006:Q2)	The effects of remittances on emerging market economies	Bayesian Vector Auto Regression (BVAR)	Yes
MARTINS (2013)	Ethiopia (1995:Q1-2008:Q4)	The impact of large inflows of foreign aid and remittances on the RER	Structural time series Unobserved Components (UC) model	No
CHOWDHURY & RABBI (2014)	Bangladesh (1971-2008)	The effects of remittances on the external trade competitiveness as measured by the movements of RER	Vector Error Correction Model (VECM)	Yes
PRAKASH & MALA (2016)	Fiji (1979-2012)	The Dutch disease effect of remittances	VECM	No
ITO (2017)	Moldova (2006:Q1-2014:Q2)	The linkage between exports, REERs, and workers' remittances	Unrestricted Vector Auto Regression (VAR)	Yes
ITO (2019)	Georgia (2000:Q1-2016:Q4)	The Dutch disease effect of remittances	VECM	Yes
		PANEL		
AMUEDO-DORANTES AND POZO (2004)	13 LAC countries (1979–1998)	The impact of workers' remittances on the RER	Fixed-effects and IV regression	Yes
BEJA (2010)	20 top remittance recipient countries (1984-2008)	The Dutch disease caused by international remittances	Seemingly Unrelated Regression (SUR)	Yes
HASSAN & HOLMES (2012)	24 developing countries (1987-2010)	The long-run RER appreciating effect of workers' remittances	Panel Error Correction Model (ECM)	Yes

Source: Own compilation

Unlike the majority of the studies which use the RER appreciation as a proxy for the Dutch disease, Guha (2013) takes a sectoral approach to explain the macroeconomic effects of remittances stemming from households' decision-making process in a small economy. Guha introduces two channels of remittance transmission – the consumption channel (demand side) and the labor channel (supply side) – and explores their impact on economic growth. By developing static and dynamic frameworks of a general equilibrium model for the case of Bangladesh, the author learns that rising remittances increase consumption levels in traded and non-trade sectors. As a result, the

relative prices of non-traded goods increase, causing labor reallocation from traded to the non-traded sector, which consequently leads to a contraction in the traded sector and the economy losing its external competitiveness.

Part of the relevant scholarly literature is also dedicated to post-communist and transition economies. However, the results seem somewhat mixed. E.g., Nikas and Blouchoutzi (2014) investigate the pertinence of the Dutch disease for two small transition countries under the free-floating exchange rate regime – Moldova and Albania – using the 1990-2010 annual data for both countries and fixed effects Ordinary Least Squares (OLS) estimation method. Their results suggest that Albania is indeed the victim of the Dutch disease, while in Moldova, they find the opposite – remittances and ODA inflows proved to depreciate the REER (real effective exchange rate). The only capital inflow that seems to have an appreciative effect on the REER in Moldova was FDI.

Moreover, Eromenko (2016) studies two landlocked resource-poor countries in Central Asia – Tajikistan and Kyrgyzstan – that have small, low-income economies and are characterized by high labor migration and dependence on remittances. Even though these countries show evident symptoms of Dutch disease, Eromenko finds that a high level of remittance flows depreciates RER. Instead, he suggests that the RER appreciation is caused by a transfer of Dutch disease from resource-rich Russia to Tajikistan and Kyrgystan, due to having close ties in terms of labor migration and remittances, as well as trade and investment flows.

Recently, Ito (2017) incorporated the impulsive response analysis derived from a VAR model for quarterly data of the period 2006-2014 in Moldova, and the author's findings provide the evidence that an increase in remittances is positively associated with the appreciation of the REER and decline in exports, though the impact is small. The same author, Ito (2019), used quarterly data of the period 2000-2016 and the VECM to examine the Dutch disease effect of remittances in Georgia. Ito's empirical findings suggest that the remittance flows appreciate the REER only in the long run and bring the reverse effect in the short run.

Even though the large chunk of the literature suggests the existence of the remittance-induced Dutch disease, there are a few studies providing contradictory results. Most notably, Rajan and Subramanian (2005) study the foreign aid-induced Dutch disease phenomenon in aid receiving

poor economies, and they obtain strong evidence that aid indeed leads to overvaluation of the RER, hurting the competitiveness of tradable sectors, which is reflected in decline in the share of labor-intensive and tradable sectors, such as manufacturing exportable industries. Conversely, the authors observe that private-to-private flows like remittances do not seem to create these adverse effects.

More recently, Martins (2013) tested the Dutch disease hypothesis for Ethiopia with the Fully-Modified OLS for 1995-2008 quarterly data and found no statistically significant evidence that capital flows such as foreign aid and remittances have an appreciative effect on the RER. Instead, he suggests that other factors, such as changes in external commodity prices, political instability, and economic policy, cause the main fluctuations in the Ethiopian currency.

Overall, we can conclude that the majority of scholarly literature indicates the remittance-induced Dutch disease effect; however, some studies either find mixed or contradictory results. Moreover, fewer studies can be found on post-communist and transition economies regarding the adverse effects of remittances, even though many such countries are characterized by high remittances-to-GDP ratio.

CHAPTER III. DYNAMICS OF MIGRATION AND REMITTANCES IN GEORGIA

3.1. Migration Patterns of Georgia Before and After Independence

According to Badurashvili and Nadareishvili (2012), massive out-migration is a new phenomenon for Georgia. During the Soviet period, more than 95% of ethnic Georgians lived on the territory of Georgia, and migration was mainly happening within the republic, towards the capital city Tbilisi. Waves of Georgia's external migration pattern after its dependence from the Soviet Union follows the periods of development given in *Table 2*.

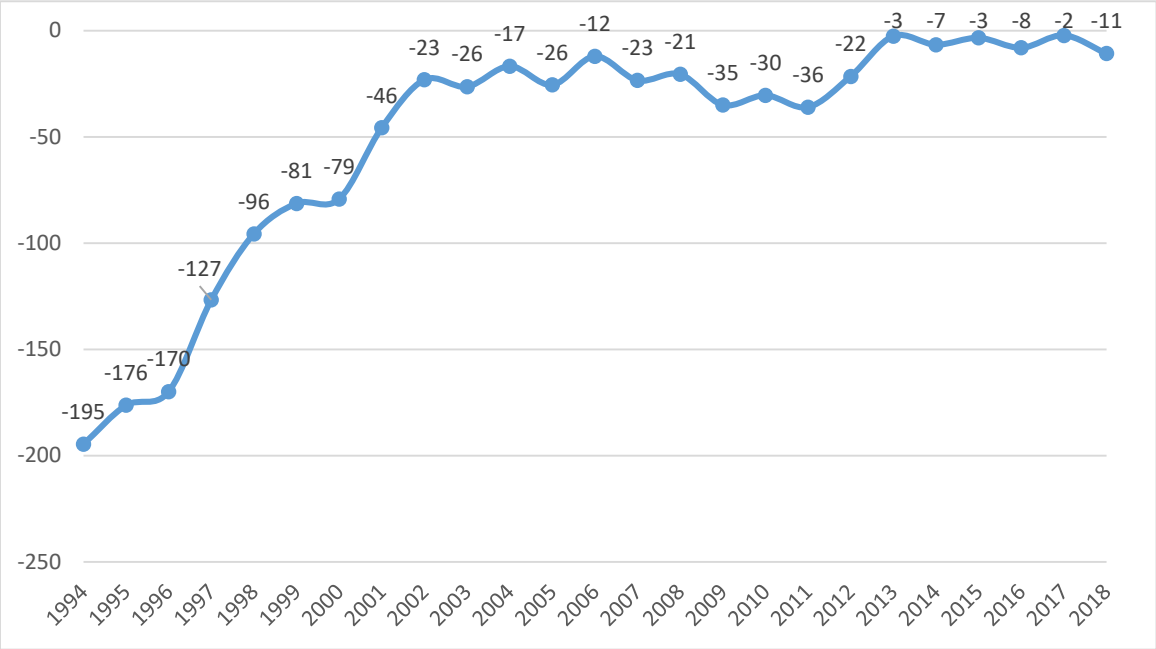
Table 2: The stages of socio-economic and political development of Georgia

YEARS	***Stage of development***
1991-1994	Total political and economic stagnation
1995-2003	Political and economic stabilization
2004-present	Economic development

Source: Badurashvili and Nadareishvili (2012)

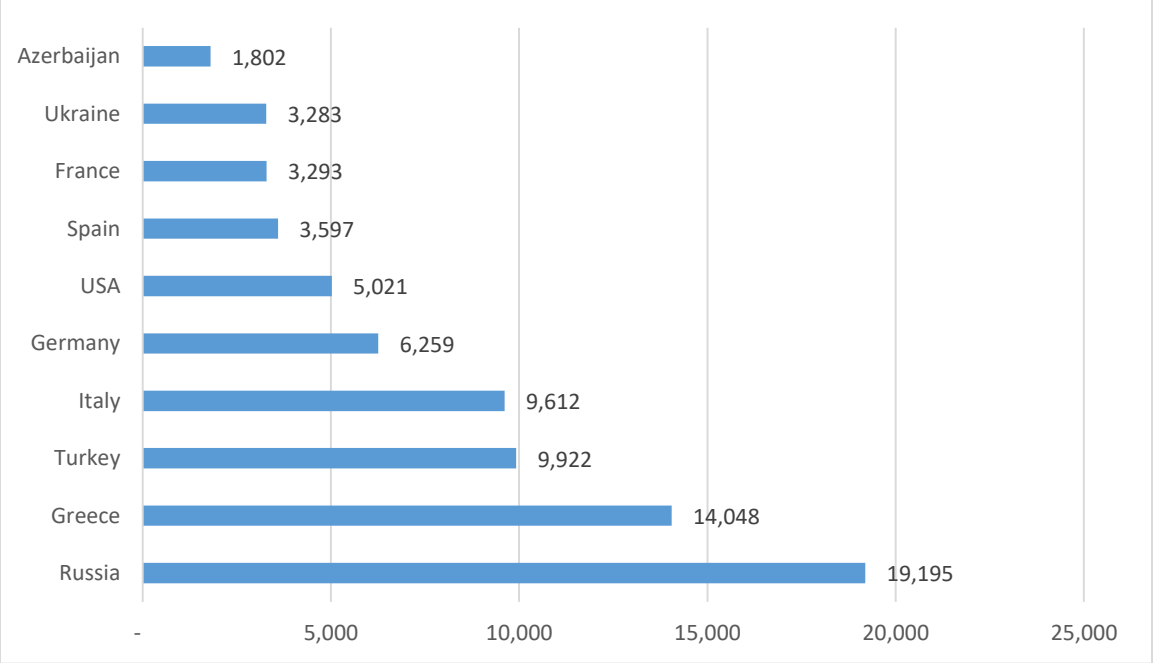
After the break-up of the Soviet Union in 1991, Georgia's transition from centrally planned to a market economy was greatly hindered by internal armed and territorial conflicts, civil wars, and high political instability. Facing the total socio-economic and political stagnation and encouraged by newly opened borders after independence in 1991, the Georgian population actively started to leave the country and seek better work and life opportunities elsewhere. As Badurashvili (2004) states, due to the persistent and intensive emigration flows, only during the period from 1989 to 2002, Georgia has lost around one million citizens, which comprised one-fifth of the total Georgian population. Therefore, the first wave of out-migration was permanent, triggered mainly by political and economic instability. Later, however, the emigration patterns transformed into circular (temporary) migration flows, and the working-age population started to leave the country for higher-earning abroad (Badurashvili, 2012). As *Figure 1* shows, the net migration has lowered and stabilized since the stage of economic development and especially diminished during the last six years.

Figure 1: Annual net migration in Georgia (thousands), 1994-2018



Source: National Statistics Office of Georgia

Figure 2: Top ten destination countries, the number of Georgian emigrants



Source: 2014 General Population Census, National Statistics Office of Georgia

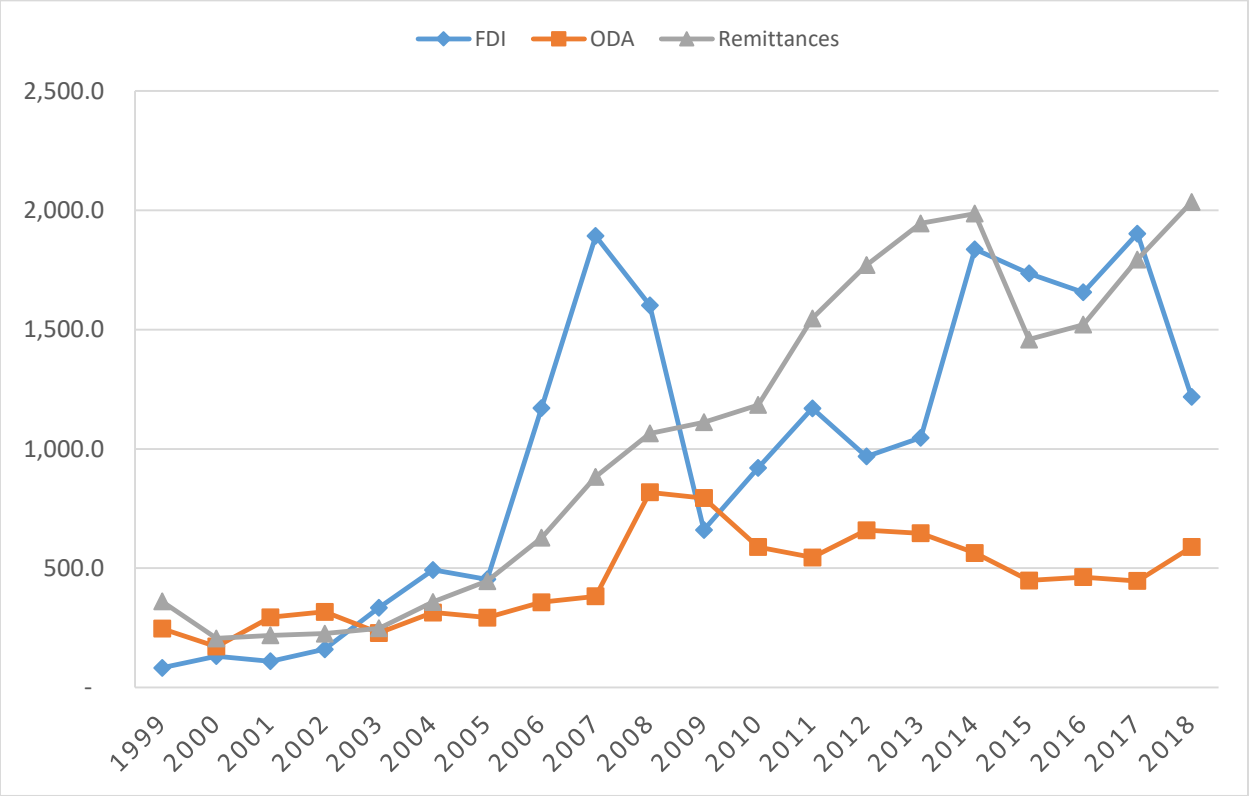
For about a decade after independence, the major country of destination for Georgian migrants was the Russian Federation, until the introduction of the visa regime in 2000, followed by completely closing the border as a result of Russia occupying the Tskhinvali Region of Georgia after the armed intervention and war in 2008. These events, as well as Georgia's pro-European geopolitical orientation, shifted the main destination of migration towards the Western European and Northern American countries during the last two decades. As *Figure 2* depicts, after Russia, the top destination countries for Georgian emigrants are neighboring Turkey and European countries such as Greece, Italy, and Germany.

3.2. Financing for Development in Georgia

Figure 3 illustrates the three primary sources of development finance for Georgia during the last two decades. ODA inflows to Georgia have been stably low, not going beyond US $382 million until 2008. However, in 2008 the ODA flow has more than doubled, reaching US $818 million compared to 2007. This sharp increase mainly can be explained as a world's response to the Russo-Georgian War in August 2008. Since then, however, ODA has been stably decreasing except for a slight drop in the years 2012 and 2013. In general, we can conclude that ODA is not the primary external source of financing for development for Georgia.

In contrast, the importance of private transfers, such as FDI and remittances, has been growing. From *Figure 3*, we can observe that FDI flows are characterized by much more volatility than the remittance flows. FDI has been growing since 1999, experiencing a sharp jump in 2006 – arguably, the 2003 Rose Revolution, peaceful change of the government, and a competitive privatization process created a favorable environment for investment, attracting foreign investors to Georgia. However, after the 2008 financial crisis, FDI flows have dropped more than two-fold. Moreover, this observation is strengthened by the fact that a country that had just gone through war, seemed like an unstable environment for investment, discouraging FDI flows even more. Overall, like in any other country, in Georgia, FDI flows are procyclical and very sensitive to economic, financial, or political shocks.

Figure 3: Inflows of net FDI, net ODA & official aid, and personal remittances in Georgia (millions, current $US), 1999-2018



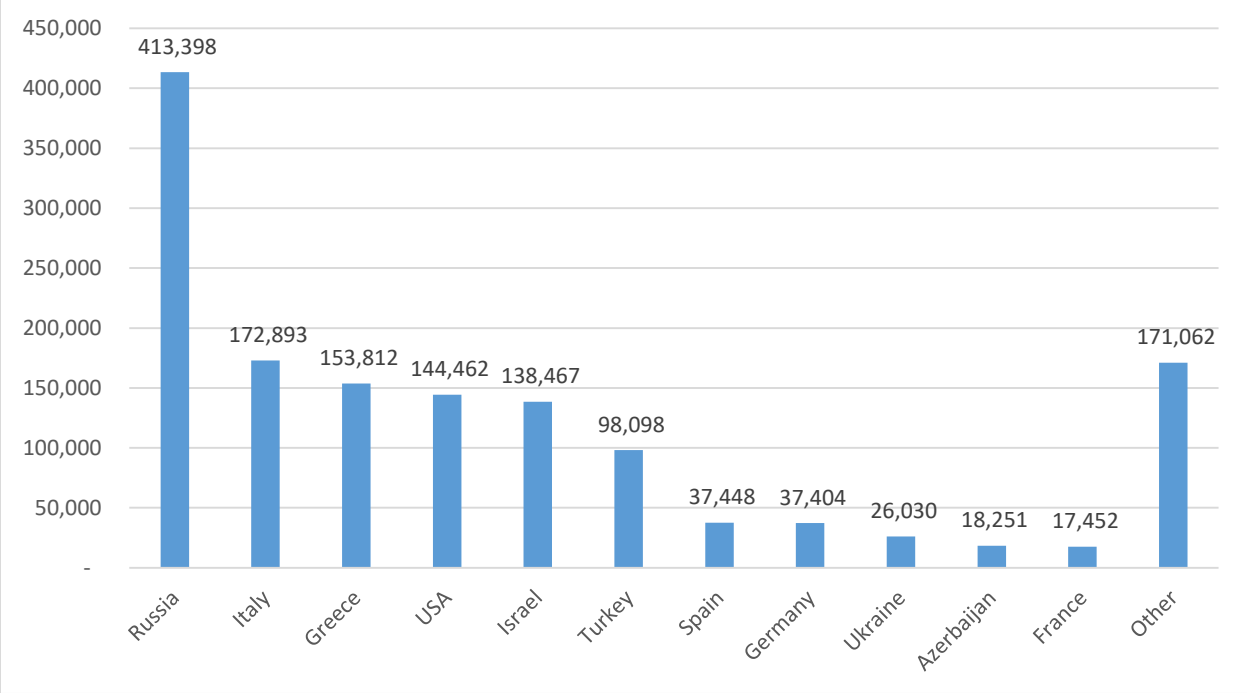
Source: Based on the World Bank's WDI data

On the other hand, remittance inflows have been stably growing in Georgia during the last two decades, except for a short decrease in 2015; however, since then, the upward trend has been maintained. From 2015 to 2017, the inflow of FDI was higher than that of remittances, but in 2018 the picture changed, and remittances stood US $200 million more than FDI in 2018. Overall, we can observe that remittances are much less volatile private transfers than the FDI, which is consistent with the theory of the countercyclical nature of remittances. For instance, from *Figure 3*, it is visible that remittances have not declined as a response to the 2008 financial crisis and the inflows of remittances were much higher than that of FDI in the 2009-2014 period.

3.3. Remittance Inflows in Georgia

In the last four years, the total amount of remittances from abroad has increased by 32% in Georgia. The largest of part of it still comes from the Russian Federation, however, in 2018, the amount of remittances from Russia has decreased by 9.2% compared to 2017, on the other hand, transfers from Israel has increased by 16.2%, and the overall transfers from the EU (including the United Kingdom) have increased by 10.7% in 2018 (State Commission on Migration Issues, 2019). Furthermore, according to the latest data from the National Bank of Georgia, in January 2020, the volume of money transfers from abroad constituted US $125.6 million – 8.6% (US $9.9 million) more than the amount in January 2019.

Figure 4: Top remittance sending countries to Georgia (thousands of $US), 2018



Source: National Bank of Georgia

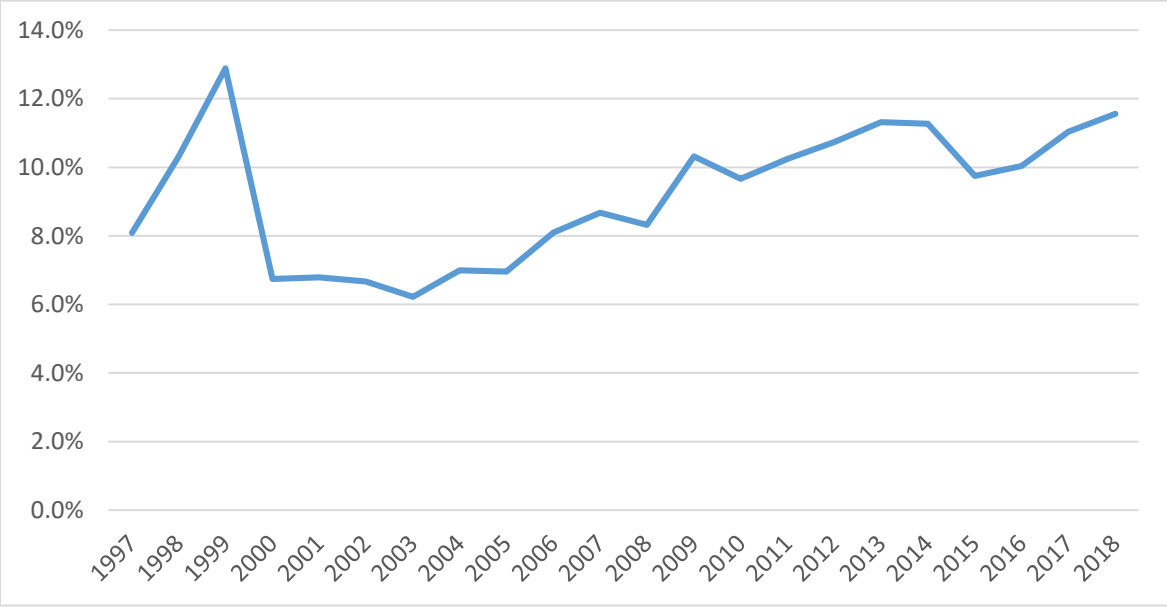
Many surveys and reports show the importance of remittances for Georgia on a household level. For instance, a recent household survey[2] revealed that for 46% of those Georgian households who have (or used to have) at least one family member abroad, this member is (or has been) the main

[2] The survey was conducted on 449 households by the State Commission on Migration Issues of Georgia in 2019.

breadwinner for the family. Moreover, more than half of the surveyed households (57%) systematically receive (or received) remittances from a working family member abroad. Besides, in 2018, money transfers from abroad made up 4.3% of the total Georgian households' income (GEOSTAT, 2019).

However, another household survey[3] revealed that remittances are mostly spent on consumption and rarely on entrepreneurial needs. 34% of the surveyed households stated that they primarily spend the received remittances on basic needs such as food and clothing; 25% spend it on improving housing conditions; 13% on education, 13% on paying off debts and only 6% of them on establishing small and medium enterprises (Lukashvili, 2018). On the other hand, remittances are fungible like any other source of income and even if they are not being spent directly on investment, they free other resources for expenditures on investment (Adams, 2006), If, for instance, a household spends received remittances primarily on food, it also saves other funds that would have been spent on food in the absence of remittances, consequently allowing a household to invest in productive activities.

Figure 5: Personal remittances, received (% of GDP), 1997-2018



Source: The World Bank

[3] The survey was conducted for Kakheti, Kvemo Kartli, and Samtskhe-Javakheti regions by the International Organization for Migration in 2015.

According to other empirical studies, remittances indeed are of crucial importance on both micro- and macro- level for Georgia. For instance, Gerber and Torosyan (2013) found evidence that remittances are associated with higher living standards and better economic well-being for the recipient Georgian households. Moreover, remitted income from abroad enables families to spend more on consumer goods and, at least in urban areas, increase savings and expenditures on education and healthcare. Their findings also suggest that remittances foster the formation of social capital as they enable households to give more gifts to other households. Furthermore, according to Badurashvili and Nadareishvili's (2012) calculations, the Gini coefficient is two percentage points higher when it is computed without remittances, suggesting that the payments from migrant workers contribute to reducing inequality among Georgian households.

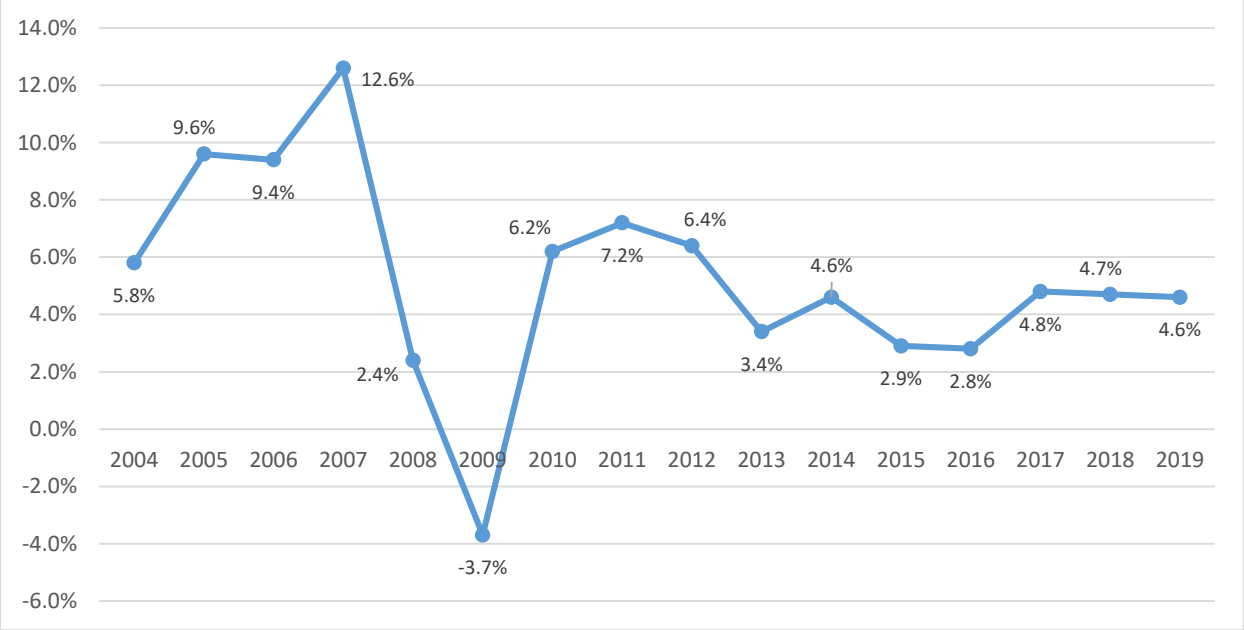
Finally, Uzagalieva and Menezes (2009) analyzed the poverty effects of emigration and inward remittance flows through direct and indirect channels in Georgia, and they found that remittances have a strong macroeconomic growth effect at the aggregate level. The fact that Georgia is characterized by a high remittances-to-GDP ratio, averaging at 10.6% during the last ten years, further strengthens this statement (*Figure 5*).

CHAPTER IV. REVIEW OF MAIN MACROECONOMIC INDICATORS OF GEORGIA

4.1. Growth

The classification of the socio-economic and political development of Georgia by Badurashvili and Nadareishvili (*Table 2*) is also consistent with the economic growth trends of Georgia. Soon after the independence and beginning of the transition process, the country experienced negative real GDP growth rates of -21.1% and -44.9% in the years of 1991 and 1992, respectively. Only in 1995 did Georgia's real GDP start to exhibit a positive growth rate of 2.6% (IMF, 2019). *Figure 6* describes the real GDP growth trend of Georgia from 2004 until the present. The trend experienced a sharp drop in growth rate right after the Russo-Georgian war in 2008, reaching the negative value of -3.7%. However, since then, Georgia's real GDP growth rate has maintained positive values, stabilizing at an average of 4.7% during the last three years.

Figure 6: Real GDP growth (annual % change), 2004-2019



Source: International Monetary Fund

Moreover, Georgia's GNI per capita has been steadily increasing since the year 2001, with a small decrease in 2015-2017. Reaching the GNI per capita of $4,440 in 2018, World Bank now classifies

Georgia as an upper-middle-income country. Nonetheless, despite the country's recent improvements in overall economic performance, the remarkable rate of growth has not been accompanied by corresponding declines in the unemployment and poverty rates. On average, more than 15% of Georgia's total labor force has remained unemployed during the last ten years (WDI, 2020), while 20.1% of the total population remains under the absolute poverty line (GEOSTAT, 2018).

4.2. Structure of the Economy

Agriculture

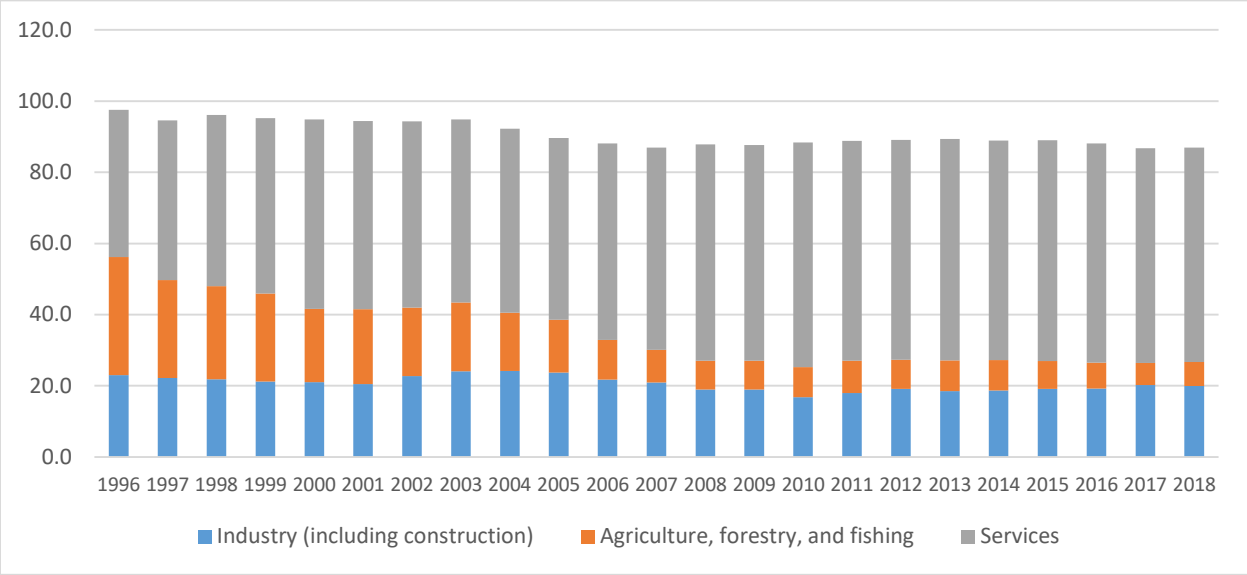
Since its transition from the centrally planned (command) to market based, Georgia's economy has undergone substantial structural changes. Before transition, around twenty-five years ago, shares of agriculture, industry, and services in GDP were more or less equally split. However, as *Figure 7* illustrates, since then, the productivity of the agricultural sector has declined, and the share of agriculture has shrunk significantly – from 33% in 1996 to only 7% of GDP in 2018. Nonetheless, the sector remains very important for the Georgian economy, as the agricultural production accounts for 45% of rural household income and subsistence agriculture accounts for 73% of rural employment (WTO, 2015). Besides, the agricultural sector employed 38.9% of the total labor force in employment in 2018 (GEOSTAT); therefore, agriculture not only provides an important safety net mechanism for the rural population but it also makes an important contribution to the country's exports. On the other hand, the low productivity level in the agricultural sector is conditioned, among other things, by low investment, lack of funding, and limited information about markets and new technologies (WTO, 2015).

Industry

The manufacturing sector of Georgia, like any other former Soviet Union country's economy, experienced a sharp contraction in output during the initial phase of the transition, and the share of the industry fell from 34,3% in 1991 to 23.6% of GDP in 1992 (World Bank). Nevertheless, later the intensive privatization policy by state authorities has created a favorable environment for the restoration of industrial production, and it then stabilized and was characterized only by slight

fluctuations. *Figure 7* also depicts that the share of the industrial sector (including construction) in Georgia's GDP has been very stable, averaging at 18.9% during the last ten years (WDI).[4]

Figure 7: Share of sectors in Georgia's economy, value added (% of GDP), 1996-2018



Source: Based on the World Bank's WDI data

Services

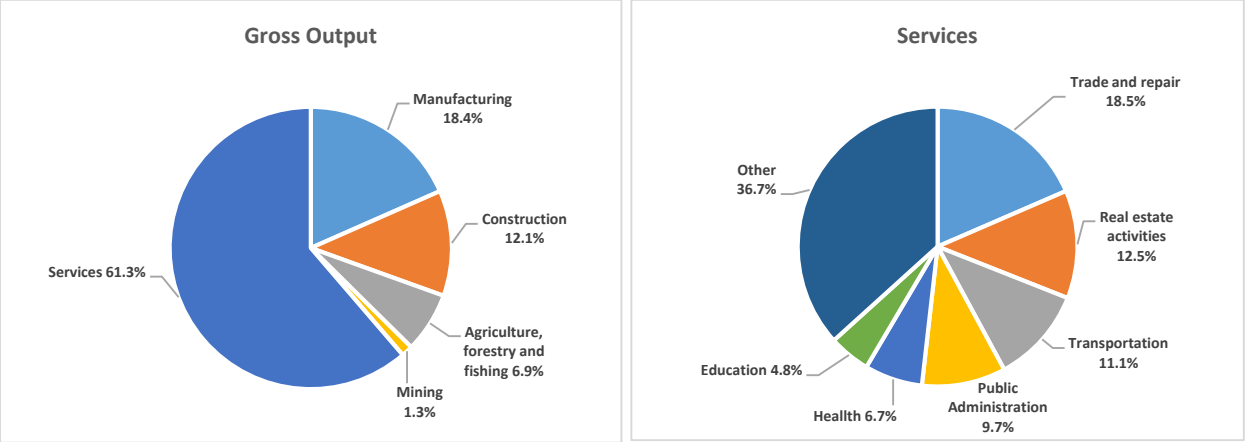
Before the transition, the services sector, and in particular, market-oriented services, was underdeveloped. Nonetheless, since the transition, the services-to-GDP ratio has gradually increased, as the corresponding share of agriculture has shrunk. For instance, a year after the independence, in 1992, the share of the service sector in Georgia's GDP was only 22.9%, however along with the rapid development of trade, transport, and financial services, the services sector accounted for 60.3% of GDP in 2018 (WTO, 2015; WDI). *Figure 7* depicts how Georgia's economy has become increasingly service-based, especially during the last ten years.

Overall, growth has primarily been powered by the non-tradable sector. Services made up almost two-thirds of the economy in 2018, followed by manufacturing (18.4%), construction (12.1%), and agriculture (6.9%). Within services, the largest sub-sectors are trade and repair (18.5%), real

[4] The industry comprises value added in mining, manufacturing, construction, electricity, water, and gas (WDI, 2020).

estate activities (12.5%), transport (11.1%) and public administration (9.7%) while health and education make up only 6.7% and 4.8% respectively (*Figure 8*).

Figure 8: Structure of gross output and the sub-sectors of services, 2018



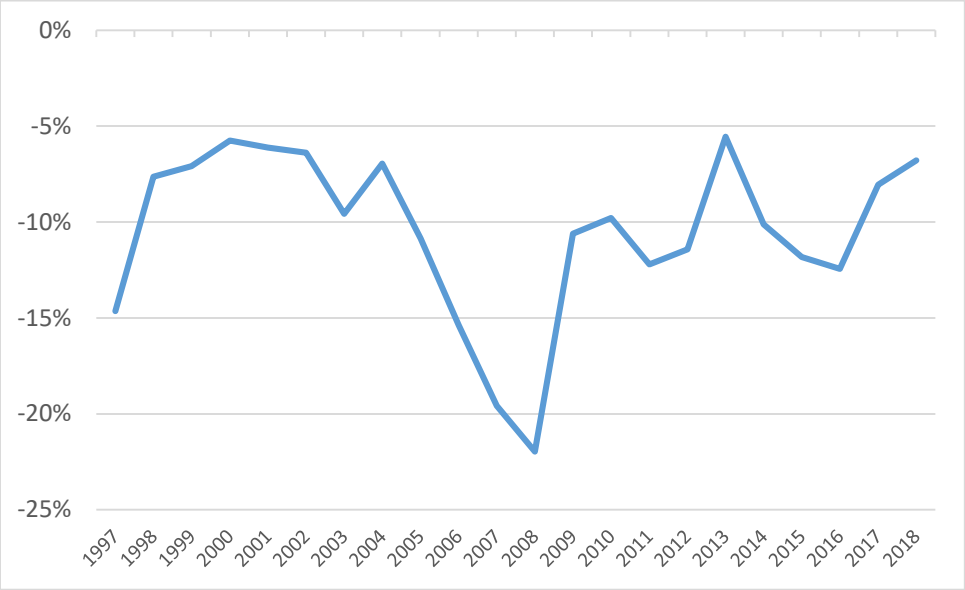
Source: National Statistics Office of Georgia

4.3. Composition of the Current Account Balance

The current account balance (CAB) determines the change in a country's net asset position vis-à-vis the rest of the world, and the CAB-to-GDP ratio is often used for assessing the macroeconomic conditions of a country and the sustainability of its external position (Capelli and Vaggi, 2016). Georgian economy experienced frequent and large fluctuations in the CAB-to-GDP ratio since the transition, but it has stabilized and averaged at a negative 10% during the last ten years (*Figure 9*). On the other hand, Georgia exhibited a relatively stable negative CA balance in the 1997-2005 period, not going beyond the negative US $700 million threshold. However, since the year 2006, the CA deficit has increased drastically, reaching its peak negative value of US $2.8 billion in 2008, due to the joint harmful effect of the global financial crisis and the Russo-Georgian war (*Figure 10*).

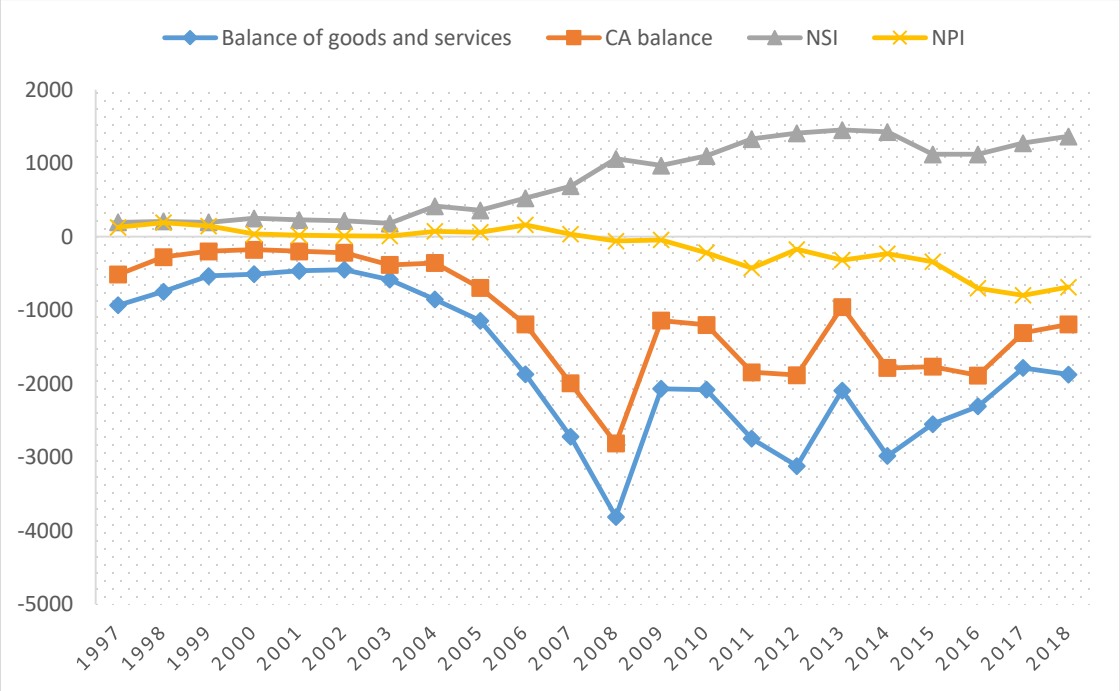
Even though the CA deficit has decreased during the last five years, dropping to US $1.2 billion in 2018, it remains very high for the Georgian economy – coupled with heavy reliance on FDI and remittances, it makes the country vulnerable to external shocks.

Figure 9: CAB-to-GDP ratio (%), 1997-2018



Source: The World Bank

Figure 10: The composition of the CA balance of Georgia (millions of $US), 1997-2018



Source: Based on the World Bank data

Furthermore, from *Figure 10*, we learn that the trade balance (balance of goods and services) is the main component of the CAB, and the trends of these two indicators are almost identical. While the other elements of the CAB, such as Net Primary Income (NPI) and Net Secondary Income (NSI), remain less volatile, but at the same time, less significant. The only component with a positive trend that contributes to reducing the current account deficit is the NSI since it captures personal transfers and remittances. From this analysis, we can now emphasize how essential it is for Georgia, as a small open economy, to foster export competitiveness in order to improve its trade and current account balances.

Overall, we can conclude that Georgia indeed shows signs of the Dutch disease: Remittances are an essential source of external financing for the country; The growth of the economy has become mostly service-based, and the share of the manufacturing sector has shrunk over the years since the beginning of the transition process; The country exhibits persistent trade deficit and negative CAB.

CHAPTER V. REMITTANCES AND THE EXCHANGE RATES

When it comes to drawing conclusions on the loss of competitiveness of a country under the examination, the majority of studies use the real exchange rate (RER) or real effective exchange rate (REER) as a main dependent variable and an overall measure of external competitiveness. *Table 3* contains data on personal remittances and different measures of exchange rates, with the purpose to illustrate any possible connections between these two indicators. Before discussing the elements of *Table 3* more deeply, let us review the methodology behind measuring the RER.

Corden and Neary (1982) defined the RER as the relative price of non- traded to traded goods – a rise in the relative price of the non-traded good (services) compared to that of the trade goods (manufacturing) corresponding to a real appreciation. Later, Edwards (1989) defined the RER by the following equation:

$$e = \frac{EP_T^*}{P_N} \qquad (1)$$

Where e is the RER; E is the nominal exchange rate defined as units of domestic currency per unit of foreign currency; P_T^* is the world price of tradable goods in terms of foreign currency, and P_N is the price of non-tradable goods. When RER is defined in such a way, higher value of the RER corresponds to a higher degree of competitiveness. Furthermore, it is assumed that there are no taxes on trade and the law of one price holds for tradable goods. However, from an empirical point of view, a measurement problem arises when it comes to the selection of the real-world counterparts of P_T^* and P_N. Firstly, it is very challenging in reality to define which goods are tradable and which are non-tradable. Secondly, the relevant data on tradable and non- tradable goods is usually unavailable on an individual country basis; therefore, some proxy for the analytical concept of the RER should be found (Edwards, 1989).

According to Issa and Ouattara (2008), most commonly, the RER is proxied by available domestic and world price indexes along with nominal exchange rates. The following ratio is usually computed:

$$RER = \frac{NER \times P^f}{P^d} \quad (2)$$

Where NER is the nominal exchange rate measured as the domestic currency per foreign currency, P^f is the index of foreign prices, and P^d is an index of domestic prices. Such a definition of the RER implies that an increase (fall) in the value of RER corresponds to a real depreciation (appreciation). The authors further clarify that depending on data availability, different measures of these indexes can be used.

Edwards (1989) suggests that, traditionally, literature offers four alternative price indexes when it comes to construction of the RER index: The Consumer Price Indexes (CPI); The Wholesale Price Indexes (WPI); The GDP deflators (GD); and Wage rate indexes (WR). However, all of these indexes have their advantages and drawbacks. From a practical point of view, in most of the empirical and policy discussions, CPIs are used as the relevant price indexes and are preferred for analyzing changes in the RER and the degree of competitiveness. There are a couple of reasons behind this preference; first of all, CPIs cover a broad group of goods, including services; thus they provide a more comprehensive measure of changes in a country's competitiveness and secondly, this indicator is updated periodically, and most countries publish reliable data on CPI behavior. However, Edwards mentions that, as the CPI includes a large number of non-traded goods, it may yield a biased measure of the changes in the degree of competitiveness of the tradable goods sector. Nonetheless, Edwards concludes that the choice of price indexes does not have a considerable impact on the construction of the RER, but the critical decision lies in between bilateral and multilateral rates. These two show significant differences in behavior and sometimes even move into opposite directions. The REER or else the trade-weighted RER index is a multilateral RER, which is the weighted average of a basket of relevant bilateral rates, where the weight of each foreign currency is equal to the respective foreign country's share in total trade (Nikas & Blouchoutzi, 2014).

The methodology behind the multilateral RER is well discussed in the work of Martins (2013). Based on Edwards (1989), Martins computed the RER index of Ethiopia as the geometric trade-weighted average of a basket of bilateral RERs.

$$RER_t = \prod_{i=1}^{n} \left(NER_{it} \times \frac{P_t^d}{P_{it}^f} \right)^{w_{it}} ; \quad Where\ t = 1, \dots, T\ and\ i = 1, \dots, n \qquad (3)$$

Where NER is the bilateral nominal exchange rate index expressed in foreign currency per domestic currency. P^d and P^f are domestic and foreign price indexes, respectively, proxied by the CPI and PPI/WPI. Martins computes the weights as the share of each partner's trade in the total volume of Ethiopia's trade with n partners.

$$w_{it} = \frac{X_{it} + Z_{it}}{\sum_{j=1}^{n} (X_{jt} + Z_{jt})}; \quad Where \sum_{j=1}^{n} w_{it} = 1,\ 0 < w_{it} < 1 \qquad (4)$$

Table 3 attempts to observe and capture any possible signs of a connection between the remittance inflows and the loss of Georgia's competitiveness measured by the changes in RERs. It includes data on the average official exchange rate of Georgia's national currency against the US dollar. Another important element of *Table 3* is the REER index, which is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs (WDI, 2020). The increase of the REER index indicates the appreciation of Georgian currency – the purchasing power of the GEL (Georgian Lari) becomes higher, and less is needed for paying for imports, while the exports become more expensive on the external market.

One can easily observe from *Table 3* that the remittance inflows and its share in GDP have been growing at high rates since the year 2000. These inflows affected Georgia's balance of payments in such a way that the current account deficit of the country has been stably much smaller than the trade deficit. The statement also corresponds to the observations made from *Figure 10*. Concurrently, the GEL has appreciated visibly since the transition, except for the last three years. This trend is more evident from the year 2003 until 2015, as depicted by the nominal (official average) exchange rate. At the same time, the REER index shows that the purchasing power of the GEL has increased during the same period by 36.3%. The same trend is also maintained in the last three columns of *Table 3*.

The measures of the real exchange rate, RER1, and RER2, are calculated by equation (2) and follow the methodology offered by Issa and Ouattara (2008).

Table 3: Remittances and exchange rates in Georgia

YEAR	REM (MILLIONS OF CURRENT US$)	REM (% OF GDP)	OFFICIAL ER	REER INDEX	RER1	RER2	REER
1997	284.00	8.09	1.30	93.81	2.23	1.62	-
1998	372.90	10.32	1.39	91.50	2.35	1.75	-
1999	360.80	12.89	2.02	78.27	2.93	2.21	-
2000	205.93	6.74	1.98	85.13	2.84	2.18	-
2001	218.64	6.79	2.07	85.13	2.93	2.31	-
2002	226.33	6.67	2.20	82.55	2.99	2.42	1.89
2003	248.45	6.22	2.15	77.98	2.96	2.45	1.76
2004	358.59	7.00	1.92	83.25	2.57	2.17	1.90
2005	446.01	6.96	1.81	88.76	2.32	1.98	1.91
2006	627.35	8.10	1.78	93.86	2.16	1.86	1.85
2007	883.07	8.68	1.67	97.21	1.90	1.70	1.77
2008	1,065.02	8.32	1.49	107.60	1.60	1.50	1.51
2009	1,111.62	10.32	1.67	104.54	1.76	1.71	1.47
2010	1,183.94	9.67	1.78	100.00	1.78	1.78	1.54
2011	1,547.27	10.24	1.69	108.47	1.60	1.64	1.62
2012	1,770.12	10.74	1.65	110.39	1.62	1.67	1.62
2013	1,945.28	11.32	1.66	107.17	1.66	1.73	1.90
2014	1,986.47	11.27	1.77	106.30	1.74	1.85	1.94
2015	1,458.74	9.75	2.27	98.36	2.15	2.47	1.89
2016	1,520.79	10.04	2.37	99.33	2.22	2.64	2.12
2017	1,793.95	11.04	2.51	97.73	2.27	2.79	2.36
2018	2,034.29	11.56	2.53	98.15	2.29	2.88	2.37

Source: REM: personal remittances, received, current US$ and % of GDP (World Development Indicators)
NER: official exchange rate, LCU per US$, period average (World Development Indicators)
RER INDEX: real effective exchange rate index, 2010 = 100 (World Development Indicators)
RER1, RER2: real exchange rate (own calculation)
REER: real effective exchange rate (own calculation)

In the case of RER1, as the majority of international transactions are quoted in USD, the US consumer prices index (CPI-US) was used as a proxy of foreign prices P^f; and for domestic prices,

the Georgian consumer price index (CPI-GEO) was used. In the second measure of the RER (RER2), the CPI-US was replaced with the average of the consumer price indexes of Georgia's eleven main trading partners.[5] The data for constructing these two measures were obtained from the World Development Indicators and National Statistics Office of Georgia. RER1 and RER2 show a stable appreciation for the period 2003-2009, and then slightly depreciating until 2015, only depreciate even more rapidly during the last three years. Interestingly, this period also corresponds to a short but sharp fall in remittance inflows in the period 2015-2017.

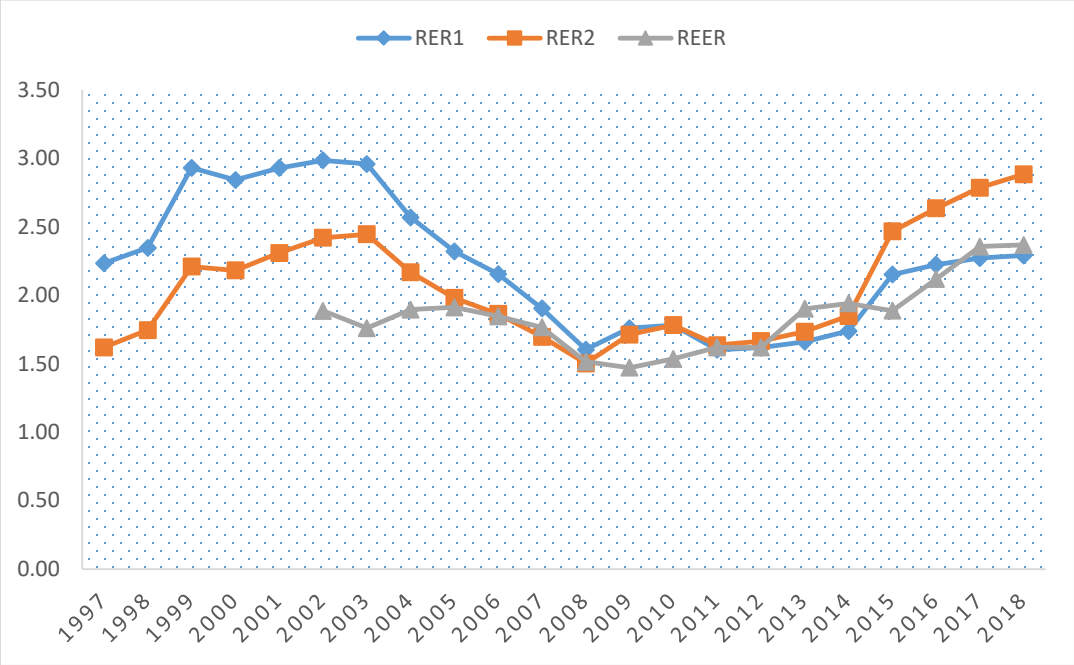
The last column of *Table 3* contains data on the real effective exchange rate (REER) which follows the methodology of Martins (2013) and was calculated by the equation (3) and the weight of each trading partner was determined by equation (4). The relevant data was obtained from World Development Indicators, National Statistics Office of Georgia and Minister of Finance of Georgia.[6] Due to limited data availability on bilateral nominal exchange rates for Georgia's eleven main trade partners, the REER was constructed only for the period 2002-2018. Moreover, since the data on the trading partners' PPI/WPI was either incomplete or unavailable, both domestic and foreign price indexes were proxied by CPI. An increase (decrease) in the obtained RER represents a depreciation (appreciation). The appreciation trend is observed for a shorter period of 2005-2009 in the case of the REER measure, with a slight depreciation in 2010-2015 and more rapid depreciation during the last three years, just like in the case of RER1 and RER2 measures.

For a more intuitive illustration of the RERs and the REER, they are plotted in *Figure 11.* The rapid depreciation phase of the period 2003-2008 is more pronounced in RER1 and RER2. For the period 2008-2014, all three measures take similar values. In the latest depreciation phase for the 2015-2018 period, RER2 takes higher values than RER1, which was the opposite case until 2008.

[5] Turkey, Russia, Azerbaijan, China, Ukraine, Armenia, USA, Germany, Bulgaria, France. Trade with these eleven countries accounted for 67.8% of Georgia's total trade flows (sum of imports and exports) during the period 1997-2018 (GEOSTAT).

[6] Retrieved from: http://treasury.ge/en/Rates. Accessed in March, 2020.

Figure 11: Real exchange rates and the real effective exchange rate in Georgia (1996-2018, 2002-2018)



Source: Own calculations based on data from World Development Indicators, National Statistics Office of Georgia and Minister of Finance of Georgia

Of course, the fact that the sequences of remittance inflows and the REER index are trending in the same direction (or in the opposite direction in the case of RER obtained from different methodologies) does not give us enough evidence to conclude that changes in remittances cause changes in REER index (or RERs). It may be the case that these two time series processes are correlated only because they tend to be trending over time due to other unobserved factors. The primary purpose of this chapter was to explore the direction of these two trends. Whether movements in these two series are indeed related to one another and possible short- and long-run relationships between them will be empirically tested in the following chapters.

CHAPTER VI. DETERMINANTS OF THE REAL EXCHANGE RATE

The key explanatory variable of our interest is remittance inflows. Therefore, we specify the general theoretical model of Georgia's external competitiveness as follows:

$$REER_t = \beta_0 + \beta_1 REM_t + \beta_2 X_t + \varepsilon_t, \quad t = 1997, \dots, 2018 \qquad (5)$$

Where X_t is the vector of control variables that affects the short- and long-run movements in the REER index along with the remittances. While defining the main determinants of our dependent variable, we follow the empirical works discussed in the literature review and especially the works of Edwards (1989) and Chowdhury (1998).

According to Edwards, in order to capture any misalignment (over- or undervaluation) in the RER, first, the equilibrium value of the RER must be established. On the other hand, Edwards emphasizes the importance of allowing for a distinction between the effects of temporary and permanent changes in the RER determinants, when establishing the equilibrium RER. The author introduces the definition of the latter notion as the relative price of tradables to non-tradables that results in the simultaneous attainment of internal and external equilibrium. Edwards also defines that internal equilibrium occurs when the non-tradable goods market clears in the current period and stays in the equilibrium in the future periods, while country is found to be in an external equilibrium when its current account balances are compatible with long-run capital flows. Furthermore, the equilibrium RER is itself a function of different variables and is influenced by determinants or what Edwards calls the "fundamentals" in the long and short run. The categorization of these fundamentals is given in *Table 4.*

The first two domestic policy-related fundamentals given in *Table 4* (import restrictions and export taxes or subsidies) are associated with the *trade policy* of a country and are usually proxied by the degree of openness of an economy. In empirical literature, the degree of trade openness is usually measured by the ratio of export and imports (total trade) to GDP. Greater trade openness is related to a reduction in import tariffs and increased trade liberalization. As a result, domestic prices of tradable goods decrease, and the export sector becomes more competitive on the external market, consequently leading do the real depreciation (Chowdhury, 2004). In other words, greater

openness of the economy will result in real depreciation if it reduces the demand for non-tradables (Issa & Ouattara, 2008). Similar logic applies to the capital and exchange controls. Lower tariffs on capital imports also reduce the cost of production of tradable goods and make the sector more competitive (Chowdhury, 2004; Polat & Rodríguez Andrés, 2019).

Table 4: Determinants of the Real Exchange Rate

FUNDAMENTALS	EXTERNAL	DOMESTIC	POLICY-RELATED	NON POLICY-RELATED
Import restrictions		*x*	*x*	
Export taxes or subsidies		*x*	*x*	
Capital and exchange controls		*x*	*x*	
Government consumption expenditure		*x*	*x*	
International terms of trade	*x*			
International transfers (ODA, FDI, remittances)	*x*			
World real interest rates	*x*			
Technological progress		*x*		*x*
Productivity improvement		*x*		*x*

Source: Based on Edwards (1989), Chowdhury (1998), and Chowdhury and Rabbi (2014).

Government consumption expenditure is another domestic policy-related fundamental determinant of the RER. However, its impact depends on the composition of government expenditures. A propensity for consuming tradable goods and services tends to depreciate the RER, while if the consumption is more biased towards non-tradable goods and services, it tends to appreciate the RER. Therefore, the theoretical impact of the government consumption expenditure is often ambiguous, as there is rarely a distinguished data available on the consumption of tradables and non-tradables (Martins, 2013; Addison & Baliamoune-Lutz, 2013).

International terms of trade is the external fundamental determinant of the RER, which refers to the price of exports relative to imports and is usually calculated by dividing a country's export unit value by its import unit value. Improvement in the terms of trade can affect the RER through income and substitution effects. Due to increased export prices and higher income, the *income effect* rises spending on both tradables and non-tradables, resulting in the appreciation of the RER (Bourdet & Falck, 2006). On the other hand, the *substitution effect* is related to the relative cheapness of non-tradables (Chowdhury & Rabbi, 2014). The final effect of the international terms of trade is ambiguous and depends on which effect dominates.

International transfers include our primary explanatory variable concerning the analysis of the movements in the RER. As discussed in the literature review, large capital inflows are expected to appreciate the recipient country's currency and lead to the Dutch disease effect. However, some authors consider this fundamental determinant to have an ambiguous effect. For instance, according to Polat and Rodríguez Andrés (2019), remittances are likely to give rise to real appreciation only if they accelerate consumption of both non-tradable and tradable goods rather than contributing to savings and investment.

World real interest rates may affect the equilibrium RER in two opposite directions. A high world real interest rate may improve a country's external lending and its creditor position vis-à-vis with the rest of the world, resulting in the appreciation of the RER. On the other hand, a high world interest rate may reduce domestic demand and the relative price of non-tradable goods in the short term and lead to depreciation of the RER (Polat & Rodríguez Andrés, 2019; Chowdhury & Rabbi, 2014).

Technological progress and productivity improvement are domestic non policy-related fundamental determinants of the equilibrium RER, which can increase the efficiency of the tradable sector, reallocate resources from non-tradable to the tradable sector and positively affect exports of a country – this is a *supply effect* that results in real depreciation. On the other hand, advancement in technology may influence the RER through *demand (income)* effect, which will increase the domestic spending on both tradable and non-tradable goods and induce an appreciation of the RER. The final effect is undetermined and will depend on the domination of one of these effects. However, it is also a common practice to establish the theoretical impact of the technological progress according to the Balassa–Samuelson effect which claims that faster advances in technology lead to an appreciation of the RER (Bourdet & Falck, 2006; Polat & Rodríguez Andrés, 2019; Chowdhury & Rabbi, 2014).

CHAPTER VII. EMPIRICAL ANALYSIS

As discussed in the introductory part of the thesis, the remittance-induced Dutch disease phenomenon remains yet unexplored for Georgia and the innovative part of this master thesis is in its main objective to test for the remittance-induced Dutch disease in Georgia based on annual data. This chapter aims to describe the variables used in empirical analysis, specify the econometric model, and discuss the estimation methodology.

7.1. Data and Variables

The analysis is based on annual secondary data on several macroeconomic variables, obtained from the databases of World Development Indicators and the National Statistics Office of Georgia. The model was estimated for the period 1997-2018, yielding twenty-two observations. The main limitation of the study is the scarcity of complete annual data on RER fundamentals presented in *Table 4*. For example, barter terms of trade index, which is one of the fundamental explanatory variables, was not included in the study due to incomplete data. Moreover, having a small sample also restricted the number of independent variables incorporated into the model. After including explanatory variables in the theoretical model, (5) can be rewritten as follows:

$$REER_t = \beta_0 + \beta_1 REM_t + \beta_2 KOPEN_t + \beta_3 TROPEN_t + \beta_4 GOVEXP_t + e_t, \quad t = 1997, \dots, 2018 \tag{6}$$

Where $REER_t$ is the real effective exchange rate index (2010=100), which is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs (WDI, 2020). An increase in the value of the REER corresponds to a rise in the purchasing power of the GEL and to real appreciation. REM_t is the received personal remittances measured as a percentage of GDP. Personal remittances consists of personal transfers from non-resident to resident individuals and compensation of employees, which refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not residents and of residents employed by non-resident entities (WDI, 2020). Remittances inflows, as the majority of discussed literature suggest, are expected to appreciate the REER. Variable $KOPEN_t$ captures the degree of capital openness of

Georgia and is calculated as $\frac{FDI+ODA}{GDP} * 100$. Where FDI (foreign direct investment) refers to direct investment equity flows and it is the sum of equity capital, reinvestment of earnings, and other capital. While ODA (net official development assistance) consists of concessional loans, grants, and net official aid from official donors to Georgia (WDI, 2020). The joint effect of FDI and ODA inflows, like remittances, is expected to lead to real appreciation.[7] $TROPEN_t$ describes the degree of trade openness of Georgia and is calculated as $\frac{exports+imports}{GDP} * 100$. A higher degree of openness is expected to reduce domestic prices of tradable goods and make the export sector more competitive on the external market, consequently depreciating the REER. The last explanatory variable, $GOVEXP_t$, is the general government final consumption expenditure, which includes all government current expenditures for purchases of goods and services (WDI, 2020). This variable is also measured as a percentage of GDP and its impact on the REER is ambiguous, as it depends on whether the consumption is biased towards tradables or non-tradables. The summary of variables, their expected signs and data sources are given in *Table 5*.

Table 5. Summary of variables

VARIABLE	DEFINITION	DATA SOURCE	EXPECTED SIGN
REER	Real effective exchange rate index (2010 = 100)	WDI	
REM	Received personal remittances (% of GDP)	WDI	+
KOPEN	Degree of capital openness (% of GDP)	WDI	+
TROPEN	Degree of trade openness (% of GDP)	GEOSTAT, WDI	−
GOVEXP	General government final consumption expenditure (% of GDP)	WDI	+/−

7.2. Model Specification and Estimation Methodology

The objective of the empirical analysis is to model the REER index of Georgia using the Vector Error Correction Model (VECM), examine the cointegrating relationship between the time series macroeconomic variables, and explain the short- and long-run dynamics among them.

[7] Variable KOPEN refers to an external fundamental determinant of the RER (i.e., international transfers) and not to the domestic policy-related determinant (i.e. capital controls), as shown in *Table 4*.

Stationarity and the Unit Root Test

Stationarity is one of the most important features of time series data. There is a high probability that regressing two non-stationary variables on one another will lead to what is known as spurious regression. As both series increase in time, they may show some degree of correlation and the estimated coefficients of the variables may appear statistically significant, even when in reality they are not. Therefore, we must test the time series properties before carrying out the regression analysis (Wooldridge, 2012; pp. 644-646).

Since we are estimating a model which incorporates more than two time series and has more complicated dynamics than an ordinary AR(1) process, we apply Augmented Dickey-Fuller (ADF) unit root test proposed by Dickey and Fuller (1979) in order to determine the order of integration of series. ADF test is based on estimating the following equation:

$$\Delta y_t = \alpha + \theta y_{t-1} + \delta t + \sum_{i=1}^{k} \gamma_i \Delta y_{t-i} + \varepsilon_t \qquad (7)$$

Where k is the number of lags of the dependent variable; $t = 1,2,\dots,n$ is the number of observations; α is the constant term of the regression, and δt is the time trend. We test the following null hypothesis against the alternative.

$H_0: \theta = 0$; $\{y_t\}$ follows a unit root process (time series is non-stationary)

$H_1: \theta < 0$; time series is stationary

We reject the null hypothesis if the absolute value of the obtained *t*-statistic is lower than the critical value at the conventional 5% significance level: $\left|t_{\hat{\theta}}\right| < DF_{cr}$ (StataCorp, 2019; p. 157).

As a preliminary tool, *Figure - I*, in Appendix A, depicting the time series plots of the variables, also provides a rough idea on the structure of stationarity. As one may observe, the series do not tend to return to their long-run average value, and they reveal non-stationary characteristics, indicating that their variance and co-variance change over time. Moreover, some variables exhibit a clear time trend; therefore, ADF tests were performed both with and without the time trend.

Determining the Optimal Lag Length

The inclusion of the lagged changes has the power to clean up any serial correlation in the model; however, the more lags we include, the more initial observations and degrees of freedom we lose,

which may lead to obtaining statistically insignificant coefficients. On the other hand, the model may suffer from specification errors if it contains too few lags (Wooldridge, 2012; p. 642). However, deciding on the maximum lag length is an empirical issue and often depends on the frequency and nature of the data. The majority of empirical literature suggests that for annual data, one or two lags is usually sufficient. A more formal way to decide on the optimal lag length is with the help of one of the information criteria, such as Akaike (AIC), Schwarz (SC), and Hannan-Quin (HQIC).

Johansen Cointegration Test

The next step after testing for unit root properties of the series is to check whether there is a long-run relationship among the dependent variable (REER), primary explanatory variable (REM), and other independent variables. This requires testing for the existence of at least one cointegrating equation among the series, indicating the long-run stationarity of the model. Engle and Granger (1987) offer the following definition of cointegration in their extended analysis of the relationship between cointegration and error correction models: "If each element of a vector of time series x_t first achieves stationairty after differencing, but a linear combination $\alpha' x_t$, is already stationary, the time series x_t, are said to be cointegrated with cointegrating vector α. There may be several such cointegrating vectors so that a becomes a matrix. Interpreting $\alpha' x_t = 0$ as a long-run equilibrium, cointegration implies that deviations from equilibrium are stationary, with finite variance, even though the series themselves are non-stationary and have infinite variance" (p. 251). In other words, two series are said to be cointegrated if their linear combination is I(0), even if individually they are I(1); in this case, the regression analysis is not spurious, but instead indicates to the long-run relationship between them. Cointegration between two series also implies a particular kind of model, called an error correction model (Wooldridge, 2012; p. 632).

Johansen's (1988) maximum likelihood cointegration approach is one of the most commonly applied methodologies when it comes to checking for the long-run statistical relationship between the RER and various explanatory variables. Johansen's test is based on an underlying VAR model, whose lag order is determined in advance. The null hypothesis that there are r or fewer cointegrating vectors is tested by "trace" or "maximum eigenvalue" statistic methods and is rejected if the test statistics exceed the 5% critical value (Greene, 2003; pp. 656-657). If there is

no cointegrating relation found among the variables, we proceed with estimating the unrestricted VAR model; conversely, if at least one cointegrating equation is found, we estimate the restricted VAR, or the VEC model, which captures both short- and long-run relationships among the series.

VECM Specification

As it will be discussed in the next chapter, since there are cointegrating equations in the model, we proceed with specifying the VECM. According to the formal definition, VECM is such a time series model in first differences that contains a vector of two or more variables as well as an error correction term, which works to bring two I(1) series back into the long-run equilibrium (Wooldridge, 2012; pp. 651-652). Furthermore, as stated by Engle and Granger (1987), the idea of error correction mechanisms is that a proportion of the disequilibrium from the current period is corrected in the following period. For example, the change in price in one period may depend upon the degree of excess demand in the previous period (p. 254).

The general form of VECM is based on underlying VAR model with p lags:

$$y_t = v + A_1 y_{t-1} + A_2 y_{t-2} + \cdots + A_p y_{t-p} + \varepsilon_t \quad (8)$$

Where y_t is a $K \times 1$ vector of variables, v is a $K \times 1$ vector of parameters, parameters from A_1 to A_p are $K \times K$ matrices and ε_t is an i.i.d. normal $K \times 1$ vector of disturabnces (StataCorp, 2019; p. 848). From (7) can be derived the following VECM form:

$$\Delta y_t = v + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \, \Delta y_{t-i} + \varepsilon_t \quad (9)$$

Where Δ denotes the difference operator, Π and Γ_i are $K \times K$ square matrices that contain the coefficients of a long-run model, y_t is a vector of endogenous variables, and v and ε_t are defined same as in (7). If there are r cointegration vectors in the model, then Π matrix can be expressed as $\Pi = \alpha\beta'$, where α is a $r \times K$ matrix of adjustment coefficients and β' is a $r \times K$ matrix of long-run relationship coefficients of the model (StataCorp, 2019; pp. 848-878).

Based on the general representation of VECM, as discussed above, the model of our interest can be specified in an error correction form, as follows:

$$\Delta REER_t = \delta_0 + \delta_1 ECT_{t-1} + \delta_2 \Delta REER_{t-1} + \delta_3 \Delta REM_{t-1} + \delta_4 \Delta KOPEN_{t-1} + \delta_5 \Delta TROPEN_{t-1} + \delta_6 \Delta GOVEXP_{t-1} + \varepsilon_t \quad (10)$$

Where ECT_{t-1} is the error correction term, and the size of its coefficient indicates the speed of adjustment from a disequilibrium toward an equilibrium state in the long run. The sign of the ECT coefficient indicates the direction of the adjustment; however, the expected sign, based on discussed empirical literature is negative, as we are interested in convergence from a short- to long-run. δ' coefficients capture the lagged changes in variables, and their values can be interpreted as the short run causal impact of explanatory variables on the dependent variable.

Model Diagnostics

To ensure the reliability of statistical inference, we further check if VECM passes standard diagnostic tests: Lagrange-Multiplier (LM) test for serial correlation, Jarque-Bera test for normally distributed disturbances, and the eigenvalue condition for model stability.

Impulse Response Analysis

Finally, to further examine the dynamics of the model, we conduct the impulse response analysis, which will demonstrate the response of the system's elements to an external shock. Impulse response function (IRF) is such an estimation technique that traces out the response of the dependent variable in the VAR system to one standard deviation shocks in the error terms, which is also known as an impulse. Moreover, IRF allows us to trace the impact of an impulse on the present and future values of the response variable (Gujarati & Porter, 2009; p. 789). In other words, IRF allows us to observe how a variable evolves over a certain time horizon, after injecting various shocks.

CHAPTER VIII. ESTIMATION RESULTS AND DISCUSSION

The summary of descriptive statistics is given in *Table 6*. As it can be observed, out of all explanatory variables, the remittances-to-GDP ratio has the smallest standard deviation and is the most stable indicator. Conversely, the degree of capital openness has a higher standard deviation, which is consistent with observations from *Figure 3* of Chapter III. Moreover, the degree of trade openness is the most volatile variable in the dataset, and at the same time, has the highest average value.

Table 6. Descriptive statistics

VARIABLE	MEAN	STD. DEV.	MIN	MAX
REER	95.25	10.07	77.98	110.39
REM	9.21	1.94	6.22	12.89
KOPEN	11.11	4.39	4.56	20.24
TROPEN	45.52	23.38	14.18	75.75
GOVEXP	14.37	4.61	8.54	25.88

8.1. Unit Root Tests

Augmented Dickey-Fuller Unit root test results presented in *Table 7* show that all variables are non-stationary at levels, even when controlling for the time trend. However, after taking them in their first difference form, the unit root null hypothesis was successfully rejected for all variables. This finding indicates that the time series are integrated of order one, i.e., they are I(1), which allows us to carry out the Johansen cointegration test.

Table 7. ADF unit root tests

VARIABLE	LEVEL		FIRST DIFFERENCE		DECISION
	Constant	Constant and Trend	Constant	Constant and Trend	
REER	-1.214	-1.905	-4.006***	-4.024**	I(1)
REM	-1.580	-2.556	-5.013***	-5.813***	I(1)
KOPEN	-1.857	-1.964	-3.394**	-3.438*	I(1)
TROPEN	-1.026	-2.142	-3.352**	-3.333*	I(1)
GOVEXP	-2.058	-1.966	-3.324**	-3.340*	I(1)

*Note: ***, ** and * indicate the stationarity at the 1%, 5% and 10% level of significance, respectively.*

Figure - II in Appendix A also shows the stationarity nature of the time series after first-differencing them – it is visible that the effect of a shock or innovation tends to diminish, and the values of the series frequently go back to their long-run average value.

Furthermore, we have to determine the optimal lag length (p) for the underlying VAR model. Akaike and Hannan-Quin lag selection criteria suggested two as an optimal lag length, while Schwartz criterion suggested one. The minimum value was yielded by Akaike (AIC) information criterion; therefore, two is set as the optimal lag length for the underlying VAR model (*Table - I*, Appendix B).

8.2. Johansen Cointegration Test

After the prerequisite procedures for the VECM estimation are done, now we can proceed with the next step of the analysis – testing for the existence of cointegration, i.e., the long-run relationship among the variables within the model. *Table - II* and *Table - III* in Appendix C provide results of trace statistics and eigenvalues for cointegration rank with and without time trend. In the first case, $H_0: r = 1$ could not be rejected at the 5% level of significance, indicating that there is one cointegrating relationship in the system. In the second case, when allowing for a linear deterministic trend, the null hypothesis of $r = 3$ could not be rejected, suggesting three cointegrating relationships among the variables. Overall, the results provide strong evidence that there exists at least one cointegrating equation among the series, which allows us to estimate the VECM.

8.3. Estimation of the Vector Error Correction Model

The VECM was estimated for one lag[8] and the cointegartion rank of one ($r = 1$), with unrestricted constant and no trend.

The Short Run Model

The lagged error correction term, ECT_{t-1}, is negative and significant at 5% level, as expected from theory. This finding provides the evidence for the long-run causal relationship among the variables, suggesting that the previous year's deviation from long-run equilibrium is adjusted during the

[8] Even though the underlying VAR is specified with two lags (p), the VECM is estimated with one lag (p-1).

current year at a convergence speed of 27.1%. In other words, on an annual basis, approximately 27% of the disequilibrium between the short- and long-run estimates is corrected and brought back to equilibrium.

Table 8. Estimates of the error correction term and the short-run coefficients

EQUATION	PARMS	RMSE	R-SQ	CHI2	P>CHI2
$\Delta REER_t$	7	4.658	0.557	16.322	0.0223

VARIABLES	COEF.	STD. ERR.	Z	P>|Z|	[95% CONF.	INTERVAL]
ECT_{t-1}	-0.271**	0.134	-2.03	0.043	-0.533	-0.009
$\Delta REER_{t-1}$	-0.672**	0.284	-2.37	0.018	-1.229	-0.116
ΔREM_{t-1}	-1.030	0.688	-1.5	0.135	-2.379	0.320
$\Delta KOPEN_{t-1}$	-1.174**	0.597	-1.97	0.049	-2.344	-0.005
$\Delta TROPEN_{t-1}$	0.776***	0.231	3.36	0.001	0.324	1.228
$\Delta GOVEXP_{t-1}$	0.118	0.409	0.29	0.773	-0.684	0.920
CONSTANT	-0.751	1.116	-0.67	0.501	-2.939	1.437

*Note: *** and ** indicate the significance at 1% and 5% levels, respectively*

As for the short-run coefficients, REER lagged one period has a significant negative effect on the REER in the current period, meaning that the previous period value of the exchange rate puts downward pressure on the current value. The primary explanatory variable, REM has a statistically insignificant impact on the exchange rate; thus, no evidence was found that the remittances inflows generate the short-run Dutch disease effect in Georgia.

On the other hand, KOPEN has a negative impact on the exchange rate at 5% significance level, meaning that a one percent increase in the degree of capital openness leads to, on average, a 1.17% decrease in the real effective exchange rate. This result suggests that in the short run, capital inflows such as FDI and ODA contribute to improving the competitiveness of Georgia's external trade sector.

As for the TROPEN, it has a highly significant positive impact on the REER, indicating the higher degree of openness leads to an appreciation of the exchange rate in the short run. This finding might be suggesting that instead of reducing the cost-prices of exportable goods and services and

making the tradable sector more competitive, reduction in trade restrictions results in higher demand for both tradable and non-tradable goods, and leads to a real appreciation in the short run.

Finally, government expenditures show a positive but statistically insignificant effect on the independent variable. This result could be the indication that the Georgian government spends approximately equally on tradable and non-tradable goods.

The Long-Run Model

The long-run estimates of the VECM are reported in *Table 9*. Due to the normalization process, the signs of the coefficients should be reversed to enable correct interpretation (Burger, Stuart, Jooste, & Cuevas, 2011). In our cointegrating equation (the long-run model), Johansen normalization restriction is imposed on the REER, which is the target variable; in other words, the coefficient of REER is normalized to one.

Table 9. Estimates of the long-run coefficients

Cointegrating equations

Equation	Parms	chi2	P>chi2
_ce1	4	147.862	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	**Coef.**	**Std. Err.**	**z**	**P>|z|**	**[95% Conf. Interval]**	
_ce1						
REER	1	.	.	.	.	.
REM	0.400	1.046	0.38	0.702	-1.649	2.449
KOPEN	-4.005***	1.083	-3.7	0.000	-6.128	-1.882
TROPEN	-0.007	0.123	-0.06	0.954	-0.247	0.233
GOVEXP	0.661	0.771	0.86	0.391	-0.850	2.171
Constant	-62.954	.	.	.	.	.

*Note: *** indicates the significance at 1% level*

$$ECT_{t-1} = [1.000REER_{t-1} + 0.400REM_{t-1} - 4.005KOPEN_{t-1} - 0.007TROPEN_{t-1} + 0.661GOVEXP_{t-1} - 62.954] \quad (11)$$

Like in the short run, the estimated coefficient of the main explanatory variable, remittances, has a statistically insignificant effect on the REER, thus allowing us to reject the Dutch disease hypothesis for the Georgian economy. A possible explanation of this finding is that emigrants' remittances are sufficiently spent on productive activities by Georgian households, boosting the country's domestic capacity and preventing the large inflows of remittances from resulting in the Dutch disease. It should be noted that this finding contradicts to that of Ito (2019), who analyzed quarterly data for a shorter period. Therefore, further research on the remittance-induced Dutch disease phenomenon within the Georgian context is encouraged for better policy-making decisions in future.

Furthermore, the statistically insignificant coefficients of TROPEN and GOVEXP imply that the degree of trade openness and the government expenditures do not affect Georgia's trade competitiveness in the long run. The only explanatory variable whose coefficient is statistically significant is KOPEN. Like it was predicted in theory, joint flows of FDI and ODA lead to real appreciation in the long run, thus worsening Georgia's external competitiveness. This finding suggests that the productive effect of capital inflows in the short run fades in the long run, harming the country's tradable sector through the increased spending effect.

8.4. Model Diagnostics

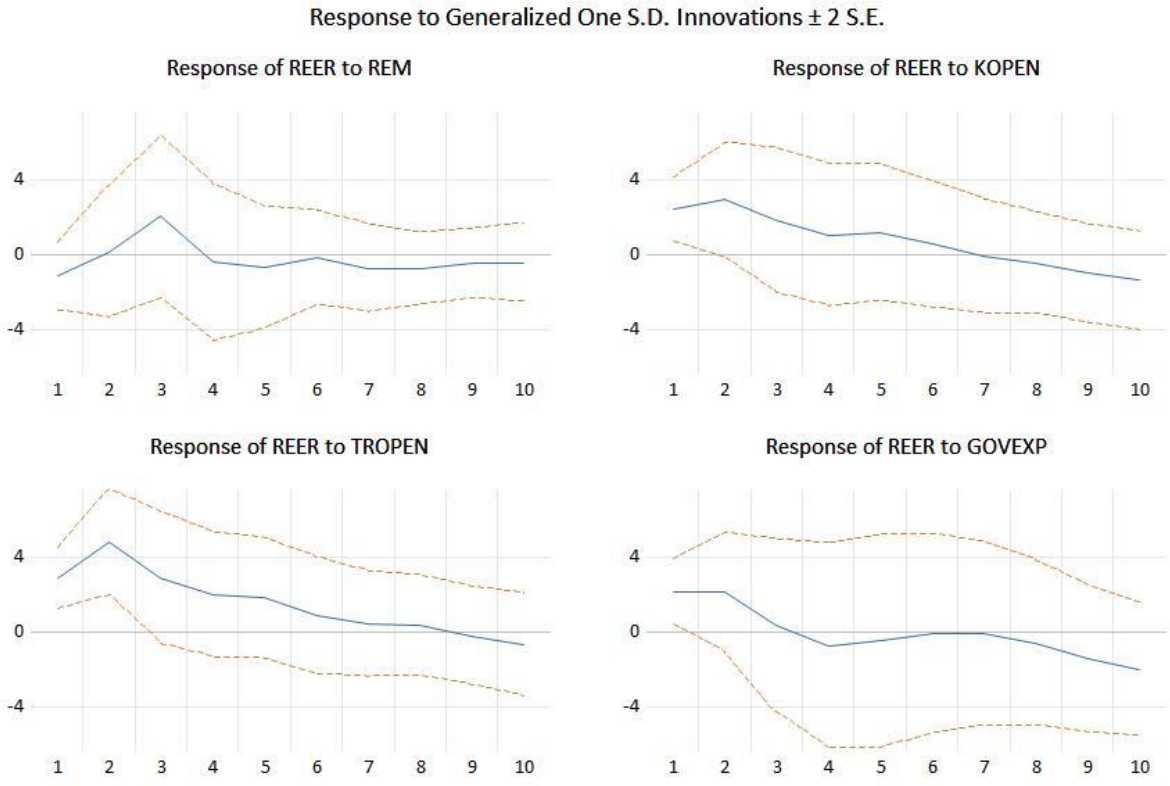
Finally, we carry out standard diagnostic tests for the VECM, and the results are reported in Appendix D. LM test for residual autocorrelation could not reject the null hypothesis of no serial correlation at any conventional significance level, for both of the lags. Thus, the problem of autocorrelation was not detected in the residuals for any order of the model, and no evidence of model misspecification was found (*Table - IV*). As for normality checks, the Jarque–Bera test could not reject the null hypothesis that the disturbances in a VECM are normally distributed. This finding is true both for each equation and for all equations jointly (*Table - V*). Therefore, we can conclude that the model residuals are normal. Lastly, VECM also successfully passed the stability test, as suggested by the eigenvalues of the companion matrix and their associated moduli (*Table - VI*), as well as their graphical representation (*Figure - III*). The obtained results show that no characteristic root (eigenvalue) of the model lies outside the unit circle, indicating that VECM

estimates satisfy the stability condition. Thus no evidence of a spurious regression is found, suggesting that the model is reliable.

8.5. Impulse Response Functions

Impulse response analysis was carried out based on the underlying VAR model and serves as an additional representation of this research's findings. *Figure 12* depicts the responses of the dependent variable REER to one standard deviation shocks of explanatory variables REM, KOPEN, TROPEN, and GOVEXP.

Figure 12. Impulse response functions



Note: The solid line represents an IRF, while the dashed lines denote 95% confidence interval.

One standard deviation shock of the main explanatory variable, REM, initiates a gradually increasing response from the REER, which turns positive from the second period, indicating the REER's real appreciation. Furthermore, it starts declining in the third period and remains in the negative region from the fourth period. However, the impact is seemingly insignificant, being close

to zero value and ranging between -0.152 and -0.763, from the fourth to the tenth period (*Table - VII*). This observation is consistent with the main finding of the VECM – remittance inflows have no significant long-run impact on the REER, providing no support for the Dutch disease effect for Georgian economy.

As for the KOPEN, its shock initially initiates a slightly upward response from the REER, and it stays in the positive region until the seventh period, suggesting the appreciative joint effect of FDI and ODA on the REER, which is consistent with the estimation results of the long-run model. However, the response becomes negative from the seventh period with a clear declining tendency in more distant periods.

This picture is very similar in the case of the next variable. As it can be observed, one standard deviation shock of TROPEN is met with an upward response of the REER until the second period, remaining positive until between the eighth and ninth periods, which is consistent with the findings of the VECM – a higher degree of trade openness has an appreciative short-run impact on the REER; however, the response turns negative in the last two periods.

As for the last explanatory variable, the impulse of GOVEXP has no noticeable impact on REER in the first two periods. The response gradually declines and remains negative from the fourth period; however, the impact is visibly small, varying closely around zero. This observation suggests the same finding as VECM – government expenditures do not have a significant impact on the Georgian REER.

CHAPTER IX. CONCLUSIONS

The main objective of this research was to explore the remittance-induced Dutch disease phenomenon in Georgia, which is a small open economy in transition, and remittance inflows constitute a significant share of GDP. For this purpose, using the VECM estimation technique, this thesis examines whether large inflows of remittances lead to the RER appreciation and whether Georgia's international trade competitiveness suffers as a result.

The results of both short- and long-run models suggest that remittances have no significant impact on the real effective exchange rate, thus allowing us to reject the remittance-induced Dutch disease hypothesis for Georgia. The impulse response analysis further supports this claim. This finding may be implying that either a sufficiently large part of received remittances are channeled to investment by Georgian households, or the fungibility of remittances allows them to free other funds for productive activities. Therefore, remittances put little or no pressure on Georgian exchange rates to appreciate through the spending effect. Based on this finding, a possible policy response from authorities could be to encourage the country's remittance inflow even more and in response to the target 10.c of SDG 10, reduce the transaction costs of migrant remittances, as well as motivate migrant workers to remit money through official channels. Interestingly, this finding is not in line with that of Ito (2019); therefore, more research on this topic is welcomed to allow for more comparison among the results and better policy implications for the future.

With regards to other international transfers, this research finds that FDI and ODA jointly depreciate the REER in the short run, but have the reverse impact, in the long run, appreciating the domestic currency and possibly contributing to the deterioration of Georgia's trade competitiveness. As it is beyond its scope, this study does not investigate the separate impact of FDI and ODA on the REER. Therefore, future research, focusing on the potential Dutch disease effects of these two inflows within the Georgian context, may be interesting and useful for policy suggestions.

Trade openness is found to have a significant short-run appreciative impact on exchange rates, which may be indicating that the higher degree of trade openness gives rise to increased demand for both tradable and non-tradable goods, consequently resulting in real appreciation in the short

run. This finding is strengthened by the impulse response function, which describes the response of the REER to the one standard deviation shock over a certain time horizon. However, this effect fades, and trade openness does not show a significant impact in the long run anymore.

Further findings show that government expenditures do not have any significant impact on the REER neither in short nor in the long run, suggesting that the Georgian government spends a roughly equal amount on both tradable and non-tradable goods and services, thus not influencing the exchange rate movements.

As a final remark, we may stress that in the Georgian context, a large chunk of empirical literature has focused on the microeconomic aspects of remittances and their importance on a household level. Moreover, macroeconomic consequences of remittances and other external inflows have been discussed only within a positive context. Another aim of this thesis was to emphasize the macroeconomic consequences of large capital inflows in Georgia and their possible unfavorable effects, one of them implying worsened trade competitiveness on the international market. The main innovation and contribution of this research regarding exploring the Dutch disease effects of remittances in Georgia were utilizing annual data since the beginning of the transition process. However, the available data allowed for a rather small sample and a limited number of explanatory variables. Future research will be beneficial to explore further dynamics in remittance and other external transfers and possible Dutch disease effects in Georgia based on complete and updated annual data on different fundamental determinants of the RER.

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APPENDICES

Appendix A. Time Series Plots

Figure - I. Time series plots of the variables defined in levels

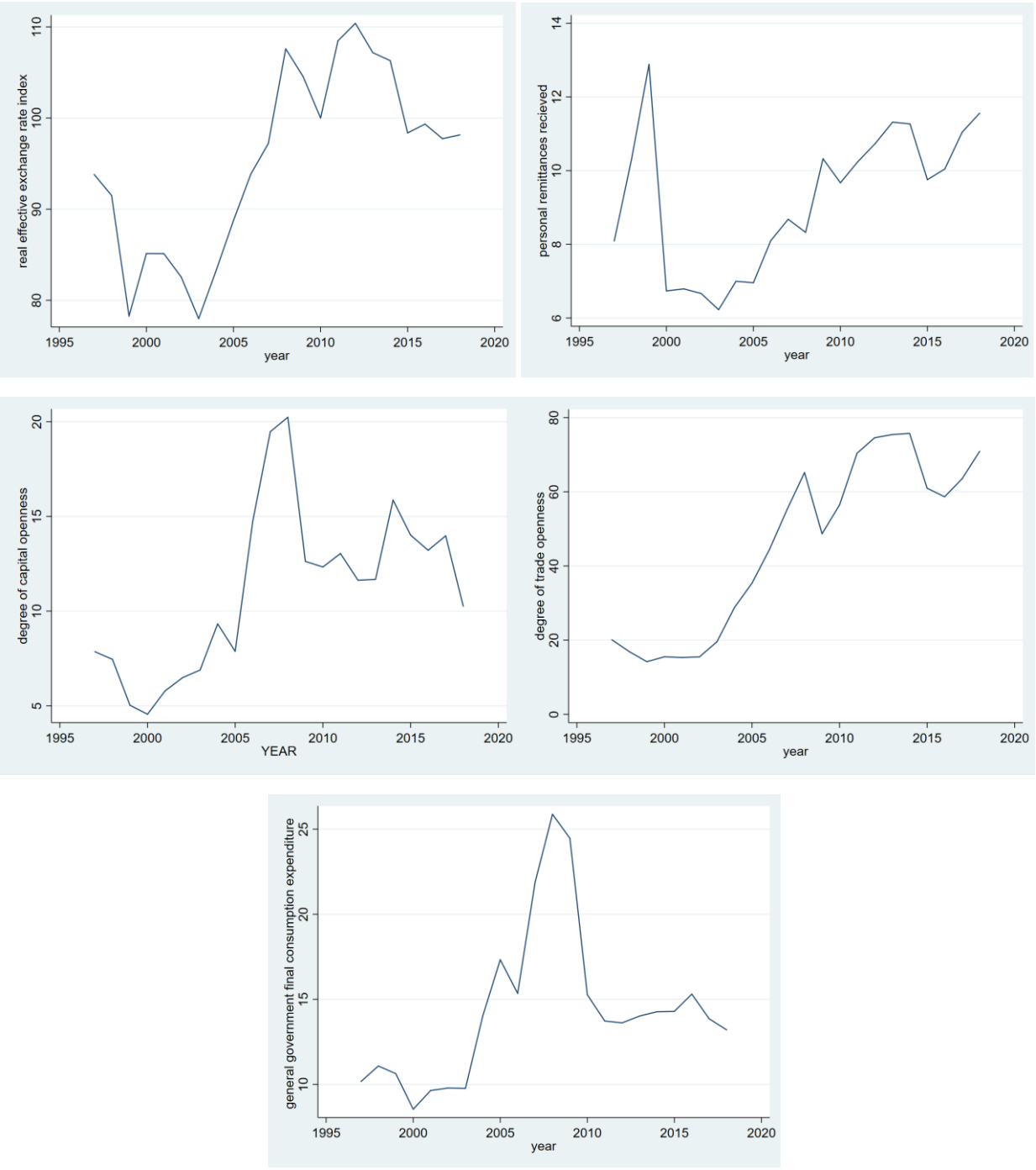
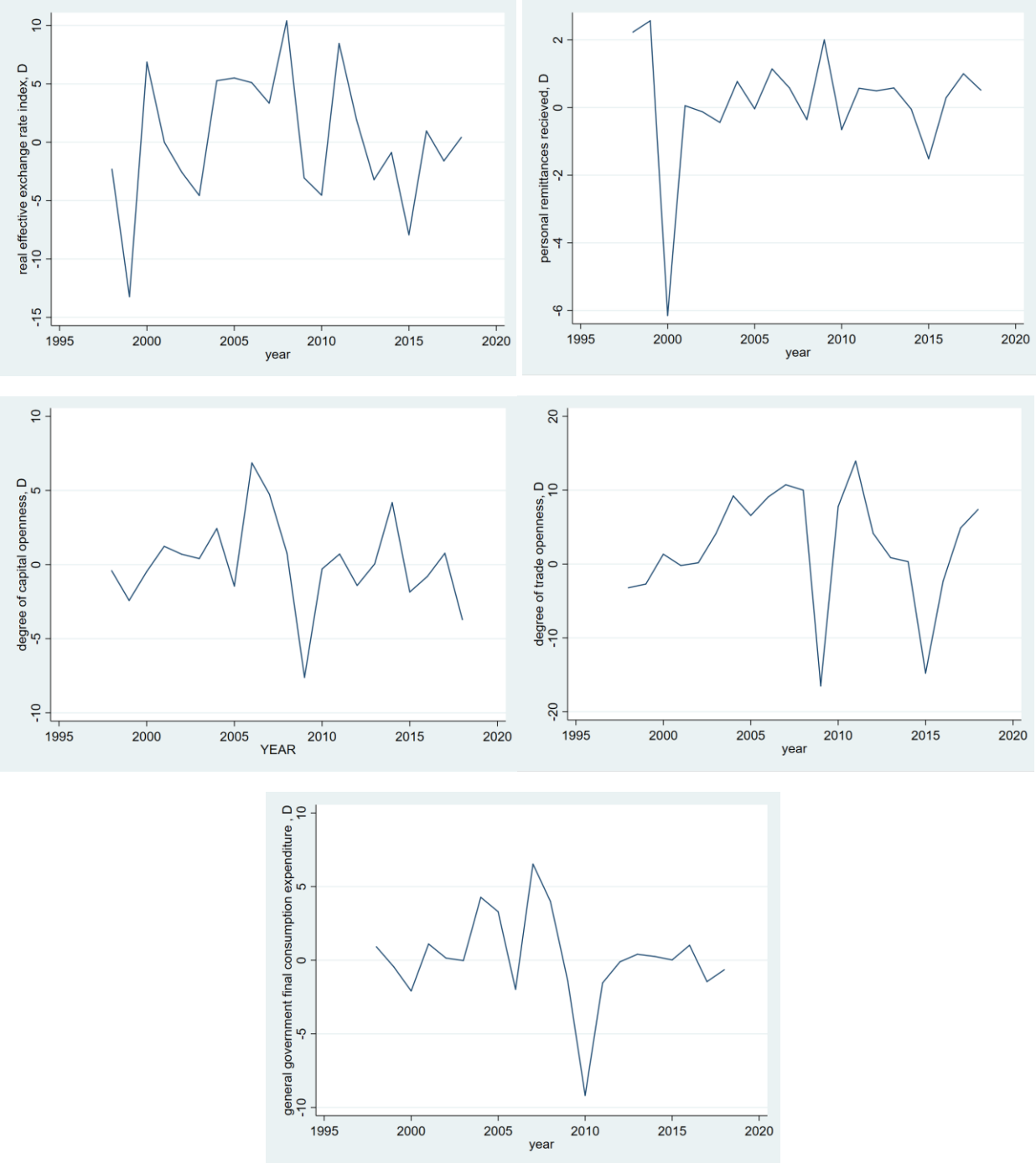


Figure - II. Time series plots of the variables after differencing



Appendix B. Optimal Lag Selection for the VAR

Table - I. Selection-order criteria

SAMPLE: 1999 – 2018
NUMBER OF OBS = 20

LAG	LL	LR	df	p	FPE	AIC	HQIC	SBIC
1	-220.817	112.73	25	0	59132.7	25.082	25.373	26.5753*
2	-188.322	64.99*	25	0	50345.9*	24.3322*	24.8668*	27.07

ENDOGENOUS: REER REM KOPEN TROPEN GOVEXP

EXOGENOUS: _CONS

Appendix C. Johansen Tests for Cointegration

Table - II. Intercept (no trend)

TREND: CONSTANT
SAMPLE: 1999 - 2018

NUMBER OF OBS = 20
LAGS = 2

MAXIMUM RANK	Parms	LL	eigenvalue	trace statistic	5% critical value
0	30	-227.61	.	78.5757	68.52
1	39	-211.456	0.80119	46.2673*	47.21
2	46	-198.528	0.72551	20.4102	29.68
3	51	-193.258	0.40961	9.8707	15.41
4	54	-188.822	0.35824	0.9999	3.76
5	55	-188.322	0.04877		

Table - III. Intercept and trend

TREND: TREND
SAMPLE: 1999 - 2018

NUMBER OF OBS = 20
LAGS = 2

MAXIMUM RANK	Parms	LL	eigenvalue	trace statistic	5% critical value
0	35	-224.918	.	103.7944	77.74
1	44	-206.789	0.83682	67.5357	54.64
2	51	-192.892	0.75083	39.7431	34.55
3	56	-181.19	0.68968	16.3401*	18.17
4	59	-176.38	0.38183	6.7201	3.74
5	60	-173.02	0.28538		

Appendix D. VECM Diagnostics

Table - IV. Lagrange-Multiplier (LM) test for autocorrelation

LAG	CHI2	DF	PROB > CHI2
1	14.4457	25	0.95340
2	21.0967	25	0.68721
H0: NO AUTOCORRELATION AT LAG ORDER			

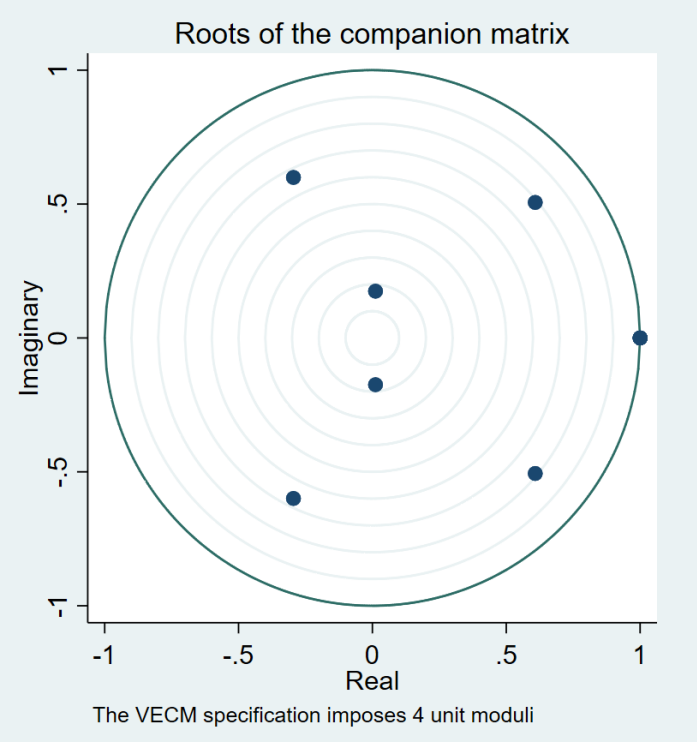
Table - V. Jarque-Bera test for normally distributed disturbances

EQUATION	CHI2	DF	PROB > CHI2
D_REER	1.333	2	0.5134
D_REM	1.421	2	0.4915
D_KOPEN	0.275	2	0.8717
D_TROPEN	0.375	2	0.8292
D_GOVEXP	0.516	2	0.7724
ALL	3.920	10	0.9509

Table - VI. Eigenvalue stability condition for VECM

Eigenvalue			Modulus
1			1
1			1
1			1
1			1
0.608280	+	0.5061014i	0.791292
0.608280	-	0.5061014i	0.791292
-0.294916	+	0.5993478i	0.667977
-0.294916	-	0.5993478i	0.667977
0.0116338	+	0.1745954i	0.174983
0.0116338	-	0.1745954i	0.174983
The VECM specification imposes 4 unit moduli			

Figure - III. Model stability graph



Appendix E. Impulse Response Analysis

Table - VII. Response of REER to generalized one S.D. innovations

PERIOD	REM	KOPEN	TROPEN	GOVEXP
1	-1.149968	2.446389	2.907230	2.171911
	(0.92197)	(0.85643)	(0.81963)	(0.87474)
2	0.166223	2.955891	4.832718	2.168706
	(1.76681)	(1.56046)	(1.40628)	(1.61012)
3	2.056001	1.871166	2.934481	0.355599
	(2.19112)	(1.92714)	(1.77069)	(2.31051)
4	-0.406615	1.067958	2.001876	-0.757921
	(2.09349)	(1.92749)	(1.69092)	(2.77525)
5	-0.686007	1.181685	1.838777	-0.475615
	(1.62998)	(1.82671)	(1.62314)	(2.85509)
6	-0.151514	0.568672	0.876937	-0.079564
	(1.27788)	(1.69830)	(1.57084)	(2.67022)
7	-0.713003	-0.083146	0.449604	-0.077537
	(1.16555)	(1.51974)	(1.42559)	(2.44533)
8	-0.763096	-0.432557	0.377309	-0.580701
	(0.98035)	(1.36869)	(1.32910)	(2.21974)
9	-0.428591	-1.001673	-0.195382	-1.420755
	(0.93344)	(1.33293)	(1.33753)	(1.96836)
10	-0.448905	-1.371750	-0.670080	-2.029761
	(1.06344)	(1.33345)	(1.39398)	(1.79348)

Note: Analytic standard errors are in parentheses