



Remittance, Foreign Aid Inflows and Dutch Disease: Evidence from South Asian Countries

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This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

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Contents

<i>List of Tables</i>	<i>iv</i>
<i>List of Figures</i>	<i>iv</i>
<i>List of Appendices</i>	<i>iv</i>
<i>List of Acronyms</i>	<i>v</i>
<i>Abstract</i>	<i>vi</i>
Chapter 1 Introduction	1
1.1 Remittances and Foreign Aid in South Asian Economies	2
1.2 Relevance and Justification	6
1.3 Objectives of the Research	7
1.4 Organization of the Thesis	7
Chapter 2 Review of Literature	9
2.1 Remittances and Dutch Disease	9
2.2 Foreign Aid and Dutch Disease	10
2.3 Remittances, Foreign Aid and Manufacturing Sector Growth	11
Chapter 3 Theoretical Approach	13
3.1 Real Effective Exchange Rate (REER) Calculation	13
3.2 Theoretical Framework of Dutch Disease	14
Chapter 4 Methodological Approach	21
Chapter 5 Data Description	24
4.1 Sources of Data and Description of Variables	24
4.2 Summary Statistics	26
Chapter 6 Results and Analysis	28
6.1. Pooled OLS Estimation of REER	28
6.2 Instrumental Variable (IV) Fixed Effect Estimation of REER	30
6.3 Pooled OLS Estimation of Traded to Non-Traded Sector Ratio	33
6.4 Fixed-Effect Estimation of Traded to Non-Traded sector ratio	34

6.5 Consequences of Dutch Disease	38
6.6 Deindustrialization: South Asian Context	40
6.7 Utilization of Remittances	42
Chapter 6 Conclusion	44
<i>References</i>	46

List of Tables

Table 1.1: Decade average of remittances and foreign aid.....	5
Table 2.1: Summary of selected remittances and Dutch Disease literature...10	
Table 2.2: Summary of selected foreign aid and Dutch Disease literature...11	
Table 4-1: Summary statistics.....	27
Table 6.1: Pooled OLS estimates of REER, with Driscoll-Kraay and cluster-robust Standard Errors.....	29
Table 6.2: First stage IV Fixed Effect estimates of REER.....	31
Table 6.3: Second stage IV Fixed-Effects estimates of REER.....	32
Table 6.4: Pooled OLS estimates of Traded to Non-Traded sector ratio.....	34
Table 6.5: Fixed-Effect estimates of Traded to Non-Traded ratio.....	35
Table 6.6: Estimates of REER and TNT, Pooled OLS and Fixed Effect models.....	36

List of Figures

Figure 1.1: External inflows to developing countries.....	2
Figure 1.2: Top ten remittances recipient in 2014.....	3
Figure 1.3: Remittances as percent of GDP and international reserves in South (2013).....	4
Figure 1.4: Remittances as percent of exports (2014).....	4
Figure 3.1: Salter diagram.....	15
Figure 3.2: Remittances and Dutch Disease.....	17
Figure 6.1: Manufacturing and services value added (% of GDP) in South Asian countries.....	40
Figure 6.2: Employment in industry and service sector in South Asian countries.....	41

List of Appendices

Appendix: Real Exchange Rate (RER) calculation	49
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List of Acronyms

AM	Arithmetic Mean
BBS	Bangladesh Bureau of Statistics
CPI	Consumer Price Index
CR	Cluster-Robust
DD	Dutch Diseases
DK	Driscoll-Kraay
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GM	Geometric Mean
GNI	Gross National Income
IOM	International Organization for Migration
ISS	Institute of Social Studies
IV	Instrument Variable
NEER	Nominal Effective Exchange Rate
ODA	Official Development Assistance
OLS	Ordinary Least Square
PPF	Production Possibility Frontier
PPI	Producer Price Index
RER	Real Exchange Rate
REER	Real Effective Exchange Rate
TNT	Traded to Non-Traded ratio
WB	World Bank
WDI	World Development Indicators
WPI	Wholesale Price Index

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Abstract

We investigate the Dutch Disease impact of migrant's remittances and foreign aid using a yearly panel data of five South Asian countries for the period of 1975-2013. We employ two separate regressions to examine the spending effect and resource movement effect of the transfer. The findings reveal that remittances have Dutch Disease impact through both of the effects, whereas no statistically significant impact of foreign aid is detected. An increase in per capita remittances erodes international competitiveness in the way of appreciating real effective exchange rate and at the same time leads to fall in traded to non-traded ratio, thus impacting on the traded sector. The analysis shows that South Asian countries have been experiencing premature deindustrialization and large remittance inflows might have been one of the main causes of it, since the inflows may slow down the structural transformation towards the manufacturing sector. Although remittances and foreign aid may have significant impact on poverty alleviation in this region, policy planners should pay much heed to effective utilization of remittances and foreign aid; otherwise the countries may be caught in the low development trap.

Relevance to Development Studies

This study focuses on the adverse aspects of international transfers which may retard the process of development in the poor country. Thus, the study is highly relevant to the development studies. Although international transfer have been playing a great role in the socio-economic development in the least developed and developing countries, a large inflow of transfer may slow down the process of development in the ways of losing external competitiveness in international trade and deindustrialization. Poor countries are lagging behind in the international trade, and in addition a loss in trade competitiveness can aggravate the backwardness further. Industrialization always gets spotlight in the development discourses to uplift the falling behind countries. Strangely, developing countries are experiencing deindustrialization even much earlier than reaching their full capacity industrialization. This study looks into premature deindustrialization along with real exchange rate appreciation following surges in international transfers in terms of remittances and foreign aid. We have found adverse effects of remittances in South Asian countries that can baffle economic development in this region impacting on export volume and industrialization. With South Asian experience this study suggests poor country to use international transfers more effectively so that they cannot be derailed from the development track.

Keywords

Dutch Disease, Foreign aid, Real Effective Exchange Rate, Remittances, Premature deindustrialization.

Chapter 1

Introduction

International transfer of remittances and foreign aid has been playing an important role in the socio-economic development in many ways in developing countries across the world. Although remittances have enormous positive impact on various socio-economic development indicators at both micro and macro level, it is not beyond adversities. Dutch Disease is one of the famous adversities. South Asia is one of the prominent regions receiving international transfers in terms of both remittances and foreign aid and not a stranger in this debate. There is a large body of literature dealing with the impact of remittances on various socio-economic development indicators in the South Asia. However, there are a few studies looking into the issue of Dutch Disease resulted from the international transfers in this region. The aim of this research is to examine the Dutch Disease impact of international transfers in terms of migrant's remittances and foreign aid using panel data of five countries in South Asia for the period of 1975 to 2013 controlling for country heterogeneity and time fixed effects.

International transfers bear both positive and negative effects on a particular country. Positive impacts of remittances include a wide range of effects such as increase in international reserves, accumulation of human and physical capital, financial development, poverty reduction etc. (see Adams and Page 2005, Barajas et al. 2009, Giuliano and Ruiz-Arranz 2005). Remittances improve macroeconomic stability and reduce output volatility as well (Chami, Hakura and Montiel 2009). At micro level, remittances increase household welfare through smoothening of consumption. Remittances also work as insurance for the migrant sending households against fall in income due to natural calamities, crop failure or economic down turn (Yang 2008, Yang and Choi 2007). Households those receive remittances may experience fall in fertility (Naufal and Vargas-Silva 2009). Similarly, foreign aid also may bear multifaceted benefits in the ways of solving balance of payment imbalances, financing capital goods, alleviating poverty; investing in health, education and infrastructure; stimulating growth, and so on (see Burnside and Dollar 2000, Fischer 2009, Sachs 2009).

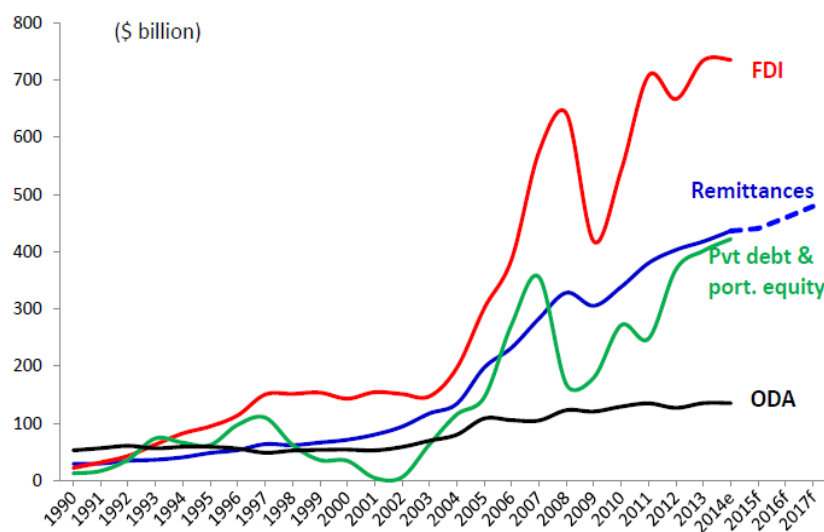
On the flip side, a large inflow of international transfers such as remittances and foreign aid can cause real exchange appreciation deteriorating external competitiveness, thus impacting on the tradable sector. Theoretically, appreciation comes about through increased prices of non-tradables and movement of productive resources such as labour and capital from tradable sector to non-tradable sector. The channel of transmission is such that transfer falls on non-tradable goods and services, which increases prices of non-tradables. The real exchange rate is defined as the relative prices of non-tradables. Thus, an increase in relative price of non-tradables leads to real exchange rate apprecia-

tion. This appreciation is reinforced by resource movement effect. Because of higher prices of non-tradables, labour moves to this sector from traded sector, thereby shooting up wages in the traded sectors. Afterwards, wages and prices also increase in the non-traded sector resulting further real exchange rate appreciation. Due to loss of external competitiveness in international trade and movement of resources to non-traded sector, the traded manufacturing sector tends to shrink. This phenomenon is called “Dutch Disease”(DD). This term was first coined in 1977 by The Economist to refer the unfavorable effects of gas revenue on manufacturing sector following the discovery of natural gas in the Netherlands¹. At that time, Dutch currency became stronger and in consequence manufacturing sector gradually became less competitive. This study will focus on the Dutch Disease effects of remittances and foreign aid on South Asian economies.

1.1 Remittances and Foreign Aid in South Asian Economies

According to the World Bank (2015) statistics, in 2014, remittances flows to developing countries increased to \$436 billion, which was a 4.4 percent higher than the volume in 2013.

Figure 1.1: External inflows to developing countries



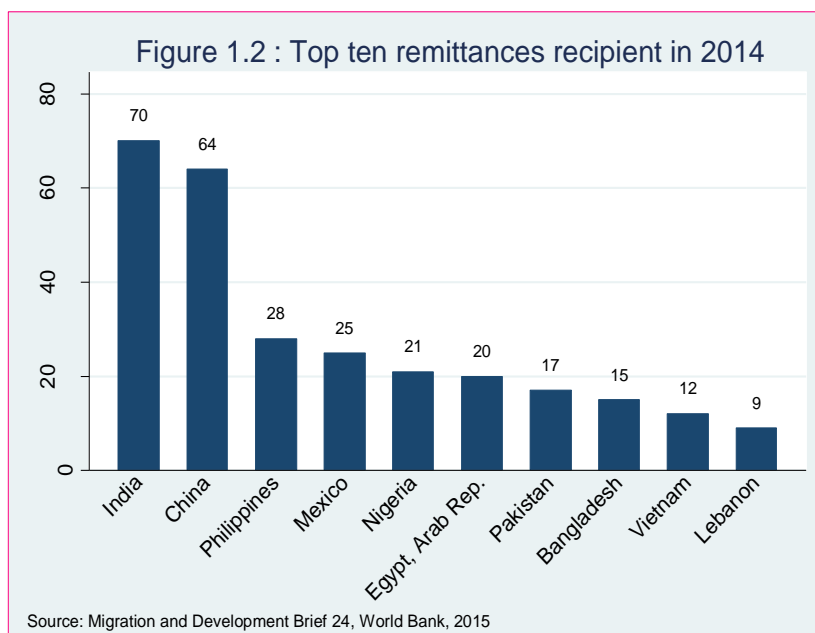
Source: Migration and Development Brief 24, World Bank, 2015

Remittances flows to developing countries have become stable and even the flows outweigh Official Development Assistance (ODA) and private capital flows (Figure 1.1). Over the time, ODA flows have been also increasing, albeit with a small rate.

¹ The Dutch Disease"(November 26, 1977). The Economist, pp.82-83 (as cited in Nsor-Ambala 2015)

Mundell (1957) shows that factor mobility is the substitute for international trade. Impediments in international trade stimulate factor movement exerting equalizing pressure on both factor and commodity prices. Lagging behind in export sectors (due to lack of capital and other impediments) instead, South Asian countries have been exporting unskilled or semi-skilled manpower abroad, especially to the GCC countries, thus earning substantial amount of remittances². According to World Bank (2015) statistics, remittances to South Asian countries increased by 4.5 percent in 2014 compared to a 2.5 increase in 2013. In this region, Pakistan saw a sharp rise in remittances (16.6 percent increase), while Bangladesh and Sri Lanka experienced 9.6 and 8 percent increase, respectively in 2014. However, two other South Asian countries, India and Nepal, experienced a fall in remittances.

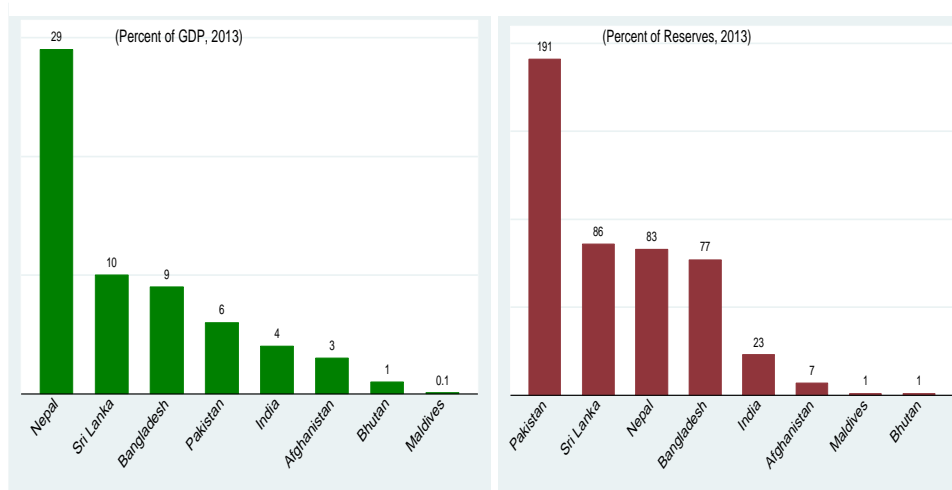
Most of the South Asian migrant workers are unskilled and semi-skilled and they migrate for a temporary period. Since the workers are temporary migrants and they leave their family back home, they remit as much as possible to their home countries. South Asian countries like Bangladesh, India, and Pakistan are in top ten remittances recipient countries in the world. In terms of remittances receipt, in 2014; India, Bangladesh and Pakistan were ranked 1st, 7th and 8th, respectively (Figure 1.2). Remittances account for a good percentage of GDP in South Asian countries as well.



² GCC countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

Take for example, remittances inflows to Nepal accounted for 29 percent of GDP in 2013. Nepal, a land locked country, heavily depends on the remittances since remittances are the main sources of foreign currency earnings in this country. Remittances also accounted for 6 to 10 percent of GDP in Sri Lanka, Bangladesh, Pakistan and India.(Figure 1.3). Moreover, remittances have become one of the main sources of international reserves in this region. In Pakistan, remittances were 191 percent of international reserves in 2013, which was the highest percentage among all other South Asian countries. While remittances were 86, 83, 77 and 23 percent of international reserves in Sri Lanka, Nepal, Bangladesh, and India, respectively (Figure 1.3).

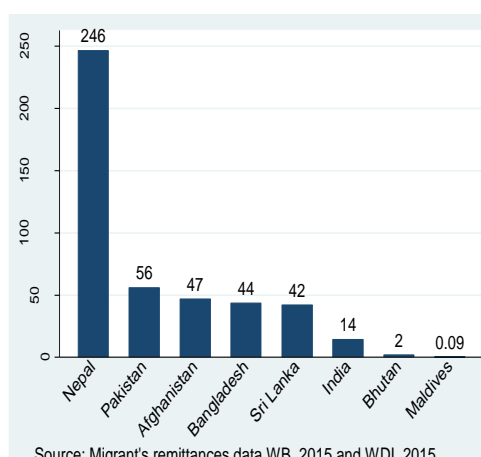
Figure 1.3: Remittances as percent of GDP and international reserves in South Asia (2013)



Source: Migration and Development Brief 24, World Bank, 2015

Remittances also account for a good portion of exports in South Asia. Figure 1.4 shows remittances as percent of total exports of goods and services in South Asian countries in the year of 2014. In Nepal, remittances were about two and half times of exports. In Bangladesh, Pakistan and Sri Lanka remittances were 42 to 56 percent of exports. In India, however, this figure was lower (14 percent) compared to other South Asian countries.

Figure 1.4: Remittances as percent of total exports (2014e)



Source: Migrant's remittances data,WB, 2015 and WDI, 2015

Migrant's remittances to this region have been growing at a high rate. Table 1.1 presents migrant's remittances figures for three decades. During 1980s on average remittances as percent of GDP were 2.7 in Bangladesh, whereas the figure in-

creased to average 9.9 during 2010s. Within three decades this figure goes up by more than three and half times. It also increased by more than three times in India within this time period. Remittances data during 1980s for Nepal are not available. During 2000s on average remittances were 13.2 percent of GDP of Nepal and within a decade this figure jumps to average 25.4 percent of GDP. Remittances figures also show similar upward trend in Sri Lanka. Only exception is Pakistan. During 1980s on average remittances were 7.4 percent of GDP, while this figure decreased to average 5.9 percent of GDP during the first four years of 2010s. Per capita remittances increased more than that of the remittances as percent of GDP. For example, per capita remittances in Bangladesh escalated by about 13 times within three decades. Actual remittances volume would be much higher as good portion of remittances are sent through unofficial channels called *Hundi*, which have no official documentations.

Table 1.1: Decade average of remittances and foreign aid

Country	1980s				2000s				2010s***			
	Remittance(% of GDP)	Remittance(per capita)**	Aid (% of GDP)	Aid*(Per capita)	Remittance(% of GDP)	Remittance(per capita)	Aid (% of GDP)	Aid(Per capita)	Remittance(% of GDP)	Remittance(per capita)	Aid (% of GDP)	Aid(Per capita)
Bangladesh	2.699	6.082	6.467	14.621	7.241	35.742	2.105	9.344	9.944	84.434	1.445	12.517
India	1.067	3.247	0.784	2.376	3.092	23.652	0.204	1.393	3.471	51.608	0.139	2.066
Nepal	-	-	9.670	16.612	13.182	49.094	6.145	20.269	25.367	176.941	4.404	30.638
Pakistan	7.395	25.129	2.840	9.802	3.808	28.187	1.642	11.167	5.937	71.158	1.295	15.129
Sri Lanka	5.117	18.601	8.480	30.572	7.625	99.268	2.477	31.166	9.172	263.826	0.912	25.458

Notes: *Aid consists of Net Official Development Assistance (ODA) plus official foreign aid. ** Both remittances per capita and aid per capita are in US \$. *** Up to 2013.

Source: Authors' calculation based on World Development Indicators (WDI) 2014, World Bank.

Foreign aid flows, however, to South Asia are not as prominent as remittances are. Only Afghanistan receives significant amount of foreign aid. According to World Bank (2015) statistics, in 2013, net ODA was about 25 percent of GNI of Afghanistan. Bhutan and Nepal received about 8 and 4.5 of their GNIs, respectively. Data in table 1.1 reveal that foreign aid in India was more or less 1 percent of GDP over the period from 1980s. In other countries initially foreign aid was higher than remittances, and then foreign aid gradually decreased over the periods. For instance, in 1980s, on an average aid flows to Bangladesh were more than double (6.467 % of GDP) of remittances, while aid flows became almost one seventh (1.445 % of GDP) of remittances during 2010s. Over the periods, Bangladesh has become trade and remittances dependent rather than aid dependent.

Each year a great number of people from South Asian countries migrate abroad for better employment opportunities. It's difficult to figure out exactly how many South Asians are working abroad at present. In Bangladesh from

1976 to 2015, a total of about 9.5 million (about 5.93 percent of total population) workers have migrated to all over the world for employment³. There are five million Indian workers are working across the globe⁴. A good number of professionals are also working abroad. In addition, there is a huge permanent Indian diaspora all over the world. Indian diaspora constitutes 25 million India originated people in some 110 countries, which is the second largest diaspora in the world⁵. In Nepal, a total of about 2 million people (about 7.3% of total population) were reported missing in 2011 census. These numbers of people are believed to be working abroad⁶. Up to December 2013, a total of 7.8 million Pakistani people (about 4.17 % of total population) were living/working/studying all over the world⁷. An estimated 1.7 million (almost 25% of total population) Sri Lankans were employed abroad in 2013⁸. As a whole, a total of 70 million people of South Asian origin living around the world (Burki 2013, as cited in Rahman 2014:3). These figures are the official documents of international labour migration from this region. In addition to this, each year a good number of workers migrate to other countries through illegal channels.

1.2 Relevance and Justification

Unlike others, this study will put emphasis on premature deindustrialization in South Asian countries as one of the consequences of Dutch Disease resulting from migrant's remittances and foreign aid. There is a growing body of work on the positive impact of remittances such as poverty alleviation, household welfare, financial development, and so on, in South Asian countries. While, there are few studies on the negative aspects such as real appreciation of exchange rate and thereby loss of external competitiveness, premature deindustrialization, contraction of manufacturing sector, inequality etc. At individual country level there are some studies on the link between worker's remittances and real appreciation of exchange rate. Take for example, Chowdhury and Rabbi (2013) study on worker's remittances and real effective exchange rate in Bangladesh and Mughal and Makhlof (2013) look into the linkage of remittances and real effective exchange rate as well as relative growth of traded to non-traded sector in Pakistan. Recently, Roy and Dixon (2015) investigated the relation between worker's remittances and real effective exchange rate using a

³ Bureau of Manpower, Employment and Training (BMET), Ministry of Expatriates' Welfare and Overseas Employment, Bangladesh.

⁴ Annual Report, 2014-15, Ministry of Overseas Indian Affairs, India

⁵ The Remittance Market in India: Opportunities, Challenges, and Policy Options, Afram, G.G., World Bank, 2012.

⁶ Labour Migration for Employment: A Status Report for Nepal, 2013/14, Ministry of Labour and Employment, Nepal.

⁷ Final year book 2013-14, Ministry of Overseas Pakistanis and Human Resource Development, Pakistan.

⁸ Ministry of Foreign Employment, Sri Lanka.

panel data of four South Asian countries such as Bangladesh, India, Pakistan and Sri Lanka. Their study considers quarterly data from 2003:4 to 2012:4 and focuses REER appreciation only.

The present study attempts to show the Dutch Disease phenomena of migrant's remittances and foreign aid using a panel data of 5 South Asian countries such as Bangladesh, India, Nepal, Pakistan, and Sri Lanka. According to statistics provided above (Figure 1.2, 1.3 and 1.4), remittances and foreign aid in Nepal are more important than other South Asian countries. Both remittances and foreign aid account for a good portion of GDP of Nepal. Therefore, we included Nepal into our dataset, whereas others excluded Nepal. This study takes into account longer time period, from 1975 to 2013, to investigate historical impact of remittances and foreign aid on the real effective exchange rate appreciation and change in the composition of traded manufacturing and non-traded service sectors. Dutch Disease theory tells us about two different effects: *spending effect* -- more responsible for real effective exchange rate appreciation and *resource movement effect* -- more responsible for shrinkage of traded manufacturing sector. Earlier studies put little or no emphasis on the resource movement effect. Focus is primarily given to spending effect, real effective exchange rate appreciation and external competitiveness, only. This study will investigate both of these effects.

1.3 Objectives of the Research

The main question of the research is: To what extent is there a Dutch Disease impact of external inflows on the South Asian economies?

Sub-questions

1. Do inflows of remittances and foreign aid appreciate Real Effective Exchange Rate (Spending effect)?
2. Do inflows of remittances and foreign aid decrease the ratio of traded sector to non-traded sector goods and services (Resource movement effect)?

1.4 Organization of the Thesis

This thesis is divided into seven chapters. Chapter 1 describes background of the research focusing on the volume of remittances, and foreign aid to South Asian economies. In addition, a scenario of labour migration from South Asia is given. This chapter also includes rationale and objectives of the research. Chapter 2 reviews empirical Dutch Disease literature of remittances, foreign aid, and manufacturing sector growth. Chapter 3 reviews theoretical literature of real effective exchange rate and Dutch Disease in details. In the first section, calculation of real effective exchange rate (REER) is discussed because REER is a complex index and it is different from the nominal exchange rate. One of

the main channels of Dutch Disease effects is the REER appreciation. In later sections, theoretical debate of international transfers and ways of transmission mechanisms are illustrated.

Chapter 4 presents the discussion of methodological issues. Fixed effect estimations of spending effect and resource movement effect equations are explained in details. Chapter 5 five describes data and sources of data. Major determinants of real effective exchange rate and the relative composition of traded to non-traded sector are focused. In line with the theoretical and empirical analysis, expected direction of each determinant is discussed. Chapter 6 is devoted to estimation and analysis of the findings. In the first section of the chapter, estimation results under pooled OLS and fixed effect models for both equations are analyzed. Later sections emphasize consequences of the Dutch Disease in South Asian countries. Chapter 7 summarizes the major findings of the study and their implications. Finally, the chapter puts forward some recommendations.

Chapter 2

Review of Literature

In this chapter some selected empirical literature of Dutch Disease resulting from remittances and foreign aid will be reviewed. This chapter is divided into three sections. First section will review remittances-induced Dutch Disease literature and second sections will review foreign aid-induced Dutch Disease literature. Finally, in third section some selected literature dealing with the effects of remittances/foreign aid on the manufacturing sector will be analyzed.

2.1 Remittances and Dutch Disease

There is a large body of work on Dutch Disease effects of natural resource revenue and international transfers focusing on both individual country and cross countries. Acosta et al. (2009) finds Dutch Disease impacts of remittances in El Salvador. The author shows that Dutch Disease impact comes about through decrease in labour supply and appreciation of real exchange rate. Remittances raise household disposable income which discourages labour supply pushing wage rate up. In response to increase in disposable income and wages, consumption demand goes up and, in effect, relative prices of non-tradables shoot up. In consequences, real exchange rate appreciates and non-tradable sector expands. Foreign demand for tradable products decreases as real exchange rate appreciates. The author also finds Dutch Disease symptoms under three different conditions -- when remittance flows are exogenously determined, remittances are countercyclical and remittances act like capital flows. Amuedo-Dorantes and Pozo (2004) find the Dutch Disease symptom that remittances appreciate real exchange rate in 13 Latin American and Caribbean countries. In South Asian countries, Dutch Disease symptoms have also been evident. Chowdhury and Rabbi (2013) show that workers' remittances cause real exchange rate appreciation in Bangladesh, which in turn causes loss of competitiveness in export market. Mughal and Makhoulf (2013) find Dutch Disease effects of remittances in the economy of Pakistan. On the other hand, Ratha (2013) does not find any Dutch Disease symptom in India.

However, international transfers can also depreciate real exchange rate rather than appreciating it always. Nyoni (1998) finds that foreign aid depreciates real exchange in Tanzania. Martins (2013) investigates the Dutch Disease impact of large inflows of foreign aid and remittances on Ethiopian economy. Applying cointegration model with time series data the author doesn't find any Dutch Disease phenomenon in Ethiopia. Barajas et al. (2011) explains that the impact of remittances on equilibrium real exchange rate comes through variety of macroeconomic channels. It depends on the remittance-receiving country's characteristics, pattern of remittance inflows (cyclical or not), long-run investment position, induced by remittance inflows, of the receiving country and uti-

lization of remittances (whether spent on non-traded or traded goods). The authors find mixed evidences of remittances on equilibrium real exchange rate in both single-country and a panel setting. Even the appreciating effects are not robust, which suggest that appreciation of real exchange rate is not the Dutch Disease side effects of remittance-receipt. Therefore, the short-run welfare induced by higher consumption due to remittance inflows may not come at the cost of declining long-run growth.

Table 2.1: Summary of selected literature of remittances and Dutch Disease

Study	Year	Countries	Methodology	Dutch Disease symptoms
Chowdhury and Rabbi	2013	Bangladesh	Vector Error correction (VEC)model	Remittances appreciate Real Effective Exchange Rate (REER) in Bangladesh.
Mughal and Makhoulouf	2013	Pakistan	IV Bayesian analysis	Remittances appreciate REER and at the same time reduce ratio of traded to non-traded ratio.
Ratha	2013	China, India, Lesotho, Mexico and Philippines	Bounds-testing approach to cointegration and error-modeling	REER appreciates in Philippines in short run , while in China and Lesotho in the long run. Appreciation does not happen in India and Mexico.
Lartey et al.	2012	Panel of 109 developing countries	System GMM, Fixed effect	Remittances cause DD through both of the spending and resource movement effects. DD operates stronger under fixed exchange rate regime.
Acosta et al.	2009	El Salvador	Bayesian estimation	Remittance inflows have DD effect under three different conditions—when remittance is exogenous, countercyclical and investment. Remittances also decrease labour supply leading to Real Exchange Rate (RER) appreciation.
Bourdet and Falck	2007	Cape Verde	Time series analysis	Adverse effect on competitiveness of tradable sector but the effect is not substantial.
Amuedo-Dorantes and Pozo	2004	Panel of 13 Latin American countries	IV fixed effect	Remittances appreciate RER in all the countries of the study.

2.2 Foreign Aid and Dutch Disease

Foreign aid is argued in literature to bridge the gap between demand and supply of capital in developing countries. As developing countries experience shortage of capital at the same time face many more macroeconomic problems, they require foreign aid. However, to reap the benefits of aid presence of some good policies is very much important. Take for example, Burnside and Dollar (2000) find that foreign aid is very much effective in accelerating growth of GDP in developing countries with good fiscal, monetary and trade policies. If aid is not channeled into investment properly rather than consumption, it causes rise of prices of non-tradables, thereby appreciating real exchange rate. Rajan and Subramanian (2006), with sample from cross country panel data,

show that one percentage point increase in the ratio of aid-to-GDP is associated with 0.2-0.3 percentage points reduction in the share of manufacturing sector to total GDP. Prati and Tressel (2006) find similar negative effects of aid on overall export sector only in normal time. Normal time is defined as when there is no weather and economic shocks like natural calamities or decreasing commodity prices. During the normal time one percentage point increase in the ratio of aid-to-GDP reduces the ratio of export to GDP by 0.3 to 0.6 of GDP. But in the long run, the effects could be 5 to 6 times larger.

Empirical evidence of aid induced Dutch Disease is mixed. Countries where aid is used as investment and aid raises productivity in non-tradables there is no Dutch Disease effect, whereas countries where aid induces consumption of more non-tradable goods and services there is Dutch Disease effect. In table 2.2, summaries of some selected foreign aid and Dutch Disease studies are presented.

Table 2.2: Summary of selected literature of foreign aid and Dutch Disease

Study	Year	Countries	Methodology	Dutch Disease (DD) symptoms
Nsor-Ambala	2015	42 low income countries	OLS, GMM, Fixed effect	No DD effect on the relative growth of manufacturing sector. Even aid flows stimulate manufacturing sector.
Addison	2013	Morocco and Tunisia	Vector Auto-regression	There is no DD effect on Tunisian economy, whereas in the long run Morocco faces DD due to foreign aid inflows.
Fielding and Gibson	2012	26 Sub-Saharan African countries	Time series OLS	An aid inflow causes RER appreciation across the region. In only one country RER depreciates. Appreciation is much larger in countries with a hard fixed exchange rate peg than in countries with a more flexible exchange rate regime.
Kang et al.	2012	55 aid receiving countries	Heterogeneous panel vector auto-regression	Mixed DD effect. Half of the countries in the sample show negative impact of global aid on cumulative export, imports and GDP growth. On the other hand, the other half shows a positive impact of aid.
Rajan and Subramanian	2011	47 developing countries	Fixed effect	Aid causes an adverse impact on the relative growth of the exportable sectors.
Fielding	2010	10 Pacific countries	Vector Auto-regression (VAR)	Mixed DD effect. Out of ten only in four countries REER appreciation is reported and in one country depreciation takes place.
Sackey	2001	Ghana	Cointegration and Granger causality	No DD even REER depreciates due to aid inflows. Export sector performance is high. Aid is properly channeled into investment rather than consumption.

2.3 Remittances, Foreign Aid and Manufacturing Sector Growth

In most of the Dutch Disease studies, focus is given to REER appreciation and loss in external competitiveness. There are some studies, which directly

investigate the effect of external inflows on the contraction of traded manufacturing sector. In literature, evidence of contraction of manufacturing sector is mixed as well. For example, Rajan and Subramanian (2011) investigate the impact of foreign aid on the growth rate of manufacturing sector in 47 developing countries and end up with the conclusion that foreign aid deter the relative growth of exportables, thereby shrinking exportable manufacturing sector.

In response to the Rajan and Subramanian (2011) study, Nsor-Ambala (2015) carries out the same study, applying different econometric technique, with the same data set as chosen by Rajan and Subramanian (2011) and finds no strong evidence of falling growth rate of manufacturing sector. Furthermore, with the extended dataset the author finds long-run positive effects of foreign aid on the manufacturing growth. Likely foreign aid, the author finds positive effect of remittances on traded manufacturing sectors in the developing countries. Similarly, Dzansi (2013) finds positive effect of remittances on the growth of manufacturing sector in a number of remittances dependent countries.

Chapter 3

Theoretical Approach

In this chapter we will discuss theoretical framework of Dutch Disease, real exchange rate and real effective exchange rate. Firstly, we will shed some light on the methodology of calculating real exchange rate and real effective exchange rate. Finally, we will delve into the links between international transfers and real (effective) exchange rate and the channels of transmission.

3.1 Real Effective Exchange Rate (REER) Calculation

One of the important channels through which Dutch Disease effect operates is the Real Effective Exchange Rate appreciation. REER is a complex index constructed by several factors. Therefore, to work with REER it is pertinent to have clear idea on REER and its methods of construction. Real exchange rate (RER) is defined as nominal exchange rate multiplied by relative price of trading partner. In real exchange rate calculation bilateral nominal exchange rate and relative price of trading partner are taken into account. But in reality, a country may have more than one trading partners. To incorporate multiple trading partners a multilateral exchange rate based real exchange rate is suggested in the literature (see Kipici and Kesriyali 1997). This alternative multilateral real exchange rate is called the Real Effective Exchange Rate. We will describe REER in details below. Detail description of the RER calculation is given in appendix.

REER is the weighted average real exchange rate. In estimating REER all possible trading partners are considered. Each trading partners is given a weight. This weight could be trading partners' share in the international trade volume of domestic country. There are different definitions of REER. Most of the definitions describe REER as Nominal Effective Exchange Rate (NEER) multiplied by effective relative price indices. NEER is the multilateral exchange rate with the trading partners. Relative effective price index varies depending on the price indices to be considered. Some definitions include Wholesale Price Index (WPI) or Producer Price Index (PPI). Other definition takes Consumer Price Index (CPI) or GDP deflator. Afari (2004) showed REER calculation mathematically as follows.

$$REER_{jt} = \sum_{i=1}^k (NEER_{jit}) \left(\frac{P_{it}^*}{P_{jt}} \right)$$

Where, subscripts j , t and i stand for country, time and trading partners, respectively. P_{it}^* denotes price index of tradables, while P_{jt} denotes price index of non-tradables. WPI, PPI or CPI of trading partners can be used as the proxy

for the price index of tradables (P_{it}^*), whereas CPI and GDP deflator of domestic country can be used as the proxy for the price index of non-tradables (P_{jt}).

Above REER is the weighted Arithmetic Mean (AM) of multilateral exchange rate. REER is also calculated by Geometric Mean (GM) averaging method. Each averaging method has some advantages and disadvantages. One of the main advantages of AM is that it is easy to compute. However, AM is greatly influenced by the base year chosen. For any analysis if the base year is to be changed, then the AM is very problematic. On the contrary, GM is free from this disadvantage since it is not influenced by the base year chosen. AM attaches larger weights to significantly appreciated or depreciated currencies alongside the home currency, whilst GM puts symmetric emphasis on appreciation and depreciation. Along with methods of averaging, choice of appropriate price index depends on the policy objectives.

Edwards (1989) discussed that use of appropriate price index is very crucial in computing real exchange rate. According to him the choice of price index depends on the objective of the policy or study. For example, if the objective is to investigate the effect of productivity shocks on the real exchange rate, it will be appropriate to take GDP based price index (GDP deflator) since it takes changes in productivity into account. While, in analyzing the effect of capital inflows on national economy or international competitiveness of the home country trade weighted CPI captures the best. This is because of the fact that capital inflows affects both tradable and non-tradable sectors through spending effect, thereby changing relative price of tradables and non-tradables. This change in relative prices corresponds to changes in real effective exchange rate.

3.2 Theoretical Framework of Dutch Disease

Problem of international transfers was debated between John Maynard Keynes and Bertil Ohlin in 1929 with regard to German's reparation payments following the World War I. The upshot of the debate was the terms of trade effects in the donor country. According to Keynes, the reparation payments were burden to Germany and the transfer would require price and cost cuts in the export sector, which in turn would cause deterioration in terms of trade. Ohlin, however, argued that because of income effects on the demand resulted from transfers, the terms of trade in the donor country would be unchanged (Brakman and Marrewijk 1998: 22). Analysis of transfer paradox kept on continuing in the work of Leontief and Samuelson. Leontief (1936) argued that donor would gain, whereas the recipient would lose from an international transfer. Samuelson (1947), however, pointed out that to hold Leontief's finding the market would have to be unstable. Moreover, he claimed that with the setting of a perfect-equilibrium, Walrasian-stable two-good, two-country, distortion-free world a transfer would reduce welfare of the donor country and

would increase welfare of the recipient country. In the next sections, we will discuss theoretical framework of real-exchange-rate-appreciating effect of transfers.

Salter-Swan framework: Salter (1959) and Swan (1960) discuss that a rise in domestic spending due to elimination of trade surplus displaces resource allocation and appreciate real exchange rate in a small dependent economy. Because of spending effect demand for non-tradables increases and thereby their prices increase. Consequently, real exchange rate appreciates and productive resources move to non-tradable sector from tradable sector.

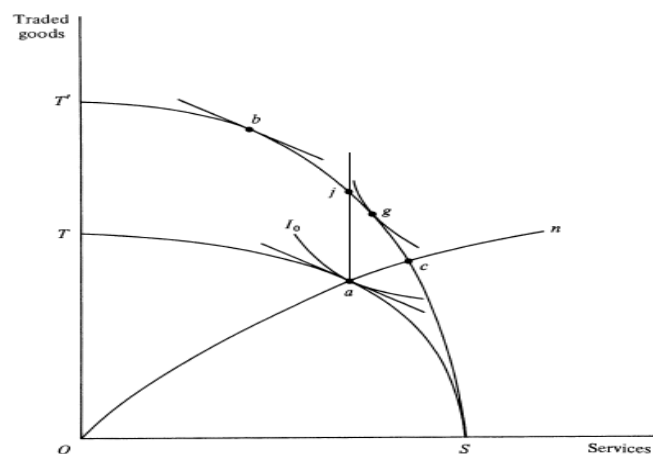
Corden-Neary (1982) model: Corden-Neary discuss Dutch Disease impacts of natural resource revenue gains. International transfer like remittances and foreign aid also act as like inflows of natural resource revenue. Natural resource revenue has two effects through which the manufacturing sector can shrink.

Spending effects: Higher disposable income gained from natural resource revenue push the aggregate demand up. Since the prices of tradable sector goods are exogenously determined, the prices of tradables do not rise. Consequently, increased aggregate demand increases the relative prices of non-tradables that correspond to appreciation of exchange rate.

Resource movement effects: Higher prices of non-tradables lead to expansion of the non-tradable sector. Therefore, resource moves from tradable sector to non-tradable sector shrinking the tradable sector. Real wage in non-tradables also increases, which creates excess demand in non-tradables. Owing to this excess demand real appreciation in exchange rate is obvious to clear the market.

The authors explain the resource movement and spending effect of booming natural resource sector with the help of the following familiar Salter diagram.

Figure 3.1: Salter diagram



Source: Adapted from Corden and Neary (1982)

Traded goods are shown on the vertical axis, while services (non-tradables) are shown on the horizontal axis. There are two traded goods in the model -- output of energy and manufacturing sectors. Assuming constant terms of trade, output of these two sectors can be aggregated into a single Hicksian composite good. The traded goods shown on the vertical axis is the composite good. TS is the production possibility frontier (PPF). Before boom in the energy sector the economy is in the equilibrium at point a where the highest possible indifference curve, I_0 , tangent to the PPF and the price line. The price line shows the relative price of the services to traded goods. Therefore, the slope of the price line is the real exchange rate. Now suppose boom happens in the energy sector. Labour demand as well as real wage increase in the energy sector. Consequently, labour shift to energy sector from both manufacturing and service sectors. Because of boom in the energy sector, possibility of producing traded goods increases, while the possibility in services production remains all the same. That's why the PPF shifts towards the traded goods at point T' remaining on the same point at S on the services axis. Assuming constant real exchange rate or relative price, new equilibrium is reached at point b . The effect of resource movement can be shown with the distance between points a and b . Since labour move to energy sector from service sector, production of services falls compared to the initial situation. This is shown by the position of point b which lies left to the point a .

But, demand for services will be higher at the new equilibrium at point b . Let's assume that the income-elasticity is zero. For this the income-consumption curve will be vertical which is shown by the vertical line connecting points a and j . Hence, with the initial real exchange rate there is an excess demand in services. Excess demand pushes price of services up which appreciates real exchange rate. Market clearing level of services must lie between points b and j on $T'S$ with increased price. This new level of services is still lower than that of the initial equilibrium at point a because of resource movement effect.

Turning to the spending effect, let's assume that the energy sector does not use any labour. Boom in the energy sector rotates the PPF to $T'S$ from TS . Provided positive income elasticity the demand for services increases with the increase in income. The positive income-consumption relation is given by the curve om . The income consumption curve intersects $T'S$ at point c . Here also there is an excess demand for services with initial real exchange rate. With this situation real exchange rate must appreciate to clear the market for services. This time the equilibrium must lie in between points j and c so that output of services rise compared with the initial situation (at point a).

When two effects are considered final equilibrium would be at point g . Both effects contribute to real appreciation of exchange rate. At point g relative price

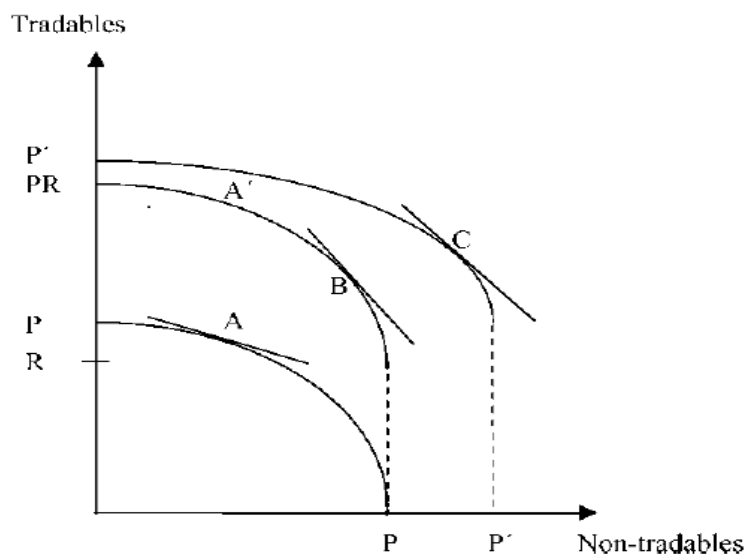
is higher than the relative price was in the initial equilibrium. Because of resource movement and real exchange rate appreciation, both employment and output in the manufacturing sector decline.

The Dornbusch model: With the inflows of international transfers real exchange rate appreciates, including with the nominal exchange rate. But at the initial stage, exchange rate overshoots then gradually adjust towards the new long-run equilibrium following recession (see Murshed 1997:77).

Krugman (1987) model: Inflows of natural resource revenue appreciates real exchange rate and some of the traded sector lose competitiveness and move abroad. He considers natural resource revenue as transfer payment from abroad. If the transfer does not last long, external competitiveness is regained and the forgone sector returns to home country. But long lasting transfer erodes trade competitiveness for some tradable sectors permanently, which do not come back even when the transfer ends. In that case, both market share and international competitiveness decline. Possible reason for this loss is due to the loss in learning-by-doing. Specialization in particular product depends on the comparative advantages. Learning-by-doing plays a great role in determining comparative advantage since present productivity depends on cumulative past output. If a country does not produce a particular product, in which earlier it had comparative advantage, for a long time, then there will be loss of learning-by-doing. Afterwards, if the country tries to produce that particular product again, the country may not keep pace with the state-of-the-art technology, management, marketing strategy, and so on, thereby losing competitiveness of that particular product.

Bourdet and Falck (2007) illustrates the impact of remittances on the output and real exchange rate as follows.

Figure 3.2: Remittances and Dutch Disease



Source: Adapted from Bourdet and Falck (2007)

In the above figure tradables and non-tradables are shown on the vertical and horizontal axis, respectively. PP curve represents the transformation curve of the economy. At point A initial equilibrium is reached. At this equilibrium point, the slope of the transformation curve is assumed to be equal to the slope of the highest attainable social indifference curve. Relative price of non-tradables is given by the tangential line at point A . Inflows of international transfers i.e. remittances or foreign aid will increase supply of tradables. Consequently, the PP curve rotates to $PR P$ curve which shows enhanced consumption possibility of tradables. Supply of international transfers is assumed to be constant over time. With an unchanged price of non-tradables new equilibrium is established at point A' . New price line would be tangent to the rotated transformation curve at point A' with the same slope. The bundle of goods demanded at this price is given by any point somewhere right to the point A' . At this point the income-consumption curve intersects the price line (not shown in the figure). There is an excess demand for non-tradables. This excess demand is measured by the horizontal distance between these two points. In response, prices of non-tradables increase to clear the market. Market pressure of supply (production) and demand of non-tradables establishes a new equilibrium at a point on $PR P$ somewhere between A' and the point where the income-consumption intersects the transformation curve. Let the new short-term equilibrium point is at point B where the tangent price line is steeper than the previous ones. Comparing the initial and new situations, it is discernable that because of spending effect of international transfers supply of non-tradables increases, while supply of tradables contracts.

Increase in relative price of non-tradables may overshoot in short run. In long run, there will be resource movement effect of international transfer. Productive resource will shift from tradable sector to non-tradable sector as demand in non-tradables increases. The transformation curve will shift outwards to P'/P' implying more production of non-tradables. Consequently, relative price of non-tradables will decrease. The new long run equilibrium can be found at point C . If resource movement effects continue, the transformation curve will keep on shifting outwards and relative price of non-tradables will keep on falling.

In the short run, increase in the relative price of non-tradables appreciates the real exchange rate which takes toll on the international competitiveness. As a result, tradables or exports volume decrease, thereby contracting the tradable sector. But in the long run the contraction effect on the tradables will be less pronounced.

Ballasa-Samuelson Hypothesis (BSH): Balassa (1964) and Samuelson (1964) argue that differences in productivity between traded and non-traded sector might lead to real exchange rate appreciation. Productivity in traded and non-traded sector depends on technological progress in these sectors. The ar-

gument is that technological progress is more likely in the traded sector. Higher productivity pushes wages up in this sector, which necessitates price-increase in the non-traded sector goods and services. An increase in relative price of non-traded sector goods and services leads to real exchange rate appreciation. If productivity differential between traded and non-traded sector remains high in the high growth countries, then it is expected that high growth countries will experience real exchange rate appreciation.

Other Channels of Real Exchange Rate Appreciation

Lopez, Monila and Bussolo (2008) explain three channels through which external inflows can appreciate real exchange rate. Firstly, remittances can appreciate real exchange rate by increasing the net foreign asset position of the remittances receiving country in relation to rest of the world. Unlike other international transfers, for example loan and foreign direct investment, remittances have no obligation to repay. That's why these have great impact on the stock of net foreign assets.

Secondly, remittance inflows can affect internal equilibrium of the economy, thus appreciating real exchange rate. If remittance inflows stimulate the demand for services (non-tradables), inflation will go up in this sector which in turn will appreciate real exchange rate. Change in sectoral productivity can also takes place. Remittances induced demand for non-tradables redirect labour to non-traded sector from traded sector, thereby decreasing productivity in non-tradable sector and increasing productivity in the tradable sector. This productivity differential leads to real exchange rate appreciation (Ballasa-Samuelson effect).

For example, if remittances raise wages due to excess demand for non-tradables, employers of the non-tradable sector can cope with the excessive pressure of wage increase because they can pass the extra cost of production on to prices. On other hand, since the prices of tradables are determined internationally, employers of tradable sector will adjust employment to maintain competitiveness. The employers put more emphasis on productivity increase to cope with the situation. As a result, productivity in this sector goes up along with fall in inflation.

Thirdly, remittances can affect real exchange rate through growth effect. On the one hand, acceleration in the rate of growth due to remittance inflows would lead to lowering in the stock of net foreign asset position, which in turn depreciates real exchange rate. If, on the other hand, stock of net foreign assets of the country is negative in relation to rest of the world, an acceleration of growth would lower liabilities to GDP ratio, which in turn appreciates real exchange rate. Therefore, externally the impact of remittances on real exchange rate through this channel depends on the country's position of stock of net foreign assets. Internally, however, faster growth would lead to real exchange

rate appreciation. Higher growth would lead to higher internal demand for goods and services, thereby adjusting labour and productivity (Balassa-Samuelson effect). In sum, externally and internally, the net effect of growth on real exchange rate could be either positive, or negative or even zero.

Chapter 4

Methodological Approach

This study attempts to examine the relationship between external inflows (remittances and foreign aid) and REER. Impacts of the inflows on changes in the composition of traded and non-traded sectors will also be investigated. To control for country heterogeneity and time fixed effects this study attempts to apply panel Fixed Effect (FE) model. In line with the theoretical framework of the Dutch Disease, this study tries to run two separate regressions. More precisely, one regression is for *Spending Effect* and another one is for the *Resource Movement Effect*.

From the theoretical analysis it is discernible that external inflows may increase domestic expenditure on both traded and non-traded sector goods and services. If this expenditure falls disproportionately on non-traded sector goods and services, then prices of non-traded sector goods and services will rise leading to REER appreciation. To investigate this relationship we employ REER as dependent variable in the spending effect equation.

As prices of non-traded goods and services increase following a surge of external inflows, resource moves to non-traded sector from traded sector. Consequently, the traded sector shrinks. To capture this resource movement effect we employ traded to non-traded ratio (TNT) as dependent variable in the resource movement effect equation. Two models are specified as:

Spending effect equation:

$$REER_{it} = \beta_0 + \beta_1 REM_{it} + \beta_2 ODA_{it} + \beta_3 FDI_{it} + \beta_4 OPEN_{it} + \beta_5 TOT_{it} + \beta_6 GOVEX_{it} + \beta_7 GDPPC + \beta_8 M2 + \gamma_t + \nu_i + e_{it} \text{ -----(1)}$$

Resource movement equation:

$$TNT_{it} = \beta_0 + \beta_1 REM_{it} + \beta_2 ODA_{it} + \beta_3 FDI_{it} + \beta_4 OPEN_{it} + \beta_5 TOT_{it} + \beta_6 GOVEX_{it} + \beta_7 GDPPC + \beta_8 M2 + \delta_t + \lambda_i + \mu_{it} \text{ -----(2)}$$

$i = 1, 2, \dots, N \quad t = 1, 2, \dots, T$

Where,

REER= Real Effective Exchange Rate

REM= Migrant's Remittances (percent of GDP/ per capita)

ODA= Net official development assistance and official aid received (percent of GDP/ per capita)

FDI= Net Foreign Direct investment (percent of GDP)

OPEN= Trade Openness (sum of exports and imports as percent of GDP)

TOT= Net Barter Terms of Trade

GOVEX= General government final consumption expenditure (percent of GDP)

GDPPC= GDP per capita (current US \$)

M2= Money and quasi money (percent of GDP)

γ_t and δ_t = Time fixed effect

ν_i and λ_i = Time invariant country fixed effect

e_{it} and μ_{it} = error terms

In the literature of determination of real exchange rate, several determinants are discussed. All explanatory variables in equation (1) have been incorporated from the discussion of real exchange rate literature. Expected directions of each variable are discussed below in details.

From the theoretical analysis and empirical findings (e.g Bourdet and Falck 2007, Corden-Neary 1982, Krugman 1987) it is evident that inflows of remittances may act like inflows of natural resource revenue. Through two channels of spending and resource movement effects remittances may appreciate real exchange rate. Therefore, positive sign for remittances (REM) in equation (1) is expected.

Foreign Aid/ODA is an international transfer like remittances. Therefore, it is expected that foreign Aid/ODA will act like inflows of remittances. Thus, positive sign for Aid/ODA is expected in equation (1) as well.

According to Balassa-Samuelson Hypothesis, differences in productivity may have impact on REER appreciation. To capture this effect we have employed GDP per capita of each country as proxy for productivity differential (see Amuedo-Dorantes and Pozo 2004). We expect that countries with higher GDP per capita (GDPPC) will experience REER appreciation. Therefore positive sign is expected in equation (1) for this variable.

Government expenditure can change the relative price of non-tradables which can influence REER in turn. Whether government expenditure appreciates or depreciates REER depends on the sectoral allocation of spending. If the expenditures fall disproportionately on the non-traded sector, then prices of non-tradables will increase which will appreciate REER (Froot and Rogoff 1995, as cited in Amuedo-Dorantes and Pozo 2004). But if it falls disproportionately on the traded sector, then it will depreciate REER (Montiel 1999:279, as cited in Amuedo-Dorantes and Pozo 2004). Therefore, we are not sure

about the expected sign of the government expenditure (GOVEX) in equation (1) -- it could be positive or negative.

External terms of trade (TOT) may influence the REER. If relative price of exports over the price of imports increase, then export will increase. As a result, non-traded sector will diminish and labor will redirect to traded sector. This labour movement will appreciate REER. Therefore, we expect positive sign for terms of trade in equation (1).

Trade openness (OPEN) has been included to capture the effect of trade restrictions on REER determination. An increase in import tariff can affect prices of non-tradables through two opposing effects -- income and substitution effects. Sign of trade openness depends on the relative strength of these effects. An increase in import tariff reduces income, which in turn reduces demand for all goods and services. A fall in demand for non-tradables will reduce prices and, thereby depreciating REER (Lartey et al. 2012). On the other hand, because of substitution effect people may switch to non-tradables from imported goods after an increase in import tariff. In consequences, prices of non-tradables rise leading to REER appreciation (Edwards 1989, as cited in Lartey et al. 2012). Therefore, in equation (1) either negative or positive association is expected.

Broad money (M2) may cause real exchange rate appreciation through increased money supply and the inflation associated. Positive sign is expected for M2 in the equation (1).

The variables which are expected to have positive signs in equation (1) are expected to have negative signs in equation (2) and vice versa. The fact is that one variable having appreciating effect in equation (1) will put pressure on productive resources to move from tradable sector to non-tradable sector and thereby the ratio of traded to non-traded ratio falls in equation (2).

Chapter 5

Data Description

Under this chapter data and sources of data for all variables are discussed. We wanted to include all South Asian countries but because of data paucity for all variables for longer time period we had to drop Afghanistan, Maldives, and Bhutan from the estimation. This paper considers a yearly panel data from Bangladesh, India, Nepal, Pakistan and Sri Lanka spanning for different years from 1975-2013. Data for all variables are not available for all these 38 years and for all countries. That's why our dataset is an unbalanced panel.

4.1 Sources of Data and Description of Variables

In the estimations of two models, two dependent variables and a total of eight explanatory variables are employed. The main variables of interest are remittances and foreign aid. Details of all variables are discussed below.

Dependent Variables

We have two dependent variables -- real effective exchange rate (REER) and traded to non-traded ratio (TNT). These two variables are described below.

Real Effective Exchange Rate (REER): This paper considers consumer price index (CPI) based REER. This is an index which considers nominal exchange rate, consumer price indexes of domestic country and its trading partners. We have employed Darvas' (2012) dataset because the dataset contains REER for longer time period for the countries under the research. Methodology of constructing REER index is discussed in details.

$$REER_t = \frac{NEER_t * CPI_t}{CPI_t^{(foreign)}}$$

Where, $NEER_t = \prod_{i=1}^N S(i)_t^{w^i}$ is nominal effective exchange rate, geometrically weighted average of bilateral nominal exchange rate [$S(i)_t$] between domestic country and its trading partner i . And the bilateral nominal exchange rate is measured as the foreign currency price of one unit of domestic currency.

$CPI_t^{(foreign)} = \prod_{i=1}^N CPI(i)_t^{w^i}$, geometrical weighted average of consumer price index of the trading partners. w^i is the weight of trading partner and N is the number of trading partners considered. $\sum_{i=1}^N w^{(i)} = 1$, the weight is summed to one.

Here CPI_t is used as proxy for price of non-tradables, while $CPI_t^{(foreign)}$ is used as a proxy for price of tradables. Therefore, an increase in the index refers to appreciation, whereas a decrease refers to depreciation.

There are four versions of REER depending on the number of trading partners in the dataset. REER is estimated considering 138, 41, 67 and 172 trading partners. In this research, REER estimated with 67 trading partners are used because of the country coverage of South Asia for longer time period.

Traded to non-traded sector ratio (TNT): To create the TNT ratio we followed Lartey et al. (2012). We have taken sum of value added in the agriculture and manufacturing sector (as share of GDP) as the proxy for the traded sector and value added in the service sector (as share of GDP) as the proxy for non-traded sector output. Agriculture (corresponding to ISIC divisions 1-5) includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Manufacturing refers to industries belonging to ISIC divisions 15-37. Service sector value added add up to value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services (World Bank 2015).

Variables of Interest

Remittances (% of GDP): Remittances are defined as the sum of workers' remittances, compensation of employees, and migrants' transfers. Broader definition of remittances has been taken covering not only workers' remittances but also professionals' income and migrant's transfer. Unskilled and semi-skilled workers along with professionals from South Asian countries migrate to rest of the world. Moreover, there is a big South Asian diaspora across the world. The permanent diaspora remit to their home countries for some altruistic motives as well. Annual remittances data as of April 2015 (World Bank 2015) is used here⁹. GDP data is taken from World Development Indicators, 2015 to express remittances as percent of GDP.

Per capita remittances (US \$): Ratio of sum of workers' remittances, compensation of employees, and migrants' transfers over total population. Annual remittances data as of April 2015 (World Bank 2015) is used here. Population data is taken from World Development Indicators, 2015 to calculate remittances as per capita.

⁹Retrieved from <<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSP/0,,contentMDK:22759429~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>> Accessed 22 July 2015.

Foreign Aid (ODA+ Aid): Net official development assistance and official aid received. Official Development Assistance (ODA) consists of concessional loans and grants provided by the members of Development Assistance Committee (DAC), by multinational institutions and, by non-DAC countries. While, official aid refers to the aid flows from official donors to DAC listed countries or territories. It is also measured in two scales -- percent of GDP and per capita. Foreign aid per capita is in current US dollar (World Bank 2014).

Control Variables

Foreign Direct Investment (FDI): Net foreign direct investment. FDI is the direct investment flows to domestic economy from foreign investors. It consists of equity capital, reinvestment of earnings and, other capital. FDI as percent of GDP is taken from World Development Indicators 2014.

Net Barter Terms of Trade (TOT): Index of relative prices of a country's export to imports. Rise in prices of export or fall in prices of imports indicate improvement in terms of trade. It indicates that every unit of exports buys more units of imports. The index is calculated as the percentage ratio of the export unit value indexes to the import unit value indexes (Base year 2000=100)(World Bank 2014).

General government final consumption expenditure (GOVEX): Sum total of government current expenditures for purchases of goods and services. This also includes compensation of employees. This is measured in percent of GDP (World Bank 2014).

Per capita GDP (GDPPC): Gross Domestic Product divided by midyear population. GDP consists of gross value added by all resident producer and product taxes less subsidies. Per capita GDP is expressed in current US dollars (World Bank 2014).

Money and quasi money, M2, (percent of GDP): Sum total of currency outside banks, demand deposits other than those of the central government, savings, foreign currency deposits of resident sectors other than the central government, and time deposit (World Bank 2014).

Instrument Variables

Crop production index (2004-2006 = 100): It is the index of agricultural production of each year relative to the base year 2004-2006(World Bank 2015)

Primary school enrollment ratio: Percent of the population of official primary education age are enrolled in primary school (World Bank 2015).

4.2 Summary Statistics

Table 4-1 reports summary statistics of all variables used in both regressions of spending and resource movement effects. Mean, standard deviation (overall, between and within), minimum and maximum values along with number of observations are presented in the table. Dependent variables and regressors should vary within the cross section and across the cross sections in a panel data setting. Variation within the cross section (here country) over time is called within variation and, variation across the cross sections is called between variation. In particular, within variation is much more important for fixed effect model because coefficient of little within-variant-regressor will be estimated imprecisely. Even the coefficient will not be identified in case of zero within variation (Cameron and Trivedi 2009: 238).

Log real effective exchange rate has smaller between variation (0.097) but it has larger within variation (0.271) with an average value of 4.77. Traded to non-traded ratio exhibits greater variation in both between and within categories with a mean value of 1.10. This implies that over time and across countries traded to non-traded ratio varies significantly. On an average traded sector remains slightly greater than the non-traded sector. Mean values of remittances as percent of GDP and as per capita are 5.18 and 2.76, respectively. Both of both of the regressors are showing considerable variations.

Table 4-1: Summary statistics

Variable	Mean	Std. Dev.	Between Std.	Within Std.	Min	Max	Obs.
Real Effective Exchange Rate (Log)	4.77	0.285	0.097	0.271	4.369	5.629	210
Traded to non-traded ratio	1.10	0.594	0.393	0.478	0.501	3.783	210
Remittances (% of GDP)	5.18	4.763	3.462	3.941	0.186	28.772	175
Log Remittances (Per capita)	2.76	1.368	0.5826	1.254	-1.358	5.744	175
ODA (Net ODA+ Official aid % of GDP)	3.95	3.197	2.520	2.261	0.090	14.123	210
Log ODA (Per capita)	2.22	0.996	0.968	0.487	-0.405	4.079	210
Foreign Direct Investment (% of GDP)	0.58	0.707	0.344	0.638	-0.100	3.670	201
Log terms of trade (TOT)	4.56	0.241	0.086	0.230	3.988	5.089	149
Log trade openness(X+M as % of GDP)	3.52	0.532	0.452	0.346	2.029	4.484	210
Government Expenditure (% of GDP)	9.42	2.939	2.778	1.557	3.164	17.611	206
M2 (% of GDP)	39.12	15.375	6.701	14.158	8.354	85.584	208
GDP growth	4.74	2.753	0.595	2.700	-13.974	10.260	210
Log GDP per capita	5.93	0.729	0.398	0.636	4.368	8.096	210
Log enrollment ratio	4.47	0.272	0.193	0.211	3.733	4.962	177
Log crop production index	4.289	0.3686	0.135	0.3483	3.410	4.955	210

ODA as percent of GDP is exhibiting huge variation having a minimum 0.090 and a maximum 14.123. Mean (3.95) and standard deviation (3.197) are close to each other. There are considerable variations in all other control variables as well. All variables show relatively larger within variations compared to between variations. As we intent to employ a fixed effect model, these larger within variations will give us more precisely estimated coefficients.

Chapter 6

Results and Analysis

In this chapter we will discuss the findings of the regression estimates and try to analyze the findings in the context of South Asian countries. We estimated pooled OLS and fixed effect models for both spending and resource movement effects regressions. To control for time invariant country fixed effects and time fixed effects we prefer to adopt fixed effect model. But there is a formal test to choose between random effect (RE) and fixed effect models. After performing the Hausman test we have found that fixed effect model is preferred to the random effect model. One of our main variables of interest, remittances, is endogenous. To address the problem of endogeneity we adopt Instrumental Variable (IV) approach to find the true impact of remittances on REER.

6.1 Pooled OLS Estimation of REER

Firstly, we have pooled all yearly data from 5 countries over different years spanning from the period of 1975-2013. Now, all the panel data is treated as cross-sectional entity. Then, we have performed simple OLS regressions. Same estimation is done with two types of standard errors. We have considered both Driscoll-Kraay (DK) and Cluster-Robust (CR) standard errors. It is shown in the literature that in case of macro panel (long time dimensions and short cross-sections) DK based estimates are more efficient than the CR based estimates. Because, 'DK standard errors are heteroskedasticity consistent and robust to general forms of cross-sectional (spatial) and temporal dependence when the time dimension becomes large' (Hoechle 2007: 286).

Our data set is an unbalanced macro panel consisting of only 5 countries (cross sections) and on average a time period of 30 years. The data suffer from the presence of heteroskedasticity, cross sectional dependency (error terms of cross sections are dependent) and autocorrelation. In that case cluster-robust standard errors will give inefficient estimates, whereas Driscoll-Kraay standard error will give more efficiency. In table (6.1) we see that under DK and CR standard errors estimations values of coefficients are all the same but values of standard errors are slightly higher in DK estimation.

Table 6.1 reports regression results of the relation between real effective exchange rate and our main variables of interest (remittances and foreign aid). In all specifications both remittances as percent of GDP and remittances as per capita have expected positive sign and are statistically highly significant. This indicates that remittances appreciate REER. But foreign aid (ODA), in both measures (percent of GDP and per capita), has negative sign and is statistically

highly significant, which indicates that foreign aid depreciates REER rather than appreciating it.

Table 6.1: Pooled OLS estimates of REER, with Driscoll-Kraay and cluster-robust Standard Errors.

Dependent variable : Log of Real Effective Exchange Rate(REER)						
Regressors	With Driscoll-Kraay Standard Error			With Cluster-Robust Standard Error		
	(1)	(2)	(3)	(4)	(5)	(6)
Remittances (% of GDP)	0.027*** (0.009)			0.027*** (0.006)		
Log Remittances (per capita)		0.172*** (0.045)	0.165* (0.084)		0.172*** (0.037)	0.165*** (0.049)
ODA (Net ODA+ Official aid % of GDP)	-0.039** (0.019)	-0.030** (0.014)		-0.039*** (0.010)	-0.030*** (0.009)	
Log ODA (Net ODA+ Official aid per capita)			-0.018 (0.064)			-0.018 (0.032)
Foreign Direct Investment (% of GDP)	0.008 (0.030)	-0.009 (0.025)	-0.005 (0.025)	0.008 (0.019)	-0.009 (0.018)	-0.005 (0.017)
Log terms of trade (TOT)	0.269*** (0.053)	0.222*** (0.061)	0.218*** (0.057)	0.269*** (0.074)	0.222*** (0.070)	0.218*** (0.073)
Log trade openness(X+M as % of GDP)	-0.137*** (0.038)	-0.229*** (0.028)	-0.313*** (0.040)	-0.137*** (0.039)	-0.229*** (0.036)	-0.313*** (0.036)
Government Expenditure (% of GDP)	0.008 (0.008)	0.012 (0.008)	0.015 (0.011)	0.008* (0.004)	0.012*** (0.004)	0.015*** (0.005)
M2 (% of GDP)	-0.007*** (0.002)	-0.005*** (0.002)	-0.004 (0.003)	-0.007*** (0.002)	-0.005*** (0.001)	-0.004** (0.002)
Log per capita GDP	-0.074 (0.112)	-0.249* (0.145)	-0.161 (0.151)	-0.074 (0.050)	-0.249*** (0.076)	-0.161** (0.074)
Constant	4.634*** (0.684)	5.737*** (1.001)	5.403*** (1.129)	4.634*** (0.443)	5.737*** (0.494)	5.403*** (0.518)
Observations	149	149	149	149	149	149
R-squared	0.402	0.421	0.387	0.402	0.421	0.387
Number of countries	5	5	5	5	5	5

Notes: In column 1-3 Driscoll-Kraay standard errors are in the parenthesis. In column 4-6 Cluster-Robust standard errors are in the parenthesis. Driscoll-Kraay standard errors are robust to heteroskedasticity, cross sectional dependence and autocorrelation. Asterisk ***, **, * indicates significance at 1, 5 and 10% level, respectively.

Foreign aid in South Asian countries is not as pronounced as remittances are. Even over the time foreign aid flows to South Asia have been decreasing. If external inflows are properly managed, then it may not have appreciating effect on REER. Even foreign aid can depreciate REER (see Fielding and Gibson 2012, Nyoni 1998).

However, the pooled OLS estimates may be biased and inconsistent as we have not controlled for the country and time fixed effects. Time-invariant unobservable country characteristics might be correlated with the explanatory variables. Country fixed characteristics and time variable may also be important determinant of REER. In addition, remittances are not purely exogenous. In the next section, we will perform instrumental variable fixed effect estimation addressing endogeneity and controlling for time-invariant country fixed effect and time fixed effect.

6.2 Instrumental Variable (IV) Fixed Effect Estimation of REER

There is reverse causality between remittances and REER. On the one hand, REER depends on remittance inflows; on the other hand, remittance inflows depend on the level of REER. For example, in the case of higher (appreciated) nominal exchange rate remitter will get fewer domestic currencies in exchange of foreign currency that may defer the decision of sending remittances. Therefore, volume of remittances decreases. Similarly, in the case of lower (depreciated) nominal exchange rate remitter will get more domestic currencies in exchange of foreign currency that prompt the decision of sending remittances. As a result, volume of remittances increases. Since nominal exchange rate is a part of REER calculation, same two way links between remittances and REER prevails. Remittances can also be procyclical and counter cyclical. If remittances are sent as capital for investment motives, in the good time of the remittances receiving economy there will be more remittance inflows (procyclical), and vice versa. Being lured into the good economic conditions, the expatriates will send more remittances for investments. On the other hand, if remittances are sent for altruistic motives, in the bad time of the economy remittance inflows increase (countercyclical), and vice versa. In case of natural calamities, crop failure, loss in income, and so on the expatriates send more remittances to help their friends and relatives back home. Therefore, in literature it is argued that remittances are endogenous (see Acosta et al. 2009, Amuedo-Dorantes and Pozo 2004, Lartey et al. 2008).

To remove the problem of potential endogeneity one can opt for instrumental variable and system GMM techniques. But in our case system GMM will not be efficient since the data set is a macro panel, large T and small N (Roodman 2009). That is why we go for IV technique only. In literature various instruments for remittances have been proposed, such as school enrollment rate, crop and livestock production index, immunization index, literacy rate, economic condition of host countries, distance between migrant sending and receiving countries, stock and flow of migrant, population density, unemployment rate in sending country etc. We have performed IV fixed effect regression using crop production index and primary school enrollment rate as instruments following Amuedo-Dorantes and Pozo (2004). It is expected that volume of remittances will be higher with low value of crop production index and low level of primary school enrollment, and vice versa. Most of the remittances earners in South Asian countries are unskilled or semiskilled workers and they have low level of schooling or no schooling at all. Surplus labour in agriculture put pressure on labour market in informal sectors. Low level of agricultural production also compels surplus workers to find their jobs elsewhere. Thus, low level of agricultural production and school enrollment will increase out migration, thereby increasing the volume of remittances.

We have found negative signs for both crop production index and school enrollment ratio in the first stage IV regression for remittances. Coefficients of instruments are statistically significant at conventional levels. Both of the instruments passed the test of under identification. Kleibergen-Paap rk LM statistics is statistically significant, which rejects the null of under identification. However, crop production index do not pass the weak instrument test. For weak instrument test the rule of thumb is that an instrument is not considered weak if F statistics is greater than 10. Crop production index has ‘Kleibergen-Paap Wald rk F’ statistics of 5.22, while primary school enrolment has 19.12 (Table 6.2). So, crop production index is weak, whereas primary school enrollment ratio is strong instrument. We have estimated IV estimates with both of the instruments to compare results.

Results of first stage IV fixed effect regression are presented in table 6.2 and results of second stage IV fixed effect estimation are presented in table 6.3.

Table 6.2: First stage IV Fixed Effect estimates of REER

Dependent variable is Log remittances per capita		
	IV-1	IV-2
<hr/>		
Regressors		
<hr/>		
Log crop production index	-1.437**	
	0.629	
Log primary school enrollment ratio		-2.181***
		0.499
Log ODA (Net ODA+ Official aid per capita)	0.058	0.090
	0.155	0.186
Foreign Direct Investment (% of GDP)	-0.202**	-0.173**
	0.081	0.083
Log terms of trade (TOT)	-0.074	-0.342
	0.165	0.267
Log trade openness	0.371	0.310
	0.323	0.375
Government Expenditure (% of GDP)	0.014	-0.011
	0.026	0.040
M2 (% of GDP)	0.032***	0.0342***
	0.010	0.010
Log per capita GDP	0.547	0.535
	0.010	0.673
	149	119
<hr/>		
Kleibergen-Paap rk LM statistic (P value)	0.0297	0.0083
Kleibergen-Paap Wald rk F statistic	5.22	19.12

Notes: Driscoll-Kraay standard errors are in the parenthesis. Driscoll-Kraay standard errors are robust to heteroskedasticity, cross sectional dependence and autocorrelation. Asterisk ***, **, * indicates significance at 1, 5 and 10% level, respectively. Regressions contain time-fixed effects. IV-1= Log crop production index, IV-2= Primary school enrollment ratio.

Table 6.3: Second stage IV Fixed-Effects estimates of REER

Dependent variable is Log of Real Effective Exchange Rate(REER)		
Regressors	IV-1	IV-2
Log Remittances (per capita)	0.277*** (0.101)	0.234*** (0.081)
Log ODA (Net ODA+ Official aid per capita)	-0.040 (0.047)	-0.031 (0.044)
Foreign Direct Investment (% of GDP)	0.016 (0.037)	-0.013 (0.023)
Log terms of trade (TOT)	-0.205*** (0.059)	-0.250*** (0.067)
Log trade openness	-0.135 (0.111)	-0.002 (0.100)
Government Expenditure (% of GDP)	0.003 (0.007)	-0.004 (0.008)
M2 (% of GDP)	-0.001 (0.003)	-0.003 (0.004)
Log per capita GDP	0.657*** (0.173)	0.818*** (0.190)
Observations	149	119
R-squared	0.750	0.862
Number of countries	5	5
Country fixed effect	Yes	Yes
Time fixed effect	Yes	Yes

Notes: Driscoll-Kraay standard errors are in the parenthesis. Driscoll-Kraay standard errors are robust to heteroskedasticity, cross sectional dependence and autocorrelation. Asterisk ***,**,* indicates significance at 1 ,5 and 10% level, respectively.

Likely pooled OLS, in IV fixed effect estimation, remittances also appear with plus sign. Remittances are statistically significant at 1 percent level. Foreign aid (ODA) has the same minus sign as in pooled OLS, but here it is not statistically significant at any conventional levels. Therefore, foreign aid (ODA) does not have any effect on the REER determination. Coefficients of remittances differ under two instruments. With the crop production index the coefficient is 0.277, whereas with primary school enrollment ratio the coefficient is 0.234. As primary school enrolment ratio appear strong instrument compared to crop production index, coefficient value 0.234 is highly acceptable.

One may question the validity of REER appreciation if the countries follow fixed exchange or managed exchange rate regimes. Under fixed exchange rate regime, there will be no impact of remittances and foreign aid on nominal exchange rate appreciation. All south Asian countries pursue almost fixed or managed exchange rate. Even they devalue their currencies against major foreign currencies on regular intervals to boost up export volume. Bangladesh,

Pakistan and Sri Lanka have effectively fixed exchange rate regimes, while India has managed float exchange rate regime (Cavoli and Rajan 2013).

REER determination depends not only on nominal exchange rate but also on price levels (discussed in section 3.1). With a fixed exchange rate regime an exogenous increase in international transfers increases general price level, thus appreciating REER. However, with flexible exchange rate regime, real appreciation happens quickly through nominal exchange rate appreciation. Under a fixed exchange rate regime real appreciation takes place in the long run. Lartey et al. (2012) investigate Dutch Disease impact of foreign remittances in countries under both fixed and flexible exchange rate regimes. They find stronger Dutch Disease impact in countries under fixed nominal exchange rate regimes. Similarly, Fielding and Gibson (2012) find stronger Dutch Disease impact of foreign aid on countries under fixed exchange rate regimes.

6.3 Pooled OLS Estimation of Traded to Non-Traded Sector Ratio (TNT)

Results of pooled OLS regressions of TNT for different specifications are presented in table (6.4). Remittances under both measures, as percent of GDP and as per capita, have expected negative signs and are statistically significant at 1% level of significance. Negative relation shows that because of remittance inflows traded sector shrinks, whereas non-traded sector expands. Foreign aid under both measures, as percent of GDP and as per capita, have unexpected positive signs and are statistically significant at 1% level.

(Continued on next page)

Table 6.4: Pooled OLS estimates of Traded to Non-Traded ratio (TNT)

Dependent variable is Traded to Non-Traded ratio (TNT)			
Regressors	(1)	(2)	(3)
Remittances (% of GDP)	-0.006* (0.003)		
Log Remittances (per capita)		-0.075*** (0.021)	-0.111*** (0.025)
ODA (Net ODA+ Official aid % of GDP)	0.032*** (0.008)	0.033*** (0.009)	
Log ODA (Net ODA+ Official aid per capita)			0.080*** (0.022)
Foreign Direct Investment (% of GDP)	-0.023 (0.022)	-0.032 (0.022)	-0.032 (0.021)
Log terms of trade (TOT)	-0.032 (0.045)	-0.041 (0.032)	-0.000 (0.051)
Log trade openness(X+M as % of GDP)	-0.134** (0.052)	-0.087 (0.052)	-0.042 (0.030)
Government Expenditure (% of GDP)	0.016*** (0.004)	0.014*** (0.003)	0.012*** (0.004)
M2 (% GDP)	0.002 (0.001)	0.002* (0.001)	0.003** (0.001)
Log GDP per capita	-0.177*** (0.052)	-0.084 (0.058)	-0.131** (0.061)
Constant	2.281*** (0.452)	1.792*** (0.407)	1.737*** (0.520)
Observations	149	149	149
R-squared	0.691	0.715	0.698
Number of countries	5	5	5

Notes: Driscoll-Kraay standard errors are in the parenthesis. Driscoll-Kraay standard errors are robust to heteroskedasticity, cross sectional dependence and autocorrelation. Asterisk ***, **, * indicates significance at 1, 5 and 10% level, respectively.

However, we didn't control for country and time fixed effects in the pooled OLS regression. Country fixed effects and time variables may have significant effects on the TNT ratio. In the next section, we will apply fixed effect model to control for time invariant country fixed characteristics and time variables.

6.4 Fixed-Effect Estimation of Traded to Non-Traded Sector Ratio (TNT)

Results of fixed effect estimates of TNT for different specifications are presented in table (6.5).

(Continued on next page)

Table 6.5: Fixed-Effect estimates of Traded to Non-Traded ratio (TNT)

Dependent variable is Traded to Non-Traded ratio (TNT)			
Regressors	(1)	(2)	(3)
Remittances (% of GDP)	-0.016*** (0.005)		
Log Remittances (per capita)		-0.090*** (0.020)	-0.094*** (0.023)
ODA (Net ODA+ Official aid % of GDP)	0.004 (0.019)	0.006 (0.016)	
Log ODA (Net ODA+ Official aid per capita)			0.047 (0.047)
Foreign Direct Investment (% of GDP)	-0.003 (0.012)	-0.003 (0.018)	-0.004 (0.016)
Log terms of trade (TOT)	-0.038 (0.094)	-0.039 (0.098)	-0.023 (0.076)
Log trade openness(X+M as % of GDP)	-0.067 (0.071)	0.037 (0.062)	0.061 (0.079)
Government Expenditure (% of GDP)	-0.006 (0.007)	-0.005 (0.006)	-0.006 (0.005)
M2 (% GDP)	-0.001 (0.003)	-0.003** (0.001)	-0.003* (0.002)
Log GDP per capita	0.007 (0.171)	0.102 (0.195)	0.079 (0.129)
Constant	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Observations	149	149	149
R squared (within)	0.8531	0.8572	0.8591
Number of countries	5	5	5
Country fixed effect	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes

Notes: Driscoll-Kraay standard errors are in the parenthesis. D-K standard errors are robust to heteroskedasticity, cross sectional dependence and autocorrelation. Asterisk ***, **, * indicates significance at 1, 5 and 10% level, respectively.

Likely pooled OLS, remittances appear statistically highly significant with negative sign and foreign aid (ODA) appears with positive sign. However, foreign aid is not statistically significant here. These findings reflect that remittances affect the composition of traded and non-traded sector and foreign aid does not have any impact. Time fixed effects and country fixed characteristics might have strong effect. That's why foreign aid appears statistically insignificant in the fixed effect model. In table 6.6, summary findings of two regressions using two different models are presented. In the next section, we will analyze and compare findings of both models in details.

Table 6.6: Estimates of REER and TNT, Pooled OLS and Fixed Effect models

Dependent variable is log of Real Effective Exchange Rate (REER) and TNT				
Regressors	REER		TNT	
	(1) Pooled OLS	(2) IV-2 FE	(3) Pooled OLS	(4) FE
Log Remittances (per capita)	0.165* (0.084)	0.234*** (0.081)	-0.111*** (0.025)	-0.094*** (0.023)
Log ODA (per capita)	-0.018 (0.064)	-0.031 (0.044)	0.080*** (0.022)	0.047 (0.047)
Foreign Direct Investment (% of GDP)	-0.005 (0.025)	-0.013 (0.023)	-0.032 (0.021)	-0.004 (0.016)
Log terms of trade (TOT)	0.218*** (0.057)	-0.250*** (0.067)	-0.000 (0.051)	-0.023 (0.076)
Log trade openness	-0.313*** (0.040)	-0.002 (0.100)	-0.042 (0.030)	0.061 (0.079)
Government Expenditure (% of GDP)	0.015 (0.011)	-0.004 (0.008)	0.012*** (0.004)	-0.006 (0.005)
M2 (% of GDP)	-0.007*** (0.002)	-0.003 (0.004)	0.003** (0.001)	-0.003* (0.002)
Log per capita GDP	-0.074 (0.112)	0.818*** (0.190)	-0.131** (0.061)	0.079 (0.129)
Constant	4.634*** (0.684)	Omitted	0.923 (0.613)	0.000 (0.000)
Observations	149	119	149	149
R-squared (within)	0.402	0.862	0.714	0.8611
Number of countries	5	5	5	5
Country fixed effect	-	Yes	-	Yes
Time fixed effect	-	Yes	-	Yes

Notes: Driscoll-Kraay standard errors are in the parenthesis. D-K standard errors are robust to heteroskedasticity, cross sectional dependence and autocorrelation. Asterisk ***, **, * indicates significance at 1, 5 and 10% level, respectively. Primary school enrollment ratio is the instrument variable.

Based on the IV-2 fixed effect estimates (column 2) if per capita remittances increase by one percent, controlling for others, then on an average REER appreciate by 0.234 percent. Alternatively, if per capita remittances double, REER appreciates by 23.4 percent which is similar to Amuedo-Dorantes and Pozo's (2004) findings. They found that a doubling of per capita remittances raises real exchange rate by 23 percent in 13 Latin American countries. On the

other hand, per capita remittances are negatively associated with traded to non-traded sector ratio (TNT) and statistically significant at 1 percent level in both pooled OLS and Fixed Effect models. Fixed effect estimates of TNT (column 4) show that, controlling for others, a one percent increase in per capita remittances leads to 0.094 percentage point fall in TNT ratio. Alternatively, if per capita remittances double, TNT ratio falls by 9.4 percentage points. Both the magnitudes of spending and resource movement effects are substantial and economically significant. These findings indicate the loss of international competitiveness, thereby reducing export volume, and contraction of traded manufacturing sector. Over the period per capita remittances in South Asian countries increased manifold (E.g. in Bangladesh 13 times) and the service sector which is primarily non-tradable expanded substantially (E.g. in Bangladesh expanded by almost 64 percent), whereas the manufacturing sectors relatively shrank.

Foreign aid (ODA), however, is not statistically significant. It is negatively associated with REER and positively associated with TNT ratio. These associations imply that foreign aid depreciates REER, while traded sectors expand. If foreign aid is efficiently used then it can increase physical and human capital stock and enhance performances of tradable sector. If foreign aid is heavily invested in non-traded sector or it enhances productivity in the non-tradable sector, it may not appreciate REER (Fielding 2010). However, in our case foreign aid has no statistically significant impact on real effective exchange rate and relative growth of non-traded sector.

Terms of trade in spending effect is negatively associated with the real exchange rate and statistically highly significant in the fixed effect model. While, terms of trade appears statistically insignificant in the resource movement regression. It indicates that terms of trade does not exert any pressure on resources to move from tradable to non-tradable sectors, thus having no bearing on REER appreciation. However, improvement in terms of trade may cause trade surplus and, which in turn may exert pressure on nominal exchange rate appreciation. To check loss in trade competitiveness due to nominal exchange rate appreciation, South Asian countries devalue their own currencies occasionally. This nominal exchange rate devaluation might have been one of the reasons for negative association between terms of trade and REER.

No statistically significant linear dependence of REER and TNT on foreign direct investment was detected. Trade openness appears statistically significant in pooled OLS estimates of REER only. Broad money supply (M2) is not statistically significant in the fixed effect estimates of REER. However, M2 has statistically significant effect on falling of TNT. An increase in broad money supply can stimulate production of non-tradable service sector and, in effect, productive resources may move to service sector from the tradable sector. This channel might have worked in South Asian countries. Per capita GDP has statistically significant effect on REER and TNT in the fixed effect and pooled

OLS models, respectively. It indicates that Ballasa-Samuelson hypothesis holds in the South Asia.

6.5 Consequences of Dutch Disease

In this section we will throw some light on the consequences of Dutch Disease impacts in South Asia. One may raise question about the Dutch Disease impact since international transfers may have wide range of benefits both at micro and macro levels. Remittances and aid have positive impacts on household welfare through consumption smoothening, poverty reduction, human capital formation through investing in health and education, and fall in fertility. These inflows also help correct the problem of balance of payment imbalances, increase foreign currency reserves that are immensely necessary for importing capital goods for industrialization in developing countries. In the initial stage of industrialization, developing countries have to import capital goods from advanced countries which require huge foreign currencies. Capital inflows can bridge the gap between the demand and supply for foreign currencies. But loan from international financial market, foreign direct investment, and portfolio investment depend on many other macroeconomic and political conditions. In this setting, foreign aid and remittance inflows can be very much effective ways.

On the other way around, Dutch Disease impacts may cancel out the benefit associated with international transfers by the cost associated or even the costs may outweigh the benefits. International transfers may entail negative consequences on industrialization, international trade, balance of payment, displacement of sectoral investment, fall in labour supply and, inflation as well.

Lopez, Monila and Bussolo (2008) mention three adverse impacts of real exchange rate appreciation caused by international transfers like remittances and foreign aid. Firstly, negative impact will be on tradable sector. Both export and import competing industries (tradable sectors) would be hurt by real exchange rate escalation and the loss of international competitiveness associated. This adverse impact may be reinforced if international transfers fuel to inflation and increase economy wide wages. The adverse impact may be magnified further if labour supply falls. Because of remittance receipt, reservation wages in the remittances receiving households may increase or the returned migrant may attach higher value to leisure. As a result, remittances may reduce labor supply.

Secondly, current account deficit may be widened. If increased consumption demand induced by transfers is not covered by the non-tradables, then import demand will increase. Due to increase in import demand coupled with fall in exports due to the loss in international competitiveness there will be deficit pressure on the current account balance.

Thirdly, there may be hurdle in controlling money supply, thereby increasing inflation. Inflows of transfers may distort sectoral allocation of investment by putting too much emphasis on a particular sector as well. If the international transfers do not go back abroad through widening of the current account, a large inflow will increase money supply. As a result, inflation will increase. It is learnt from experiences that prices of financial assets, real estate and land shoot up after a surge in remittances. Excessive demand in a particular sector draws productive resources from other sectors distorting the allocation of sectoral investment. If price bubble is created in a particular sector, there may be high chance to burst the bubble in future.

Furthermore, most importantly, because of Dutch Disease impacts developing countries may experience 'premature deindustrialization'. The term 'premature deindustrialization' was first coined by Dasgupta and Singh (as cited in Rodrik, 2015). This term refers to deindustrialization before having the proper experience of industrialization in developing countries. There is an inverted U relationship between industrialization and income. At the initial stage industrialization increase with the increase in income then it peaks and afterwards tends to fall (deindustrialization) as the service sectors become more important.

With some exception, in most of the developing countries manufacturing sector began to contract (or in the process of contraction) earlier as compared to contraction in the developed countries in regard to income levels (Ibid). Deindustrialization in the developing countries takes place at the income level which is much smaller than the income level at which deindustrialization starts in developed countries.

Rodrik (2015) explains two broad ways -- economic and political -- in which developing countries may face the dire consequences of premature deindustrialization. On the economic perspective, in developing countries surplus labour with low level of productivity exists in the rural area. By shifting these surplus labors from the rural area to the urban manufacturing sector, where productivity of labour is much higher, low income developing countries can ensure rapid economic convergence. Industrialization paves the way of growth through the reallocation effects and productivity gain in the manufacturing sector. However, manufacturing sector tends to gain stronger productivity in the long run rather than in the short run. Organized formal manufacturing sector can stimulate growth process, thereby reaching the goal of unconditional convergence.

Since low-income countries tend to start with the production of more primary goods and low level of manufacturing goods, growth dynamics within the manufacturing sector tends to be smaller in the short run. There will be only the reallocation effect. But, with the passage of time growth dynamics within the manufacturing sector tends to be stronger widening the path of growth.

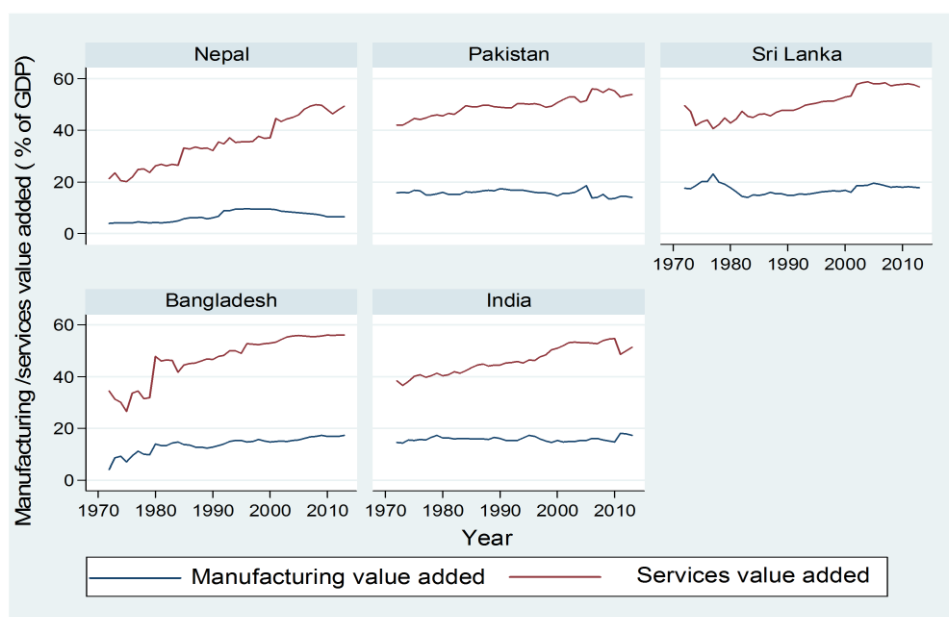
Premature deindustrialization impedes both productivity gain and reallocation slowing down the pace of economic convergence.

On the political perspective, impact of premature deindustrialization is not obvious immediately. Premature deindustrialization may take a toll on the democratic development in the developing countries. Historically, industrialization in the western societies played a great role in establishing modern states and forming democratic politics. Therefore, relative absence of democratic politics in the developing world may fuel to political instability leading to fragile state and malfunctioning politics.

6.6 Deindustrialization: South Asian Context

In South Asia over the period, service sectors have been expanding, while the manufacturing sectors have been shrinking. Figure 6.1 illustrates manufacturing and service sector compositions in the South Asian countries. In this region service sector becomes dominant, whereas the manufacturing sector diminishes as percent of GDP measures. In Nepal, manufacturing value added was almost 4 percent of GDP over 1970s and reached to peak 9 percent in 1990s and then started to fall in 2000s. In 2013, it was only 6.5 percent of GDP. Service sector value added was around 22 percent of GDP in 1970s and continued to increase. In 2013, it reached to 49 percent of GDP. Value added in manufacturing and service sectors follow the same patterns in Pakistan as well.

Figure 6.1: Manufacturing and services value added (% of GDP) in South Asian countries

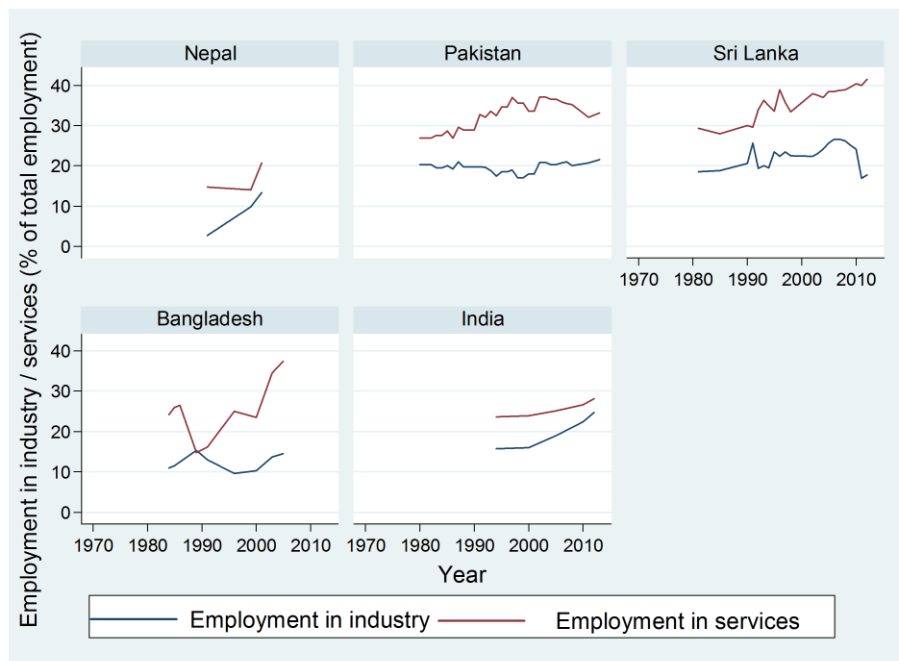


Source: World Bank (2015)

Manufacturing value added fluctuates between 14 to 15 percent of GDP over the period, whereas service sector value added reached to 53.8 percent in 2013. Manufacturing value added in Sri Lanka was little higher than that of Pakistan (about 17 percent) but it also tends to fall reaching a high of about 19 percent. In Bangladesh, manufacturing value added grows slowly from about 5 percent in 1970s to about 17 percent in 2010s. Manufacturing value added in India increased by 4 percentage points from 1972 to 2013, while the service sector value added increased by 13 percentage points during the period.

Figure 6.2 illustrates employment in industry and service sectors for the period of 1972 to 2013 in South Asian countries. Over the period, there is an upward trend in employment in service sector and a downward trend in employment in industry. In Pakistan, employment in industry and service sector was 20.3 and 26.8 percent of total employment, respectively in 1980. Employment in industry fluctuates between 20-21 percent from the period of 1972 to 2013, while employment in service sector, with some ups and downs, increased over the period. Sri Lanka shows upward trend for service sector employment and downward trend in industry employment. Bangladesh also shows divergence between employment in industry and service sector. However, India shows convergence. But actual employment in manufacturing sector would be lower as industry includes manufacturing along with mining and quarrying, construction, and public utilities.

Figure 6.2: Employment in industry and service sector in South Asian countries



Source: World Bank (2015)

From these two graphs it is clear that deindustrialization has already set on in South Asian subcontinent. Amirapu and Subramanian (2015) term deindustrialization in India as ‘premature non-industrialization’ because India never experienced sufficient industrialization in the first place. Same applies to all other South Asian countries where service sector became large (almost 50% of GDP) and manufacturing sector starts to fall before reaching its peak. This divergence between service and manufacturing sectors entails far-reaching economic implications. Service-led growth may not be sustainable in the long run or it may come to saturation, even further expansion of service sector may require expansion in latest technology based manufacturing sector. In that case, to stimulate further growth manufacturing sector will need to be revitalized. But, because of dwindling or stagnant manufacturing sector there will be loss of learning-by-doing and in consequence countries in this region, in future, may face much hurdle in adopting up-to-date high-tech manufacturing strategy.

In development discourses much more emphasis is given on the structural transformation to reach the goal of industrialization. The transformation requires that countries should widen the horizon of manufacturing sector from low technology to high technology based activities. As far as developing countries are concerned, structural changes in the production process are to be occurred to come by productivity gains. The structural change comes through some stages -- firstly absorbing existing technology, then catching up with technologically advanced countries, and finally continuing manufacturing activities with the accumulated knowledge (see Storm 2015). Migrant’s remittances to South Asia might have been one of the main stumbling blocks for structural transformations towards manufacturing sector and at the same time main reasons for ever expanding service sectors. From the theoretical analysis it is palpable that international transfer falls excessive on the non-traded service sector goods and services. Government has much control on the spending of foreign aid as it is directly received and spent by the government. If the government efficiently handles foreign aid channeling them into investment; like investment in education, health, skill development of the labour; in that case foreign aid may not cause Dutch Disease. On the other hand, government has little control on spending of remittances at micro level as it is directly received and spent by the remittances receiving households. If households spend remittances on investment purposes and capita formation, then Dutch Disease may not be the cause of concern. In the next section, we will focus on utilization of remittances in South Asian countries to analyze the ultimate usages of remittances.

6.7 Utilization of Remittances

Lion’s share of foreign remittances to South Asia is spent on consumption, whereas meager share is spent on investment purposes. So far two household

remittance surveys have been conducted in Bangladesh -- first one by International Organization for Migration (IOM) in 2009 and second one by Bangladesh Bureau of Statistics (BBS) in 2013. IOM (2010) finding reveals that in most cases (80 percent) migrants send remittances primarily to meet family expenses and the second major purpose is paying off debt and celebration of religious festivals. In only a small number of cases (5 percent) it is found that remittances are spent on buying land/property. BBS (2014) finding reveals that at the national level about 84 percent remittances received are spent on expenditure heads and the remaining 16 percent are saved. Expenditure heads includes food and non-food durables, medical, house repairing, festivals, and so on. About 25 percent of remittances receiving households invest some part of remittances. According to Reserve Bank of India, more than half of the remittances to India are spent on family consumption heads, while rest are either deposited in bank accounts (20 percent) or invested in land, property, and securities (7 percent)(Afram 2012). According to Nepal Living Standards Survey (2011), major share (79 percent) of total remittances received by the households are spent on daily household needs, while rest are spent on loan repayment (7 percent) buying property (5 percent), education(4 percent) and capital formation(2 percent). Pakistan also follows same pattern in using remittances. IOM (2009) survey in Pakistan reflects that half (50.21 percent) of remittances are used in consumption items and other half are used on buying real estate and agricultural machinery (22.12 percent) health(3.56) education (4.52) loan repayment (5.52) and Savings (14.08).

With the pattern of remittances utilization it can be easily said that remittances to South Asia expand service sectors and fuel to inflation through augmenting demand for non-tradables. A little portion of remittances are spent on productive purposes and capital formation. Although some parts of remittances are spent on human capital -- education and health, its benefits are realized in the long-run. Spending on education and health stimulate demand for non-tradables as well. Moreover, some portion of remittances are invested in buying land and property, thereby increasing price of real estate and, which in turn increases the cost of production as fixed costs of business go up. Higher prices of essentials also have expansionary pressure on wages. This price-wage spiral emanated from remittances appreciates real exchange rate in South Asia.

Chapter 6

Conclusion

Based on the Salter-Swan-Dornbusch-Neary framework this study has examined the Dutch Disease impact of migrant's remittances and foreign aid. We have used pooled OLS and fixed effect models with a panel data of 5 South Asian countries for the period of 1975 to 2013. We have employed two separate regressions to examine the spending effect as well as the resource movement effect. The spending effect examines real effective exchange rate appreciation, whereas the resource movement effect examines fall in traded to non-traded ratio.

We have found Dutch Disease effect of migrant's remittances, while no such impact has been detected for foreign aid flows. A remittances elasticity of about 0.23 is found, suggesting that a doubling of per capita remittances raises real effective exchange rate by about 23 percent. On the other hand, a doubling of per capita remittances leads to fall in traded to non-traded ratio by 9.4 percentage points. Magnitudes of both of the effects are substantial and economically significant. These findings reflect loss of international competitiveness along with fall in the traded manufacturing sectors in South Asian countries.

Foreign aid flows have been statistically insignificant in both spending effect and resource movement effect regressions, suggesting that foreign aid are not important determinant of real effective exchange rate and have no role on redirecting resources to non-traded sector from traded sector. Foreign aid money may not fall exclusively on non-traded goods and services as it is received directly by the government. How the aid money is spent depends on Government's policy. If aid goes to investment and productivity gains, then aid may not have appreciating effect. Moreover, in the case of tied aid, especially aid with procurement restriction, a substantial portion of aid goes back to the donor countries or the third countries. These might have been the reasons for foreign aid not to be statistically significant in this study.

The study finds that over the period, service sectors have been expanding, while the manufacturing sectors have been contracting in South Asian countries, which leads to premature deindustrialization. Problem of premature deindustrialization is acute in this region because countries start to face deindustrialization before experiencing their full capacity industrialization (Amirapu and Subramanian 2015). Flying geese pattern of industrialization, where relatively low industrialized countries follow footsteps of a regional industrialized country, may be absent in South Asia. While such pattern of industrialization is found in East Asian countries. For instance in East Asia, industrialized Japan played the role of leader and the follower countries; Hong Kong, Taiwan, Singapore, and South Korea; became industrialized by absorbing the manufactur-

ing sector left by Japan and then moving towards more sophisticated techniques. Along with this, the large influx of foreign remittances to this region may be attributed to premature deindustrialization. To widen the path of industry-led growth in South Asia there should be structural transformation towards manufacturing sector and then service sector, but remittances can slow down this transformation or make it happen partially or miss it all together.

Although remittances may have strong positive impact on poverty alleviation and reduction of unemployment rate in this region, policy makers should pay attention to the negative impact of it. Still agriculture is the largest employer in South Asia. According to World Bank (2014), agriculture accounts for about 47 percent of total employment in 2013. Industrialization is immensely necessary in this region to bring structural transformation in agriculture as well. Reallocation of surplus labours from agriculture to modern industrial sector will increase labour productivity as well as stimulate growth. ‘Services-led’ growth as opposed to ‘industry-led growth’ may not be sustainable in the long-run and may come to a saturation point. If these countries are trapped in low level of industrialization, in the long there will be loss of learning-by-doing in the manufacturing sector. In addition, industrialization also paves the way for service sector expansion. Therefore, without sufficient industrialization countries in this region may be mired in a quagmire of low development trap.

Policy interventions are also required to channel remittances into investment instead of mere consumption so that real effective exchange rate appreciation can be checked. Otherwise, loss in competitiveness of international trade will slow down export sector growth, which in turn put more pressure on service sector to generate excessive employments. Moreover, remittances induced inflation may push the low income people below the poverty line.

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Appendix

Real Exchange Rate (RER) calculation

Theoretically, there are two broad definitions of RER—external and internal RER (Afari 2004).

External RER is the nominal exchange rate adjusted for price level differences between home and abroad. It is measured in a common currency. More precisely, it is the ratio of foreign price level (or cost) to domestic price level (or cost). On the other hand, internal RER is defined as the ratio of price of tradables to non-tradables within a particular country.

External RER is based on purchasing power parity (PPP) theory which incorporates relative prices of a fixed basket of goods produced or consumed within

two countries. In literature there are three different definitions of external RER.

- PPP based RER: Under this definition the external RER fixes the relative value of currencies by comparing relative prices of consumption or production baskets between two countries (Hinkle and Nsengiyumva 1999, as cited in Afari 2004). Actually, this RER is expenditure index.
- Mundell-Fleming model of “One composite goods” model: Under this definition external RER is defined through PPP in terms of aggregate production cost of all goods. As this RER is the output price or cost of production index, it differs from the above definition of expenditure based index.
- RER based on law of one price: Pricing of internationally traded goods based on law of one price is also regarded as external RER (Hinkle and Nsengiyumva 1999, as cited in Afari 2004). Under this definition relative cost of producing internationally traded goods between two countries is measured in a common currency.

Mathematically external RER based on PPP can be shown by the following expression.

$$RER_{ppp} = e \frac{p^f}{p}$$

Where RER_{ppp} is the PPP based real exchange rate and ‘e’ is the nominal exchange rate. P^f and P are foreign price (or cost) and domestic price (or cost), respectively. Under this definition a fall in the RER indicates appreciation of domestic currency. Along with external RER internal RER also measures international competitiveness due to change in relative price of tradable and non-tradable sector goods.

Internal RER is defined as the relative price of tradables to non-tradables. It is measured as the ratio of price of tradable sector goods (P_T) to price of non-tradable sector goods (P_{NT}). Mathematically,

$$RER_{in} = \frac{P_T}{P_{NT}} = e \frac{P_T^*}{P_{NT}}$$

Where,

RER_{in} is the internal RER. P_T^* is the foreign price of tradables and ‘e’ is the nominal exchange rate. RER, under this definition, measures the trade-off between tradable and the non-tradable goods. It does not merely measure the value of currencies rather it measures international competitiveness and the pace of resource movement within tradable and non-tradable sectors. Decline in RER_{in} indicates real appreciation of domestic currency. For example, if there is no change in foreign price of tradables but price of non tradables increases for some reasons i.e. because of natural resource revenue or international transfers the RER will fall. This fall in RER will appreciate domestic real exchange rate.

But one of the main shortcomings of these definitions of real exchange rate is that these are bilateral exchange rates only.