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## REMITTANCES, DUTCH DISEASE, AND COMPETITIVENESS: A BAYESIAN ANALYSIS

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The paper studies symptoms of Dutch disease in the Pakistani economy arising from international remittances. An IV Bayesian analysis is carried out to take care of the endogeneity and uncertainty due to the managed float of Pakistani Rupee. We find evidence for both spending and resource movement effects in both the short and the long-run. These impacts are stronger and different from those the Official Development Assistance and the FDI exert. We find that while aggregate remittances and the remittances from Persian Gulf contribute to the Dutch disease in Pakistan, those from North America and Europe do not.

*Keywords:* Remittance, Real Exchange Rate, Dutch Disease, Competitiveness, Bayesian Analysis, Pakistan

*JEL classification:* F40, F41, O10

### 1. INTRODUCTION

Remittances are an important source of foreign exchange for developing countries. The volume of remittance transfers to many developing countries, including Pakistan, exceeds that of foreign private capital and official development assistance. Remittances to Pakistan have seen a sharp and sustained rise in the recent years, increasing from under \$1 billion in 1999 to over \$12 billion today (State Bank of Pakistan, 2012). This has not gone without leaving its macroeconomic impact. Anecdotal evidence points to links with higher price levels and added reliance on imports (State Bank of Pakistan, 2007).

Remittances are found to promote economic growth (Stark and Lucas, 1988; Faini, 2002). Rise in remittances has also made the developing countries governments like Pakistan's less reliant on other financial inflows for their foreign exchange requirements. Remittances are also purported to be a relatively stable source of foreign exchange

\* We are most grateful to an anonymous referee for valuable suggestions.

(Mughal and Makhlof, 2011), more so than FDI and portfolio inflows, and help countries cope up with difficult economic conditions.

Remittances to Pakistan are found to be sent primarily for altruistic motives (Anwar and Mughal, 2012), and therefore help the migrant households survive in times of crisis. Remittance inflows, for instance, rose substantially in the aftermath of the October 2005 earthquake and the country's worst floods in July 2010. These inflows have also led to lower poverty and economic disparity in the country (Mughal and Anwar, 2012).

Remittances, however, can lead to the overshooting of a country's exchange rate and hurt its competitiveness, a phenomenon known as the Dutch disease. The overvalued exchange rate makes the country's exports relatively expensive, imports cheaper, and thus puts pressure on the country's current account. The additional demand arising from remitted money raises prices in the non-tradable sector while the prices can not move much in the tradable sector in a small open economy. This shifts resources from industry and agriculture (tradable sectors) to services (non-tradable sector), making the country's tradable sector less competitive. Why does this matter? In the words of Rajan and Subramanian (2010): "a number of studies (Jones and Olken, 2005; and Rodrik, 2007) have argued that the traded goods sector is the channel through which an economy absorbs best practices from abroad. The absence of these learning-by-doing spillovers, which may be critical to long run productivity growth, could be one constraint on growth".

The aforementioned spending and resource shifting effects of the Dutch disease which lead to lower competitiveness have been examined for various developing countries. For example, in their study of 13 Latin American and Caribbean countries, Amuedo-Dorantes and Pozo (2004) find that a 100 percent rise of remittances cause the real exchange rate (REER) to appreciate by 22 percent. Similarly, Bourdet and Falck (2006), in their empirical analysis of the Cape Verdean economy, find evidence of adverse effects of remittances and official development assistance on the country's competitiveness. Acosta *et al.* (2009) examine a panel of 109 developing countries for the period of 1990 to 2003 and find that capital flows from abroad help the exchange rate go up. Kapur (2004) argues that the exchange-rate appreciating effect of remittances is stronger among smaller developing countries.

Remittances have also been associated with declining competitiveness through a decrease in the labour supply in the remittance-receiving country (Amuedo-Dorante and Pozo, 2006; Bussolo and Medvedev, 2007; Görlich *et al.*, 2007).

However, there is no consensus on the deleterious effects of remittances on external competitiveness. Rajan and Subramanian (2005), for instance, find remittances to be different from other financial flows in this sense. Mongardini and Rayner (2009) look for the impact of worker remittances in Sub-Saharan Africa, and find no link with rise in exchange rate. Grabel (2008) suggests that the short-term impacts of remittances are similar to those of other financial inflows, with the differences mostly due to different economic policies.

In the context of Pakistan, Hyder and Mahboob (2006) estimate that an increase in workers' remittances of one percentage point of GDP is associated with an appreciation of Pakistan's real effective exchange rate by 0.16 percent. Similarly Ahmed (2009) finds that a 1% increase in remittances as a share of GDP appreciates Pakistan's real exchange rate by approximately 2.5%. Other studies on Pakistan include Afridi (1995), Chishti and Hasan (1993), Haque and Montiel (1992, 1998), Hussain (2008), Janjua (2007), and Rehman *et al.* (2010). These studies generally evaluate the country's equilibrium exchange rate, and do not study the resource movement symptoms of Dutch disease.

Remittances, being financial inflows, are intrinsically associated with the country's monetary aggregates, and hence, influence and may in turn be influenced by the country's monetary policy. Any model studying the impact of worker remittances on a developing economy will therefore contain an element of uncertainty present due to the role of the country's central bank. Whether by performing sterilization operations in the open market or controlling money supply to combat inflation acceleration, the central bank appears in the remittances - real exchange rate equation in one way or the other. Given this uncertainty, and the availability of limited number of observations, significant number of parameters and potential endogeneity issue make the use of standard Ordinary Least Squares (OLS) techniques problematic for the problem at hand. The use of probabilistic Bayesian paradigm can help in such a situation. In this paper, we study the Dutch disease aspect of migrant remittances to Pakistan using Bayesian analytical methods.

Though the use of probabilistic approach is increasing in economic studies, particularly those dealing with macro and financial economics,<sup>1</sup> this is to the best of our knowledge, the first application of the technique in a study of Dutch disease effects.

In this study, we employ both annual as well as monthly data, examining the periods 1980-2008 and July 2000-March 2009 respectively. This helps us gauge both the short- and medium/long-run role of foreign remittances on the country's external and internal competitiveness. Appropriate instrumental variable has been selected and constructed to tackle remittances' potential endogeneity due to reverse causality between the volume of remittances and the country's real exchange rate. We also look at the sector-wise effect of remittances to determine which sectors have lost competitiveness as a result of remittance flows. Consequently, we are able to monitor both the spending as well as the resource movement aspects of the Dutch disease.

Moreover, in assessing the remittances' impact on the REER, remittance flows are disaggregated with respect to remitting regions. This helps better examine the differential impact of remittance transfers pertaining to different Pakistani migrant communities. Previous studies on remittance flows to Pakistan such as Mughal and Makhoul (2011) reported that migrant remittances from the three main remitting

<sup>1</sup> For other applications of Bayesian paradigm in macroeconomics, see for example Clark and Doh (2011)'s evaluation of trend inflation and Antonakakis and Tondl (2011)'s study on the determinants of FDI.

regions differ substantially in their macroeconomic behaviour. The volatility and magnitude of remittances from these regions varies substantially, and can therefore impact the country's course of currency and sectorial transformation in a differential manner. A region-wise analysis of remittances' impact on competitiveness can thereby help us better comprehend their role in the economy.

We are mainly interested in answering the following questions:

*Has Pakistan's real exchange rate gone up as a result of remittance inflows?*

*If so, remittance flows from which regions have contributed the most?*

*Has the country's competitiveness suffered as a result? How, if so, have the inflows altered the country's economic structure?*

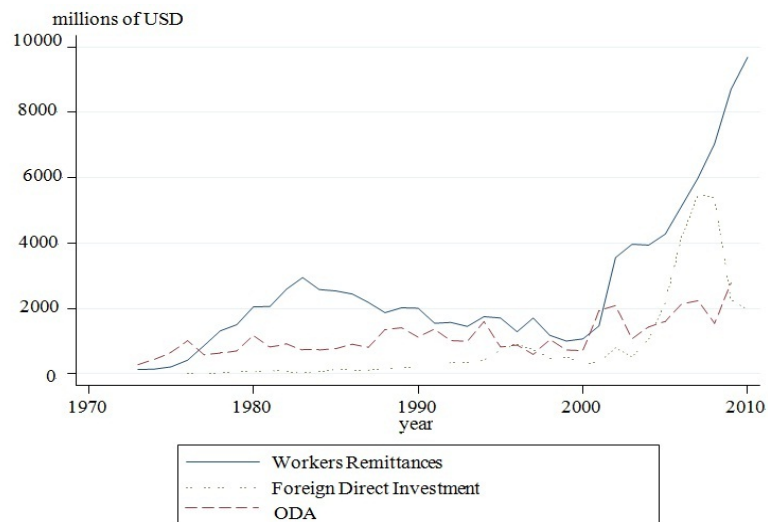
In the rest of the paper, we attempt at analyzing these questions. First, we present some salient features of the Pakistani economy during the period under examination (Section 2). Section 3 introduces the model and describes the econometric technique used. The results are presented and interpreted in Section 4, both for the yearly and short-run monthly models. Section 5 analyzes the impact of remittances on the reallocation of resources between the tradable and non-tradable sectors. The last section concludes the paper and provides some policy recommendations.

## 2. REMITTANCES AND EXCHANGE RATE OF PAKISTAN: SOME STYLIZED FACTS

Pakistan is one of the significant migrant sending countries in Asia. An estimate of the number of overseas Pakistanis ranges from the official 4 million (United Nations, 2009) to the estimated 7 million (Economic Survey, 2009-10). Major concentrations of the diaspora are found in Saudi Arabia, the United Kingdom, the United States, the United Arab Emirates and Canada. Pakistanis resident in these five countries constitute more than 80 percent of the overseas Pakistani population Oda (2009). Historically, remittances sent by the overseas Pakistanis have ranged from 1 to 10 per cent of the country's annual output, average during the last thirty years being 5%. This compares favourably with other foreign capital inflows (Figure 1).

The Persian Gulf, North America and Europe are country's principal remittance source regions (Figure 2). Remittances to Pakistan first picked up in the 1970's, when the construction boom in the Persian Gulf engaged millions of Pakistani temporary migrants. The amount remitted by these migrants peaked in early 1980's, when the flows surpassed exports as the biggest source of foreign capital. The inflows slowed down during the cheap oil period of late 1980's and the 1990's with the weakening of Arab economies. The Gulf war in the early 1990's also had a dampening effect on remittances. The second and ongoing phase of growth in official remittances began in the aftermath of the tragic events of September 11, when in the financial year 2001-02, formal remittances to Pakistan more than doubled. Besides the curbs on illegal money transfer mechanisms, called Hundi or Hawala, fears among the migrants in the Western countries, such as stricter scrutiny of

their capital investments, risk to life or property convinced them to transfer their savings back home. Strengthening currencies, booming real estate sector and well performing stock markets in the home country also played their role. Free float of Pakistani Rupee, that slashed the official - market exchange rate spread, also channelled more remittances towards the formal means of money transfer. Though the rise in receipts from all the destinations has been substantial, remittances from United States have risen the most, from a mere \$73.3 million in 2000 to over \$1.7 billion in 2008.

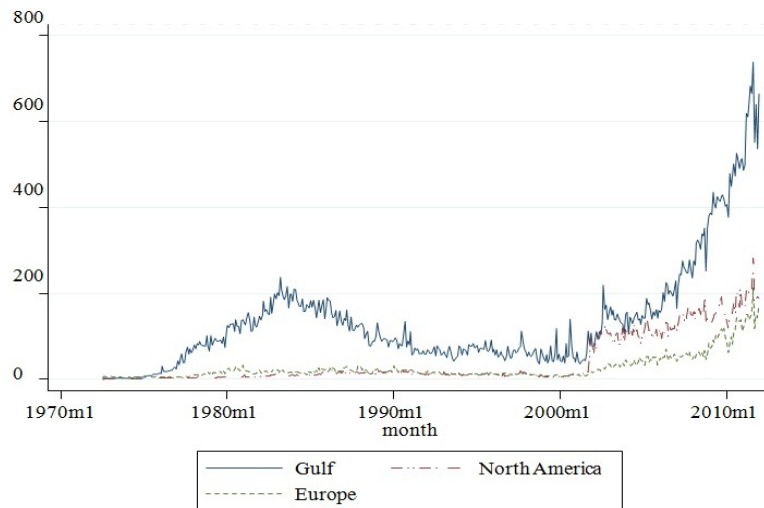


Source: Author's calculations using World Bank World Development Indicators (2011).

**Figure 1.** Remittances, Foreign Direct Investments and Official Development Assistance to Pakistan (1973-2010)

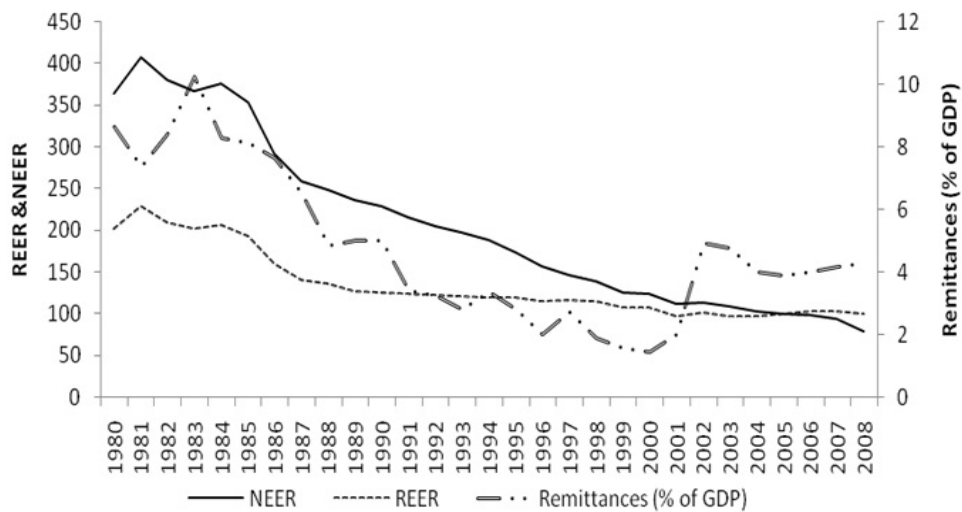
This boom has taken the share of remittances in the Pakistani economy to the highest levels since the late 1970s and early 1980s. Remittances have now become the second most important source of foreign exchange after cotton and textile exports (which make up half of the country's exports). Being such a substantial source of foreign exchange, remittances must generate some effect on Pakistan's exchange rate. This raises the possibility of the economy facing the Dutch disease. A cursory look at Figure 3 shows a correlation between the remittance flows and the Real Effective Exchange Rate (REER) of the Pakistani Rupee. Pakistan's REER index gradually fell during the 1980s and 90s. In 1982, Pakistan abandoned fixed exchange rate and switched to a managed float regime. The Rupee fell sharply in the following decades, owing mainly to chronic trade deficit. This was despite the sharp rise in official migrant remittances which reached an

all time high of ten percent of the GDP in the financial year 1983. The nominal exchange rate dropped from Rs. 10 to a US Dollar to over 50 in late 1990s.



Source: Author's calculations using State Bank of Pakistan (2012).

**Figure 2.** Region-Wise Receipts



Source: WB Online 'World Development Indicators' & IFS database.

**Figure 3.** Pakistan's Real and Nominal Exchange Rates (year 2000=100) and Remittances as a Share of the GDP

The currency continued sliding till the beginning of the new century, when Pakistan switched to a free-float after two years of multiple and dirty-float exchange rates. This led to an immediate drop of 18.5% in the financial year 2001.

The REER maintained its downward trend in early 2000s despite a jump in formal remittance inflows starting from the financial year 2001. This period witnessed higher inflation in the country compared to its major trade partners, and an even sharper nominal rise of other major currencies against the US Dollar than the Pakistani Rupee. However, by the middle of the decade, high financial inflows had begun to take their toll and the REER index was on the rise.<sup>2</sup>

Pakistan's central bank, the State Bank of Pakistan (SBP) targets interest rates to pursue the twin goals of growth and price level adjustment. It sells and purchases treasury bills, and intervenes in the open market to inject or mop up money to balance the monetary system. In spite of this occasional intervention policy, money growth in the economy has remained somewhat high (consistently in the double digits during the previous decade),<sup>3</sup> and inflation rate has remained above the comfort zone,<sup>4</sup> putting the country's export sector under increasing pressure. Pakistan competes with other developing countries in mostly agricultural and low-cost industrial products. Major items include cotton, textiles and apparels, rice, leather goods, fish, surgical instruments, sporting goods, light machinery, cement, and petroleum products. Margins for these products are often low in the international market, and even small fall in price competitiveness can cost the exporters their market share. Figure 4 gives a nonparametric estimation of the relationship between remittances to Pakistan and its exports and imports. Prima facie, there is a negative relationship between exports and remittances (elasticity between remittances and exports as a share of GDP is, *ceteris paribus*, -0.20 as against +0.16 for imports).

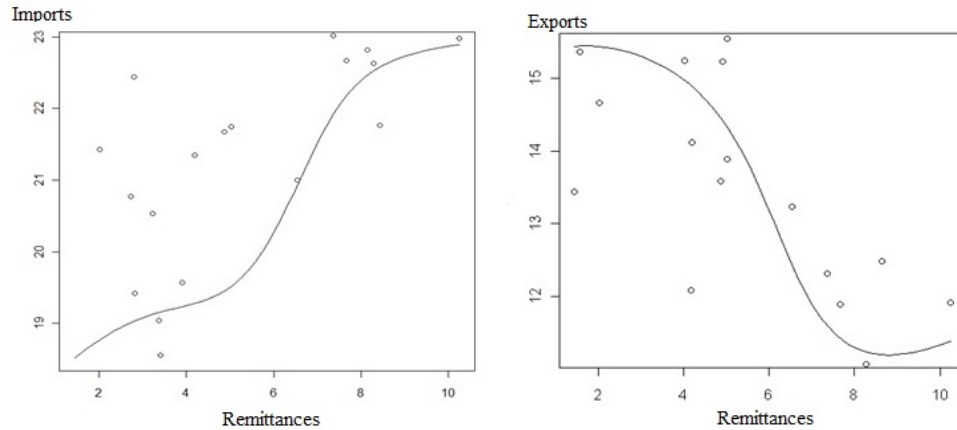
This preliminary evidence of the Dutch disease needs to be substantiated. For this, we proceed and study the drivers of real exchange rate (REER) in Pakistan.

<sup>2</sup> Pakistan's real exchange index was at the same level in June 2009 as in Jan 2001.

<sup>3</sup> The growth in the country's mass of money in circulation remained in double digits in all years of the last decade (except for the year 2008).

<sup>4</sup> For instance, the inflation rate rose by 24.3 percent in the financial year 2008-09. In cumulative terms, the economy experienced an inflation of 66 per cent between June 2007 and Oct 2010 (SBP 2010).





**Figure 4.** Relationship between Remittances, Imports, and Exports (millions of USD/ Kernel Density Estimation)

### 3. EMPIRICAL ANALYSIS

#### 3.1. Econometric Strategy

Real effective exchange rate (REER) is considered a major determinant of a country's external competitiveness. It is the relative price of domestic to foreign goods. An appreciation of the REER reduces the profitability of the export oriented sectors of the economy by raising their relative cost and by making the non-tradables relatively cheaper. Following Edwards (1988, 1989), and Montiel (1999), the Real Effective Exchange Rate (REER) can be considered as a measure of relative prices of the tradables and non-tradables, determined by various macroeconomic fundamentals driving the internal or external equilibrium. These fundamentals (also called determinants or drivers) explain, at least partly, the medium to long-term behaviour of the real exchange rate (Engel *et al.*, 2007).<sup>5</sup> A country's real exchange rate can be estimated using various measures and macroeconomic models, and the choice of the appropriate measure depends on the question under study (Driver and Westaway, 2004). In this study, we are mainly concerned with whether or not foreign remittances have affected the country's competitiveness. For this, we employ Real Effective Exchange Rate (REER) and examine its interaction with migrant remittances using annual as well as monthly data.

<sup>5</sup> For a review of literature on the REER determinants, see for instance, Edwards (1989), Edwards and Savastano (2000), Froot and Rogoff (1995), Hinkle and Montiel (1999) and Rogoff (1996).

First, we analyse the impact of our selected annual variables on Pakistan's real effective exchange rate. Following the literature on drivers of REER, our model can be written as:

$$\begin{aligned}
 REER_t = & \theta_0 + \theta_1 TOT_t + \theta_2 OPEN_t + \theta_3 Money\ growth_t + \theta_4 GOV_t + \theta_5 GDPpc_t \\
 & + \theta_6 FDI_t + \theta_7 REMIT_t + \theta_8 ODA_t + \theta_9 Exchange\ rate\ regime_t \\
 & + \theta_{10} Disaster_t + \varepsilon_t.
 \end{aligned}
 \tag{1}$$

Here, FDI represents the foreign direct investments, ODA represents the official development assistance (the two taken as a share of GDP), TOT represents the terms of trade, OPEN stands for trade openness as a share of GDP, GOV represents the public expenditure to GDP, and PROD is the proxy for productivity. Besides, POP indicates the demographic change, M2 growth the growth in money supply, 2000 the dummy variable for exchange regime change, and disaster the dummy indicator for natural disaster hitting the country.  $\theta$  is the parameter to be estimated and  $\varepsilon$  stands for the errors. All the variables except for the growth of money supply and the dummy variables are taken in their log form (The variables and the reasons for their inclusion are explained below. Summary statistics are shown in Table 1).

**Table 1.** Summary Statistics for Annual and Monthly Models

Yearly variable	Label	Min.	Mean	SD	Max.
REER	Real effective exchange rate index (2005=100)	96.91	134.27	40.382	228.16
Rem	Workers' remittances and compensation of employees, received (% of GDP)	1.454	4.747	2.430	10.248
Open	Trade (% of GDP)	25.59	31.13	3.348	38.23
TOT	Net barter terms of trade index (2000=100)	57.63	107.71	21.689	150.00
GOV	Expense (% of GDP)	7.781	11.347	2.382	16.805
GDPpcw	GDP per capita weighted	11399	15686	1466.366	18851
GDPpcp	GDP per capita (current US\$)	372.4	523.4	91.965	702.8
Pop	Age dependency ratio (% of working-age population)	70.26	84.87	7.101	93.17
ODA	Net ODA received (% of GDP)	0.939	2.242	0.957	4.984
FDI	Foreign direct investment, net inflows (% of GDP)	0.102	0.984	0.975	3.904
IV	Instrumental variable for remittances	1345	2057	5344.937	31128
ME	Remittances from Middle East (current US\$)	0.920	2.977	2.177	7.950

Europe	Remittances from Europe (current US\$)	0.12	0.46	0.246	0.93
America	Remittances from North America (current US\$)	0.110	0.547	0.397	1.500
Money growth TNT	Money growth rate Tradable to Non-Tradable Ratio	4.314	14.967	5.832	29.301
Monthly variable		Min.	Mean	SD	Max.
REER	Real effective exchange rate index (2005 = 100)	93.02	100.00	3.021	104.10
Rem	Workers' remittances and compensation of employees, received (current US\$)	84.74	371.60	109.390	602.20
FDI	Foreign direct investment, net inflows(current US\$)	18.30	212.20	237.566	1263.0
Money Market Rate	Call Money Rate	0.740	6.336	3.051	11.29
Export	Imports (current US\$)	39560	71550	19783.358	1316
Import	Exports (current US\$)	42880	111100	54946.968	2624
Money Growth Rate	Money Growth rate	-0.063	0.016	0.043	0.334
ME	Remittances from the Middle East (current US\$)	44.2	182.5	73.117	333.9
Europe	Remittances from Europe(current US\$)	5.31	31.31	15.125	66.46
America	Remittances from North America (current US\$)	7.73	91.11	40.880	152.30

Along with the impact of aggregate remittance flows, we include three region-wise remittance variables to study the corresponding impact of remittances coming from the three principal remitting geographical zones.<sup>6</sup> The three regions are the Persian Gulf (comprising six Gulf Cooperation Council states of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates), North America (consisting of Canada and the U.S) and Europe (mainly the United Kingdom). The three regions together account for 90 percent of Pakistani migrants around the World and a similar proportion of remittances.

Remittances may also affect the REER in the short-run. To account for this possibility, we study the behaviour of the REER in the last decade using monthly data.

<sup>6</sup> The regional regressions are not instrumented as the *R* packages used for these estimations do not allow multiple variable instruments.

We take imports, exports, remittances, FDI, and money growth rate as potential drivers for this analysis. Monthly data for GDP are not available, hence we are unable to determine the Balassa-Samuelson effect. Similarly, terms of trade, demographic evolution and official development assistance are not included due to data inavailability. As discussed above, these fundamentals explain a big part of REER movement, and in their absence, the monthly estimations can only be considered suggestive. This analysis can show the robustness of the impacts of remittances on the annual REER. Alternatively, it can hint at the way in which the impact has deviated in the recent years from the over all trend. As a robustness check, we carry out our analysis using WPI-based REER and find the results with identical signs and magnitudes.<sup>7</sup>

Once the existence of Dutch disease has been inferred through REER appreciation mechanism, we go further and estimate the remittances' association with the tradables to non-tradables ratio (TNT) in the country. The course of this ratio, calculated as the sum of agricultural and industrial value-added weighted by the services sector value-added (Lartey *et al.*, 2008), approximates the magnitude and direction of resource reallocation through the sectoral movement of resources. We also construct alternative series of tradables and non-tradables using disaggregated sector-wise data, in which the tradable sector consists of agricultural and industrial goods and services that the country has traded in the last three decades.

### 3.2. Choice of Variables

We take Consumer Price Index (CPI)-based Real Effective Exchange Rate (REER) index as our indicator of choice, defined as the nominal effective exchange rate index adjusted for relative changes in consumer prices. The REER for the Pakistani Rupee is calculated as a geometric-weighted mean of the level of consumer prices in Pakistan relative to its major trade partners. The REER can also be calculated using Wholesale Price Index (WPI) or Producer Price Index (PPI). Unlike CPI-based REER, these two give a higher weightage to the tradables than the domestic non-tradables. Given that the non-tradables constitute half of Pakistan's output, the use of CPI-based REER should be more suitable for this analysis.

Remittances are taken as a share of GDP. As discussed above, foreign remittances may cause the real exchange rate to appreciate. They can however equally respond to changes in the country's exchange rate. This is because migrants may vary their remitting behaviour, keeping in mind the welfare of the recipients and their investment plans. In other words, migrants' behaviour, whether altruist, self-interested or compensatory, plays a role in the determination of a country's exchange rate. Money remitted for investment motives, for instance, would likely be procyclical and may therefore push the real exchange rate further up; the reverse may happen in the case of

<sup>7</sup> We thank the anonymous referee for pointing out this possibility.

altruistic remittances. This means that remittances may be endogenous to the REER in our model and thus need to be instrumented.

Several instruments for remittances have been proposed in the literature, such as the stock or flow of migrants, distance from the remittance sending country, remittances to the rest of the world, population, recipient country's latitude, school enrolment, population density etc. Nevertheless, data availability precludes some of them, while others are not found appropriate in our case. Stock or flow of migrants can be an excellent instrument, but complete and reliable data on the variable are not available. Remittances to Pakistan are found to be strongly correlated both to home as well as host countries' economic situation (Goujon and Mughal, 2013). Therefore, remittances to Pakistan may not be strongly associated with remittances to the rest of the world. Likewise, latitude does not appear to be a pertinent instrument for remittances to Pakistan. The choice of latitude is based on the argument that most host countries are in the north, while the migrant-sending countries are located in southern latitudes. In case of Pakistan however, a big chunk of remittances comes from the Persian Gulf states which are further to the south of Pakistan. Likewise, the reasoning behind the choice of distance as instrument for remittances is that greater distances between the migrant-sending and receiving countries are inversely proportional to migration, and ultimately the amount remitted by the migrants. Although millions of Pakistani migrants live in the nearby Gulf states and their remittances make up a major part of the total, yet two of the four major sources of Pakistani remittances are the distant United States and United Kingdom.

We take the per capita output of Pakistan's top ten remittance-sending countries<sup>8</sup> weighted by their respective shares in the country's remittances, as our instrument for remittances. As shown in Goujon and Mughal (2013), remittances to Pakistan from various destinations are strongly influenced by the economic situation of the host countries. Nevertheless, host economy output, weighted by the country's share in Pakistan's total formal remittance flows, need not be linked to Pakistan's REER. Besides being intuitive, the instrument passes the required econometric tests of overidentification and weak instruments. It is highly correlated with Pakistan's remittance flows (correlation coefficient being 0.81) and is exogenous to the REER (correlation coefficient being 0.06). Foreign Direct Investments (FDI) and foreign aid (ODA) as shares of the GDP are the other indicators of the country's private and public financial receipts. We do not include portfolio investment in our model, as portfolio inflows have stayed relatively insignificant for most of the period under study.<sup>9</sup>

Following Lartey (2007, 2008), Prati and Thiessy (2006), and Rajan and Subramanian (2010), we expect Dutch disease effects for development aid inflows.

<sup>8</sup> In Pakistan's case, the ten top remitting countries during the last three decades have been: Saudi Arabia, USA, UAE, UK, Kuwait, Oman, Bahrain, Qatar, Germany and Canada.

<sup>9</sup> In the studied period, portfolio investments never went above 0.02 percent of the GDP in contrast to remittances, foreign assistance and FDI which crossed 10, 7 and 4 percent of the GDP respectively.

Foreign assistance to a developing country is often directed at the improvement of institutional and human capital as well as various infrastructure projects. Much of the resulting increase in demand falls on the non tradables, leading to higher prices and an appreciated real exchange rate. Nonetheless, these investments may foster higher productivity (especially that of the non-tradable sector relative to the tradable sector) and increased competitiveness in the long run, which may alleviate or even reverse the previously induced Dutch disease effects (Issa and Ouattara, 2008). The competitiveness enhancing impact of FDI crucially depends on the nature of foreign investments. Investments made in export and import-competing sectors lead to improved physical and human capital, technology and technical knowledge spillovers and higher productivity, which should ultimately lead to a more competitive economy. On the other hand, if foreign investors gain access to domestic assets through hasty privatization, and the investment amounts to little more than change of asset ownership, the investors may not care to substantially invest in the acquired assets' future, and the investments may not result in higher productivity (Mughal and Vechiu, 2010). FDI may well cause the REER to appreciate in such a case.

In Pakistan, much of the FDI coming during the recent years have gone in the services sector, with finance, information and telecommunications attracting the bulk of foreign investments (SBP, 2012). The country has also privatized much of the previously state owned banks and industrial corporations. The cumulative impact of these investments on the REER may well be positive.

Among the REER fundamentals, country's per capita or per worker output (taken as an indicator of productivity) control for the Balassa-Samuelson effect. The Balassa-Samuelson effect could develop both due to the productivity differential between the country's tradable and non-tradable sectors, as well as due to the productivity differential between the country and its trade partners. To examine the latter aspect, we take the ratio between Pakistan's and its ten principal trade partners' GDP per capita, each weighted by the country's corresponding share in Pakistan's trade, as an alternative indicator of productivity besides the standard GDP per capita variable.<sup>10</sup> Following the Balassa Samuelson hypothesis, we expect a positive sign for the productivity variables. As a developing country catches up with developed economies, its tradable sector productivity increases faster relative to the non-tradable sector. This leads to higher income and increased demand for the non-tradables, thus causing structural inflation. As a result, the REER moves up.

The sign of trade openness, taken as the sum of exports and imports of the country as a share of its output,<sup>11</sup> is mostly found in the literature to be negative (see for instance,

<sup>10</sup> Pakistan's ten major trade partner during the studied period, in descending order, are the United States, Japan, Germany, United Kingdom, Saudi Arabia, China, France, Italy, South Korea, and Malaysia.

<sup>11</sup> The Sachs-Warner trade restriction index could serve as a better proxy, but the data for this variable are incomplete and hence, can not be considered in our study.

Candelson *et al.*, 2007; Edwards, 1989; Lee *et al.*, 2008; Saborowski, 2009). It is mainly because opening up to international trade through lower tariff and non-tariff barriers leads to more efficient tradable sector, bringing down the relative prices of the tradables and increasing their consumption.

On the other hand, the impact of terms of trade can not be judged a priori, and depends on whether the income or the substitution effect dominates (the REER rises in the former scenario and wanes in the latter). Improved terms of trade means higher domestic income, which leads to increased spending. Spending on tradables does not cause a change in their prices (small economy hypothesis), but higher demand of non-tradables causes their prices to increase, leading to appreciation in the REER. On the other hand, cheaper imports relative to domestic non-tradables lead to higher consumption of imported goods at the cost of the non-tradables. The resulting drop in the price of non-tradables causes the REER to fall.

The net effect of government consumption is likewise ambiguous. Government expenditure in developing countries is predominantly spent on non-tradables (principally on public sector salaries), contributing to real exchange rate appreciation. On the other hand, if public spending involves a high share of imported goods, the country's trade balance is adversely affected, necessitating depreciation in exchange rate. However, if public money is well spent on infrastructure, development and maintenance of public institutions and human capital improvement, the country's productive sectors strengthen and the short-term appreciation in the REER dampens in the long run. The impact of public spending on the REER can be better studied using government spending on the non-tradables. This variable is however unavailable, and in its place, total government spending as a share of the GDP is deemed a suitable alternative (Edwards, 1989; Chishti and Hassan, 1993).

We take age dependency ratio as the primary indicator for demographic change. It is defined as the ratio of dependents (persons under 15 or over 65) to the working-age population. Alternatively, we use population growth rate. Both indicators put upward pressure on a developing country's real exchange rate, as the ensuing increase in demand raises the country's imports and causes a deterioration in the trade balance. A positive sign can therefore be expected for both of the indicators.

There is some evidence that monetary policy influences a country's real exchange rate, at least in the short term (Rodrik, 2008). For example, money growth, being a nominal variable, is usually not considered among the determinants of the REER. However, several studies, including Lartey *et al.* (2008) and Lommatzsch and Tober (2004) count it among REER's important drivers. Excess money growth puts upward pressure on prices of non-tradable goods, and is associated with inflationary tendencies and appreciation of the real exchange rate (Lartey *et al.*, 2008).

Similarly, change of exchange rate regime, if not taken into account, can lead to spurious empirical results (Ball *et al.*, 2010; Caceres and Saca, 2006; Levy-Yeyati and Sturzenegger, 2005). A fixed exchange rate regime is less able to neutralize the spending effects on the non-tradables, causing resource reallocation, ultimately leading to a higher

REER (Lartey *et al.*, 2008). As mentioned above, Pakistan followed a managed float till 1998, and after a brief transition period, officially free-floated the Rupee in 2000. We take a dummy variable to account for this de jure change in exchange regime, taking the value of one for the post-2000 period.

Recent literature has proposed natural disasters as another potentially important determinant of the REER in the developing countries (see for instance Barajas *et al.*, 2010; Christiansen *et al.*, 2009). A natural disaster can wipe out a developing country's productive capital, causing lower productivity. If the resulting income shock improves the country's trade balance, this can lead to a REER depreciation. On the contrary, if the country relies on foreign capital (such as foreign aid) to rebuild the damaged infrastructure or to smooth consumption, the country's REER may appreciate. Since Pakistan has occasionally suffered severe natural catastrophes, we find it appropriate to include the incidence of natural disasters as a driver of the country's real exchange rate. The disaster variable is a dummy variable which takes the value of one for a loss of 1000 or more lives, loss of \$1 billion or 1 million casualties in any given year.<sup>12</sup> In our studied period, six years (1992, 1996, 1998, 1999, 2005 and 2007) meet the above criteria, either due to severe flooding or the 7.6 magnitude earthquake in 2005.

We consider the period from 1980 to 2008 in the annual, and from July 2001 to March 2009 for the monthly analysis. Therefore, we work with 29 yearly and 93 monthly observations. Data for remittances and FDI have been provided by the State Bank of Pakistan, the dependency ratio is taken from the World Bank WDI database, data for our the disaster dummy come from Université Catholique de Louvain's EM-DAT Disaster Database, whereas the remaining variables come from the IFS online database.

Before describing the results, we first briefly mention the technique used in the study.

### 3.3. The Bayesian Paradigm

We use the Bayesian Instrumental Variable method to control for endogeneity. We estimate the parameters of the above equation, so our model can be written as

$$\begin{cases} REMIT = \delta PIBH + \varepsilon_1, \\ REER = \beta REMIT + X\gamma_i + \varepsilon_2, \quad i = 1, \dots, 8, \\ (\varepsilon_1, \varepsilon_2) \sim N(0, \sigma), \end{cases}$$

<sup>12</sup> We take this arbitrary definition keeping in view the area, population and economic size of the country. Relaxing the definition of number of dead to 500 adds another year. Considering monetary losses of at least \$100 million adds yet another two observations.



where  $X$  is the matrix of explanatory variables defined above. PIBH is the instrument for remittances.

The Bayesian analysis provides the benefits of exact sample results, integration of decision-making, ‘estimation’, ‘testing’, and model selection, and a full accounting of uncertainty (Rossi *et al.*, 2005). It is a rational framework which models all the inputs, implying that the parameters are considered as variables. By taking the unobservable information into account in this way can improve the quality of the estimations and forecasts (Parent and Bernier, 2007). The Bayesian approach draws heavily on the probability theory and takes account of prior information to generate the distribution of observables conditional on the data and the prior.

The Bayesian approach requires the specification of prior distribution. The prior can be specified as follows:

$$\delta \sim N(m_\delta, A_\delta^{-1}), \quad (\beta, \gamma) \sim N(m_{\beta\gamma}, A_{\beta\gamma}^{-1}), \quad \text{and} \quad \sigma \sim IW(\eta, V).$$

Prior values are given in parentheses.

$m_\delta$  : prior mean (0),

$A_\delta$  : pds (positive definite symmetric) prior precision (0 .01),

$m_{\beta\gamma}$  : prior mean vector for prior on  $\beta, \gamma(0)$ ,

$A_{\beta\gamma}$  : pds prior prec for prior on  $\beta, \gamma(0.01)$ ,

$\eta$  : d.f. parm for  $IW$  prior on  $\sigma(5)$ ,

$V$  : pds location matrix for  $IW$  prior on  $Sigma(0)$ .

There are several types of priors. We use the non informative prior (also called flat prior), giving the mean a value 0. A prior distribution is considered noninformative if its impact on the posterior distribution of  $\theta$  is minimal.

Results of Bayesian analysis are shown in the form of moments of marginal distributions of the parameters (such as the posterior mean and posterior standard deviation). These are the OLS analogues of parameter coefficients and standard errors. To calculate the posterior mean, we apply the Markov Chain Monte Carlo (MCMC) method using the Gibbs algorithm.<sup>13</sup>

<sup>13</sup> The annual and monthly estimations are made using the *R* Bayesm and MCMCpack packages respectively, the latter solves the linear model whereas the former finds the posterior marginal distribution.

## 4. REMITTANCES AND DUTCH DISEASE: SPENDING EFFECT

## 4.1. Annual REER Model

The findings given in Table 2 show that remittances parameter has a positive marginal posterior mean, the posterior mean being +0.29. In other words, a doubling of migrant remittances (as a share of GDP) leads to a real exchange rate appreciation of 29%. A look at the quantiles (three out of five quantiles showing a positive sign) confirms the positive (though moderate) nature of the remittances posteriors. Moreover, if the baseline equation is repeated without the remittance instrument, the marginal mean drops to 0.27 which signifies that the the impact of remittances is underestimated if endogeneity is not taken into consideration.

**Table 2.** Annual REER Determinants

	Mean			SD	
Intercept	-0.660			8.291	
Rem	0.29			0.27	
Open	-0.272			0.825	
TOT	-0.226			0.615	
GOV	-0.339			0.451	
GDPpcw	-0.461			0.741	
Pop	2.814			2.104	
ODA	-0.051			0.158	
FDI	0.014			0.153	
Money Growth	-0.004			0.009	
Exchange Rate Regime	-0.068			0.378	
Disaster	0.0362			0.155	
Quantiles	2.5%	5%	50%	95%	97.5%
Intercept	-17.340	-14.655	-0.6186	13.077	15.667
Rem	-0.23	-0.12	0.28	0.74	0.87
Open	-1.885	-1.594	-0.2838	1.073	1.327
TOT	-1.449	-1.241	-0.2286	0.769	0.927
GOV	-1.207	-1.055	-0.3604	0.424	0.587
GDPpcw	-1.942	-1.683	-0.4667	0.763	0.965
Pop	-1.460	-0.585	2.7903	6.190	6.901
ODA	-0.373	-0.321	-0.0476	0.203	0.266
FDI	-0.293	-0.231	0.0142	0.266	0.319
Money Growth	-0.022	-0.020	-0.0042	0.012	0.014
Exchange Rate Regim	-0.816	-0.705	-0.0692	0.542	0.653
Disaster	-0.285	-0.225	0.0403	0.281	0.323

FDI and ODA show a positive and negative sign respectively, both showing a relatively weak mean value. Their impact seems marginal as compared to that of foreign remittances. Dependency ratio and disaster dummy exhibit positive signs, while the remaining variables show negative signs. Age dependency ratio has by far the strongest impact of all the variables in the model. The same model was estimated using GDP per capita as the productivity indicator, and did not alter our results (results not shown).

**Table 3.** Annual Region-Wise REER Determinants

	Mean			SD	
Intercept	-0.595			3.943	
Open	-0.053			0.288	
TOT	-0.268			0.160	
GOV	-0.356			0.127	
GDPpcw	-0.078			0.220	
Pop	1.836			0.913	
ODA	0.002			0.046	
FDI	0.062			0.043	
ME	0.350			0.089	
Europe	-0.004			0.105	
America	-0.109			0.048	
Disaster	0.0001			0.040	
Exchange Rate Regime	-0.047			0.125	
Quantiles	2.5%	25%	50%	75%	97.5%
Intercept	-8.341	-3.126	-0.661	1.936	7.254
Open	-0.620	-0.241	-0.052	0.128	0.531
TOT	-0.586	-0.370	-0.268	-0.164	0.048
GOV	-0.610	-0.439	-0.356	-0.275	-0.103
GDPpcw	-0.518	-0.218	-0.804	0.065	0.3610
Pop	0.0259	1.2441	1.848	2.429	3.5952
ODA	-0.091	-0.027	2.686	0.032	0.0925
FDI	-0.024	0.035	6.276	0.090	0.1510
ME	0.1705	0.293	3.502	0.408	0.5293
Europe	-0.212	-0.073	-4.481	0.061	0.2062
America	-0.206	-0.140	-1.097	-0.078	-0.014
Disaster	-0.079	-0.025	6.262	0.0261	0.0798
Exchange Rate Regim	-0.301	-0.127	-4.824	0.0344	0.1979

In terms of region-wise impacts (Table 3), remittances from the Persian Gulf show a strong positive impact. A 1% growth in remittances from the Gulf as a share of GDP is associated with 0.35% appreciation of the REER. Remittances from North America and

Europe, however, do not appear to be associated with REER appreciation. Remittances from Europe have a negligible impact, while those from North America show a small negative relationship. Both the Gulf and North American remittances have robust signs maintained through out the distribution.

#### 4.2. Monthly REER Model

The REER lifting effect of remittances is confirmed using the monthly data (Table 4). Remittances and FDI respectively show positive and negative marginal mean values. Exports and imports have intuitive negative and positive marginal means. The region-wise impacts of remittances (Table 5) are similar for Europe. The relationship between remittances from Europe and Pakistan's real exchange rate is marginal, and not REER-appreciating. This may owe to the stable nature of these inflows (Mughal and Makhoulf, 2011).

**Table 4.** Monthly REER Determinants

	Mean		SD		
Intercept	4.759		0.165		
Rem	0.0217		0.011		
FDI	0.0057		0.004		
Exports	-0.086		0.028		
Imports	0.0574		0.018		
Money Growth	-0.170		0.058		
Quantiles	2.5%	25%	50%	75%	97.5%
Intercept	4.437	4.647	4.7603	4.870	5.084
Rem	-0.0003	0.014	0.0218	0.029	0.043
FDI	-0.003	0.002	0.0057	0.008	0.014
Exports	-0.141	-0.105	-0.087	-0.068	-0.03
Imports	0.0214	0.0451	0.0575	0.0697	0.094
Money Growth	-0.285	-0.209	-0.170	-0.131	-0.054

**Table 5.** Monthly Region-Wise REER Determinants

	Mean	SD
Intercept	4.662	0.184
Asia	-0.038	0.012
Europe	-0.001	0.015
America	0.0106	0.0076
FDI	0.0096	0.00418
Exports	-0.069	0.0277
Imports	0.0725	0.0193
Money Growth	-0.136	0.0564

Quantiles	2.5%	25%	50%	75%	97.5%
Intercept	4.308	4.537	4.660	4.782	5.026
Asia	-0.064	-0.047	-0.038	-0.03	-0.013
Europe	-0.031	-0.011	-0.001	0.008	0.0287
America	-0.0043	0.005	0.010	0.015	0.0257
FDI	0.0015	0.006	0.009	0.012	0.0178
Exports	-0.124	-0.088	-0.069	-0.051	-0.016
Imports	0.0341	0.059	0.072	0.085	0.1102
Money Growth	-0.248	-0.174	-0.136	-0.098	-0.027

However, remittances from the Persian Gulf appear to negatively interact with the REER. This apparently contradicts the Dutch disease effects found with the annual series. This may be partly due to the different time periods for the two data sets. The annual data set covers all the three major episodes of Pakistan's formal remittance experience: sharp rise in early 1980s, followed by stagnation and decline in the late 1980s and 1990s, and revival in the 2000s. The monthly data set, on the other hand, begins just before the 9/11 attacks and shortly after the de jure free float of Pakistani Rupee. This data set, therefore, does not include the greater part of the country's remittance experience prior to these two important changes in the early 2000s. This difference can be crucial, as the relationship between remittances from the GCC countries and the REER is similar if same time period is studied using the two data sets. The bivariate correlation between the two variables turns from +0.89 in the pre -2000 annual subset to -0.45 afterwards. This latter is similar to -0.4 correlation found for the monthly sample. These results may thus hint a change in the behaviour of remittances from the GCC during the last decade.

If indeed remittances from the Middle East have had no Dutch disease-causing effect during the 2000s, this should portend well for the economy, given the ongoing substantial flows of remittances from the Gulf states.

Here, a caveat needs to be mentioned: Even though the REER appreciating effects of remittances found in this study are unambiguous and stronger than those found in earlier studies on Pakistani remittances, the effects found over all are relatively mild (the effects are just a fraction of those exerted by demographic factors, for instance). This may owe to the strong relationship with domestic savings that remittances to Pakistan exhibit (Anwar and Mughal, 2012). Part of the savings that remittances generate goes to the tradable sector, thus limiting the loss to the sector through other channels. Similarly, some of remittances consumed are spent on imported goods, pushing down the real exchange rate (the positive correlation between remittances and imports (Figure 4) is a case in point).

Official development assistance, on the contrary, does not appear to have a damaging impact on the country's exchange rate. This could be due to the fact that these inflows, being official transfers, are not spent in the same way as remittances. Our

results provide evidence to the argument that despite wastage of development funds due to bureaucratic red-tape, corruption, and lack of spending capacity, ODA has improved the country's real exchange rate. This is hardly surprising given the fact that foreign assistance is often directed at infrastructure development and provision of public service projects with high social and economic returns in developing countries, adding to the economy's productive capacity. Aid also puts upward pressure on a country's imports, and keeps the real exchange from rising in the long run.<sup>14</sup> Our results corroborate the findings of Issa and Outtara (2008) in the context of the Syrian economy.

FDI shows mixed signs of Dutch disease inducing effects (the correlation with the REER is positive in the annual and negative in the monthly model). This divergence may be due to the remarkably high levels of foreign investment in the 2000s that reflect disproportionately in the monthly results. FDI remained under \$1 billion till 2003, but rose sharply then onwards to cross \$5.4 billion in 2008.

The effect of FDI on the REER, however, appears to be much weaker than those of the remittances. This can be gauged from the sectoral distribution of these inflows. Foreign investments in Pakistan have involved both services and industrial sectors. FDI to Pakistan has been either in the form of acquisitions of private local concerns (e.g. banks, food and beverage companies) and nationalized corporations, or domestic-consumption-related investments. Oil and gas exploration, fossil-fuel based power plants, communications and financial services together comprised 72 percent of foreign investments in Pakistan during the period from 2001 to 2009 (SBP, 2012).

Among other determinants of REER, terms of trade and trade openness both show a negative correlation with the real exchange rate. In the case of trade openness, the result is expected, and corroborates the evidence generally found in the literature. The negative sign for terms of trade implies that rapid deterioration of terms of trade in the recent years has pushed the real exchange rate upwards.<sup>15</sup> The strong relationship between REER and age dependency ratio highlights the important role demographic change is playing in the developing countries. The negligible mean value of money supply growth indicates that this nominal variable plays no role in the long run. The exchange regime dummy shows a negative sign, meaning that Pakistan's adoption of flexible exchange rate regime has made the country's exchange rate more competitive. The disaster dummy shows a small positive impact, which may point to the fact natural disasters in Pakistan have generally followed a surge in migrant remittances and official development assistance.

Another notable finding is the lack of support for the Balassa Samuelson hypothesis. This apparently counterintuitive result has been discussed in previous studies such as

<sup>14</sup> See for instance, Tressel *et al.* (2009) and Torvik (2001) for more on the latter argument.

<sup>15</sup> After remaining above 100 throughout the 1980s and 1990s, the country's terms of trade sharply fell from 90 in 2001 to 55 in 2008.

Rogoff (1996). Dumrongrittikul (2011) also find evidence of real exchange rate depreciation among relatively rapidly growing developing countries.

The results so far have confirmed spending effect symptoms of the Dutch disease. Moreover, we have some indications of the gradual erosion of competitiveness of Pakistan's export sector (Figure 4). In the next section, we study the resource movement aspect of the Dutch disease.

## 5. REMITTANCES AND DUTCH DISEASE: RESOURCE REALLOCATION EFFECT

In this subsection, we analyze the impact of remittances on the reallocation of resources between the tradable and non-tradable sectors. This helps distinguish the resource movement effect of remittances from their spending effect (Lartey *et al.*, 2008). The rising spending power of remittances-receiving households that increases the relative demand for services raises the price level of the non-tradable sector. This leads labour and capital movement towards the non-tradable sector at the cost of tradable goods sector, resulting in the loss of export competitiveness. A clear negative relationship will therefore confirm our hypothesis that in Pakistan, remittances have added to the loss of competitiveness of its major exports through resource movement towards the production of non-tradable goods and services.

**Table 6.** Remittances and Tradable to Non-Tradable (TNT) Ratio

	Mean			SD	
Intercept	5.849			2.890	
Open	0.175			0.108	
TOT	-0.080			0.073	
GOV	-0.039			0.070	
GDPpcw	-0.616			0.209	
Pop	-0.456			0.453	
ODA	0.009			0.023	
FDI	-0.009			0.021	
Rem	-0.059			0.029	
Exchange Rate	-0.098			0.057	
Disaster	0.016			0.020	
Quantiles	2.5%	25%	50%	75%	97.5%
Intercept	0.255	3.941	5.825	7.717	11.560
Open	-0.042	0.106	0.175	0.245	0.391
TOT	-0.231	-0.127	-0.077	-0.03	0.066
GOV	-0.177	-0.085	-0.040	0.005	0.100
GDPpcw	-1.041	-0.752	-0.615	-0.480	-0.209

Pop	-1.343	-0.752	-0.456	-0.155	0.441
ODA	-0.035	-0.004	0.0098	0.025	0.055
FDI	-0.053	-0.023	-0.009	0.004	0.033
Rem	-0.117	-0.078	-0.059	-0.040	-0.001
Exchange Rate	-0.214	-0.135	-0.097	-0.059	0.015
Disaster	-0.024	0.002	0.0161	0.029	0.057

Table 6 shows the findings of estimation using the tradable to non-tradable (TNT) ratio as the explained variable. As expected, remittances have a negative average impact on the sectoral output decomposition. However, its impact (marginal posterior mean = -0.06), is much smaller than those of trade openness, productivity, or the demographic change.<sup>16</sup> This behaviour of remittances (strong REER appreciation coupled with a weak relative tradable to non-tradable output) corroborates the findings of Sosa and Magud (2010).

We further probe this question by reconstructing our tradable to non-tradable ratio by redefining the tradable and non-tradable sectors using disaggregated data. Agricultural and industrial goods and services which Pakistan has generally not traded in the last three decades are excluded from the list of tradables. We treat industrial subsectors of slaughtering, construction and electricity and gas distribution, and the agricultural subsector of forestry as non-tradables. The series slightly differs from the original one, with a partial correlation of 0.95. Results using this reconstructed series confirm the weak nature of correlation between remittances and sectoral resource movement (results available upon request). A 100% increase in remittances causes less than 1% change in the tradable to non-tradable ratio.

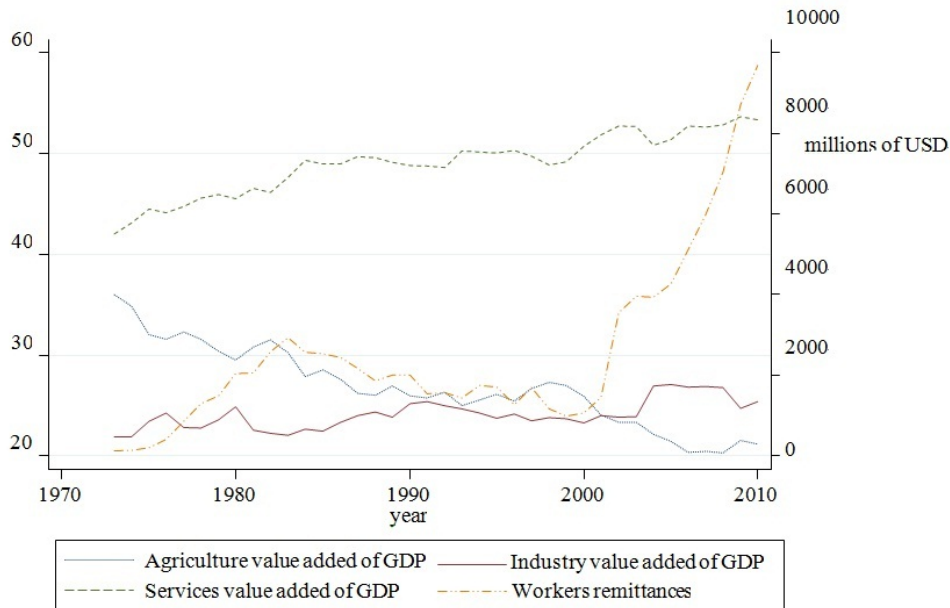
Pakistan's economic structure has evolved in the last three decades, with an increasingly important role of services at the cost of the share of the agricultural sector.<sup>17</sup> Remittances also seem to be among the contributors to this trend. Remittances are positively correlated with the country's services sector during the studied period, whereas the tradable sector, comprising industry and agriculture, is negatively associated (Figure 5). Rise in remittance inflows has pushed up the weight of non-tradable sector in the economy at the cost of industry and agriculture. However, it must be noted that agriculture shows the expected negative relationship, whereas the association with industry comes out to be positive. A possible reason for this can be that industry has over the years benefited from the increase in demand for manufactured goods as a result of remittance receiving households' rising purchasing power. Moreover, remittances

<sup>16</sup> Lartey *et al.* (2008), in contrast, find a sizeable 1 percent drop in the tradable to non-tradable ratio for a 1 percent remittances to GDP increase.

<sup>17</sup> The share of services in the national production rose from 45 percent in 1980 to 54 percent in 2009, whereas that of agriculture dropped by an equal 9 percent to 20 percent from the previous 29 percent.



have sometimes financed small and medium industrial startups, whereas remittance receiving households are often known to neglect or abandon agriculture. This last result nevertheless requires further investigation and is left for future research.



Source: Authors' calculations based on WB Online 'World Development Indicators'.

**Figure 5.** Relationship between Remittances and Sectoral Output Shares (Kernel Density Estimation)

FDI, on the other hand, shows a small but helpful influence on the non-tradables' sector. The weak impact of FDI on the TNT ratio points to the diverse nature of foreign investments made in the country, ranging from bank acquisitions to fertilizers and pharmaceuticals. FDI, therefore, clearly exhibits neither the spending nor the resource movement effects of the Dutch disease. However, lack of real exchange rate depreciation effect suggests that the flows of FDI that accelerated in the 2000s have apparently not improve the country's competitiveness, and the purported benefits of FDIs have not materialized.

Among other findings, the productivity indicator shows a negative relationship with the structural shift ratio. Gradual strengthening of the services sector, mostly at the cost of the agricultural sector, is a common sight in the developing economies. The negative sign of government spending also underscores this point. In Pakistan, much of the federal budget has historically gone on debt servicing, defence, pays and perks of

government employees, and provision of education and health services. This confirms the expenditure bias towards non-tradable goods shown in the literature (see for instance, Bergstrand, 1991).

The positive sign for trade openness is intuitive, and supports the broad agreement in the literature on the productivity-enhancing impacts of trade liberalization. In terms of region-wise impact (Table 7), remittances from the Persian Gulf and North America both show negative signs. This confirms the anecdotal evidence of remittances financing the real estate boom in the country (Oda, 2009).

**Table 7.** Region-Wise Remittances and Tradable to Non-Tradable Ratio

	Mean			SD	
Intercept	7.424			2.989	
Open	-0.037			0.123	
TOT	-0.056			0.066	
GOV	-0.065			0.074	
GDPpcw	-0.537			0.236	
Pop	-0.739			0.448	
ODA	-0.013			0.021	
FDI	-0.022			0.018	
ME	-0.124			0.039	
Europe	0.1285			0.046	
America	-0.035			0.020	
Exchange Rate	-0.125			0.050	
Disaster	0.0264			0.017	
Quantiles	2.5%	25%	50%	75%	97.5%
Intercept	1.552	5.506	7.411	9.345	13.376
Open	-0.280	-0.119	-0.039	0.041	0.211
TOT	-0.189	-0.099	-0.056	-0.013	0.075
GOV	-0.210	-0.114	-0.065	-0.0187	0.080
GDPpcw	-1.021	-0.684	-0.536	-0.385	-0.062
Pop	-1.629	-1.029	-0.733	-0.447	0.126
ODA	-0.057	-0.027	-0.013	0.00009	0.028
FDI	-0.059	-0.034	-0.022	-0.010	0.015
ME	-0.203	-0.149	-0.124	-0.098	-0.046
Europe	0.0363	0.0983	0.128	0.158	0.222
America	-0.076	-0.048	-0.035	-0.223	0.006
Exchange Rate	-0.226	-0.158	-0.125	-9.308	-0.025

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

Remittance flows to Pakistan have, over the years, helped millions of Pakistanis come out of poverty (Mughal and Anwar, 2012) and improved health and educational attainment among the rural recipient households (Mansuri, 2007). The resulting better educated and healthier workforce can indeed improve the country's long-run competitiveness. This beneficial impact of remittances through human capital accumulation may take time to realize, and in the meanwhile, negative impacts may dominate through the monetary channel. This study has shown that the Pakistani economy exhibits symptoms of Dutch disease as a result of migrant remittance inflows. The results lend credence to the argument that remittances have, over the years, caused a shift in resource allocation through consumption of non-tradable goods and services. This additional demand for non tradable goods and services has pushed up the price level and made local production relatively expensive. The net effect is that the country's exports have become relatively less competitive in the foreign markets and the imports have become more attractive. The harmful effects of remittances on the country's competitiveness are opposite to what we find for the FDI and particularly, for the official development assistance. The real exchange rate appreciating effect of remittances is more significant than the one caused by other financial flows because unlike foreign capital inflows, remittances are the outcome of a gradually developing social process (that of migration), and are not prone to sudden stops or reversals. Therefore, their REER affecting tendency can be dealt only partially through temporary monetary and fiscal measures. The loss in external competitiveness, in this case, needs to be remediated through improvements in internal competitiveness. More attention is required for channelling remittances towards productive avenues. In the absence of adequate investment opportunities, much of the remittances are spent on conspicuous consumption. By providing investment avenues to overseas Pakistanis and promoting small-scale enterprises, these remittances can be harnessed in a way that improves the country's productivity. In terms of macroeconomic adjustment, the country needs to rethink its monetary policy in light of the increasing importance of remittance receipts. As demonstrated by Chami *et al.* (2006), a country's optimal monetary policy for a remittance-dependent economy is different from the one for an economy with no significant remittances. The competitiveness-affecting impact of remittances can be further controlled through judicious use of fiscal policy. Improving labour productivity through skill enhancement programs and making the taxation regime leaner and more transparent can be steps towards this goal.

In the end, it must be said that real exchange rate is only one of the factors defining a country's competitiveness (the WEF Global Competitiveness Index, for instance, is based on over 140 indicators of competitiveness). Pakistan's competitiveness score has

fallen in both in absolute and relative terms in the recent years.<sup>18</sup> In the last few years, it has done poorly in comparison to similar and neighbouring economies, even relative to those who receive more remittances as a share of output than Pakistan. Policymakers, therefore, need to concentrate both on the external as well as internal competitiveness improvements to extenuate the effects of remittance-induced loss of competitiveness.

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