GROUP 1

RELATIONSHIP BETWEEN REMITTANCES AND DUTCH DISEASE IN PHILIPPINES

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 19,353.

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
Agrivalue	Value Added of Agricultural Sector
ARCH	Autoregressive Conditional Heteroscedasticity
ASEAN	Association of Southeast Asian Nations
CAD	Canadian Dollar
CFO	Commission on Filipino Overseas
CNN	Cable News Network
DD	Dutch Disease
DUM	Dummy Variable
DUM_E_	Dummy Variable for Exchange Rate Regime
DUM_F_	Dummy Variable for Financial Crisis
DUM_O_	Dummy Variable for Oil Deregulation Law
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDPG	Gross Domestic Product Growth
GDPPC	Gross Domestic Product per Capita
GMM	Generalized Method of Moments
INF	Inflation
IT	Interaction Term
JB	Jarque-Bera
LP	Labour Productivity
M2	Money and Quasi Money
Manuvalue	Value Added of Manufacturing Sector
MENA	Middle East and North African Region
OLS	Ordinary Least Square

PMG	Pooled Mean Group
REER	Real Effective Exchange Rate
REM	Remittances
Servalue	Value Added of Service Sector
SIC	Schwarz Information Criteria
TO	Trade Openness
TOT	Terms of Trade
U.S.	United States
USD	United States Dollar

List of Appendices

Abstract

The aim of our study is to analyze the relationship between remittances and Dutch disease in Philippines in between year 1980 to 2010. Remittances constitute to a question on whether it boost economic growth through investments (resources blessing) or it could have harm the export competitiveness of a country through Dutch disease effect (resources curse). A hypothesis we included in this study is worth highlighted which is labour is being categorized under the term' natural resources' and that the labour exporting country (Philippines) is exporting the resources (labour) and receive income (remittances). As contrary to the previous researches done on remittances and Dutch disease which emphasized remittances acts as the role of capital inflow, the underlying mechanism is different but the channel is still the same which are the spending effect and resources allocation effect. Our result suggests that there is a presence of Dutch disease in Philippines by having to detect it through both channels. We found that an increase in the percentage of remittances to GDP resulted in an increase in real effective exchange rate by index 57.4032. In other word, it means that there will be a rise in price of non tradable goods due to an incline in income level. Then, appreciation of REER will harm the export sector. On the other hands, managed floating exchange rate regime has lesser impact on REER as compared to floating exchange rate regime. As for resources allocation effect, it is found that remittances increase the output level in services sector but decrease the output in manufacturing and agriculture sectors at the same time. So, the resources are moving from tradable sector (manufacturing and agriculture sectors) to non tradable sectors(services sector). Both indicate the existence of Dutch disease. Since there is indeed long run relationship existed between remittances and REER, it tells us that Dutch disease take times to show it true effect. Therefore, it is important to highlight this issue in order to sustain long term economic growth by increasing their export competitiveness. Government does play a significant role in implementing policy to curb the problem of Dutch disease.

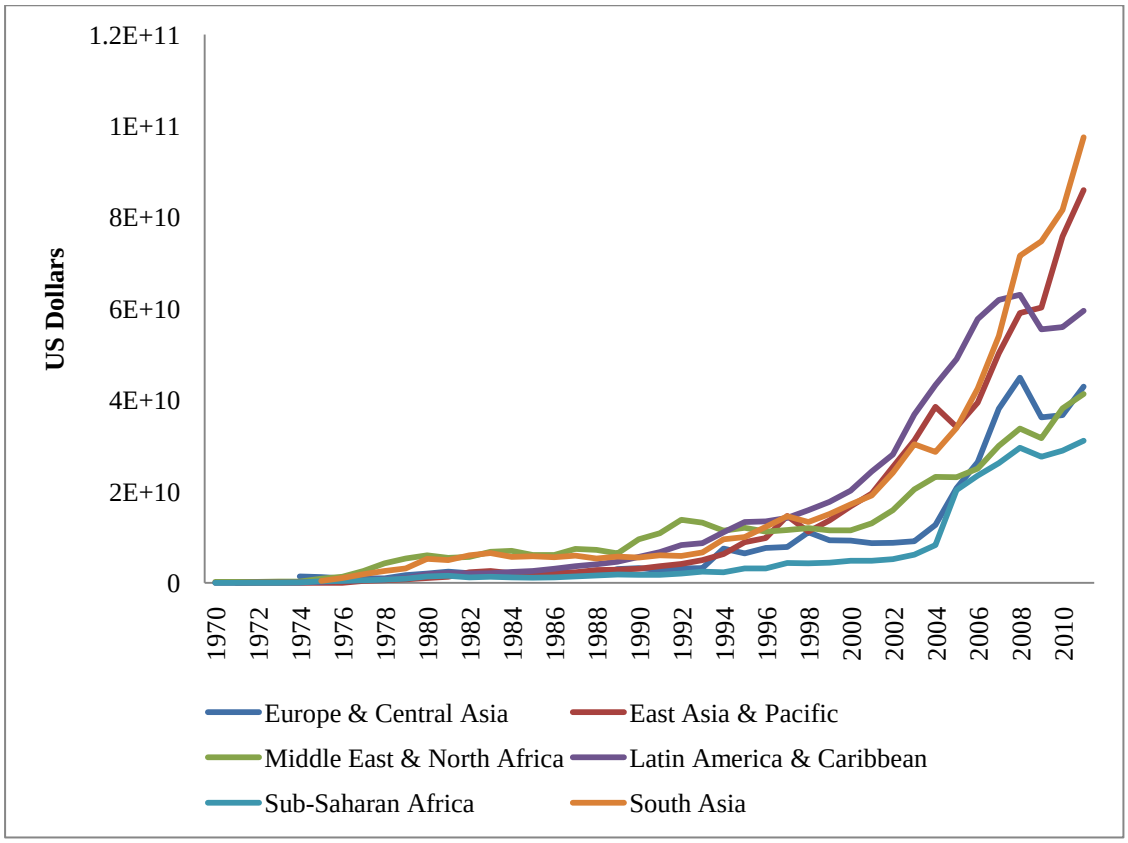
CHAPTER 1: INTRODUCTION

1.0 Overview

1.0.1 Remittances

Economic growth always associated with foreign direct investment (FDI). In fact, it is the largest source of external funds that play an important role in boosting the economy of Asian country in both short term and long term (Baharumshah & Thanoon, 2005; Marwah & Tavakol, 2004). However, remittances gained its light when the trend of labor migration shows an increasing trend for the past two decades, especially in developing country. Remittances are the portion of migrant workers' earnings sent home, acting as a financial support to their families, as defined by International funds for Agricultural development.

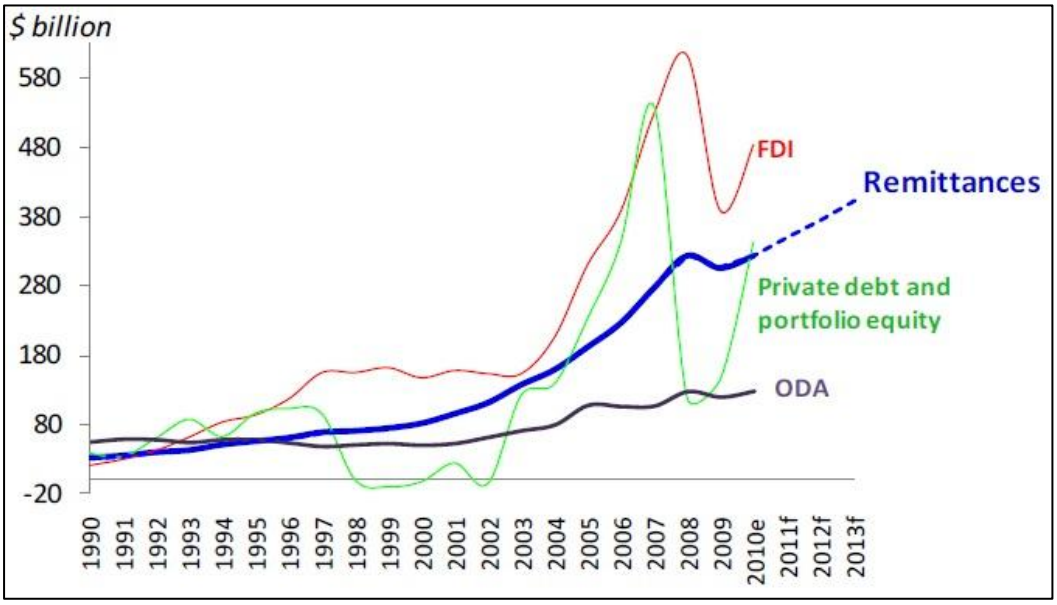
Figure 1.1: Remittances from Developing Countries across Different Regions



Source: Author's illustration: Data from World Bank Indicators

Figure 1.1 shows the remittances from developing countries across different regions. As interpreted from the graph, the remittances flow into developing countries started slow and then increase significantly between 1974 until 2010.

Figure 1.2: ODA, FDI, Remittances, Private Debt and Portfolio Equity in Developing Countries



Note: 1. e = estimate

2. f = forecast

Source: World Development Indicators and Migration and Remittances Unit estimates

As shown in the graph above, it shows that remittances flow into developing countries (refer to the Appendix 2) have been significantly increasing through all the years just below FDI. A recent report found that remittances to be received by developing countries are estimated at $406 billion in year 2012, growing 6.5% from previous year and is expected to grow continuously by 7.9% and 10.1% in year 2013 and year 2014 respectively, reaching $534 billion in the year of 2015 (Worldbank, 2012). As mentioned by Combes and Ebeke (2011), remittances have higher impact on the economy in developing country, as compared to developed countries. Moreover, it claims that remittance can improve the standard of living and reduce poverty in developing country (Koc & Onan, 2004; Adams JR, 2013).

Remittances are important for growth of a country, mainly because of the growth-enhancing and poverty-reducing effects on the financial development. Positive relationship between remittances and financial sector development is illustrated in the research of Aggarwal, Demirgüç-Kunt and Martínez Pería (2011). Besides, remittances have welfare and growth effects due to the power of improving recipient family's income and living standards. Remittances could also affect macroeconomics variables, either directly or indirectly. For examples, output growth, financial sector, real exchange rates, human capital formation and investment ratio (Rao & Hassan, 2011).

With the increasing importance of remittances to the developing countries, due to the significant migration in order to seek for better opportunities, sometimes is not a good thing for the development of a country. No matter how beneficial is the migration activities are, there is still negative effects, mainly the draining of labor and capital out of local production of tradable goods. Migration is contagious within a country that would lead to mass exportation of labor and the condition will be much worsened (Taylor, 1999).

Moreover, the increasing phenomenon of remittances would cause a significant uproar much alike as Dutch Disease effect, like a resource boom collapsing tradable sector, associating with appreciation of real exchange rate, losing competitiveness internationally (Guha, 2013). The rising demand caused by the remitted money increases the prices in the non-tradable sector, where prices could not be easily adjusted in the tradable sectors in small market. Furthermore, resources from tradable sectors to non-tradable sectors, causing the competitiveness of a country lesser due to the crucial tradable sectors are 'eliminated' in the process (Makhlouf & Mughal, 2011).

1.0.2 Dutch Disease

Natural resources supposed to bring in extra wealth to the country and boost the economy. Contrary to most belief, natural resources could have stunted the economic development through four channels of transmission. They are overvalued currency (Dutch disease), socially damaged producers' rent-seeking behavior, poor economic policy and also negligence of human capital development.

Firstly, the overvaluation of currency is also known as one of the symptoms of Dutch Disease. The resource boom that causes the increment of raw-material exports resulted in appreciation of real exchange rate, which then causes the real wages to increase and then deteriorating other exports, such as the high-tech products or manufacturing products that helps in economic growth. This repetitive booms and busts would cause the exchange rate to be volatile, where the total exports could be reduced (Gylfason, 2001; Cavalcanti, Mohaddes & Raissi, 2011). Manufacturing products are characterized by learning-by-doing, whereby the natural resources boom shifting the labor force from manufacturing to services sector would cause the economic growth to be sluggish. This would cause the market to be inefficient due to the learning effects are not practiced by firms (Stijns, 2005).

Secondly, the surge in natural resources would socially damage the producers' rent-seeking behavior. For example, as mentioned by Gylfason (2001), government might tend to impose tariffs to protect domestic producers. Besides, issue like corruption might also arise due to the resource boom, which in turn decreases the quality of the government institutions, ended up with poor economic performance. Countries with poor quality institutions are more likely to suffer from the resource boom

rather than gaining, also known as the resource curse. Other than that, the profits from the resource boom are most likely to be spent in government consumption rather than investing in other profitable investments, generally in those low savings countries. This will also negatively affect the economic development of the countries (Brunnschweiler, 2008; Cavalcanti, Mohaddes & Raissi, 2011). Exploitation of natural resources would not sustain the economic growth if the resource rent is not effectively handled, such as investing in physical and institutional infrastructure including education (Douangngeune, Hayami & Godo, 2005).

Thirdly, natural resource abundance might give a false security signal to people, and government would lose the aim for growth-oriented economic management, such as free trade, bureaucratic efficiency and institutional quality. Government will have lesser incentive to promote social wealth by concentrating on exploiting profit from the natural resource available in the country (Gylfason, 2001).

Lastly, nations that are overconfident with their natural resources often neglect the development of their human capital, mainly by dedicating inappropriate attention and expenses on education. It is said that the wealth from the natural resource blinded them to the importance of education (Gylfason, 2001). It is important to develop human capital through education because the technological process would lead to a sustainable economic growth (Douangngeune, Hayami & Godo, 2005).

Thus, economists have regards Dutch disease to be one of the fundamental mechanisms to explain the natural resources curse. The word "disease" basically means it will bring negative impact to the economy when there is a boom in natural resources in a country. Besides, it also refers the term of Dutch disease as the negative consequences caused by

sudden large increase in country's income. Back in 1960's, it was used to describe the oil and gas revenues that had negative impacts on the Netherlands's industrial production. They later use 'Dutch' to represent the country. It mostly happens in resources abundant country where they export their resources and gain revenues from this booming sector.

There are two main sectors which are tradable sectors and non tradable sectors in every country. Tradable sectors include agricultural sector and manufacturing sector while non tradable sectors include retail trade, service sectors and construction. Dutch disease phenomena can lead to appreciation of exchange rate through different channels. One of it is through the spending effect. When a country receives sudden increase in income, more foreign currency will flow in. Consumers exchange it into local currencies and increase their demand for non traded goods and tradable goods when their income is higher. Price of tradable goods is determined by the world price and the price would not be affected when there is an increase in domestic demand (assume small economy). On the other hand, price of non tradable goods will shoot up when domestic demand is higher. Then, it appreciates the real exchange rate. It makes the export sector less competitive in the international market as the price of goods become more expensive as compared to other country. The downside of spending effect is shrinking traditional export market. It will slow down the economic growth in long term.

Meanwhile, resource movement effect will also appear when resources such as capital and labor switch from tradable sector to non tradable sector when the domestic demand for non traded good has been inclined due to a rise in income level. Wages in non tradable sector will increase but the wages is assumed to be the same in the nation. Thus, the cost of production in non booming sector (tradable sector) will rise and cause the sector to shrink since the price follow the world market and

unable to be adjusted freely. This process is also known as de-industrialization.

Symptoms of Dutch disease include:

- Large inflow of capital will appreciate local currency .Then it leads to loss in export competitiveness.
- Growth of production of manufactures and other tradable goods will be declined.
- Resources shifted from traditional tradable good sector to non tradable goods sector.
- An incline in output and employment in services sector within the country. If resources move away to overseas employment, then its net effect is ambiguous.
- Rise in the relative price of non tradable over tradable.

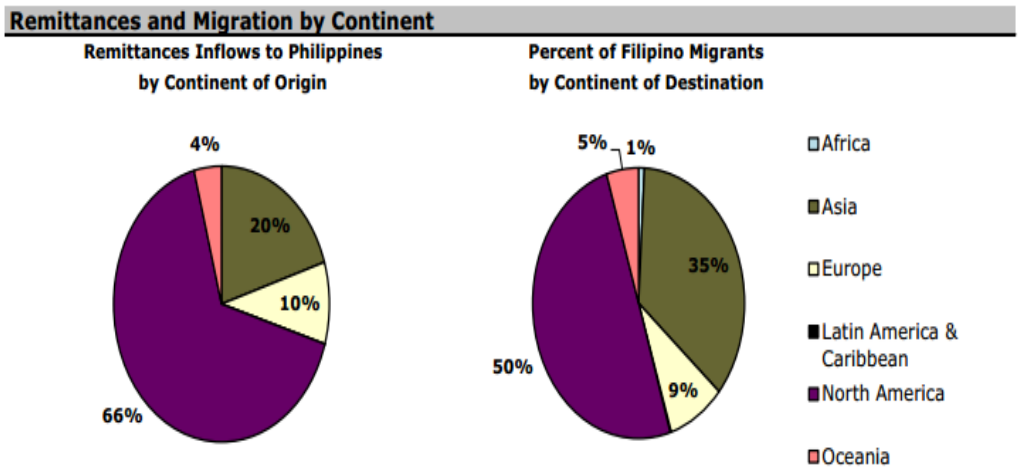
Source: Bangko Sentral Review January 2007

1.1 Philippines Background

1.1.1 Trends of Migration and Labour

Philippines is an interesting case to study as the country has sent out labor dated back to 1970s where the economy growth of Philippines was not in line with the population growth. Thus, the country faced severe balance of payment deficit. At the same time, oil crisis in 1973 further worsened the problems. Oil-rich countries, on the other hand, demanded more workers to work on construction sector. Therefore, large scale labour migration taken place in Philippines (Asis, 2006).

Figure 1.3: Remittances and Migration by Continent

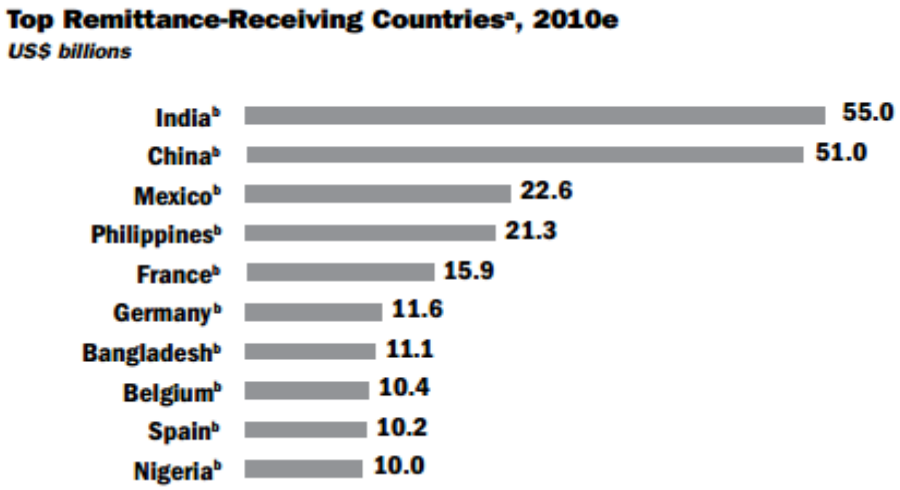


Source: Migration Policy Institute

Figure 1.3 showing two pie charts which describe remittances inflow to Philippines by continent of origin and percent of Filipino

Migrants by continent of destination respectively. The highest remittances flow to Philippines is from North American which contributed 66% of total remittances inflow. Among the countries in North American, United States (U.S.) has the largest crowd of Filipino immigrants. In between 1980 and 2006, the numbers has gone tripled from 501,440 to 1.6 million. Right behind Mexico, Filipinos are the second largest immigrant group in U.S and 64% of the Filipino immigrants staying in U.S in 2006 were of working age (Terrazas, 2008). Fluent in English and willingness to work in overseas under wide range of conditions have put Filipino in great position of labor deployment to match with the demand from worldwide especially for U.S.

Figure 1.4: Top Remittance-Receiving Countries, 2010



Source: Development Prospects Group, World Bank

Figure 1.4 showing the top 10 of the remittance-receiving countries in 2010. India has received the highest amount of remittance which is US $ 55 billion while Philippines has ranked four amounted to US$ 21.3 billion.

Out of the expected remittance flows to developing countries at total $351 billion in 2011, Philippines has estimated to record worth of $ 23 billion of remittance inflow and this keeping the country remained as the top 5recipients of officially recorded remittances (Worldbank, 2011).

Philippines has been chosen for this study although Philippines is not the top remittance-receiving country in the Figure 1.4 but only ranked as top 4. The reason behind is because the Philippines' remittances receipt has greater contribution to its Gross Domestic Product (GDP) and seem to have increased much in recent years as compared to the India, China and Mexico.

According to the data collected from the World Bank, in year 2011, Philippines's remittances receipt as a share of GDP is 7.63%. However, the remittances receipt as a share of GDP for the India, China and Mexico are much lower, which are only 3.41%, 0.55% and 2.04% respectively. Moreover, China and India have huge amount of total population. According to the data from World Bank, China and India have the total population of 1.3 billion and 1.2 billion, whereas the Philippines only have a total population of 0.9 billion. Therefore, remittances inflow will have larger impact on small economy like Phillippines.

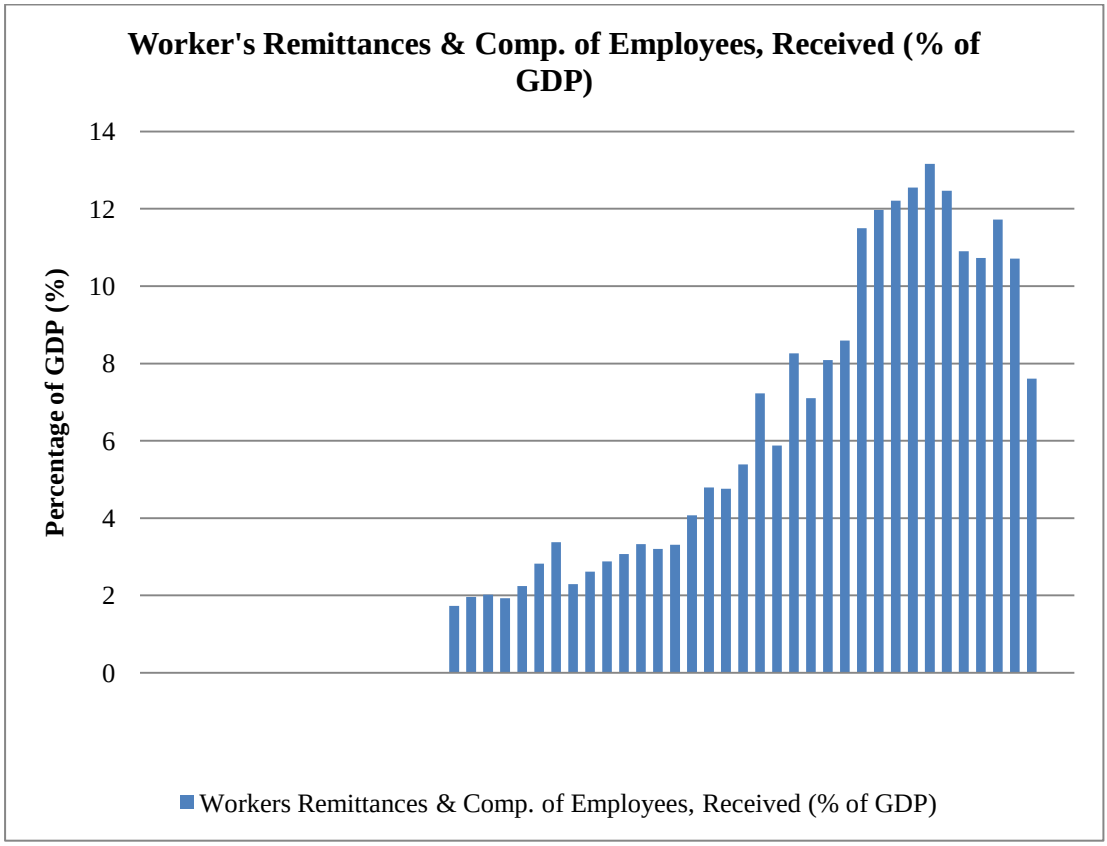
According to Commission on Filipino Overseas (CFO), overseas Filipinos consist of permanent residents and overseas Filipinos workers. Permanent residents also include Filipino immigrants or legal permanent residents that has obtained foreign citizenship and do not depend on work contracts. Whereas overseas Filipino are those temporary or irregular workers that stay overseas under work contract and require to go back to home country once the contract has expired (Tuaño-Amador, Claveria, Co & Delloro, 2007). Temporary migrants include contract workers, intra

company transferees, student, and businessmen while irregular workers are those whose stay overseas illegally or on a expired visa on travelling.

Different country might have their own classification for remittances under balance of payment statistics but all of them follow the definition set by World Bank (compensation of employees, worker's remittances and migrant's transfer). As for Philippines, remittances are classified as below:

- Compensation of employees which comprised of wages, salaries and other benefits received by workers who have stayed overseas for less than one year (income account).
- Remittances transferred back to home country from workers who have lived abroad for more than one year or more (current transfer account).
- Receipt of gift and donations of individual.
- Capital transfer of financial assets conducted by migrants as they move to another country and stay for more than one year(capital account).

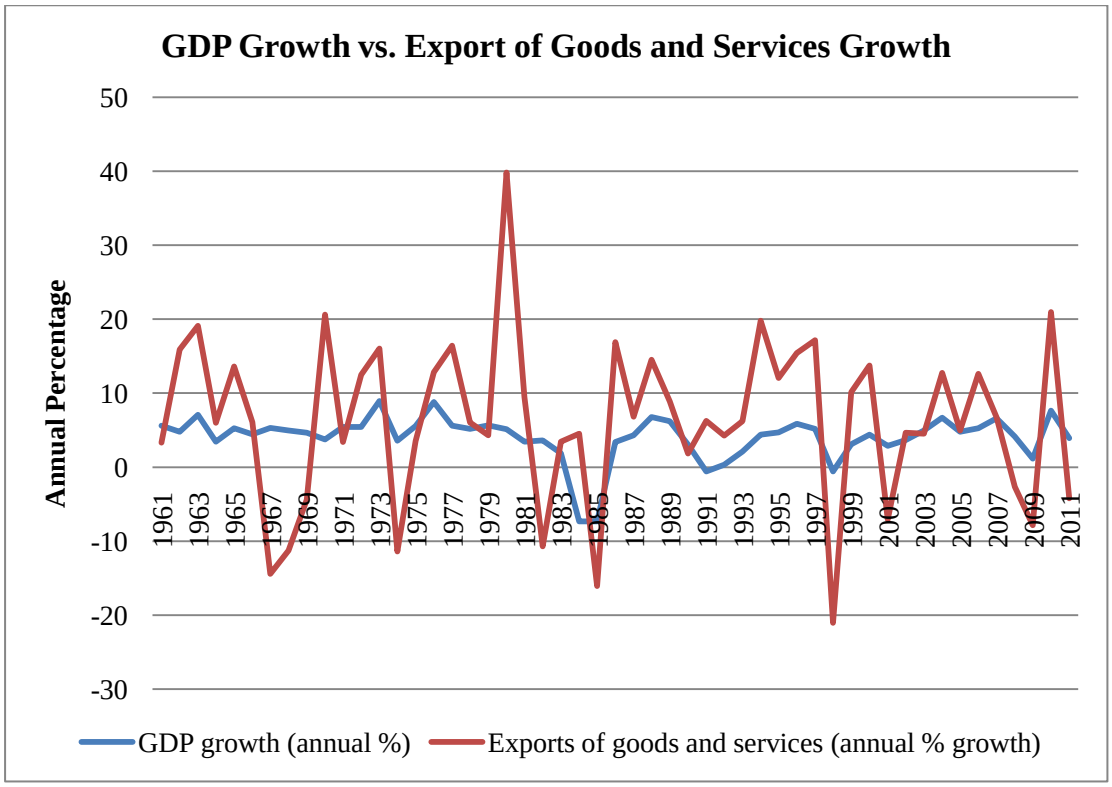
Figure 1.5: Worker's Remittances & Compensation of Employees, Received (% Of GDP)



Source: Author's illustration: Data from World Bank Indicators

From Figure 1.5 above, we can see an inclining trend of worker's remittances and compensation of employees, received as percentage of GDP from year 1977 (1.73%) until it reached the peak at 2005(13.16%).Since then it decreased to 7.61% in 2011. From here, we can see that remittances is contributing larger and larger portion to the GDP of Philippines.

Figure 1.6: GDP Growth vs. Export of Goods and Services Growth



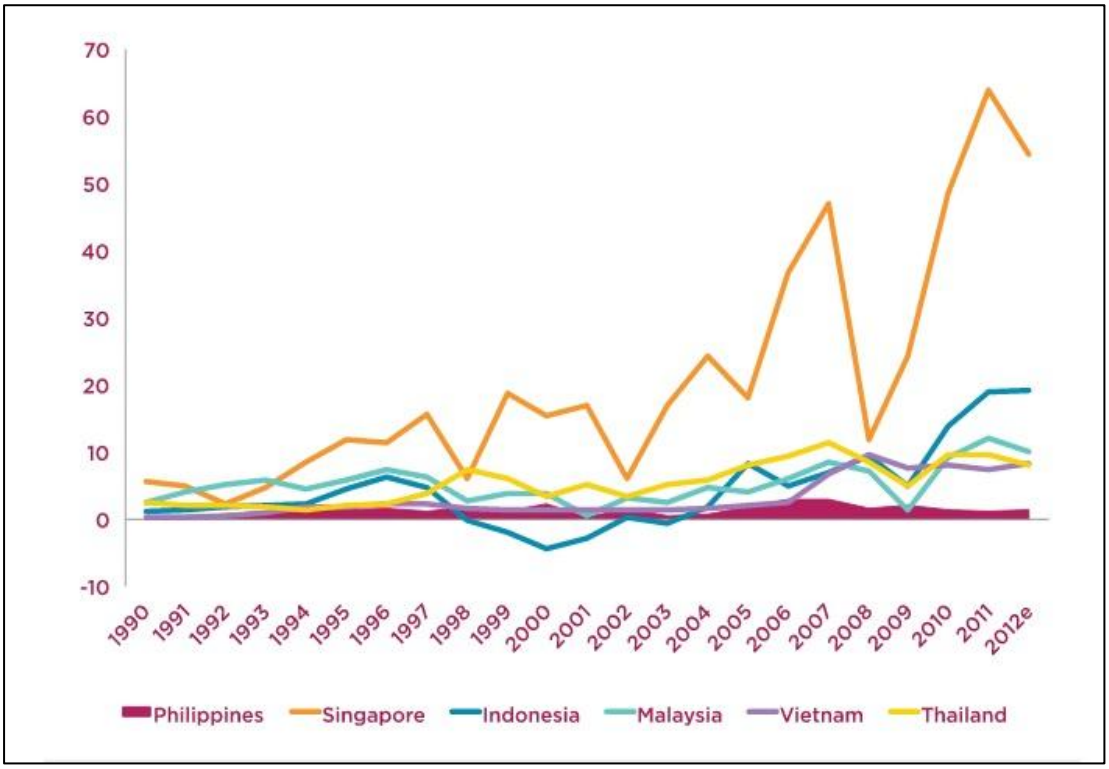
Source: Author's illustration: Data from World Bank Indicators

Furthermore, we can see that the annual GDP growth of Philippines is not deviating far from the previous year in between 1961 and 2011 in Figure 1.7. In other words, we do not see any drastic movement in GDP growth although the remittances have been inclined from year 1977 to year 2005. While in between 1983 and 1985, there is an economy crisis in Philippines due to political turmoil (1983) followed by the incident of external debt crisis (Solon & Floro, 1993). Thus, the GDP growth is the lowest in 1985 which is -7.31%. On the other hands, export of goods and services (annual % growth) has a volatile trend from 1961 to 2011. The highest growth was in 1980 amounted to 39.82%. However, there is negative annual percentage growth of goods and services' export in 1967 (-14.42%), 1968 (-11.28%), 1969 (-4.37%), 1974 (-11.41%), 1982 (-10.69%), 1985 (-16.07%), 1998 (-21.03%), 2001 (-7.07%), 2008 (-2.68%), 2009 (-7.83%) and 2011 (-4.2%). The lowest point was in 1997 which is when the ASEAN financial crisis comes in. From a CNN report,

Philippines economy has outperformed its forecasted growth of 3.5 % by 2.9% in the first quarter of 2012. Analysis shown that the force behind the growth is strong demand consumption due to the money sent home from overseas workers of Philippines. The report also pointed out 70% of Philippines economy is from consumptions (Ko, 2012).

FDI flows into the country is said to have the ability in eliminating occurrence of Dutch disease caused by remittance (Fayad, 2010). This might not be applicable for the case of Philippines because the insufficient of FDI flows into Philippines in enhancing productivity.

Figure 1.7: Net FDI in USD Billions among the ASEAN-6 from 1990 to 2012e



Source: Arangkada Philippines based on BSP

The Figure 1.7 shows that, among the all six countries, Singapore has the most noticeable increasing trend of net FDI from year 1990 to 2012

(estimated), at the same time, the remaining countries also found to have increasing net FDI inflow except for Philippines. From the figure, we found that Philippines did not grow much during this period. Its net FDI inflow is near to zero USD in billions throughout the years. A panel data research done by Wang, Gu, Tse and Yim (2013) in 287 cities from year 1999 to 2005 reported a significantly positive relationship between FDI and labour productivity. The result is consistent with the research done by Lee (2009) based on panel data as well, where FDI helps in promoting labour productivity growth especially in manufacturing sector. As the low growth rate of net FDI inflow in Philippines, the statement of FDI eliminating exchange rate appreciation via increasing labour productivity may not be applicable.

Remittances are said to have reducing effect towards the recipient country's poverty rate and able to improve the standard living of the nations (Acosta, Calderon, Fajnzylber & Lopez, 2008; Adams JR & Page, 2005). Similar result has been found in the case of Ghana (Adams JR & Cuecuecha, 2013), where remittances help in improving the standard living of recipient country's citizens and hence promoting the country's growth. This is because of the remittances are found to be spent on non productive investment such as education, housing and healthcare which help in enhancing the country's economy.

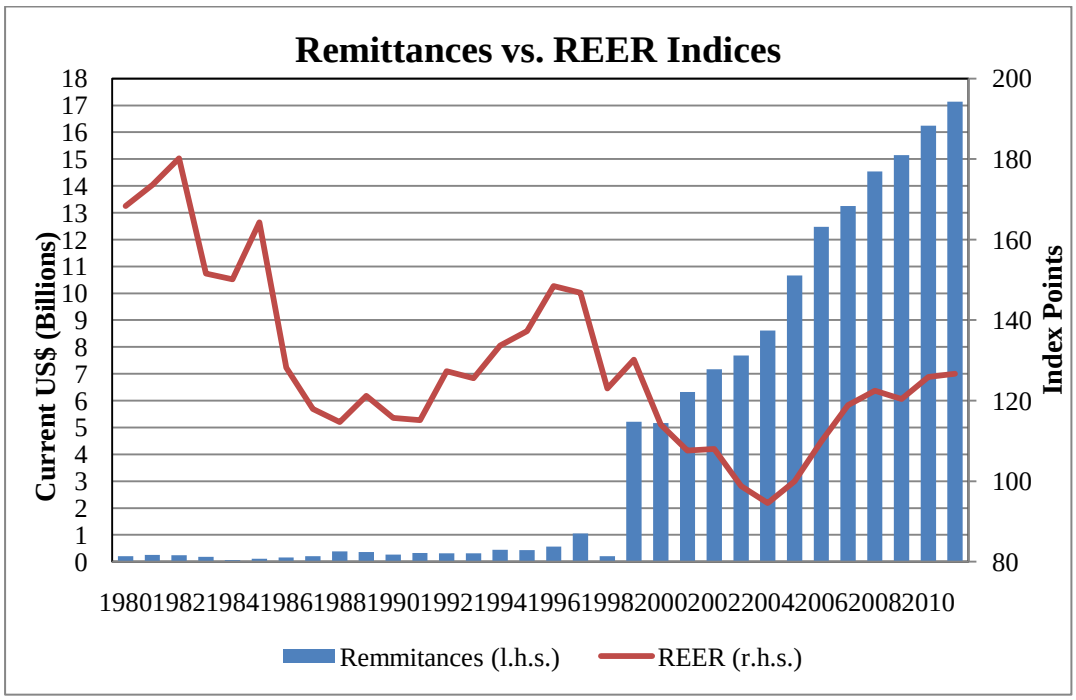
Despite the robust GDP growth in Philippines, National Statistic Coordination Board of Philippines reported that poverty remained unchanged during the first semester of 2012 (estimated at 27.9%) as compared with 2006 (estimated at 28.8%) and 2009 (estimated at 28.6%) first semester figures. It means that the percentage of Filipino living below poverty line has been about the same in the past 6 years.

Moreover, the issue of high unemployment rate in Philippines has also been addressed when it rose to 7.1% in January 2012 (Ong, 2013). Bloomberg pointed out that about 660,000 positions have been lost since October 2011 even when the economy is growing at 6.6 % in 2012 (Yap, 2013). Nevertheless, there was a case done in Mexico that found remittance to have bad impact on poverty (de la Fuente, 2010).

1.1.2 Why is Philippines Highly Suspected of Contacting Dutch Disease?

1.1.2.1 Symptom 1: Increase in Remittances Accompanied by Appreciation of REER

Figure 1.8: Remittances vs. REER Indices



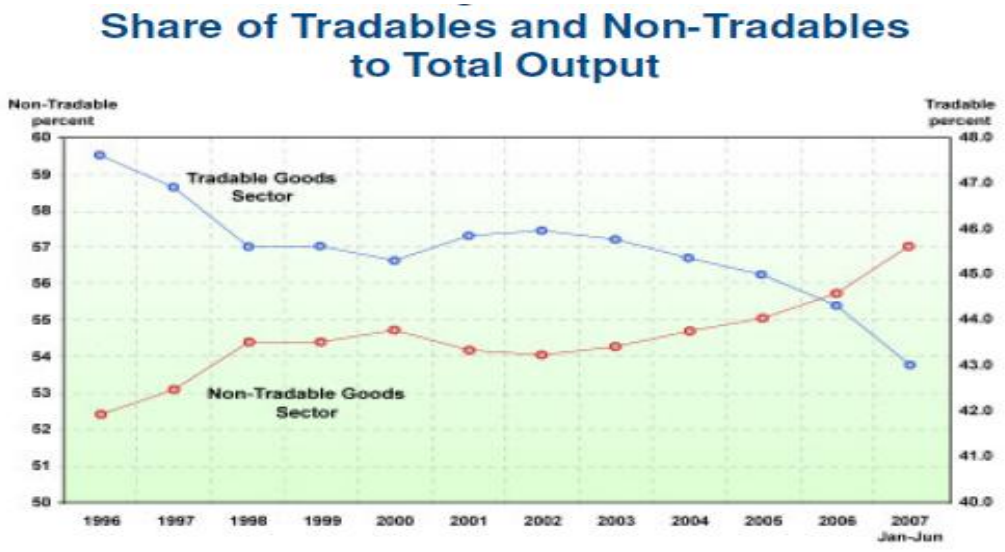
Note: 1. l.h.s. = left hand side axis
2. r.h.s. = right hand side axis

Source: Author's illustration: Data from World Bank Indicators

Figure 1.6 is comparing remittances (in current US$) and real effective exchange rate[1] (REER) in index form. An increase in REER index means appreciation of the currency of home country. As from 1983 until 1988, we can see a declining REER index .It means that the value of Peso to U.S dollar has depreciated. However, REER index again rise from 1989 to 1996 as well as from 2004 to 2011. In general, it means that PESO to U.S. dollar appreciated within these two periods. When remittances increased drastically since 1999, the movement of REER became unstable. It depreciated at first but appreciated again in 2005.Since 2005, remittances move in the same way with REER. In other word, remittances increases along with the appreciation of Peso to U.S dollar. It seems to indicate one of the symptoms of Dutch disease.

1.1.2.2 Symptom 2: Decline in Share of Tradable to Total Outputs

Figure 1.9: Share of Tradables and Non-Tradables to Total Output



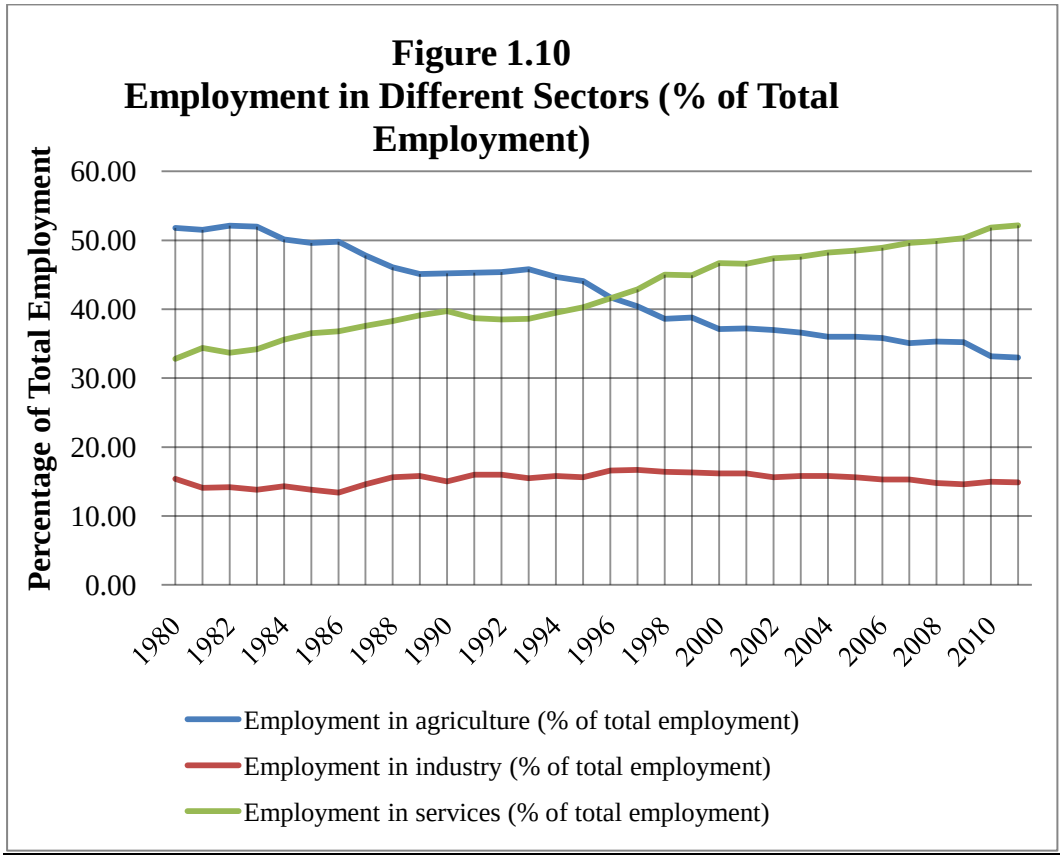
Source: BangkoSentral Review January 2007

[1]According to World Bank, real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.

First of all, agriculture, mining and quarrying and manufacturing are included in tradable goods sectors whereas construction, electricity, gas and water and all types of services are under the category of non-tradable goods sector. Figure 1.8 shown shares of tradable goods and non-tradable goods to total output between 1996 and 2007. There is an obvious declining trend in tradable good where it dropped from 59.8% in 1996 to 43.0%. Non-tradable good sector, on the other side, shows an inclining trend from 1996 to 2007. Expansion of non-tradable good sector and contraction of tradable good sectors lead us to believe there might be Dutch disease.

1.1.2.3 Symptoms 3: Incline in Employment in Services Sector

Figure 1.10: Employment in Different Sectors (% of Total Employment)



Source: Data from World Bank Indicators

The major employment in Philippine in year 1980 is contributed by the employment in agriculture sector, which is approximately half of the total employment (about 52%). During the same year, the second most of employment in the economy is located in the services sector with about 33% whereas the third largest is in the industry (or manufacturing) sector with about 15%. In the following years, employment rate in agricultural sector has faced a descend trend progressively. Contradict to agricultural sector, the employment in services sector rose up in the same years. The different trends in the employment of the two sectors continue until year 1996, where the employment in services sector began to overtake the agricultural sector as the biggest employees of the workers. Employment in services sector continued to grow in years and contributed approximately 52% of the total employment in year 2011, while the employment in agricultural sector has dropped to just about 33% of the total employment. Throughout the years from 1980 to 2011, manufacturing sector's employment to total employment remained in a steady ratio with a range of 3.3% in between the highest and the lowest percentage. The employment in this sector contributed roughly 15% of the total employment in year 2011. An incline in employment in services sector and a decline in agricultural sector seems to point toward the possibility of Dutch disease.

1.2 Problem Statement

Migration, remittance and development in a country often being debated but there is still less empirical result to confirm that either they will have a positive or negative effect on economic growth. Remittance claims to have positive indirect effect on the income, thus, raise the capital and reduce risk on local production. At the same time, economic environment also limit the development in migrant sending areas (Taylor, 1999). Theory always say that capital inflow is good for the economy, so why this Dutch disease, caused by sudden capital inflow, is an

economic issue? It is because the fear of losing competitiveness in export especially in manufacturing sector. De- industrialization will reallocate the resources to low tech primary production. In long term, economy growth will suffer when the country lose its competitiveness in the international market.

To the best of our knowledge, there is limited literature done on the relationship between remittances and Dutch diseases based on single country analysis. While they say natural resources will cause Dutch disease, can labour be categorized under the term 'natural resources'? If so, will labour-exporting country exhibit symptoms of Dutch disease by rely on their export of natural resources (labour)?

Although previous studies have done on remittances and Dutch disease, the concept is having remittances as the role of capital inflow that would have cause Dutch disease. Why do we stress so much on this concept? It is because natural resources exporting countries tend to grow slower as compared to countries which specialized in different pattern of trade. Then, by having said that the natural resources actually is a curse, economic growth will be sluggish if the country more focus on natural resources products (Murshed & Serino ,2011). Let's say labour is the natural resources of Philippines and it tend to specialized in exporting labour, remittances inflow will have stunted the economic growth instead of the boosting the economic growth. This seemingly small issue might have lead to a totally great impact on Philippines's economy. If they overlook the mechanism, it will genuinely lead to different adoption of policy. When there is a disease, we must know the cause of it in order to suit the remedies to the case.

In our study, we regard remittances as the role of income bring in by resources (labor). Not only that, there is also uncertainty on the role of remittances towards a country. Different methods of detecting Dutch disease will likely to cause the misinterpretation of result. All these questions lead us to study the relationship of remittances and Dutch disease in one of the largest labor-exporting

country, Philippines. Meanwhile, some researches only focus on detecting Dutch disease through one channel. In our study, we also consider both main channel of Dutch disease: spending effect and resources movement effect.

Another issue is that exchange rate regime seems to be closely related to remittances. Monetary policy restrictive by floating exchange rate regime will lead to 'overshooting' of the real exchange rate (Buiter & Miller, 1981; Claassen, 1990). Under floating exchange rate regime, remittances inflow tends to bring larger impact on the exchange rate and make it more volatile in the market. It is because exchange rate is allowed to fluctuate in a wider range under floating exchange rate regime (Kent & Naja, 1998).

On the other hands, remittances inflow has lesser impact on exchange rate movement as compared to floating exchange rate regime. It is because the movement of exchange rate is closely regulated by government and it will be fixed at certain rates. Any changes in exchange rate will be offset with adjustment in foreign reserve account. In the case of Philippines, it becomes more interesting as it adopt managed floating exchange rate regime since 1984 (Yap & Bagsic, 2008). Managed float regime is an exchange rate that controls by government which government intervention prevent the exchange rate fluctuate out of the range. The question is, what is the impact of remittances on real effective exchange rate under managed floating exchange rate regime?

1.3 General Objective

The research question and problem statement prompt us to analyze the relationship between remittances and Dutch Disease in Philippines. In our study, we will examine the relationship through two main channels which are spending

effect and resources allocation effect. Our research will contribute to the limited literature on Dutch disease based on the hypothesis which is labour will be act as the role of income from exporting natural resources (labour).

1.4 Specific Objectives of the Study

- To detect the presence of Dutch disease through spending effect and resources allocation effect.
- To examine the effect of remittances on REER as to detect the presence of Dutch disease from 1980-2011 in Philippines.
- To analyze the effect of remittances on the sectorial sectors of Philippines (Agricultural sector, manufacturing sector, services sector).
- To examine whether remittances under the influence of exchange rate regime will influence REER.

1.5 Significance of Study

Existing empirical literature on detecting Dutch disease mostly focus on oil exporting countries or country with abundant natural resources. Moreover, it mostly constructs panel analysis across the region. Only limited researches have been done on specific country due to the concept of Dutch disease still considered new in this century. So far there is limited literature stressing on labor being the natural resources that might cause Dutch disease. Thus, through our study, we may able to strengthen this concept and motivate future researches to be done in this field.

More importantly, this study can contribute to limited literature done on relationship of remittances and Dutch disease in labour exporting country, to be exact, we will narrow down the scope to analyze on developing labour-exporting country as remittances has much larger impact on developing country. In a way that it might suggest that remittances is actually being one of the reasons that slowing down the development of developing countries, in which people tend to look pass upon its impact. It is important to find out whether remittances being one of the factor to hinder economic development in developing country in long term. It then suggest the suitability of further adopting remittances as an engine for growth for Philippines.

Remittances do play a significant role in the economy of Philippines. The question arises when every action comes with positive impact and negative impact. In long term, will the remittances caused the economy of Philippines continue to grow stronger or the other way round, remain a question. Although remittances do come into light in few researches, its effect on the economy still ambiguous. It is important to know the real impact of remittances on the economy of Philippines so the policymakers will be aware of the issue while enjoying the benefits bring in by remittances. The old saying goes like 'prevention better than cure'. Then, it might encourage appropriate policy taken by the government if the Dutch disease effect is getting stronger and hinder the economic development within the country.

From a wider perspective, this concept of Dutch disease could be applied to other labor exporting country as some of the country might even not be aware of this issue as the negative impact might take a longer time to show its trails. Thus, our study also contribute to the society in the sense that it create awareness towards the negative impact that caused by Dutch disease. It is important for policymakers to be aware of any economic issue so they will have enough time to prepare for unpredictable scene.

In short, we will be able to provide more insight towards the relationship between remittances and Dutch disease in one of the largest labor exporting country, Philippines. Given that remittances are more stable than foreign direct investment (FDI) and other foreign aids, it is still a rather new issue worldwide. In our study, we analyze both of the channels which are through spending effect and resources movement effect. This will allow us to see a clearer picture on the effect of remittances on sectorial shares of tradable and non tradable sectors. Employment of each sectors mentioned above will also be look upon.

Besides, long term relationship between remittances and REER will be justified after the study. We also interested in finding out whether remittances under the influence of exchange rate regime will influence REER. As such, we hope that our research could contribute to the society and the economy of Philippines.

1.6 Organization of the paper

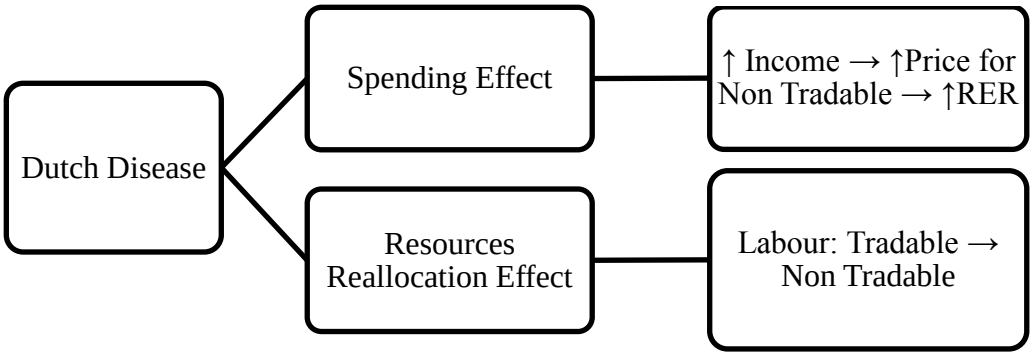
In our paper, Chapter 1 represents the introduction which generally describes the overview of important elements in our study as well as our main focus in the paper. Chapter 2 represents the literature review of past studies done on the related topic, followed by data description and methodology being employed in Chapter 3. Chapter 4 will illustrate our empirical results while Chapter 5 is about conclusion and limitation.

CHAPTER 2: LITERATURE REVIEW

2.0 Dutch Disease

The earlier work done by Corden and Neary (1982) has laid a strong foundation for the theory of Dutch Disease. They divided the economy into three sectors which are booming sectors (energy), lagging sectors (manufacture) as well as non tradable sectors (services). Booming sector and lagging sectors fall under tradable good category. Corden et al. (1982) has considered international trade theory (intersectoral factor mobility) when forming the model to test on the consequences of a boom in energy sector towards the income's functional distribution and profitability in lagging sector (manufactures). The researchers have sourced out the two major effect of the boom which are the spending effect and resources effect.

These two effect acts as the transmission mechanism for Dutch disease. As for spending effect, it is being understood that a higher income resulted in higher price for non tradable (services). Thus, lead to real appreciation in real exchange rate. On the other hand, resources movement effect occurs when the boom in energy sector resulted in the movement of labour from tradable goods sector to non tradable good sector. Then, increased wages in the non-tradable sectors appreciate the real exchange rate.



2.0.1 Oil & Other Natural Resources

Few researchers were keen to find out the relationship between resources boom (oil) and Dutch disease. Kutan and Wyzan (2005), E ́gert (2012) as well as Beine, Bos and Coulombe (2012) were focused on examining the relationship of real effective exchange rate of oil exporting countries and oil price to detect the presence of Dutch Disease.

Kutan and Wyzan (2005) found that oil prices significantly affect the real exchange rate movement and this indicated the presence of Dutch disease effect in Kazakhstan. They extended model of Balassa-Samuelson effect which include oil price beside its basic model consisting inflation, labor productivity. Labor productivity is found to be significant but the impact is smaller. Although the researchers mentioned that real appreciation may be due to factors other than Dutch disease effect, Kazakhstan still exposed to risk of Dutch disease in medium and long term.

Meanwhile, E ́gert (2012) found that there is presence of Dutch disease in most of the post soviet countries of Central and South –West Asia by running the nominal and real exchange rate models at first then run growth equations to find out the link between commodity price and real exchange rate as well as the impact of them on economic growth.

To convince the finding of E'gert's research, another research was conducted in Russia, Algieri (2012) detected the symptoms of Dutch disease by using VECM model. The results shown that oil price (Dutch disease effect), productivity changes (Balassa-Samuelson effect), government deficit and international reserves has a significant effect on real effective exchange rate.

There are also researches done on other resources such as American silver in Moctezuma (Drelichman, 2005). In his study, he adopted Markov-switching regression framework by using the

combination of existing price data to come up with price indexes for traded and non traded goods. He managed to prove that there is a persistent incline in relative price of non traded goods following the discovery of silver.

2.0.2 Capital Inflow

Natural resources are not the only way to have cause Dutch disease, capital inflow by any sources will contribute to the occurrence of Dutch disease. Mieiro, Ramos and Alves (2012) had analyzed the Dutch disease effect in Macao. Instead of oil boom, what concern to Macao is the gaming tourism boom which began to gain its light after 2002 gaming liberalization.

After the Chinese government removed existing barriers between Macao and mainland China, number of visitors increased sharply. Moreover, stock of Inward Direct Investment in Gaming, Hotels and Restaurants (adjusted by the implicit price deflator of Macau's Gross Domestic Product), which is also known as GT indicators, surged drastically. Thus, the authors proposed that currency flow was caused by GT revenues beside foreign aids and FDI.

Due to the GT sectors (services exporter to non-residents in domestic market) contributed more than 100% of its GDP growth in Macao. Therefore, Dutch disease effect is highly suspected. The final result is that there is presence of Dutch disease phenomena in the case of Macao due to GT boom.

However, Dutch disease phenomena only will have negative impact in long term if Macao has lose its gaming privileged position. Another research has been done on the tourism which found that sudden increase in tourism revenue will increase relative price of non-traded

good,subsequently, lead to de-industrialization of traded goods sector (Chao, Hazari, Laffargues, Sgro & Yu, 2006).

However, concept of Dutch disease later has been extended to include human resources (cheap labour) as the developing countries receive large inflow of capital due to cheap labour (Bresser-Pereira, 2008). The similar condition that would have caused Dutch disease pheonomena in the first place (natural resources boom).The channel of capital inflow might be different but it would have cause the similar effect (DD effect).

2.0.3 Foreign Aids

Based on the study of Rajan and Subramanian (2011), foreign aids are found to have caused the appreciation in real exchange rate. After the country receive aids, the money will be spent on expansion of non tradable services such as construction, health care, and education. Then, the wages in non tradable sector will increase and attract the labour from tradable sector to non tradable sector. Since the price of tradable is adjusted according to the world price, increase in wage will increase cost of production and shrink the tradable sector. On the other hands, higher wages increase the level of income within the country .When these extra incomes are being spent, it raises the relative price of non trade good to traded good. A rise in real exchange rate hurt the export sector. They implied that this is the reason why the export growth of tradable sectors is relatively low.

On the contrary, few literatures opposed to the study of Rajan et al. (2011) by stating that foreign aids not necessary stunted the economic growth with the presence of Dutch disease. Nkusu (2004) found that low-income countries not necessary will exhibit the symptoms of Dutch disease. This is because low income countries have not achieved full employment and efficient production as assumed in the Dutch disease theory. So,

increased demand of non traded goods induced by inflow of foreign aids is being satisfied by the vacant productive capacity.

Baldé (2011) agreed that remittances and foreign aids influence saving and investment positively. Fielding and Gibson (2012) further proposed that aid may be used for investment in tradable sectors and thereby alleviate the effect of exchange rate appreciation. Moreover, a combination of both high level of productivity in non traded good sector and investment surprisingly tend to depreciate real exchange rate. Bandara, Jemio shown that trade good sector investment in countries such as Mexico, Sri Lanka and Thailand is large enough to cover the effect of de-industrialization caused by foreign aids (as cited in Fielding & Gibson, 2012). However, there is indeed Dutch disease effect in countries such as Pakistan and Philippines. In other words, an appreciation of real exchange rate and decline in tradable sector were caused by inflow of foreign aids.

Again, the answer of which foreign aids will cause Dutch disease is uncertain due to different conditions in countries such as policy taken. For example, Botswana, Indonesia and Norway have avoided the Dutch disease through government policy as mentioned in the study of Hjort (2006).

2.1 Relationship between Remittances and Dutch Disease

2.1.1 Remittances as Blessing towards Economic Growth?

Few researches also supported the positive link between remittances and financial development tends to improve the economy in the home country (Chowdhury, 2011; Aggarwal, Demirgüç-Kunt & Pería, 2011; Giuliano & Ruiz-Arranz, 2009). A sound institution environment also plays an important role in attracting investment and securing the financial sector as well as quality services. It then encourages the household to use their saving (including remittances received) for investment purpose (Catrinescu, Leon-Ledesma, Piracha & Quillin, 2009). However, increase in remittances inflow might deteriorate the institutional quality (Abdih, Chami, Dacher & Montiel, 2011).

Özcan (2011) also found no evidence to support worker's remittances will cause Dutch disease effect in 10 developing countries being analyzed by using Pedroni's panel cointegration tests and FMOLS estimator. If remittances inflow is complement with policy tools and more liberalized trade system, it will have potential to improve these countries export structure.

On the other hands, Fayad (2010) and Yang (2008) suggested that remittances received will be transformed into investment to the home country. Fayad (2010) used dynamic pooled mean group (PMG) estimator to find out the Dutch disease treat imposed by remittances in a panel of net labour exporters in the Middle East and North African (MENA) region.

Fayad (2010) proposed that Dutch disease effect caused by remittances could be alleviated through migration-induced FDI due to international migration effect. Moreover, the productivity-enhancing depreciative effect of simultaneous FDI is found to have offsetting power

on the appreciative effect of remittances. Then he further argued that presence of an educated Diaspora provide sufficient knowledge for foreign investors and make them feel positive about the profitability of future FDI. However, the problem lies within how large must be of FDI as percentage of GDP in order to offset the large amount of remittances received as percentage of GDP. It certainly varies with different countries.

While Yang (2008) found that the behavior of household spending will varied with exogenous shocks to the income and wealth of migrants households. When there is favourable exchange rate shock that raises their initial income, the remittances will more likely to be spent on investment such as education for children. This again argued by Acosta, Lartey and Mandelman (2009) based on their finding that concluded remittances still causing Dutch disease regardless of whether remittances is being spent or invested.

2.1.2 Remittances as the Curse of Resources (Dutch Disease)?

However, remittances inflow has raised up the concern of losing competitiveness in international market will stunt the economic growth in long term. Economists pointed out the possibility of the countries to behave like "youngsters" nowadays which is "enjoy first, suffer later".

Amuedo-Dorantes and Pozo (2004) and Javaid (2011) argued that remittance will incur large inflow of capital, thereby causing the country to be infected by Dutch Disease. Amuedo-Dorantes et al. (2004) found that real exchange rate appreciated by 22% in their panel of 13 Latin American and Caribbean nations when remittance's transfer was doubled.

One of the interesting parts from this study is that the authors regard remittances as "private aids" while foreign aid is being quoted as "public aids". Remittances can be referred to different terms as in "capital

inflow', 'private aids' and so on. Different researches give rise to different term. As for our study, we regard remittances as "resources (labor) income".

Famous economist, Krugman (1987) has been aware of this issue (Dutch disease). In his opinion, he said that competitive advantages no longer based solely on underlying attributes of countries but through learning–by-doing. Therefore, favorable development, as in remittances inflow or resources boom, may lead to a loss of competitiveness in some sectors permanently due to appreciation of currency.

Vargas-Silva (2009) also supported the argument of Dutch disease where statistical result shown that the exchange rate explained the variation in remittances with high percentage. He also concluded that there is a positive shock to remittances which later appreciated the Mexico Peso. It means that the household convert portion of remittances received into local currency. This fitted the theory of spending effect which causes the appreciation of currency. In addition, he also used different approach which is developing a model that incorporating remittances and exchange rate as the determinants of money demand in Mexico.

Apart from using real exchange rate as dependent variables in most literature, Lartey, Mandelman and Acosta (2012) used sectorial output shares (agriculture, manufacturing and services) as regressands to capture resource movement effect. They suggested that this method is more superior in catching up the Dutch disease effect following an inflow of remittances. Not only that, this study also concern of exchange rate regime might alter the spending and resource movement effect of remittances.

The research done by Lartey et al. (2012) was based on an unbalanced panel data set consist of 109 developing and transition countries by using Generalized Method of Moments (GMM) estimation method. As the statistical result shown that 1% point increase in the

remittances to GDP ratio will cause 1% fall in the output ratio, it further confirm that remittances has a persistent impact on resources allocation.

In addition, Acosta, Lartey and Mandelman (2009) have developed a general equilibrium model of a small open economy using Bayesian methods and Salvadorian data. In their study, few conditions have been considered such that whether remittances are exogenously determined, countercyclical or act like capital inflows. It all ended up to one conclusion which is remittances lead to Dutch disease, it may be altruistically motivated or not. Put it in simple word, it means that whether remittances is being spent or invested, Dutch disease effect still existed.

2.2 Transmission Mechanism between Remittances and Dutch Disease

2.2.1 Spending Effect

Based on the most basic model proposed by Corden and Neary (1982), spending effect happen when remittances received is spent rather than being invested. Koc and Onan (2004) found that remittances are mostly spent on consumption in least developed country. About 80% of the households receiving remittances used remittances on daily expenses to improve their standard of living.

When the remittance received into the country, more income are available to spent, demands for both tradable and non-tradable goods will increase, and hence "spending effect", one of the phenomenon of Dutch Disease will take place and drive up the REER (Lartey, Mandelman & Acosta, 2012). When demands are higher for tradable and non tradable goods, both prices of tradable and non tradable goods will increase. Due to the increase of prices, the tradable sector's international competitiveness of

the country might be threatened because domestic consumers will more likely to buy foreign imported goods which relatively cheaper than the domestic goods.

As for the supply side, real exchange rate can be determined by supply side factors, also known as Balassa-Samuelson effect through the productivity differential. Productivity gain appreciates the real exchange rate are normally explained by the efficient usage of resources and technology available. The reason for substituting productivity differential with labor productivity is due to the data availability. Labor productivity is found to be negatively related to real exchange rate, which means real appreciation (Coricelli & Jazbec, 2004).

2.2.2 Resources Movement Effect

When the residents in the country have more income, they tend to increase their living standard by spending in the sectors such as healthcare services, education, hospitality, construction and other services. It in turn drives up the demand for in non-tradable sectors (Qin, 2006).

Higher demand and higher prices imply higher profits in the non-tradable sector, it will then be fulfilled by higher supply, and thereby, the suppliers in non tradable sector will produce more by increasing the labor demanded (attract more labors with higher wages) and investing more capital into this sector from the tradable sector which is less favorable. When wage rate in non tradable sector is higher, more labors tend to work in that sector instead of in the tradable sector, hence, the wage rate in tradable sector will as well increase as the result of reducing in labor supply, results an overall increase in wage rates. Given that the international price of traded good is fixed, the higher wage rate as one of the costs of production will burden the tradable good sector with lower profitability (Özcan, 2011; Rajan & Subramanian, 2011).

Consequently, the production in non tradable sector will increase in expense of tradable sector. This effect of remittances on reallocation of resources is termed as the "resource reallocation effect".

As inflow of remittance increases significantly, it raises the issue whether changing of major production sectors and restructuring economic activities happened Philippine. In this study, besides of validating the effect of remittances on real exchange rate, we will as well study the Dutch disease effect of remittance by investigating how remittance changes the resource allocation in different sectors of Philippines.

2.2.2.1 Tradable Sector

Manufacturing sector contributed to one of the larger sectors in tradable sector in most of the countries. According to the World Factbook, in calculating the world GDP for year 2012, manufactured goods contributed to the largest part of it in tradable goods. Hence, in order to detect the existence of Dutch disease, the trend of production in manufacturing sector will serve as the best indicators. When Dutch disease incurred, the real exchange rate will rise with a retrenchment in manufacturing production (Barajas, Chami, Fullenkamp, Gapen & Montiel, 2009). Meanwhile, it is found that the flow of remittance into manufacturing sector does not promote its growth (Agu, 2009).

Tradable sector also greatly depends on the contribution of agriculture sector. An increase in remittances will generate negative impact towards agriculture sector. This is because the remittances will promote growth in non productive investment such as construction for residential purpose instead of productive investment in agriculture sector (de Haas, 2006).

According to Lartey, Mandelman and Acosta (2012), both manufacturing and agriculture sectors in tradable sector have inverse response towards a rise in remittance receipt. Besides that, the relationship between remittance and external trade balance also found to be negative (Okodua & Olayiwola, 2013). In another way, it also represents that the net export from manufacturing and agricultural sectors in tradable sector has bad influence by remittance.

2.2.2.2 Non Tradable Sector

Non tradable sector mainly contributed by the service sector, which it is producing intangible goods. Therefore, unlike manufacturing and agricultural sectors, instead of using natural resources, service sector actually employed more of human capital (Soubbotina & Sheram, 2000).

When there is positive flow of remittance into a country, the increase of income level of the residents will promote the growth in this sector with higher demand for the production of this sector from different perspectives. Indirectly, the more human capital is needed in order to produce more to fulfill increasing demand in this sector. Hence, under the effect of remittances, the education (a type of services) in the country will be promoted due to the human capital with higher education level is demanded (Calero, Bedi & Sparrow, 2009).

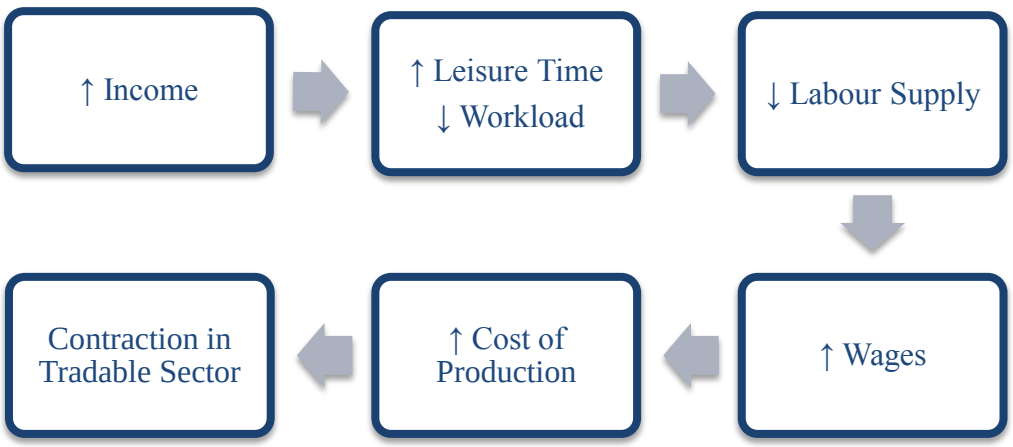
From another perspective, remittances receipt could be the effective tools in upholding service sector by channeling into the financial investments (Giuliano & Ruiz-Arranz, 2009). This can be proven by the study done by Demirgüç-Kunt, Córdova, Perá & Woodruff on 2011 in Mexico. Banks act as the middle person between depositors and recipients of remittances and charge fees according to the services used. At the same time, more banking products are demanded as the income level has increased when remittance flows in.

2.2.3 Labour Effect

Bayangos and Jansen (2011) came out with labour effect beside the famous spending effect and resources movement effect. Remittances inflow occurs is when the workers migrate out from their home country and send back their income to their country. As compared to other literature whose only concern for how outflow of workers affect the economy by sending back remittances, this study expose to a new era which emphasized on the effect of labour that are left behind.

The household receiving remittances will tend to reduce their workload and increase their leisure time when they have higher income. In other words, the labour market will shrink further and further. Demand for labor higher than supply of labor, wages level will increase and increase the cost of production. In the end, competitiveness of country will as the tradable industry facing diseconomies of scale.

Another researcher further implied that decline in labor supply also caused by increase in reservation wage of remittance's recipients. Higher wages lead to higher production cost. Thereby, tradable sector will shrink further (Acosta, Lartey & Mandelman, 2009). If labor effect happens in labor-exporting countries only, it fits the theory we tend to bring out in our study, whereby labor being categorized under "natural resources". The county is exporting the services out and the remittances received acts as the role of income from natural resources not as capital inflow.



2.3 Why is Analysis on Dutch Disease Providing Ambiguous Conclusion across the Countries?

When the researchers use different approach to detect Dutch disease, it will lead to different answer even as the research is done on the same country. We take Canada as an example. Beine, Bos and Coulombe (2012) argued that using bilateral CAD/USD exchange rate to examine the presence of Dutch disease in Canada economy is misleading due to the fact that there are other factors to affect USD which then causes the evolution of the CAD/USD exchange rate. Instead, they analyzed the effect of commodity price on the U.S currency and Canadian currency components separately. Then, they further look into impact of both currencies on the shares of manufacturing employment in Canada. They finally found out that Canada indeed exhibit symptoms of Dutch disease when the manufacturing sector has declined in between 2002 to 2008 regardless of which evolution of currency.

When the light all shed toward relationship of Dutch disease toward manufacturing sectors in the research done by Beverelli, Erba and Rocha (2011), Olusi and Olagunju (2005) emphasized on the agriculture sector instead of manufacturing sector in the case of Nigeria. They argued that traditional tradable sector (industrial sector) should be the agricultural sector in least developing countries. By taking agricultural sector as the traditional tradable sector, they found that there is indeed a presence of Dutch disease. This result is contradicted with the earlier studies which regarded manufacturing sector as the declining tradable sector.

There is also an exception of Dutch disease in a resources rich country. Pegg (2010) mentioned that Botswana has strong growth of economy for its export of diamonds but there is a little evident on the presence of resources movement effect as well as spending effect. Instead of appreciation of real

exchange rate, the problem of wages and labour productivity is being more concerned for their government.

In order to detect the presence of Dutch disease in a more precise and consistent way, different approaches and the focus on the study must be specially customized following the characteristic of certain country.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this chapter, we will investigate the presence of Dutch disease by looking at the relationship between the real effective exchange rate (REER) and remittances in Philippines. We are using simple linear regression model to test whether remittances significantly affect REER. An appreciation of REER due to increase in remittances indicate the presence of Dutch disease through spending effect.

We also discuss on how remittances will affect different sectors which are manufacturing, agriculture and services sectors respectively, to indicate the presence of the Dutch Disease through resources allocation effect. Thus, we are using another three simple regression models to analyze the effect of remittances based on the sectorial analysis of manufacturing, agriculture and services sectors.

Ordinary least square (OLS) is used to test for all models since we are using simple linear regression model and the sample size is small. In addition, we employ Autoregressive conditional heteroscedasticity, Breusch Godfrey serial correlation, LM test, Ramsey RESET test and Jarque-Bera (JB) test for diagnostic checking. After that, we use unit root test which is Augmented Dickey-Fuller (ADF) to test whether a data series contains any unit root. Last but not least, we also examine long run relationship between remittance and REER in Philippines by using Engle- granger 2 steps cointegration test. In this case, secondary data is used for all analysis on annual basis (1980-2011) in Philippines.

3.1 Data Description

In our study, we adopt time-series analysis to analyze the effects of remittance on REER in Philippines. We have collected 32 years of annual data from year 1980 to 2011 based on the availability of the data for all variables. The econometric methodology will be separated into two parts, where the first part is to examine the effect of remittances on REER (spending effect) whereas the second part is to observe the resources reallocation effect of Dutch disease by using sectorial analysis on the output of tradable and non tradable sectors.

For the first part of the econometric methodology, Real Effective Exchange Rate (REER) will be used as the dependent variable. Then, we will observe how remittance and other variables (inflation rate, labor productivity, exchange rate regime, financial crisis and an interaction term) affect the dependent variable. The REER index is directly collected from the World Bank with the base year of year 2005. We then convert its base year into year 2000 for data consistency purpose.

Then, we compute remittances as a share of GDP by dividing remittances (REM) in current USD with the nominal GDP in current USD. Both of the data are also adopted from World Bank as well as the annual percentage inflation rate in terms of consumer prices. We have found the data of labour productivity (LP) from the Yearbook of Labor Statistic published by the Bureau of Labor and Employment Statistics under the Department of Labor and Employment of Philippines. It is calculated by the GDP divided by the employed person; however, it is in terms of Philippines Peso. Therefore, we compute the labour productivity by using the nominal GDP in current USD divided by employed person adopted from the Labor Survey done by the National Statistics Office of the Republic of Philippines.

Two dummies are included in this equation, which are the exchange rate regime (DUM_E_) and financial crisis (DUM_F_). Moreover, we will like to see whether REM under the influence of exchange rate regime, will affect the REER at the same time. Therefore, we include an interaction term which is the multiplication of REM and the dummy of exchange rate regime.

For the sectorial tests in the second part of econometric methodology, we will use value added as a share of GDP for the agriculture, manufacturing and services sectors as the dependent variables and it can be adopted from the World Bank database. Remittances (REM) will be remaining as main independent variable in these equations.

Besides, we have added in some other variables to acts as the baseline. They are the trade openness (TO), terms of trade (TOT), GDP per capita (GDPpc), GDP growth, money and quasi money (M2) and a dummy variable, Oil Deregulation Law. GDPpc, GDP growth, TOT and M2 data are available in World Bank, but TO is not. Therefore we calculated TO by dividing the sum of exports and imports of goods and services by GDP in current USD. All the data used in this calculation are based on the data in World Bank. Both of the value indexes are collected from World Bank. In addition, we would also like to see how Oil Deregulation Law affects the sectors and hence its dummy (DUM_O_) is included.

Table 3.1 Sources of Variables

Variable	Source
Spending Effect	
Real effective exchange rate index (2005 = 100)	World Bank
Workers' remittances, receipts (BoP, current US$)	World Bank
GDP (current US$)	World Bank
Inflation, consumer prices (annual %)	World Bank
Employed Persons (In thousands)	Labor Survey done by the National Statistics Office of the Republic of Philippines.
Resources Reallocation Effect	
Manufacturing, value added (% of GDP)	World Bank
Agriculture, value added (% of GDP)	World Bank
Services, etc., value added (% of GDP)	World Bank
Workers' remittances, receipts (BoP, current US$)	World Bank
GDP (current US$)	World Bank
Money and quasi money (M2) as % of GDP	World Bank
Net barter terms of trade index (2000 = 100)	World Bank
Goods exports (BoP, current US$)	World Bank
Goods imports (BoP, current US$)	World Bank
GDP per capita (constant 2000 US$)	World Bank
GDP growth (annual %)	World Bank

3.2 Theoretical Framework

3.2.1 Model for Analysis on Dutch Disease through Spending Effect

According to Dutch disease theory, sudden income inflow due to resources boom will lead to an appreciation of exchange rate (Corden & Neary, 1982; Kutan & Wyzan, 2005; E ́gert, 2012; Algieri, 2012; Drelichman, 2005). While some researchers further their studies on analyzing the exchange rate movement based on Balassa-Samuelson effect (Coricelli & Coricelli, 2004; Broeck & Sløk, 2006). When the productivity growth is being boosted in traded sectors, it will increase the real wages in that sector. With wages level being fixed in the economy, wages in non traded sector therefore will rise too. Thus, it has an impact on real exchange rate. This is known as Balassa-Samuelson effect.

Apart from focusing solely on examining the relationship of remittances and real exchange rate in our study, we shall not neglect other determinants of real exchange rate. In short, we adopt our theoretical framework from Kutan and Wyzan (2005) which replaced the term of trade (de Gregorio & Wolf, 1994) with oil price as the function of real exchange rate. Labour productivity will be the proxy for measuring Balassa-samuelson effect .Inflation is included due to sticky prices of non traded good sector. The original model we adopted from Kutan et al. (2005) is as following:

$$RER = f\ (Productivity, inflation, oil\ price) \quad (1)$$

In detecting the presence of Dutch disease, real exchange rate is often being used as dependent variable whereas the remittance is being used as independent variable. An appreciation of real exchange rate due to inflow of remittances indicate that there is a Dutch disease effect (Lartey, Mandelman & Acosta, 2012; Javaid, 2011). Meanwhile, Kipici and Kesriyeli (1997) suggested that there is another way of calculating real exchange rate by using the basis of tradable goods and non tradable goods:

$$r_r = e\frac{P_t}{P_n}$$

The r_r in this equation represents the real exchange rate, e is the nominal exchange rate, whereas P_t and P_n are the international prices of tradable goods and prices of non tradable goods. As the prices of non tradable goods increase in relative to tradable prices, the ratio of prices of tradable good to non tradable good will decrease, which is defined as an appreciation in real exchange rate (Özcan, 2011).

However, real effective exchange rate is more accurate than real exchange rate as being discussed in the study of Beine et al. (2012). It is because an appreciation of bilateral exchange rate might be driven by either strength of one currency or weaknesses of another currency, by other means, it could not display the true effect of the changes in commodity prices toward exchange rate. Therefore, we will use real effective exchange rate as dependent variable in our study. REER also defined as the relative price of domestic to foreign goods.

As such, we modify the model by replacing oil price with remittances. The modified model will be displayed as following:

$$REER = f\ (Productivity, inflation, remittances) \quad (2)$$

$$REER_t = \beta_0 + \beta_1 REM_t + \beta_2 INF_t + \beta_3 LP_t + \varepsilon_t$$

3.2.2 Model for Analysis on Dutch Disease through Resources Allocation Effect

There are a lot of researches have been done on the topic of the resources reallocation effects to detect relationship between remittances and Dutch disease. Some literature found that remittance will promote productivity in service sector but there is limited evidence in supporting the argument that the growth in agriculture and manufacturing sectors will be boosted by remittances (de Hass, 2006; Agu, 2009; Lartey, Mandelman & Acosta, 2012). Among these researches, Lartey, Mandelman and Acosta (2012) have the similar objective with our study, which is to detect the resources reallocation effect caused by Dutch disease. Therefore we adopt the equation from their research as below:

$$Value\ Added_i = f\ (Remittances, GDP\ per\ capita, M2, Terms\ of\ Trade, Trade\ Openness, GDP\ Growth) \quad (3)$$

Where i = Manufacturing, Agricultural and Service

$$\text{Value added}_i = \beta_0 + \beta_1 REM_t + \beta_2 GDPPC_t + \beta_3 M2_t + \beta_4 TOT_t + \beta_5 To_t + \beta_6 GDPG_t + \varepsilon_t$$

Where i = Manufacturing, Agricultural and Service

The authors examine the relationship between the regressand, value added for manufacturing sector (% of GDP) with the regressors which are the remittances (% of GDP), GDP per capita, M2 (% of GDP), Terms of Trade, Trade Openness and GDP Growth in Equation 3. Later in the research, the authors replaced the value added for manufacturing sector (% of GDP) by the value added for agriculture and services sector in percentage of GDP to examine the effects of the same regressors on these two sectors.

When there is a higher GDP per capita or M2, output in manufacturing and services sectors will increase whereas the outputs in agriculture sector will reduce. As the residents have more income and money in hand, they will tend to demand more manufactured goods and leisure services. It leads to increase to production in these two sectors. However, these two factors will discourage the production in agriculture sector when more resources have been switched to the other sectors.

M2 in our study is representing the money supply of financial development. When the money supply growth will put the prices of non tradable goods increase, and the inflation will happen and the real effective exchange rate will appreciate. So that, monetary expansion discourages financial investment in local currency by lower interest rate. The temporary nominal depreciation will cause by low financial returns but not driven by fundamentals and given that the price is constant, this is call real depreciation.

According to an increase in the money supply will lead to devaluation of the country's currency (Kia, 2013). It is explained that when there is a higher supply of the currency, the prices of goods will be increased and inflation will be resulted in the long run. This will then lead

to lower exchange rate because the increase in prices will discourage exporting activities.

The result also shows that terms of trade is significantly positively related to all the three sectors. According to Özcan (2011), an improvement in TOT may generate income effect because an improvement in TOT will increase the purchasing power of the consumers and demand for more goods. Trade openness is also shows a significant positive relationship with agriculture and manufacturing sectors but significant negative relationship with services sector. A relaxation in trade regulation will encourage more exports of manufactured and agricultural goods and therefore the resources allocating in service sectors will reallocate into manufacturing and agriculture sector. However, the GDP growth has inverse relationship with agriculture and services sectors but it promotes manufacturing sector because investors will tend to invest in the manufacturing sectors instead of agriculture and services sectors.

In our study, we introduce four models. One of it is to detect the presence Dutch disease through spending effect, by observing the relationship between the real effective exchange rate and remittance. The other three models are to detect the presence of Dutch Disease through resources allocation effect, by looking at the relationship between the sectors (tradable and non tradable sector) and remittance. Manufacturing sector and agriculture sector will represent the tradable sectors whereas services sector will represent non-tradable sector.

3.3 Empirical Model

3.3.1 Detecting Dutch Disease through Spending Effect

In order to capture the effect of spending effect, we are using REER as the dependent variable. This is because large inflow of capital will lead to the incline in the demand for non-traded goods for remittances recipient household. Thus, an appreciation of appreciation of local currency due to large inflow of remittances, indicate the presence of Dutch disease. By using Ordinary Least Square (OLS) method, we form the model as below:

Dutch Disease equation (spending effect):

$$REER_t = \beta_0 + \beta_1 REM_t + \beta_2 INF_t + \beta_3 LP_t + \beta_4 IT_t + \beta_5 DUM\_F_{\_t} + \varepsilon_t \quad (4)$$

$REER_t$ = Real Effective Exchange Rate at time t

REM_t = Remittance (%) at time t

INF_t = Inflation (annual %) at time t

LP_t = Labor Productivity at time t

IT_t = REM*DUM at time t

$DUM\_E_{\_t}$= Exchange Regime at time t, where 0 = Floating Exchange Rate

1 = Managed Floating Exchange Rate.

DUM_F_t = Financial Crisis at time t, where 0 = No Crisis

1 = Crisis.

ε_t = Error term at time t

The equation 4 is to examine the effect of remittance (independent variable) on real effective exchange rate (dependent variable), along with other explanatory variables such as inflation, labour productivity, exchange rate regime, financial crisis and interaction term between remittance and DUM_E_ (exchange regime). When the remittance incline, an appreciation of REER indicate the presence of Dutch Disease. IT_t, Interaction term between remittance and DUM represent the dummy of exchange regime multiply with remittance. Interaction term means that the remittance will affect the real effective exchange rate though the influence of exchange rate regime (Lartey, Mandelman & Acosta, 2012).

Under the dummy of exchange rate regime (Dum_E_), in any given year, "0" is indicating a floating rate policy whereas "1" is indicating a managed float policy. Exchange rate regime is found to affect REER by few literatures (Mussa, 1986; Eichengreen, 1988; Baxter & Stockman, 1989). In 1980 to 1984, the exchange rate regime is floating exchange rate whereas the central bank of Philippines implements the managed floating exchange rate regime since 1985 to 2011 (Bagsic & Yap, 2008;Bautista, 2003). The reason we put "0" for floating rate policy is because exchange rate is totally free of government intervention. However, managed float policy means that there is still government intervention but the impact is lesser than fixed exchange rate regime.

As for financial crisis's dummy (Dum_F_), "1" will represent the existence of financial crisis and "0" as otherwise. As Philippines government finally turned to IMF for its IMF-World Bank stabilization

program due to financial crisis, the peso was devaluated (Solon & Floro, 1993). This is where outlier comes into play. Outlier in linear regression will lead to inaccurate results in modeling (Shakouri G &Nadimi, 2013). In order to correct the model, detection of such data by looking at its residual table enables us to lessen the impact of outliers. Thus, there is a need to put dummy in our model to capture the financial crisis effect.

3.3.2 Detecting Dutch Disease through Resources Allocation Effect

In order to capture resources allocation effect, we are using value added as a share of GDP for the agriculture, manufacturing and services sectors respectively to serve as the dependent variables. When remittances increase due to resources boom, the labour tends to move from tradable sectors to non tradable sector which offer higher wages. In other words, the growth of tradable sectors (manufacturing and agricultural sectors) will decline whereas the growth of non tradable sectors (services sectors) will incline. This indicates the presence of Dutch disease. Therefore, we need to look at the effect of remittances on the value added as a share of GDP for the agriculture, manufacturing and services sectors respectively.

By using Ordinary Least Square (OLS) method, we form the model as below:

$$AGRIVALUE_t = \beta_0 + \beta_1 REM_t + \beta_2 TOT_t + \beta_3 DUM\_E_t + \beta_4 DUM\_F_{\_t} + \beta_5 DUM\_O_{\_t} + \varepsilon_t \quad (5)$$

$$MANUVALUE_t = \beta_0 + \beta_1 REM_t + \beta_2 TOT_t + \varepsilon_t \quad (6)$$

$$SERVALUE_t = \beta_0 + \beta_1 REM_t + \beta_2 TOT_t + \beta_3 DUM\_E_{\_t} + \beta_4 DUM\_O_{\_t} + \varepsilon_t \quad (7)$$

$Agrivalue_t$ = Value Added of Agriculture Sector at time t

$Manuvalue_t$ = Value Added of Manufacturing Sector at time t

$Servalue_t$ = Value Added of Service Sector at time t

REM_t = Remittance at time t

$GDPPC_t$ = GDP per Capita at time t

TO_t = Trade Openness at time t

TOT_t = Term of Trade (in billions) at time t

$DUM\_E_{\_t}$ = Exchange Regime at time t, where 0 = Floating Exchange Rate

1 = Managed Floating Exchange Rate.

$DUM\_F_{\_t}$ = Financial Crisis at time t,

where 0 = No Crisis

1 = Crisis.

$DUM\_O_{\_t}$ = Oil Deregulation at time t,

where 0 = No oil deregulation policy

1=Oil deregulation policy

ε_t = Error term at time t

The equation 5, 6 and 7 are using same independence variable which are remittances and term of trade, to estimate the presence of the Dutch Disease. The only different in three of the equations is the dependent variable as well as the dummy variables. Dummy variable for equation 5 are policy of oil deregulation, exchange rate regime, and financial crisis effect whereas we do not put in any dummy variable in equation 6. As for equation 7, we put in two dummy variables which are policy of oil deregulation and exchange rate regime.

The concept of deregulation in oil market is similar with the one in the case of deregulation in energy market, where the deregulation in energy market is found to have negative effect on price level (Linden & Peltola-Ojala, 2010).). The increment in the oil price to an intolerable level causes a heavy burden to the Filipinos but it is still not ended yet until today (Philippine Revolution Web Central, 2013). Therefore, we will consider the implementation of the Oil Deregulation Law since 1997 to the last year in sample period which is year 2011.We indicate "0" before the law is applied and "1" after the law is applied.

3.4 Unit Root Test

We will use ADF test to determine whether a time series data contain a unit root. If the model contain unit root, it means that the series is not stationary. Therefore, it will lead to the problem of spurious regression. Spurious regression occur when one non-stationary variable regress on the other variable. Even if the R^2 is very high, it does not mean the variables are related. Therefore, we might overlook the result of the test. Other than this, assumptions of classic linear regression model

will be violated. We could not trust the result of hypothesis testing since the t-ratio is not accurate and consistent. One of the advantages of Augmented Dickey-Fuller test is that it can test for a larger and more complicated set of time series models (Kyung, Pesaran & Shin, 2003). Below is the equation for the ADF test:

$$\Delta Y_t = \beta_1 + \beta_{2t} + \theta Y_{t-1} + \alpha_i \sum \Delta Y_{t-t} + \varepsilon_t$$

In the model, Y_t is our variable of interest, Δ is the differencing operating, t is the time trend, ε is the white noise residual and $\beta_1, \beta_2, \theta, \alpha_1, \ldots, \alpha_m$ is a set of the parameters to be estimated. The test is focus on whether the coefficient θ equal to zero, that mean the original $Y_1, Y_2, \ldots, Y_N$ process has a unit root. So, the null and alternative hypotheses for unit root are:

$H_0: \theta = 0$ (Y_t is non- stationary series)

$H_1: \theta \neq 0$ (Y_t is stationary series)

The unit root hypothesis of the Augmented Dickey-Fuller (null hypothesis) will be rejected if the t-statistic from these tests is negatively less than the ADF critical value tabulated (Gujarati & Porter, 2009). In our study, we use ADF test to see whether each variables in stationary in their level form. If the variables are not stationary in level form, we will move on to test whether they are stationary in the form of first difference. Then, we use cointegration test to determine whether the variables are cointegrated in long run. If the variables are cointegrated in long run, the model can still be remained in their level form even when the series are not in stationary form.

3.5 Cointegration Test

If there are two (or more) series are cointegrated with each other to form an equilibrium relation, they tend to move closer and in the same direction over the time even though the series themselves are non-stationary. The concept of cointegration indicates the existence of a long-run relationship between the variables at which the economic system converges to an equilibrium point in long run. u_t can be interpreted as the disequilibrium error which means the distance that the system is away from equilibrium at time *t* (Gujarati & Porter, 2009). When the series is cointegrated, they would not move too far away from each other.

However, if the linear combination of two nonstationary I(1) variables able to cancel out the stochastic trend, the variables are said to be cointegrated and the result will be meaningful and consist of no spurious regression problem. The cointegration of two variables means that there is a long term or equilibrium relationship between them. If they are not cointegrated, their linear combination will be nonstationary and this will cause the error term to be nonstationary as well.In our study, we use cointegration test to determine whether there is a long-run relationship between remittances and REER.

3.5.1 Engle-Granger 2-Step Cointegration Test

Assume y_t be a (k×1) vector, then components of y_t are said to be cointegrated of order d, b, denoted, y_t~ CI (d, b), if

i. All the components of the vector y_t are I(d),
ii. There exists at least one vector of coefficients β (≠0), such that:

$$z_t = \beta' y_t \sim I(d - b).$$

The vector β is called the cointegrating vector. Usually we consider the case with d=b=1 (Engle-Granger, 1987). Engle-Granger 2-step cointegration test is use to determine the long-run relationship between different series. Ssekuma (2011) revealed that if the variables are found to be cointegrated, the OLS regression will generate the 'super consistent' estimators for the cointegrating parameter in the long run regression. In a way that it means that there is a very strong relationship between the estimated parameters, as the size of the sample gets larger, they will approach to their true value way faster than the usual estimator.

Step 1: Perform the cointegrating regression

$$Y_t = \beta_0 + \beta_1 X_t + u_t$$

And save the residual, $\widehat{u_t}$, t =1,2,…,T.

Step 2: Run unit root Test on the residuals

$$\Delta u_t = \gamma u_{t-1} + \sum \Delta u_{t-i}$$

The null hypothesis and alternative hypothesis as below:

H_0: $\gamma = 0$ (It has a unit root/no cointegration)

H_1: $\gamma = 0$ (It is stationary/cointegration)

If the p-value of t-statistic is less than 0.01, there is sufficient evidence to reject the H_0 which mean that the series is stationary or cointegrated.

3.6 Diagnostic Checking

Econometric problems such as heteroscedasticity, autocorrelation, model specification error, and the error term are not normally distributed might exist in estimated model. The results will become biased, inconsistent and inaccurate if the model suffers from all these problems. Thus, it is important to do diagnostic checking as to make sure that the estimated model is free from any econometrics problems.

3.6.1 ARCH Test for Heteroscedasticity

Heteroscedasticity means that the standard deviation and variance of each error term u_i are both constant. Symbolically it means:

$$(u_i^2) = \sigma^2 \text{ where } i = 1, 2, \ldots, n$$

Heteroscedasticity happens when the conditional variance of Y_i increases when X increases, causing the variance of Y_i to deviate from a constant value:

$$(u_i^2) = \sigma_i^2$$

Heteroscedasticity means the inconsistency of the variance of error terms. In our study, there is only time-series data. Therefore, we will apply ARCH test to detect heteroscedasticity problem due to this test is applied specifically for time-series data. Our null hypothesis is there is no

heteroscedasticity problem. The decision rule would be reject null hypothesis when P-value is lower than the level of significance, α. Otherwise, do not reject it. We include the number of lagged residuals from 1 to 5 and determine the minimum AIC and SIC among these 5 lagged residuals in order to find out the optimal lag length. After that, we will generate the output using E-Views with the optimal lag length we have selected. Based on the test statistics value or P-value of the auxiliary model, we will know whether the model contains heteroscedasticity problem or not.

3.6.2 Breusch-Godfrey Serial Correlation LM Test

Autocorrelation means that the independent variable is correlated with the error term and it is mostly occurred in time-series data. Breusch-Godfrey LM Test is much better than Durbin-Watson and Durbin h-tests because it takes into consideration higher orders of serial correlation and the lagged dependent variable. The null hypothesis is there is no autocorrelation problem. The decision rule would be reject null hypothesis when P-value of F-statistics is lower than the level of significance, α. Otherwise, do not reject it. When conducting the auxiliary model, we need to determine its optimal lag length using E-Views with the procedures. We need to indicate the number of lagged residuals from 1 to 5 and determine the minimum AIC and SIC based on the number of lagged residuals to determine the optimal lag length. After that, we will generate the output using E-Views and find out the P-value. Lastly, we will know whether the model contains autocorrelation problem or not.

3.6.3 Ramsey RESET Test

Ramsey RESET Test was developed by Ramsey in year 1969. It is very helpful in testing the model specification like the functional form of independent and dependent variables only. For this test, the null hypothesis is model specification is correct. The decision rule would be reject null hypothesis if P-value of F statistics is lower than level of significance, α. Otherwise, do not reject it.

We can use E-Views to conduct RESET Test with the procedures and specify the number of fitted terms of 1 in the regression test. Therefore, based on the P-value and level of significance, α, we can see whether there is model specification error or not. If the problem of model specification problem do exist in the model, it could have mean that the error consist of a relevant variables but omitted out from model, the model include irrelevant variables ,the model is in wrong functional form or we have committed error of measurement bias. Then, it leads to underfitting of a model (omitting relevant variables) or overfitting of a model (including irrelevant variables)

3.6.4 Jarque-Bera (JB) Test for Normality

Jarque-Bera Test is used to determine whether the error term follows normal distribution. The null hypothesis is error term is normally distributed. The decision rule would be reject null hypothesis if P-value of Jarque-Bera statistics is lower than the level of significance, α. Otherwise, do not reject it. We need to make sure that the test-statistics value is very

small as well as the P-value is higher than level of significance, α so that we can conclude that the error term does follow normal distribution.

This test is using skewness and kurtosis to measure the OLS residual by using the following method:

$$JB = [\frac{S^2}{6} + \frac{(K-3)^2}{24}]$$

CHAPTER 4: RESULTS AND INTERPRETATIONS

4.0 Introduction

In this chapter, we will present the estimated results on relationship of remittances and Dutch disease through spending effect. The second part in this chapter will present the estimated result of effect of REM on three sectors (agriculture, manufacturing and services) respectively. This represents the relationship of remittances and Dutch disease through resources allocation effect.

First of all, we adopt Augmented Dickey-Fuller (ADF) test to examine whether the series of each variables in our model is stationary (as shown in Table 4.1). When t statistic is greater than upper critical value, we may reject the null hypothesis of a unit root [I(1)]. Thus, it concludes that the series is stationary. We found that the series of variables (REER, REM, INF, LP, Agrivalue, Manuvalue, Servalue, GDPPC, TO, TOTNB, GDPG and M2) are stationary at first difference with constant and trend. The series must be in stationary form to prevent the error term to correlate with each other and causing the result to be not robust.

Next, we carry out diagnostic checking to find out the best model which is Model 6 (as shown in Table 4.2). While for measuring resources allocation effect, the best model is Model 6 (as shown in Table 4.3). Engle granger test is employed as to examine whether there is a long term relationship between REER and REM as well as the long run relationship between REM towards agricultural sector, manufacturing sector and services sectors respectively.

4.1 Unit Root Tests

The result of Augmented Dickey Fuller (ADF) test at level and first differenced form was shown in Table 4.1. The result of these tests considered the effect in the case of constant and constant with trend. Based on the Schwarz Information Criteria (SIC) for ADF test, we have selected the best number of lags length. As for the ADF test, the null hypothesis states that a series contains a unit root while the alternative hypothesis is the series is stationary by its nature. At the level form with constant, the series REER, REM, LP, AGRIVALUE, MANUVALUE, SERVALUE, GDPPC, TO, TOT and M2 are all not rejecting the null hypothesis at 1% levels of significance. Thus, REER, REM, LP, AGRIVALUE, MANUVALUE, SERVALUE, GDPPC, TO, TOT and M2 are containing a unit root or they are non stationary. When we proceed to level form with constant and trend, INF and GDPG are rejecting the null hypothesis at 1% levels of significance while MANUVALUE is rejecting the null hypothesis at 10% levels of significance. However, the REER, REM, LP, AGRIVALUE, SERVALUE, GDPPC, TO, TOT and M2 are failed to reject the null hypothesis at 1% levels of significance. This means that REER, REM, LP, AGRIVALUE, SERVALUE, GDPPC, TO, TOT and M2 are non stationary.

Next, we proceed to first difference of the ADF test with constant, the series REER, REM, INF, LP, AGRIVALUE, MAUNUVALUE, SERVALUE, TOT, GDPG and M2 are rejecting the null hypothesis at 1% levels of significance. Therefore, these series are stationary at first difference of the ADF test with constant. GDPPC is rejecting the null hypothesis at 10 % levels of significance but TO have failed to reject the null hypothesis at 1% levels of significance. Moreover, at first difference with constant and intercept, the t-statistic of all variables are rejecting the null hypothesis at 1% levels of significance except for TO is rejecting the null hypothesis at 5% levels of significance. Thus, the series are also stationary at first difference with constant and trend. In short, we will look at the first difference form with constant and trend.

Table 4.1 Results of Unit Roots Test for ADF Test

Variable	Level		First Difference	
	Constant	Constant and trend	Constant	Constant and trend
REER	-2.1464 (0)	-1.9011 (0)	-5.7501 (0) ***	-5.9802 (0) ***
REM	-0.7499 (0)	- 1.7294 (0)	-5.9956 (0) ***	-5.8880 (0) ***
INF	-3.6297 (1) **	-5.1468 (1) ***	-6.3728 (1) ***	-5.3709 (4) ***
LP	2.3128 (0)	-0.1129 (0)	-3.9223 (0) ***	-4.8999 (0) ***
Agrivalue	-0.7706 (0)	-1.6514 (0)	-5.0579 (0) ***	-4.9745 (0) ***
Manuvalue	-0.7137 (0)	-3.3491 (3) *	-5.9435 (0) ***	-5.9263 (0) ***
Servalue	-1.2046 (0)	- 1.8899 (0)	-6.1645 (0) ***	-6.4419 (0) ***
GDPPC	-0.0993 (1)	-1.4066 (4)	-2.9533 (0) *	-6.2925 (4) ***
TO	-1.9059 (2)	-0.2907 (0)	-2.1036 (1)	-3.9780 (0) **
TOT	-2.0179 (0)	-2.0034 (0)	-6.5621 (0) ***	-6.7284 (0) ***
GDPG	-3.6934 (1) ***	-4.8066 (4) ***	-6.9834 (4) ***	-7.2923 (4) ***
M2	-1.2078 (0)	-1.3645 (0)	-6.0862 (0) ***	-6.1341 (0) ***

*Note: ***, **, * indicate the rejection of the null hypothesis at 1%, 5%, and 10% significant levels. Values represent t-statistic of ADF test. Schwarz information criterion with a lag length of 4 is used in the ADF test.*

4.2 Analysis of Dutch Disease through Spending Effect

4.2.1 Comparison of Models

Based on Table 4.2, we begin with Model 1 which consists of REM, INF and LP on the right hand side of the equation. Our result shows that the

series REM is significant at 1% significance level whereas LP is only significant at 10% significant level. This equation is free from model specification and normality problem. However, it suffered from autocorrelation and heteroscedasticity problem as both of them reject the null hypothesis which states that there is no heteroscdasticy or no autocorrelation at 1% significance level. We suspect that the error terms are correlated with each other due to the changes in exchange rate regime since 1985, which is when Philippines government change its exchange rate regime from floating exchange rate regime to managed floating exchange rate regime.

Therefore, Model 2 is formed by including Dummy variable which is DUM_E_ which represents changes in exchange rate regime. From Model 2, it shows that REM, LP and DUM_E_ are significant at 1% significance level while INF is insignificant. The autocorrelation and heteroscedasticity problem are solved but the error terms is not normally distributed whereby the result of Jarque-Bera test (0.0000) is less than significant level at 1%. As for small sample size like in our study, normality assumption of OLS methods is very important. It because the OLS estimators will no longer become best, unbiased and consistent if this assumption is violated.

To solve the normality problem exists in Model 2, we proceed to Model 3 by including another Dummy variable which is DUM_F_ (economic crisis). From Model 3, it shows that REM, LP, DUM_E_ and DUM_F_ are all significant at 1% significance level while INF is still not significant. In this model, the normality problem have been solved but suffered from autocorrelation and model specification problem.

We then include one more variable which is the interaction term (IT) in Model 4 which made up by multiplying REM with DUM_E_. The

result shows that the model free from normality, autocorrelation, heteroscedasticity and model specification problem but the INF and DUM_E_ are not significant. The result shows that LP, DUM_F_ are significant at 1% significance level but REM and IT only significant at 10% significance level. Our main objective in this study is to find out the relationship between REER and REM, so a weak relationship of REM and REER prompt us to proceed with another model in order to get the best model.

From Model 5, we try to exclude the DUM_E_ variable. Although all variables are significant at 1% significance level and passed all diagnostic checking, we still suspect that model 5 have spurious regression problem because all the variable are stationary at I(1) while INF are stationary at I(0). Therefore, Model 5 might not be trusted.

Hence, we proceed to Model 6 by excluding the INF. The results show that all the variables are significant at 1% significant level and the model free from normality, autocorrelation and specification problem. However, the model is suffered from weak heteroscedasticity problem where the p-value of ARCH test (0.0778) smaller than 1% level of significance but this model still can be trusted after the Newey-West Test has been applied. Due to the spurious regression problem in Model 5, Model 6 is the best model among the seven models in which the model is free from all the normality, autocorrelation, heteroscedasticity and model specification problem. So, we will further interpret the result of Model 6 in next section.

For the Engle Granger test in Model 6, the null hypothesis states that the there is no cointegrating relationship between the variables. As the result shows that the t-statistic is smaller than lower critical value which is

to reject the null hypothesis at 1% level of significance, we conclude that there is at least one cointegrating relationship in the model.

As to determine whether there is a long term relationship between REER and REM, Engle Granger test is used to test the cointegration between them in Model 7. The result shows that there is significant at 5% level of significance which means there is long term relationship between REER and REM.

Table 4.2 Dutch Disease Effect through Spending Effect

Variables	REER						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
CONSTANT	106.5109***	136.3179***	139.9978***	100.3077***	96.7073***	99.8038***	124.1712***
	(8.6467)	(7.9786)	(6.0816)	(21.2199)	(4.3300)	(3.9154)	(3.7503)
REM	-3.5151***	-3.2590***	-2.8701***	52.5907*	57.4032***	58.9353***	-2.9285***
	(0.9238)	(0.6395)	(0.4906)	(28.5339)	(6.6052)	(6.6404)	(0.6799)
INF	0.5272	-0.1085	-0.2792	0.1845	0.2285		
	(0.3231)	(0.2500)	(0.1925)	(0.3007)	(0.1603)		
LP	0.0053*	0.0064***	0.0062***	0.0063***	0.0063***	0.0060***	
	(0.003033)	(0.0021)	(0.0016)	(0.0015)	(0.0015)	(0.0015)	
DUM_E_		-33.2587***	-38.8006***	-3.2631			
		(5.9051)	(4.6211)	(18.8014)			
DUM_F_			27.0007***	24.2121***	23.9114***	24.7721***	
			(5.8526)	(5.7449)	(5.3742)	(5.4412)	
IT				-55.2570*	-60.0538***	-61.7169***	
				(28.4252)	(6.5156)	(6.5314)	
Jarque-Bera (Probability)	0.1161***	0.0000	0.8518***	0.5868***	0.5905***	0.5654***	0.4380***
LM (2)	0.0052	0.4806***	0.0407*	0.2947***	0.3262***	0.6031***	0.0006
ARCH (1)	0.0016	0.9399***	0.3172***	0.4396***	0.4627***	0.0778**	0.0024
Ramsey RESET	0.2661***	0.4003***	0.0794**	0.7666***	0.8750***	0.1303***	0.5596
Engle-Granger (ADF)	-3.1007***	-5.3654***	-5.5116***	-5.0393***	-4.9797***	-5.1561***	-2.5792**

*Note: The asterisks *, **, *** indicate significancy at 10%, 5% and 1% level of significance respectively. T-statistic in parentheses.Values represent t-statistic of ADF test. Schwarz information criterion with a lag length of 7 is used in the ADF test.*

4.2. 2 Analysis of Model 6 (Table 4.2)

After conducting some tests, the final equation is chosen and interpretation on the estimated coefficients for the model is carried out:

$$REER = 99.8038 + 58.9353REM + 0.0060LP - 61.7169IT + 24.7721DUM\_F\_$$

(3.9154) (6.6404) (0.0015) (6.5314) (5.4412)

The sign of the coefficient of REM is consistent with our prior expectation which is the increase in remittance appreciates the real effective exchange rate (Tuaño-Amador, Claveria, Co & Delloro, 2007; Lartey, Mandelman & Acosta, 2012; Amuedo-dorantes & Pozo, 2004; Javaid, 2011; Vargas-Silva,2009).

We found that an increase in the remittances as a share of GDP resulted in an increase in real effective exchange rate, with coefficient significant at 1% level. Our result suggests that remittances inflow will increase the price level of non-tradable good, thereby appreciating real effective exchange rate. Subsequently, it leads us to believe that there is indeed a presence of Dutch disease in Philippines. It is consistent with our theory saying that remittances will tend to increase the income level of remittances-receiving household. When household's income level increase, their demand for non traded goods increase as they would probably spend more on education and housing which is categorized under non tradable sector (Adams JR & Cuecueca, 2010). It then pushes up the price of non-traded good and in the end real effective exchange rate increase. In this case, we consider spending effect does happen in Philippines.

Before we include the interaction term for Model 1 to Model 3, the coefficient sign for remittances is negative and the model suffered from various problems. Model 1 has heteroscedasticity and autocorrelation problems while error term in Model 2 is not normally distributed. Model 3 has autocorrelation as well as model specification problems. After we include interaction term in Model 4 to 6, the coefficient sign for remittances instantly change to positive. Model 6 being the best model, it also indicates that interaction term is very important to our model.

If we look solely at relationship between remittances and REER, it indicates presence of Dutch disease. When we look at Model 4, Dum_E_ that represent exchange rate regime is insignificant. In other words, exchange rate regime alone has not much effect on REER. But, remittances under the influence of exchange rate regime would have much larger effect on REER. Supported by the argument of Mandelman (2013) which found that there will be a sluggish real appreciation due to price rigidities under fixed nominal exchange rate regime, our result shows that managed floating exchange has lesser impact on REER as compared to floating exchange rate.

Besides the usual fixed nominal exchange rate regime and floating exchange rate regime, some countries such as Philippines adopts managed floating regime. Central bank will intervenes into foreign exchange rate partially and not exactly follow the demand and supply in market. This is to ensure their export will have a sustainable growth (Bofinger & Wollmershäuser, 2001). In our study, we found that there is indeed a difference between floating exchange rate regime and managed exchange rate regime as mentioned above.

Managed floating can't be categorized under fixed exchange rate regime nor managed exchange rate regime. But, we can't neglect the fact that they have different impact on REER. In other words, remittances under managed floating nominal exchange rate regime would still cause real appreciation of nominal exchange rate but the impact is in between under fixed exchange rate regime and floating exchange rate regime; larger than under fixed exchange rate regime but smaller than under floating exchange rate regime.

Besides that, the result shows that labor productivity has positive effect on real effective exchange rate. Productivity increase and real appreciation of exchange rate often capture by the Balassa-Samuelson effect, where the price level in the non-tradable sectors increases due to the higher wages as compared to the tradable sectors caused by the productivity increase. Other than that, it also can be explained by the increase in productivity tend to push up the capacity of exports, hence generate higher revenues due to the higher demand from world market, which in the end causing the price of imports to rise and lead to real appreciation (Lommatzsch & Tober, 2004).

Furthermore, the dummy variable captures the financial crisis that occurred in 1985 and 1997. When there is financial crisis in Philippines, the real effective exchange rate will fluctuate more than the real effective exchange rate without financial crisis.

4.3 Analysis of Dutch Disease Effect through Resources Allocation Effect

4.3.1 Comparison of Models

This table explores the relationship between remittances with the output of different sectors. We have tested the possible models by inclusion of different sets of regressors and we found that most of the models suffered from different problems, especially the normality and model misspecification problem. Few selected models have been listed in the table together with the best model we have found (the other models are included in Appendix 4).

Model 1 (Table 4.3) is the original model we adopted from the research by Lartey, Mandelman and Acosta. This model fits well in agriculture sector whereas it is found to have model misspecification error for services sectors. In the manufacturing and services sectors, GDPPC, TOT and GDPG are insignificant whereas only TO is insignificant in agriculture sector. Other that this, all the variable are stationary at I(1) while GDPG are stationary at I(0). We suspect that model 1 have spurious regression problem. Due to our small sample size, we suspect that we have included too much regressors in regressing the relationship between the outputs of the sectors.

Therefore, we tried to drop the variable GDPG out from the model and the result has been shown in Model 2 (Table 4.3). But the model misspecification problems in both of the sectors (manufacturing and

services sector) still cannot be solved and the model for agriculture sector is suffered from the normality problem. The variable TOT is insignificant in all the three sectors, meanwhile, GDPPC is insignificant in manufacturing and services sectors and TO is insignificant in agriculture sector.

Exactly the same case has happened in Model 3 (Table 4.4) when GDPPC and GDPG are not in included in the regression. In this model, we found that REM and TOT are insignificant in manufacturing and agriculture sectors. Besides that, TO is also found to be insignificant in agriculture sector model.

We move on to Model 4 (Table 4.4) whereby the equation involved only three regressors, which are remittances, TO and TOT. Equation of agriculture and service sector has suffered from model misspecification problems at 1% significance level. At the same time, the error terms in manufacturing and services sectors are found to have autocorrelation problem. The result of this test is reported in Model 4 with the application of Newey-West test to resolve the autocorrelation problem. We then notice that all the variables are significant in agriculture sectors, whereas in manufacturing sector, REM and TO are not significant and TOT is insignificant in services sector.

In Model 5 (Table 4.5), we only examine the relationships between the remittances, TOT and the outputs of the sectors. As all the sectors are suffering from autocorrelation problems, we employed Newey-West test to solve this issue. Besides that, there are insufficient evidences to support that manufacturing and services sectors are free from heteroskedasticity problem and the error term in agriculture sector are found to be not normally distributed. But, the other two sectors (manufacture and services) have not rejected the null hypothesis of normality test at 1% significance

level. Since all sectors has not suffer from model specification problem at 1% significance level and only TOT found to be insignificant in agriculture and services sector, we thereby generate another model by adding different dummies for the sectors. In the end, we found the best model for our sectorial test which is reported in Model 6.

In Model 6 (Table 4.5), the result for manufacturing sector is same with Model 5. The standard errors for the variables are more reliable after applying Newey-West test. For the agriculture sector, three dummies have been added, which are the exchange rate regime, financial crisis and oil deregulation dummy; whereas for services sector, dummies of exchange rate regime and oil deregulation are included. We found that Model 6 is the best for both of the sectors as they passed all the diagnostic checking tests.

We are using Engle Granger test in testing whether there is long run relationship between a series. If there is cointegration relationship between a series, the null hypothesis will be rejected. For the equation of agriculture sector in the Model 6, t-statistic for Engle Granger test is sufficient to reject null hypothesis at 1%, 5% and 10% significant level since the t-statistic is less than lower critical value means that, these series are cointegrating and the error term are stationary. So, there is long run relationship of agriculture sector against remittance and term of trade.

The equation for manufacturing sector in Model 6 shows that the series are cointegrating and the error term are stationary since the t-statistic for Engle Granger test in equation of manufacturing sector is less than lower critical value. Moreover, the p-value for manufacturing sector is sufficient evidence to reject null hypothesis at 10% level of significance. We can conclude that there are long run relationship between manufacturing sector, remittance and term of trade, but the impact of long run relationship is weak.

For the equation of services sector in Model 6, the t-statistic for Engle Granger test is sufficient evidence to reject null hypothesis at 5% and 10% level of significance because the t-statistic is less than lower critical value. So, we can conclude that the series of services sector are cointegrating and the error term was stationary. There is long run relationship between services sector, remittance and term of trade.

Table 4.3 Dutch Disease Effect through Resources Allocation Effect

Variable	Model 1			Model 2		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	27.3059***	43.2382***	29.0124***	27.7901***	37.5325***	30.8525***
	(1.7487)	(5.2938)	(8.1837)	(1.4782)	(4.8232)	(6.9043)
REM	0.0836**	-0.4141***	0.6530***	0.0886**	-0.4728***	0.6720***
	(0.0340)	(0.1192)	(0.1842)	(0.0377)	(0.1231)	(0.1763)
GDPPC	-0.0012	-0.0098***	-0.0038	-.0.0015	-0.0066*	-0.0048
	(0.0011)	(0.0034)	(0.0053)	(0.0010)	(0.0032)	(0.0046)
TO	0.0456***	-0.0371	-0.0936**	0.0456***	-0.0377	-0.0934**
	(0.0079)	(0.0241)	(0.0372)	(0.0078)	(0.0256)	(0.0366)
M2	-0.1289***	-0.1412***	0.4254***	-0.1298***	-0.1311***	0.4221***
	(0.0111)	(0.0336)	(0.0519)	(0.0108)	(0.0353)	(0.0506)
TOT	0.0097	-0.0520*	0.0704	0.0072	-0.0219	0.0607
	(0.0100)	(0.0302)	(0.0467)	(0.0086)	(0.0282)	(6.9043)
GDPG	-0.0130	0.1524**	-0.0491			
	(0.0241)	(0.0728)	(0.1126)			
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5865***	0.2479***	0.5774***	0.6402***	0.0001	0.5161***
LM (2)	0.2328***	0.8764***	0.2099***	0.2063***	0.8264***	0.2319***
ARCH (1)	0.5528***	0.2243***	0.4172***	0.7748***	0.3682***	0.4213***
RESET	0.0572**	0.1877***	0.0009	0.0594**	0.4605***	0.0012
Engle-Granger (ADF)	-6.2686***	-5.8853***	-4.0981***	-6.4095***	-5.2628***	-4.1067***

Table 4.4 Dutch Disease Effect through Resources Allocation Effect

Variable	Model 3			Model 4		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	25.8929***	28.9489***	24.5067***	19.2437***	21.5025***	44.7566***
	(0.7165)	(2.4174)	(3.2835)	(1.9273)	(2.6336)	(6.8158)
REM	0.0472*	-0.6598	0.5337***	-0.0474	-0.7657***	0.8218**
	(0.0254)	(0.0858)	(0.1166)	(0.1101)	(0.1845)	(0.3201)
GDPPC						
TO	0.0499***	-0.01830	-0.0791**	-0.0207	-0.0974***	0.1361**
	(0.0017)	(0.0250)	(0.0340)	(0.0186)	(0.0333)	(0.0553)
M2	-0.1340***	-0.1501***	0.4081***			
	(0.0107)	(0.0360)	(0.0489)			
TOT	0.0123	0.0013	0.0778**	0.0727***	0.0689**	-0.1062
	(0.0081)	(0.0272)	(0.0370)	(0.0196)	(0.0312)	(0.0716)
GDPG						
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5426***	0.0000	0.8131***	0.8128***	0.0146*	0.4143***
LM (2)	0.1504***	0.9134***	0.1078***	0.0007	0.0590**	0.0000
ARCH (1)	0.8041***	0.7166***	0.2403***	0.4014***	0.6094***	0.0170**
RESET	0.0287*	0.2702***	0.0039	0.0625*	0.0006	0.0009
Engle-Granger (ADF)	-5.5169***	-5.0355***	-4.0261***	-2.4040**	-3.2986***	-1.6437*

Table 4.5 Dutch Disease Effect through Resources Allocation Effect

Variable	Model 5			Model 6		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	19.4835***	22.6288***	43.1828***	19.4835***	21.4125***	43.6992***
	(1.8315)	(2.1968)	(6.3411)	(1.8315)	(1.1232)	(1.9019)
REM	-0.1253*	-1.1313***	1.3327***	-0.1253*	-0.2738***	0.3993***
	(0.0623)	(0.1094)	(0.2321)	(0.0623)	(0.0839)	(0.1291)
GDPPC						
TO						
M2						
TOT	0.0587***	0.0031	-0.0142	0.0587***	0.0368**	-0.0882***
	(0.0190)	(0.0259)	(0.0618)	(0.0190)	(0.0137)	(0.0232)
GDPG						
DUM_E_					-2.297***	7.5686***
					(0.4711)	(0.7954)
DUM_F_					3.2298***	
					(0.6878)	
DUM_O_					-6.7669***	6.2098***
					(0.6521)	(1.0413)
Jarque-Bera (Probability)	0.6840***	0.0000	0.9899***	0.6840	0.8352***	0.0916
LM (2)	0.0001	0.0037	0.0000	0.0001	0.9618***	0.1106
ARCH (1)	0.0555*	0.8022***	0.0050	0.0555	0.2739***	0.1606
RESET	0.2091***	0.1149***	0.1703***	0.2091	0.6466***	0.8721
Engle-Granger(ADF)	-1.8547*	-3.1405***	-1.9789**	-1.8547*	-5.5523***	-3.8732***

*Note: The asterisks *, **, *** indicate significancy at 10%, 5% and 1% level of significance respectively. T-statistic in parentheses.Values represent t-statistic of ADF test. Schwarz information criterion with a lag length of 7 is used in the ADF test.*

4.3.2 Analysis on Model 6 (Table 4.5)

$$AGRIVALUE_t = 21.4125 - 0.2738REM_t + 0.0368TOT_t -$$
$$(1.1232) \quad (0.0839) \qquad (0.0137)$$
$$2.2970DUM\_E\_t + 3.2298DUM\_F\_t - 6.7669DUM\_O\_t$$
$$(0.4711) \qquad (0.6878) \qquad (0.6521)$$

$$MANUVALUE_t = 19.4835 - 0.1253REM_t + 0.0587TOT_t$$
$$(1.8315) \quad (0.0623) \quad (0.0190)$$

$$SERVALUE_t = 43.6992 + 0.3993REM_t - 0.0882TOT_t +$$
$$(1.9019) \quad (0.1291) \qquad (0.0232)$$
$$7.5686DUM\_E\_t + 6.2098DUM\_O\_t$$
$$(0.7954) \qquad (1.0413)$$

In Model 6, we found that remittance is statistically negatively related to manufacturing and agriculture sectors at 10% and 1% level of significance respectively. Meanwhile, remittance is statistically positively related to services sector at 1% significance level. The result is consistent with our expected signs, which are negative for manufacturing and agriculture sectors and positive for service sector.

It is proven that, remittances do cause increasing output level in service sector at the expense of manufacturing and agriculture sectors, and Dutch disease caused by remittance does exist in Philippines. When remittances flow in, the demand for products and services from services sector will be driven up and more production is needed to fulfill higher demand. Wage level in services sector will increase and therefore attract more workers from tradable sector to change their job and work in non tradable sector. Given that wage level is same within the country, wage level is forced to increase in tradable sector (manufacturing and agricultural sector) and raise their cost of production. In the end,

production level of both manufacturing and agricultural sector falls as a result of increase in cost of production.

For another regressor in Model 6, which is TOT, an increase in TOT will lead to increase in manufacturing and agriculture productions and decrease in services sector. The result is consistent with our expected signs. In the research done by Spatafora and Warner in 1995, they concluded that TOT has negative impact on trade but it is positively related with services sector. The shocks in the TOT had lead to an increase in the residents' wealth and further lead to an increase in demand for non-tradable goods. However, in their case, there is absence of Dutch disease and therefore this may constitute to the reason why their result is vary with ours. Their result is in contradict with the result done by Adubi and Okunmadewa (1999), where they found that the higher TOT will lead to higher production in tradable sectors as higher profit can be earned from higher TOT. Furthermore, Özcan (2011) revealed that an improvement in TOT may cause an income effect where the people have more incomes resulted from the increase in wages. In this case, people spend more in manufactured and agriculture goods instead of those from services sectors.

Both of the government policies, the exchange rate regime and the oil deregulation law have generated negative effect on agriculture sectors but positive effect to the services sectors. These dummies are all significant at 1% level. There are different impacts of exchange rate regime on the volume of trade in different countries (Qian & Varangis, 1994). In some countries where the exchange rate regime is in higher level of volatility, it will cause the demand of export to decrease; however, it will increase in some countries as well. Our result is consistent with the research done by Baum, Caglayan and Ozkan (2004), the exchange rate volatility is positively related to trade. Under a floating rate regime, the exchange rate is more volatile and it will actually cause a positive effect on level of export on agricultural products. This can be explained by when

there is a floating rate regime, the price of exported commodities will be increased, and the level of production tends to increase as higher profits can be earned from exporting. However, when the regime is changed into managed floating, the fluctuation will be reduced and level of production in agriculture level will be reduced. Then the resources will flow into service sectors and promote production in services sectors.

In the case of oil deregulation law, when the law is being implemented, the agriculture sector production is lower than when there is not; however, the service sector production is higher than when the law is not implemented. Gamboa (2013) and Suarez (2013) revealed that the oil deregulation law has lead to a sharp increase in oil related product. The persistent co movement does exist between the commodities prices (Alquist & Coibion, 2013). When the prices of oil related products are higher, the other commodities' prices will also be higher and then lead to a decrease in the agriculture production as demand decreases. The resources will then shift to the services sectors because the demand in services sectors is relatively higher.

However, when there is financial crisis, it will positive statistically affect the agriculture sector production at 1% significance level. The production in agriculture sector will be higher in facing financial crisis than when there is no financial crisis. According to Ikhsan (2010), financial crisis seems to attacks modern sectors such as construction and management instead of agriculture sector. In fact, financial crisis had caused serious drop in the world commodity prices. As the prices of tradable goods dropped, input prices plunged as well which is favorable for tradable sectors. At the same time, financial crisis will leads to depreciation in Philippines Peso, in turn, it enhances the trades for some tradable products (Rolando, 2009).

CHAPTER 5: CONCLUSION, LIMITATION AND RECOMMENDATION

5.0 Conclusion

Before conducting our study, we noticed that there are two researches done on Philippines but both finding are different. Özcan (2011) found absence of Dutch disease in Philippines but Bayangos and Jansen (2011) tell the otherwise. We divided the literature into two main groups whereby one group supporting the view of remittances bring in large capital inflow that boosted the investments (Catrinescu, Leon-Ledesma, Piracha & Quillin, 2008) whereas the other group argued that the remittances is most probably spend based on personal needs which would have cause Dutch disease in the end (Koc & Onan, 2013; Adams JR & Cuecueca, 2010). One literature neither support nor object to it, but, it says that either way (spend or invest), still will lead to Dutch disease (Acosta, Lartey & Mandelman, 2009). In our study, we basically more biased towards the later.

As we stress on the natural resources country will tend to rely too much on exporting their resources, the country tend to grow slower due to losing competitiveness in export sector (Murshed & Serino ,2011). We generate a hypothesis that regards labor as the natural resources and that labour exporting country will rely too much on exporting labour, thus, the country will lose competitiveness of export as the manufacturing sector deteriorated along the booming of natural resources.

The mechanisms in which remittances would cause Dutch disease effect through two major channels, remains the same. One of the channels is through spending effect. By using OLS method to test on the effect of remittances (independent variable) on REER (dependent variable), we found that an increase

in the percentage of remittances to GDP resulted in an increase in real effective exchange rate by index 57.4032. When remittances increase the income level of remittances receiving households, demand of non traded goods will increase. Given the price of tradable goods is adjusted according to the world market, the increase in price of non traded will then lead to the appreciation of REER. If the home country's currency is strengthened, the export goods will become more expensive as compared to the goods in foreign countries. Therefore, export drop and might create deficit in trade balance.

The other channel, resources allocation effect, has found to be significant in our study as well. The increase in remittances tend to increase the output in services sector but decrease the output in manufacturing sector and agriculture sectors at the same time. This is because demand for non traded good increase when the income level of remittances-receiving household increase. Therefore, labour will be demanded more in the non traded sectors and wages level will increase. Labour thereby moves from tradable sectors to non tradable sector. As provided that the wage level is same across the country, tradable sector forced to increase the wage of workers. This will increase the cost of production in tradable sector and further shrink the tradable sector. Beside the influence of exchange rate regime and financial crisis, our result also suggests that the implementation of oil regulation will affect agricultural sector negatively but has a positive effect on services sector.

To answer our main objective which is whether remittances inflow will lead to the presence of Dutch disease in Philippines, the answer is yes as our results show that remittances do cause the appreciation of REER in 1980-2011 as well as it caused an increasing output level in service sector at the expense of manufacturing and agriculture sectors. Two findings fitted well of the symptoms of Dutch disease as we mentioned earlier. Besides, we also found that managed floating exchange has lesser impact on REER as compared to floating exchange rate.

Last but not least, we also found that there is indeed long run relationship existed between remittances and REER. It means that remittances would not come as a shock and cause Dutch disease spontaneously. Instead, it takes time to show its true effect. Put it in a simple way, remittances initially come as a great help towards the economic growth but the 'side effect' slowly accumulated and turn into a 'disease' in long term.

5.1 Limitations and Recommendation

One of the limitations is that we only managed to get annual data from 1980 to 2011 due to finite samples. So, the sample size is quite small (32 samples) and it is not sufficient enough as we plan to conduct this research from year 1980 quarter one to 2011 quarter four. Due to some variables such as the inflation rate are not recorded based on quarterly or monthly basis, this make it more difficult to collect higher frequency data. It may leads to a biased estimation as the error terms of the model might not be normally distributed.

Moreover, the amount of remittances receipts in Philippines might have been underestimated according to Tuaño-amador, Claveria, Co and Delloro (2007). The senders of remittances might remit their income back to Philippines via different channels. The collection method of data for the amount of remittances receipt is based on the usual and formal channel, which is through the banking system. However, the amount of remittances remitted back through the informal channels is not reported appropriately. Therefore, there is high possibility that the official reported amount of remittances has been underestimated. In addition, there are changes in the reporting system on the remittances in year 1998. As a result, the amount of remittances receipt in year 1998 showed a significant increment.

We suspect that the amendment on reporting system may cause inconsistency in the data.

The hypothesis we have made in which we considered labour can be categorized under natural resources and that remittances acts as the role of revenue from natural resources, still lack of evidence to prove the theory although our statistical results do suggest that it could be that way. Therefore, we recommend economists and future research could look into this issue. In addition, our statistical result do shows that labor-exporting country (Philippines in our case) exhibit symptoms of Dutch disease. As such, we also recommend researchers to do a panel analysis on few labor-exporting countries in future so to find out whether they will exhibit the symptoms of Dutch disease just as in our case.

As to curb the issue of Dutch disease, Philippines government could adopt policy adjustment such as exchange rate devaluation or accumulation of budget surpluses. As in the case of Indonesia, these two approaches helped them to avoid 'Dutch disease" (Usui, 1996; Priyati, 2009). Exchange rate devaluation is said to be able to reverse the real exchange rate and reduce the impact of Dutch disease toward declining of tradable sectors. As for accumulation of budget surpluses approach, the government is said to sterilize the extra revenue due to oil boom. By accumulating the surpluses, it turned into government deposits. Then, they need to carry our demand management policy to sustain the devaluation effect. Devaluation of exchange rate further boosts the manufacturing sector.

The Philippines government can as well generate a more proper orientation of the remitters and recipients of remittances. The purpose of doing this is to channel the remittances to flow into the more appropriate sectors and as to take the most beneficial actions to the country. For instance, the remittances will be penetrated to the sectors that contributed to the biggest part of the external trade sectors of Philippines. And so the remittances will be used in with more

productively way at the same time, the external trade balance can be sustained (Okudua & Olayiwola, 2013).

There is also literature mentioned that Dutch disease effect could be offset if the country is specializing in resources–intensive manufacturing industries. In their study, Rybczynski theorem is applied which also means that an increase in the endowment of one factor will increase by a greater proportion the output of the commodity intensive in that factor and will reduce the output of the other commodity, holding commodity price constant. If the countries consume more of it resources as input (oil) in domestic manufacturing sector, it helps to eliminate the potential of deindustrialization due to resources boom (Beverelli, Erba & Rocha, 2011).

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APPENDIX

Appendix 1: Definition

According to the World Bank

Real effective exchange rate: The nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.

Workers' remittances: Current transfers by migrants who are employed or intend to remain employed for more than a year in another economy in which they are considered residents.

GDP: The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Inflation as measured by the consumer price index: The annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.

Manufacturing value added: The net output of the manufacturing sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.

Agriculture value added: The net output of agriculture sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.

Services value added: The net output of services sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.

Money and quasi money (M2): The sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.

Net barter terms of trade index: The percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000.

Goods exports: All movable goods (including nonmonetary gold) involved in a change of ownership from residents to nonresidents. The category includes goods previously included in services: goods received or sent for processing and their subsequent export or import in the form of processed goods, repairs on goods, and goods procured in ports by carriers.

Goods imports: All movable goods (including nonmonetary gold) involved in a change of ownership from nonresidents to residents. The category includes goods previously included in services: goods received or sent for processing and their subsequent export or import in the form of processed goods, repairs on goods, and goods procured in ports by carriers.

GDP per capita: Gross domestic product divided by midyear population.

GDP growth: Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars.

According to Investopedia

Trade Openness: Trade Liberalization or the removal or reduction of restrictions or barriers on the free exchange of goods between nations. This includes the removal or reduction of both tariff (duties and surcharges) and non-tariff obstacles (like licensing rules, quotas and other requirements). The easing or eradication of these restrictions is often referred to as promoting "free trade."

According to Economic Glossary

Employed Persons: People who are actively engaged in the production of goods and services. This is one of three official categories used to classify individuals by the Bureau of Labor Statistics (BLS) based on information obtained from the Current Population Survey..

Appendix 2: List of Developing Countries

Europe & Central Asia	
Albania	Macedonia, FYR
Armenia	Moldova
Azerbaijan	Montenegro
Belarus	Romania
Bosnia and Herzegovina	Russian Federation
Bulgaria	Serbia
Georgia	Tajikstan
Kazakhstan	Turkey
Kosovo	Turkmenistan
Kyrgyz Republic	Ukraine
Latvia	Uzbekistan
Lithuania	
Middle East & North Africa	
Algeria	Libya
Djibouti	Morocco
Egypt, Arab Rep.	Syrian Arab Republic
Iran, Islamic Rep.	Runisia
Iraq	West Bank and Gaza
Jordan	Yemen, Rep.
Lebanon	
Sub-Saharan Africa	
Angola	Malawi
Benin	Mali
Botswana	Mauritania
Burkina Faso	Mauritius
Burundi	Mozambique
Cameroon	Namibia
Cape Verde	Niger
Central African Republic	Nigeria
Chad	Wranda
Comoros	Sao Rome and Principe
Congo, Dem. Rep.	Senegal
Congo, Rep.	Seychelles
Cote d'Ivoire	Sierra Leone
Eritrea	Somalia
Ethiopia	South Africa
Gabon	South Sudan
Gambia, The	Sudan
Ghana	Swaziland
Guinea	Tanzania
Guinea-Bissau	Togo
Kenya	Uganda

Lesotho	Zambia
Liberia	Zimbabwe
Madagascar	
East Asia & Pacific	
American Samoa	Myanmar
Cambodia	Palau
China	Papua New Guinea
Fiji	Philippines
Indonesia	Samoa
Kiribati	Solomon Islands
Korea, Dem. Rep.	Thailand
Lao PDR	Timor-Leste
Malaysia	Tonga
Marshall Islands	Tuvalu
Micronesia, Fed. Sts.	Vanuatu
Mongolia	Vietnam
Latin America & Caribbean	
Antigua and Barbuda	Guyana
Argentina	Haiti
Belize	Honduras
Bolivia	Hamaica
Brazil	Mexico
Chile	Nicaragua
Colombia	Panama
Costa Rica	Paraguay
Cuba	Peru
Dominica	St. Lucia
Dominican Republic	St. Vincent and the Grenadines
Ecuador	Suriname
El Salvador	Uruguay
Grenada	Venezuela, RB
Guatemala	
South Asia	
Afghanistan	Maldives
Bangladesh	Nepal
Bhutan	Pakistan
India	Sri Lanka

Appendix 3: Dutch Disease Effect through Spending Effect (Model 6)

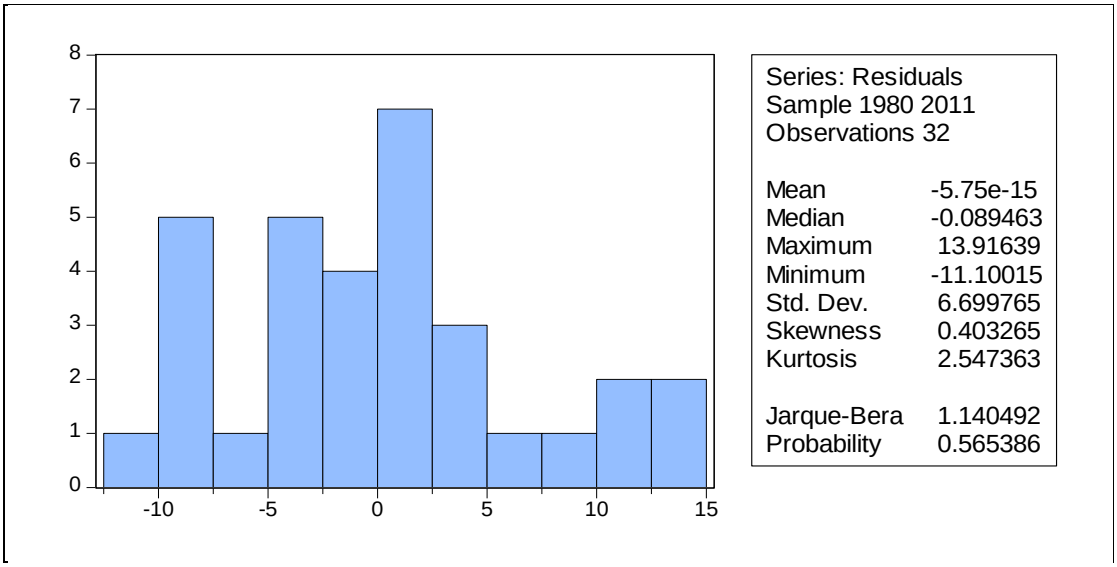
Ordinary Least Square (OLS)

Dependent Variable: REER
Method: Least Squares
Date: 07/18/13 Time: 21:36
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	58.93525	6.640424	8.875224	0.0000
LP	0.006031	0.001501	4.018021	0.0004
DUM1	24.77205	5.441183	4.552695	0.0001
IT	-61.71693	6.531449	-9.449194	0.0000
C	99.80376	3.815397	26.15816	0.0000

R-squared	0.876110	Mean dependent var	112.9105
Adjusted R-squared	0.857756	S.D. dependent var	19.03451
S.E. of regression	7.178910	Akaike info criterion	6.922773
Sum squared resid	1391.492	Schwarz criterion	7.151794
Log likelihood	-105.7644	Hannan-Quinn criter.	6.998687
F-statistic	47.73387	Durbin-Watson stat	1.878857
Prob(F-statistic)	0.000000		

Normality Test



Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.408003	Prob. F(2,25)	0.6693
Obs*R-squared	1.011473	Prob. Chi-Square(2)	0.6031

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/18/13 Time: 21:39
Sample: 1980 2011
Included observations: 32
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-0.700066	6.855271	-0.102121	0.9195
LP	-2.24E-05	0.001539	-0.014560	0.9885
DUM1	-1.976355	6.515566	-0.303328	0.7641
IT	0.652155	6.738722	0.096777	0.9237
C	0.436124	3.963267	0.110042	0.9133
RESID(-1)	0.099511	0.231031	0.430727	0.6704
RESID(-2)	-0.170375	0.201907	-0.843830	0.4068

R-squared	0.031609	Mean dependent var	-5.75E-15
Adjusted R-squared	-0.200805	S.D. dependent var	6.699765
S.E. of regression	7.341687	Akaike info criterion	7.015654
Sum squared resid	1347.509	Schwarz criterion	7.336284
Log likelihood	-105.2505	Hannan-Quinn criter.	7.121934
F-statistic	0.136001	Durbin-Watson stat	1.962644
Prob(F-statistic)	0.990203		

Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	3.233204	Prob. F(1,29)	0.0826
Obs*R-squared	3.109505	Prob. Chi-Square(1)	0.0778

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/18/13 Time: 21:39
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30.86900	12.34049	2.501440	0.0183
RESID^2(-1)	0.314935	0.175148	1.798111	0.0826

R-squared	0.100307	Mean dependent var	44.84721
Adjusted R-squared	0.069283	S.D. dependent var	55.31260
S.E. of regression	53.36210	Akaike info criterion	10.85442
Sum squared resid	82577.91	Schwarz criterion	10.94693
Log likelihood	-166.2435	Hannan-Quinn criter.	10.88458
F-statistic	3.233204	Durbin-Watson stat	2.018639
Prob(F-statistic)	0.082578		

Ramsey RESET Test

Ramsey RESET Test:

F-statistic	1.928189	Prob. F(1,26)	0.1767
Log likelihood ratio	2.289280	Prob. Chi-Square(1)	0.1303

Test Equation:
Dependent Variable: REER
Method: Least Squares
Date: 07/18/13 Time: 21:40
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	288.2265	165.2540	1.744143	0.0929
LP	0.024860	0.013640	1.822596	0.0799
DUM1	116.7494	66.45354	1.756858	0.0907
IT	-299.5255	171.3791	-1.747737	0.0923
C	247.7256	106.5925	2.324044	0.0282
FITTED^2	-0.014877	0.010713	-1.388593	0.1767

R-squared	0.884664	Mean dependent var	112.9105
Adjusted R-squared	0.862484	S.D. dependent var	19.03451
S.E. of regression	7.058607	Akaike info criterion	6.913733
Sum squared resid	1295.422	Schwarz criterion	7.188559
Log likelihood	-104.6197	Hannan-Quinn criter.	7.004830
F-statistic	39.88551	Durbin-Watson stat	1.966792
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Unit Root Test

Null Hypothesis: MODEL6 has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.156148	0.0000
Test critical values:	1% level	-2.641672	
	5% level	-1.952066	
	10% level	-1.610400	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MODEL6)
Method: Least Squares
Date: 07/18/13 Time: 21:53
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MODEL6(-1)	-0.944849	0.183247	-5.156148	0.0000

R-squared	0.469780	Mean dependent var	-0.091544
Adjusted R-squared	0.469780	S.D. dependent var	9.334801
S.E. of regression	6.797251	Akaike info criterion	6.702640
Sum squared resid	1386.078	Schwarz criterion	6.748897
Log likelihood	-102.8909	Hannan-Quinn criter.	6.717719
Durbin-Watson stat	1.972112		

Appendix 4: Empirical Result for Other Model (Spending Effect)

Variables	REER					
	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
CONSTANT	145.5224***	145.2892***	120.8075***	112.4312***	118.3225***	148.9333***
	(5.0470)	(4.6509)	(2.8216)	(3.8947)	(7.9757)	(7.7915)
REM	-1.9459***	-1.5169**	43.5258***	57.3225***	-2.4899**	-2.0462***
	(0.5397)	(0.6850)	(5.8738)	(6.8271)	(0.9698)	(0.5727)
INF					0.4533**	-0.1647
					(0.2104)	(0.2842)
LP						
DUM	-29.7828***	-33.3673***	-8.7948*			-31.5757***
	(5.8777)	(5.9361)	(5.0861)			(6.7028)
DUM1		25.7247***	25.6497***	25.2733***		
		(7.5394)	(7.6512)	(7.2103)		
IT			-45.0618***	-58.9097***		
			(5.9248)	(6.3890)		
Jarque-Bera (Probability)	0.4294	0.4595	0.5809	0.5036	0.4295	0.2559
LM (2)	0.2561	0.0437**	0.0389**	0.0452**	0.0018***	0.1559
ARCH (1)	0.8313	0.5573	0.6909	0.6613	0.0038***	0.6888
Ramsey RESET	0.0421**	0.1212	0.7992	0.7144	0.1533	0.8816
Engle-Granger (ADF)	-4.0038***	-3.4263***	-3.4149***	-3.4680***	-2.6417***	-4.0259***

Variables	REER					
	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19
CONSTANT	152.2659***	114.1421***	110.7363***	114.6207***	133.9532***	133.9136***
	(5.1814)	(24.3696)	(4.3547)	(10.2304)	(5.7411)	(4.3616)
REM	-1.6897**	51.7268*	56.2751***	-3.8932***	-3.2060***	-2.7622***
	(0.6816)	(29.6108)	(701484)	(0.7298)	(0.6186)	(0.4669)
INF	-0.3378**	0.1084	0.1498			
	(0.1299)	(0.3970)	(0.1195)			
LP				0.0047***	0.0065***	0.0064***
				(0.0017)	(0.0021)	(0.0012)
DUM	-37.3172***	-3.0839			-32.1022***	-35.5989***
	(5.6987)	(22.8370)			(5.1921)	(5.3001)
DUM1	27.6867***	25.0067***	24.7224***			25.3694**
	(9.7493)	(7.5790)	(6.4507)			(9.6878)
IT		-53.2109*	-57.7445***			
		(24.3696)	(6.7227)			
Jarque-Bera (Probability)	0.5564	0.5927	0.5976	0.1915	0.0000***	0.6680
LM (2)	0.0235**	0.0057***	0.0123**	0.0010***	0.5141	0.0388**
ARCH (1)	0.6856	0.6973	0.7021	0.0016***	0.7556	0.0351**
Ramsey RESET	0.5149	0.3884	0.6109	0.4557	0.7696	0.2978
Engle-Granger (ADF)	-3.6886***	-3.3240***	-3.2953***	-2.6267**	-5.3733***	-5.2134***

Appendix 5: Dutch Disease Effect through Resource Allocation Effect (Model 6)

Ordinary Least Square (OLS)

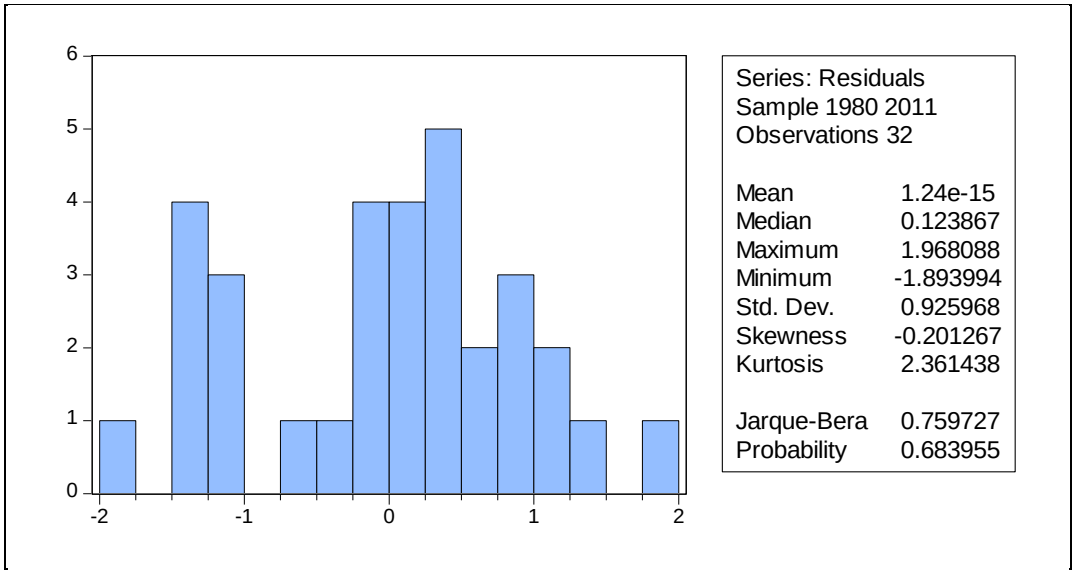
Manufacturing sector

Dependent Variable: MANUVALUE
Method: Least Squares
Date: 07/18/13 Time: 22:17
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-0.125254	0.042803	-2.926299	0.0066
TOT	0.058682	0.014817	3.960386	0.0004
C	19.48354	1.271042	15.32879	0.0000

R-squared	0.459557	Mean dependent var	23.93677
Adjusted R-squared	0.422285	S.D. dependent var	1.259566
S.E. of regression	0.957366	Akaike info criterion	2.839797
Sum squared resid	26.57993	Schwarz criterion	2.977210
Log likelihood	-42.43676	Hannan-Quinn criter.	2.885346
F-statistic	12.32983	Durbin-Watson stat	0.487759
Prob(F-statistic)	0.000133		

Normality Test\



Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	17.80182	Prob. F(2,27)	0.0000
Obs*R-squared	18.19888	Prob. Chi-Square(2)	0.0001

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/18/13 Time: 22:22
Sample: 1980 2011
Included observations: 32
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.000794	0.029448	0.026969	0.9787
TOT	0.010079	0.010852	0.928781	0.3612
C	-0.884728	0.938274	-0.942931	0.3541
RESID(-1)	0.755891	0.194473	3.886863	0.0006
RESID(-2)	0.047976	0.210403	0.228021	0.8213

R-squared	0.568715	Mean dependent var	1.24E-15
Adjusted R-squared	0.504821	S.D. dependent var	0.925968
S.E. of regression	0.651594	Akaike info criterion	2.123811
Sum squared resid	11.46352	Schwarz criterion	2.352832
Log likelihood	-28.98098	Hannan-Quinn criter.	2.199725
F-statistic	8.900908	Durbin-Watson stat	2.114958
Prob(F-statistic)	0.000102		

Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	3.890155	Prob. F(1,29)	0.0582
Obs*R-squared	3.666593	Prob. Chi-Square(1)	0.0555

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/18/13 Time: 22:23
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.571840	0.221340	2.583544	0.0151
RESID^2(-1)	0.346024	0.175438	1.972348	0.0582

R-squared	0.118277	Mean dependent var	0.849877
Adjusted R-squared	0.087873	S.D. dependent var	0.994818
S.E. of regression	0.950105	Akaike info criterion	2.797851
Sum squared resid	26.17826	Schwarz criterion	2.890367
Log likelihood	-41.36670	Hannan-Quinn criter.	2.828009
F-statistic	3.890155	Durbin-Watson stat	1.453153
Prob(F-statistic)	0.058173		

Ramsey RESET Test

Ramsey RESET Test:

F-statistic	1.415325	Prob. F(1,28)	0.2442
Log likelihood ratio	1.577961	Prob. Chi-Square(1)	0.2091

Test Equation:
Dependent Variable: MANUVALUE
Method: Least Squares
Date: 07/18/13 Time: 22:23
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-1.606660	1.245946	-1.289511	0.2078
TOT	0.758726	0.588617	1.288998	0.2079
C	109.5739	75.73741	1.446760	0.1591
FITTED^2	-0.249730	0.209915	-1.189674	0.2442

R-squared	0.485560	Mean dependent var	23.93677
Adjusted R-squared	0.430442	S.D. dependent var	1.259566
S.E. of regression	0.950583	Akaike info criterion	2.852986
Sum squared resid	25.30103	Schwarz criterion	3.036203
Log likelihood	-41.64778	Hannan-Quinn criter.	2.913717
F-statistic	8.809384	Durbin-Watson stat	0.529412
Prob(F-statistic)	0.000284		

Augmented Dickey-Fuller Unit Root Test

Null Hypothesis: MODEL6M has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.854722	0.0614
Test critical values:	1% level	-2.641672	
	5% level	-1.952066	
	10% level	-1.610400	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MODEL6M)
Method: Least Squares
Date: 07/18/13 Time: 22:26
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MODEL6M(-1)	-0.231391	0.124758	-1.854722	0.0735

R-squared	0.095774	Mean dependent var	-0.057292
Adjusted R-squared	0.095774	S.D. dependent var	0.654799
S.E. of regression	0.622653	Akaike info criterion	1.922073
Sum squared resid	11.63091	Schwarz criterion	1.968330
Log likelihood	-28.79213	Hannan-Quinn criter.	1.937151
Durbin-Watson stat	1.861393		

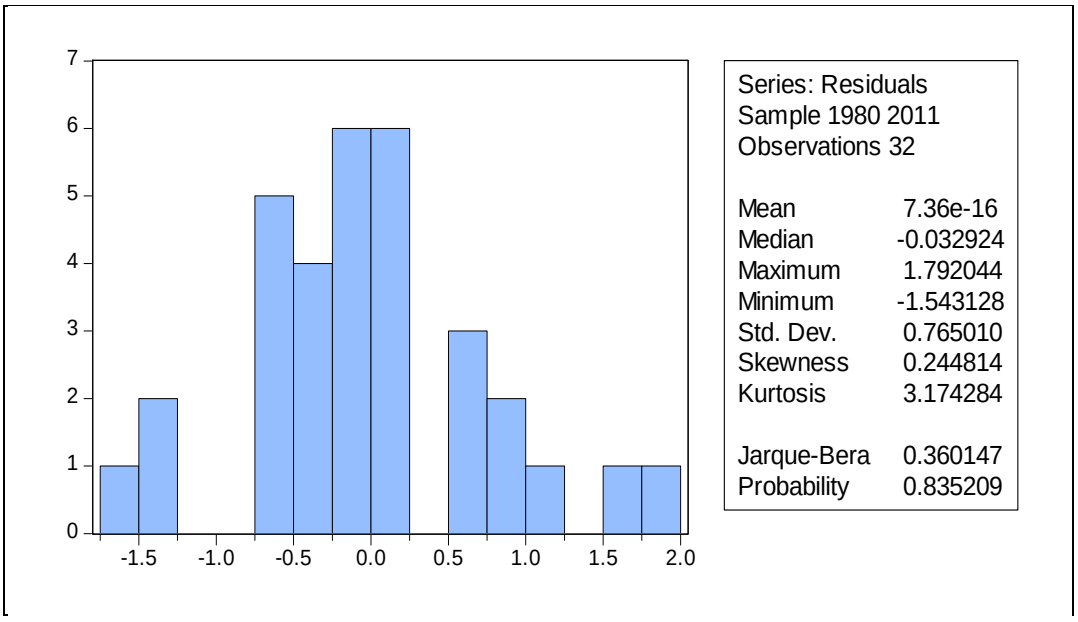
Agriculture sector

Dependent Variable: AGRIVALUE
Method: Least Squares
Date: 07/18/13 Time: 22:28
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-0.273835	0.083932	-3.262580	0.0031
TOT	0.036754	0.013665	2.689694	0.0123
DUM_E_	-2.296923	0.471117	-4.875483	0.0000
DUM_F_	3.229755	0.687752	4.696108	0.0001
DUM_O_	-6.766923	0.652085	-10.37737	0.0000
C	21.41249	1.123220	19.06349	0.0000

R-squared	0.976123	Mean dependent var	18.54218
Adjusted R-squared	0.971531	S.D. dependent var	4.950826
S.E. of regression	0.835336	Akaike info criterion	2.645395
Sum squared resid	18.14244	Schwarz criterion	2.920221
Log likelihood	-36.32632	Hannan-Quinn criter.	2.736492
F-statistic	212.5833	Durbin-Watson stat	2.021197
Prob(F-statistic)	0.000000		

Normality test



Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.029312	Prob. F(2,24)	0.9711
Obs*R-squared	0.077974	Prob. Chi-Square(2)	0.9618

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/18/13 Time: 22:29
Sample: 1980 2011
Included observations: 32
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-0.002420	0.088264	-0.027415	0.9784
TOT	-0.000531	0.014704	-0.036132	0.9715
DUM_E_	0.008952	0.493126	0.018154	0.9857
DUM_F_	0.037166	0.734778	0.050581	0.9601
DUM_O_	0.021958	0.694577	0.031613	0.9750
C	0.033481	1.206613	0.027748	0.9781
RESID(-1)	-0.009236	0.212791	-0.043404	0.9657
RESID(-2)	0.052106	0.223370	0.233270	0.8175

R-squared	0.002437	Mean dependent var	7.36E-16
Adjusted R-squared	-0.288519	S.D. dependent var	0.765010
S.E. of regression	0.868385	Akaike info criterion	2.767955
Sum squared resid	18.09823	Schwarz criterion	3.134389
Log likelihood	-36.28729	Hannan-Quinn criter.	2.889418
F-statistic	0.008375	Durbin-Watson stat	1.993242
Prob(F-statistic)	0.999999		

Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	1.165109	Prob. F(1,29)	0.2893
Obs*R-squared	1.197356	Prob. Chi-Square(1)	0.2739

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/18/13 Time: 22:29
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.468525	0.187001	2.505459	0.0181
RESID^2(-1)	0.196684	0.182216	1.079402	0.2893

R-squared	0.038624	Mean dependent var	0.583487
Adjusted R-squared	0.005474	S.D. dependent var	0.858160
S.E. of regression	0.855809	Akaike info criterion	2.588801
Sum squared resid	21.23984	Schwarz criterion	2.681316
Log likelihood	-38.12641	Hannan-Quinn criter.	2.618959
F-statistic	1.165109	Durbin-Watson stat	1.905084
Prob(F-statistic)	0.289305		

Ramsey RESET Test

Ramsey RESET Test:

F-statistic	0.164746	Prob. F(1,25)	0.6883
Log likelihood ratio	0.210183	Prob. Chi-Square(1)	0.6466

Test Equation:
Dependent Variable: AGRIVALUE
Method: Least Squares
Date: 07/18/13 Time: 22:29
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-0.338458	0.180630	-1.873764	0.0727
TOT	0.049716	0.034826	1.427583	0.1658
DUM_E_	-3.348416	2.634480	-1.270997	0.2154
DUM_F_	4.627134	3.513017	1.317139	0.1997
DUM_O_	-9.546760	6.880759	-1.387458	0.1775
C	26.49390	12.57116	2.107515	0.0453
FITTED^2	-0.010409	0.025645	-0.405889	0.6883

R-squared	0.976279	Mean dependent var	18.54218
Adjusted R-squared	0.970586	S.D. dependent var	4.950826
S.E. of regression	0.849086	Akaike info criterion	2.701327
Sum squared resid	18.02367	Schwarz criterion	3.021957
Log likelihood	-36.22123	Hannan-Quinn criter.	2.807607
F-statistic	171.4891	Durbin-Watson stat	1.849702
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Unit Root Test

Null Hypothesis: MODEL6A has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.552292	0.0000
Test critical values:	1% level	-2.641672	
	5% level	-1.952066	
	10% level	-1.610400	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MODEL6A)
Method: Least Squares
Date: 07/18/13 Time: 22:30
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MODEL6A(-1)	-1.012741	0.182400	-5.552292	0.0000

R-squared	0.506803	Mean dependent var	-0.002646
Adjusted R-squared	0.506803	S.D. dependent var	1.105580
S.E. of regression	0.776427	Akaike info criterion	2.363498
Sum squared resid	18.08516	Schwarz criterion	2.409755
Log likelihood	-35.63421	Hannan-Quinn criter.	2.378576
Durbin-Watson stat	1.961002		

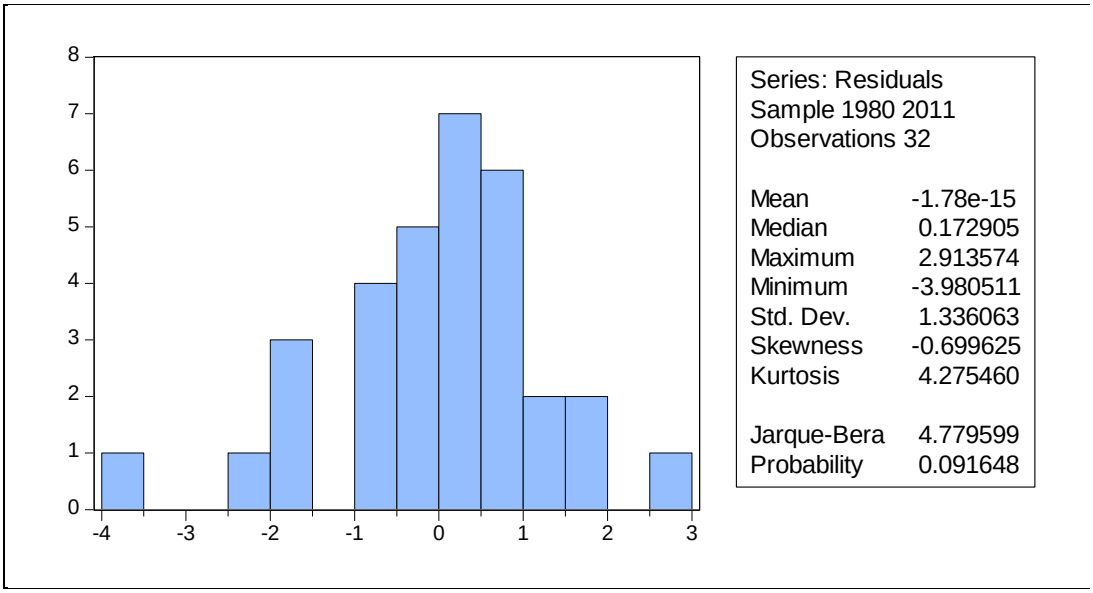
Service sector

Dependent Variable: SERVALUE
Method: Least Squares
Date: 07/18/13 Time: 22:32
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.399281	0.129107	3.092639	0.0046
TOT	-0.088243	0.023169	-3.808677	0.0007
DUM_E_	7.568613	0.795416	9.515294	0.0000
DUM_O_	6.209757	1.041261	5.963691	0.0000
C	43.69916	1.901884	22.97677	0.0000

R-squared	0.956074	Mean dependent var	47.11060
Adjusted R-squared	0.949567	S.D. dependent var	6.374817
S.E. of regression	1.431614	Akaike info criterion	3.698083
Sum squared resid	55.33699	Schwarz criterion	3.927104
Log likelihood	-54.16932	Hannan-Quinn criter.	3.773997
F-statistic	146.9187	Durbin-Watson stat	1.316791
Prob(F-statistic)	0.000000		

Normality test



Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.995151	Prob. F(2,25)	0.1571
Obs*R-squared	4.404565	Prob. Chi-Square(2)	0.1106

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/18/13 Time: 22:32
Sample: 1980 2011
Included observations: 32
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.086743	0.140973	0.615321	0.5439
TOT	0.013194	0.023671	0.557412	0.5822
DUM_E_	0.018207	0.768261	0.023700	0.9813
DUM_O_	-0.793254	1.154379	-0.687169	0.4983
C	-1.068450	1.937259	-0.551526	0.5862
RESID(-1)	0.326021	0.200572	1.625455	0.1166
RESID(-2)	0.176365	0.229535	0.768357	0.4495

R-squared	0.137643	Mean dependent var	-1.78E-15
Adjusted R-squared	-0.069323	S.D. dependent var	1.336063
S.E. of regression	1.381597	Akaike info criterion	3.674997
Sum squared resid	47.72026	Schwarz criterion	3.995627
Log likelihood	-51.79996	Hannan-Quinn criter.	3.781277
F-statistic	0.665050	Durbin-Watson stat	1.895991
Prob(F-statistic)	0.678391		

Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	1.966406	Prob. F(1,29)	0.1714
Obs*R-squared	1.968539	Prob. Chi-Square(1)	0.1606

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/18/13 Time: 22:32
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.318017	0.651658	2.022557	0.0524
RESID^2(-1)	0.251850	0.179600	1.402286	0.1714

R-squared	0.063501	Mean dependent var	1.759423
Adjusted R-squared	0.031208	S.D. dependent var	3.227682
S.E. of regression	3.176918	Akaike info criterion	5.212041
Sum squared resid	292.6914	Schwarz criterion	5.304556
Log likelihood	-78.78664	Hannan-Quinn criter.	5.242199
F-statistic	1.966406	Durbin-Watson stat	1.949040
Prob(F-statistic)	0.171444		

Ramsey RESET Test

Ramsey RESET Test:

F-statistic	0.021054	Prob. F(1,26)	0.8858
Log likelihood ratio	0.025902	Prob. Chi-Square(1)	0.8721

Test Equation:
Dependent Variable: SERVALUE
Method: Least Squares
Date: 07/18/13 Time: 22:33
Sample: 1980 2011
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.271238	0.892200	0.304010	0.7635
TOT	-0.062322	0.180191	-0.345869	0.7322
DUM_E_	5.670178	13.10881	0.432547	0.6689
DUM_O_	4.447116	12.19409	0.364694	0.7183
C	37.58457	42.18535	0.890939	0.3811
FITTED^2	0.003037	0.020932	0.145099	0.8858

R-squared	0.956110	Mean dependent var	47.11060
Adjusted R-squared	0.947669	S.D. dependent var	6.374817
S.E. of regression	1.458295	Akaike info criterion	3.759773
Sum squared resid	55.29222	Schwarz criterion	4.034599
Log likelihood	-54.15637	Hannan-Quinn criter.	3.850870
F-statistic	113.2777	Durbin-Watson stat	1.304076
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Unit Root Test

Null Hypothesis: MODEL6S has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.873191	0.0003
Test critical values:	1% level	-2.641672	
	5% level	-1.952066	
	10% level	-1.610400	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MODEL6S)
Method: Least Squares
Date: 07/18/13 Time: 22:36
Sample (adjusted): 1981 2011
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MODEL6S(-1)	-0.668639	0.172633	-3.873191	0.0005

R-squared	0.333354	Mean dependent var	0.003572
Adjusted R-squared	0.333354	S.D. dependent var	1.558491
S.E. of regression	1.272483	Akaike info criterion	3.351544
Sum squared resid	48.57641	Schwarz criterion	3.397802
Log likelihood	-50.94893	Hannan-Quinn criter.	3.366623
Durbin-Watson stat	1.871746		

Appendix 6: Empirical Result for Other Model (Resources Effect)

Variable	Model 7			Model 8		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	28.7014***	35.7811***	39.1143***	23.9978***	39.6150***	39.9252**
	(1.0048)	(3.1576)	(4.8209)	(4.0582)	(10.0695)	(17.5372)
REM	0.0955**	-0.4778***	0.7394***	0.0729	-0.4258	0.6883
	(0.0374)	(0.1175)	(0.1794)	(0.1202)	(0.2564)	(0.5060)
GDPPC	-0.0018*	-0.0066**	-0.0081*	-.0.0034	-0.0122	0.0035
	(0.0010)	(0.0030)	(0.0046)	(0.0032)	(0.0072)	(0.0141)
TO	0.0487***	-0.0539**	-0.0709*	-0.0256*	-0.1151***	0.1412**
	(0.0073)	(0.0228)	(0.0348)	(0.0150)	(0.0270)	(0.0520)
M2	-0.1336***	-0.1162***	0.3915***			
	(0.0100)	(0.0314)	(0.0480)			
TOT				0.0598***	0.0282	-0.0946
				(0.0197)	(0.0425)	(0.0741)
GDPG	-0.0018	0.0926	0.0319	-0.0532	0.1083	0.0837
	(0.0211)	(0.0664)	(0.1014)	(0.0508)	(0.1223)	(0.1821)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5816	0.0892*	0.5774	0.7552	0.4077	0.2970
LM (2)	0.2285	0.5967	0.2099	0.0006***	0.0318**	0.0000***
ARCH (1)	0.9258	0.5633	0.4172	0.2495	0.1796	0.0028***
RESET	0.2478	0.2688	0.0009***	0.0567*	0.5402	0.0085***
Engle-Granger (ADF)	-6.4267***	-4.7384***	-4.0981***	-3.4953***	-3.7967***	-1.9167*

Variable	Model 9			Model 10		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	27.7764***	42.8550***	28.0454***	25.6543***	29.5268***	23.6634***
	(2.6061)	(5.4265)	(8.8689)	(0.07436)	(2.5389)	(3.4421)
REM	0.1771***	-0.4903***	0.4608**	0.0524*	-0.6725***	0.5522***
	(0.0535)	(0.1113)	(0.1722)	(0.0257)	(0.0878)	(0.1191)
GDPPC	-0.0033**	-0.0080**	0.0006			
	(0.0016)	(0.0033)	(0.0072)			
TO				0.0483***	-0.0144	-0.0848**
				(0.0075)	(0.0257)	(0.0348)
M2	-0.0799***	-0.1812***	0.3246***	-0.1309***	-0.1575***	0.4190***
	(0.0105)	(0.0220)	(0.0457)	(0.0110)	(0.0374)	(0.0507)
TOT	0.0329**	-0.0708**	0.0229	0.0153*	-0.0060	0.0884**
	(0.0136)	(0.0283)	(0.0393)	(0.0085)	(0.0289)	(0.0391)
GDPG	-0.0146	0.1537**	-0.0457	-0.0242	0.0587	-0.0857
	(0.0359)	(0.0747)	(0.1325)	(0.0215)	(0.0735)	(0.0996)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5675	0.0023***	0.4878	0.5582	0.0000***	0.26984
LM (2)	0.0593	0.5715	0.0012***	0.2198	0.9408	0.1286
ARCH (1)	0.5584	0.4631	0.0565	0.6766	0.7305	0.3549
RESET	0.0002***	0.7249	0.0096***	0.0550*	0.2809	0.0033***
Engle-Granger (ADF)	-3.7157***	-6.5489***	-2.5755**	-5.3252***	-5.1421***	-4.0432***

Variable	Model 11			Model 12		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	28.7222***	34.6929***	38.7395***	25.9409***	35.6639***	36.8688**
	(0.9556)	(3.1127)	(5.8911)	(3.1754)	(7.8436)	(15.6333)
REM	0.0958**	-0.4949***	0.7335***	0.0935	-0.4678*	0.6559
	(0.0365)	(0.1189)	(0.2167)	(0.1183)	(0.2392)	(0.4615)
GDPPC	-0.0018*	-0.0055*	-0.0077	-0.0046*	-0.0097	0.0054
	(0.0009)	(0.0029)	(0.0059)	(0.0027)	(0.0058)	(0.0122)
TO	0.0486***	-0.0467**	-0.0685*	-0.0274*	-0.1115***	0.1439***
	(0.0069)	(0.0226)	(0.0381)	(0.0153)	(0.0267)	(0.0490)
M2	-0.1335***	-0.1197***	0.3903***			
	(0.0098)	(0.0319)	(0.0598)			
TOT				0.0504***	0.0218	-0.0799
				(0.0175)	(0.0356)	(0.0801)
GDPG						
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5904	0.0002***	0.6131	0.9179	0.3045	0.2271
LM (2)	0.2404	0.6720	0.0539*	0.0003***	0.0512*	0.0000***
ARCH (1)	0.9620	0.4760	0.4990	0.1596	0.4156	0.0014***
RESET	0.2467	0.7228	0.0029***	0.0105**	0.2543	0.0109**
Engle-Granger (ADF)	-6.4412***	-4.8772***	-3.3577***	-2.4116**	-3.8103***	-1.8592*

Variable	Model 13			Model 14		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	28.3248***	37.0910***	29.7592***	33.6300***	40.0690***	24.6725**
	(1.8512)	(4.9176)	(7.7356)	(2.5102)	(5.1302)	(10.5784)
REM	0.1829***	-0.5508***	0.4788***	0.1600	-0.4217*	0.5503
	(0.0470)	(0.1136)	(0.1685)	(0.1367)	(0.2131)	(0.4793)
GDPPC	-0.0036**	-0.0048	-0.0004	-0.0084***	-0.0124**	0.0115
	(0.0016)	(0.0031)	(0.0063)	(0.0027)	(0.0048)	(0.0112)
TO				-0.0214	-0.1149***	0.1345***
				(0.0138)	(0.0265)	(0.0463)
M2	-0.0808***	-0.1716***	0.3217***			
	(0.0121)	(0.0227)	(0.0461)			
TOT	0.0300***	-0.0407	0.0139			
	(0.0066)	(0.0257)	(0.0375)			
GDPG				0.0203	0.1117	-0.0326
				(0.0439)	(0.1180)	(0.1764)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5503	0.0000***	0.5118	0.8250	0.3662	0.1959
LM (2)	0.0703*	0.9463	0.0027***	0.0003***	0.0365**	0.0000***
ARCH (1)	0.4595	0.6010	0.0635*	0.0015***	0.1550	0.0000***
RESET	0.0001***	0.9262	0.0080***	0.0051***	0.5542	0.0062***
Engle-Granger (ADF)	-3.7150***	-5.7135***	-2.6119**	-2.8634***	-3.8218***	-2.2227**

Variable	Model 15			Model 16		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	33.5440***	30.4244***	32.0622***	26.9094***	29.0369***	30.9260***
	(1.7686)	(2.3750)	(5.3621)	(0.2764)	(0.8902)	(2.2539)
REM	0.2513***	-0.6502***	0.5125***	0.0446	-0.6694***	0.5068***
	(0.0518)	(0.0995)	(0.1596)	(0.0264)	(0.0850)	(0.1106)
GDPPC	-0.0063***	-0.0016	-0.0015			
	(0.0017)	(0.0023)	(0.0057)			
TO				0.0582***	-0.0182	-0.0277
				(0.0054)	(0.0173)	(0.0172)
M2	-0.0851***	-0.1699***	0.3209***	-0.1433***	-0.1527***	0.3473***
	(0.0157)	(0.0235)	(0.0469)	(0.0089)	(0.0286)	(0.0516)
TOT						
GDPG	0.0301	0.0573	-0.0145	-0.0120	0.0539	-0.0150
	(0.0269)	(0.0699)	(0.1319)	(0.0213)	(0.0685)	(0.1326)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.6271	0.0000***	0.5035	0.4159	0.0000***	0.7137
LM (2)	0.0346**	0.8554	0.0013***	0.2274	0.9233	0.0025***
ARCH (1)	0.6600	0.9530	0.0814*	0.9749	0.7533	0.0469**
RESET	0.0022***	0.1932	0.0109**	0.0789*	0.2948	0.0250**
Engle-Granger (ADF)	-3.6770***	-5.0505***	-2.5223**	-4.7928***	-5.0485***	-2.8505***

Variable	Model 17			Model 18		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	21.6047***	28.8591**	53.1192**	18.9319***	21.4363***	45.1804***
	(4.9985)	(13.1825)	(21.4618)	(1.7872)	(2.6172)	(6.5338)
REM	-0.0623	-1.0332***	1.4334***	-0.0203	-0.7600***	0.7849**
	(0.1088)	(0.2673)	(0.4912)	(0.1094)	(0.1733)	(0.3126)
GDPPC	-0.0016	-0.0042	-0.0063			
	(0.0036)	(0.0086)	(0.0154)			
TO				-0.0207	-0.0974***	0.1360**
				(0.0179)	(0.0340)	(0.0553)
M2						
TOT	0.0541**	-0.0227	-0.0633	0.0785***	0.0702**	-0.1141*
	(0.0245)	(0.0689)	(0.1009)	(0.0175)	(0.0299)	(0.0658)
GDPG	-0.0721	0.0233	0.1879	-0.0886**	-0.0188	0.1205
	(0.0629)	(0.1616)	(0.2381)	(0.0377)	(0.1086)	(0.1551)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.9974	0.0000***	0.7280	0.8028	0.0082***	0.4597
LM (2)	0.0001***	0.0018***	0.0000***	0.0013***	0.0630*	0.0000***
ARCH (1)	0.0215**	0.7432	0.0515*	0.4722	0.6036	0.0132**
RESET	0.2324	0.1697	0.0776*	0.1823	0.0007***	0.0035***
Engle-Granger (ADF)	-3.1827***	-3.2359***	-1.9484*	-3.3160***	-3.3332***	-1.8453*

Variable	Model 19			Model 20		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	22.6476***	30.4223***	28.9395***	33.4182***	38.9006***	25.0138**
	(1.3215)	(1.9487)	(4.3331)	(2.6464)	(4.6926)	(10.0474)
REM	0.0966**	-0.6856***	0.4748***	0.1566	-0.4404*	0.5558
	(0.0345)	(0.0836)	(0.1142)	(0.1411)	(0.2230)	(0.4730)
GDPPC				-0.0082***	-0.0113**	0.0111
				(0.0028)	(0.0044)	(0.0106)
TO				-0.0202	-0.1084***	0.1326***
				(0.015)	(0.0252)	(0.0451)
M2	-0.0768***	-0.1737***	0.3240***			
	(0.0106)	(0.0236)	(0.0469)			
TOT	0.0548***	-0.0177	0.0191			
	(0.0141)	(0.0196)	(0.0395)			
GDPG	-0.0506*	0.0666	-0.0394			
	(0.0253)	(0.0712)	(0.1192)			
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.3442	0.0000***	0.4794	0.8329	0.1392	0.2072
LM (2)	0.0496**	0.9522	0.0013***	0.0005***	0.0653*	0.0000***
ARCH (1)	0.4966	0.7632	0.0633*	0.0026***	0.2025	0.0000***
RESET	0.0007***	0.3723	0.0130**	0.0068***	0.3199	0.0070***
Engle-Granger (ADF)	-3.0404***	-5.4103***	-2.5525**	-2.8720***	-4.0181***	-2.2582**

Variable	Model 21			Model 22		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	33.4150***	30.1790***	32.1245***	26.9055***	29.0644***	30.9211***
	(1.7353)	(2.3421)	(5.1050)	(0.2729)	(0.8839)	(2.2142)
REM	0.2533***	-0.6464***	0.5115***	0.0426	-0.6603***	0.5043***
	(0.0511)	(0.0988)	(0.1596)	(0.0258)	(0.0837)	(0.1104)
GDPPC	-0.0061***	-0.0014	-0.0016			
	(0.0017)	(0.0023)	(0.0054)			
TO				0.0580***	-0.0175	-0.0279
				(0.0053)	(0.0172)	(0.0166)
M2	-0.0839***	-0.1674	0.3203***	-0.1437***	-0.1511***	0.3468***
	(0.0147)	(0.0232)	(0.0461)	(0.0088)	(0.0284)	(0.0509)
TOT						
GDPG						
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.5470	0.0000***	0.5109	0.3570	0.0000***	0.7350
LM (2)	0.0456**	0.8636	0.0029***	0.1993	0.9237	0.0050***
ARCH (1)	0.7101	0.8646	0.0845*	0.8983	0.7125	0.0494**
RESET	0.0021***	0.2213	0.0093***	0.0724*	0.2933	0.0218**
Engle-Granger (ADF)	-3.6202***	-5.0733	-2.5485**	-4.9090***	-5.0540***	-2.8825***

Variable	Model 23			Model 24		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	24.0732***	28.0610**	46.6883**	22.9471***	30.0284***	29.1730***
	(4.2212)	(10.9962)	(20.2625)	(1.2710)	(1.8982)	(4.1214)
REM	-0.0466	-1.0383***	1.3927***	0.0884**	-0.6749***	0.4685***
	(0.1066)	(0.2480)	(0.4726)	(0.0321)	(0.0826)	(0.1150)
GDPPC	-0.0031	-0.0037	-0.0024			
	(0.0031)	(0.0072)	(0.0140)			
TO						
M2				-0.0796***	-0.1700***	0.3219***
				(0.0088)	(0.0233)	(0.0463)
TOT	0.0406*	-0.01833	-0.0281	0.0511***	-0.0130	0.0162
	(0.0203)	(0.0556)	(0.0965)	(0.0147)	(0.0188)	(0.0371)
GDPG						
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.8745	0.0000***	0.9907	0.4078	0.0000***	0.5229
LM (2)	0.0000***	0.0022***	0.0000***	0.0514*	0.9733	0.0027***
ARCH (1)	0.0077***	0.7674	0.0099***	0.0442**	0.7565	0.0564*
RESET	0.1243	0.1730	0.0911*	0.0001***	0.4172	0.0138**
Engle-Granger (ADF)	-2.0174**	-3.2388***	-1.8827*	-3.2534***	-5.3255***	-2.6357**

Variable	Model 25			Model 26		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	30.8207***	24.9910***	42.3274***	24.1643***	26.1118***	37.5778***
	(2.4761)	(2.3952)	(8.863461)	(1.1475)	(1.5660)	(3.3012)
REM	0.0382	-1.0754***	1.3157***	-0.1449	-0.8714***	0.9661**
	(0.1101)	(0.1217)	(0.4065)	(0.1637)	(0.2107)	(0.3842)
GDPPC	-0.0065**	-0.0021	-0.0006			
	(0.0027)	(0.0028)	(0.0100)			
TO				0.0075	-0.0722*	0.0951
				(0.269)	(0.0384)	(0.0669)
M2	-0.0017	-0.0062	0.1055			
	(0.0564)	(0.1281)	(0.2068)			
TOT						
GDPG				-0.0369	0.0274	0.0453
				(0.0578)	(0.1064)	(0.1658)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.8381	0.0000***	0.9591	0.2656	0.0014***	0.7381
LM (2)	0.0001***	0.0023***	0.0000***	0.0000***	0.0302**	0.0000***
ARCH (1)	0.0003***	0.7810	0.0118**	0.0060***	0.7882	0.0014***
RESET	0.0215**	0.1556	0.1217	0.0111**	0.0000***	0.0000***
Engle-Granger (ADF)	-2.6458**	-3.1425***	-2.1120**	-2.7848***	-3.0812	-1.6483*

Variable	Model 27			Model 28		
	Manuvalue	Agrivalue	Servalue	Manuvalue	Agrivalue	Servalue
CONSTANT	27.5197***	28.8455***	30.6358***	19.1700**	22.5578***	43.6143***
	(0.4161)	(0.8732)	(2.2334)	(1.7728)	(2.1820)	(6.2298)
REM	0.1054*	-0.6885***	0.4779***	-0.0978	-1.1251***	1.2949***
	(0.0591)	(0.0833)	(0.1109)	(0.0668)	(0.1012)	(0.2481)
GDPPC						
TO						
M2	-0.0870***	-0.1704***	0.3205***			
	(0.0121)	(0.0233)	(0.0478)			
TOT				0.0646***	0.0045	-0.0223
				(0.0195)	(0.0281)	(0.0624)
GDPG	0.0013	0.0498	-0.0214	-0.0889*	-0.0202	0.1224
	(0.0251)	(0.0685)	(0.1250)	(0.0456)	(0.1363)	(0.2098)
DUM_E_						
DUM_F_						
DUM_O_						
Jarque-Bera (Probability)	0.2359	0.0000***	0.5589	0.9748	0.0000***	0.8835
LM (2)	0.0000***	0.9585	0.0011***	0.0002***	0.0029***	0.0000***
ARCH (1)	0.0001***	0.9140	0.0428**	0.0542*	0.8199	0.0088***
RESET	0.5274	0.3902	0.0705*	0.3188	0.1233	0.2216
Engle-Granger (ADF)	-0.9374	-5.1632	-2.5744**	-3.1468***	-3.1562***	-2.1060**