Analysis of "Dutch Disease Effects" on Asian Economies

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Abstract: This chapter addresses the issue of the Dutch Disease in relationship with capital inflows through exporting natural resources, accepting foreign aids and emigrant remittances. The analysis focuses on Asian economies that are expected to sustain their growth, and adopts a vector auto-regression model with Granger causality and impulse response tests. The main finding are as follows. First, from the perspective of natural resource abundance in Asian economies, the Dutch Disease was identified for 1980-1995, but not for 1995-2014, probably because of their institutional improvements. Second, in the economies of Cambodia, Lao PDR, Myanmar and Vietnam, their accepted foreign aids have not caused the Ditch Disease and have rather promoted their economic growth, due to their aid contributions to infrastructure development. Third, regarding the Ditch Disease effects of emigrant remittances, the disease was verified in Nepal but not in Bangladesh, due to their different demand structures and policy efforts.

Keywords: Dutch Disease, Asian Economies, Capital Inflows, Natural Resources, Foreign Aids, Emigrant Remittances, and Vector Auto-regression (VAR)

1. Introduction

Asian Economies have been accepting intensively capital inflows in terms of foreign direct investment, foreign aids, and emigrant remittances since the 1980s. Some economies with rich natural resources have also been able to obtain foreign currencies by exporting their developed resources. It is basically believed that capital inflows towards emerging and developing economies have been useful for raising their economic growth, and thus these economies have adopted policies to attract capital inflows. It is also pointed out, however, that capital inflows have downsides, for instance, of accompanying financial risks such as boom-bust cycles for domestic economies and of causing currency appreciation that deteriorates the competitiveness of tradable sectors. The latter issue is often referred to as the "Dutch Disease".

The Dutch Disease is inspired by the crisis of Netherlands in 1960s that was caused by discoveries of huge natural gas deposits in the Northern Sea. It was named by *the Economist* magazine on November 26, 1977. The Disease was described as the negative impact on a country's economy due to large inflows of foreign income through the discovery of large oil reserves, natural gas etc. The theoretical framework for describing the Dutch Disease effect of "capital inflows" in small open economies was provided by the Salter-Swan-Corden-Dornbusch model, and this model has been applied to examine the economic impacts of foreign aids and emigrant remittances as well as natural-resource exports, since they constitutes the major elements of capital inflows.

This chapter examines the Dutch Disease effects of a variety of capital inflows: natural resource abundance, foreign aids and emigrant remittances, focusing on Asian economies. The basic reason for targeting Asian economies is that most of Asian economies still stay at the stages of middle income and low income, and thus are expected to sustain their economic growth to realize the "Asian Century" as ADB (2011) in [1] proposed. In this context, it would be of great significance to diagnose Asian economies from the perspective that their dependence on capital inflows in various forms might accompany the risk of the Dutch Disease. If some symptom of the disease were identified, Asian economies should have a strategy to remove the source of disease in advance in order to ensure their sustainable growth.

The rest of this chapter is structured as follows. Section 2 describes the theoretical framework of the Dutch Disease by the Salter-Swan-Corden-Dornbusch model. In brief, Corden and Neary (1982) in [2] explained this model in the following way: capital inflows trigger higher relative prices of non-tradable goods through raising higher disposal income and aggregate demand (spending effect), which corresponds to a real exchange rate appreciation; this leads further to movement of resources from tradable sector to non-tradable sector (resource movement effect). From the longer-term perspective, Bourdet and Falck (2006) in [3] added "capital accumulation effect", supposing that the capital inflows contribute to domestic capital accumulation, which might offset the economic damage from the Dutch Disease.

Section 3 examines the Dutch Disease effects of "natural resource abundance" in Asian economies based on the theoretical framework described in Section 2. The natural resource abundance in this study is expressed as the "natural resource rents", which is defined by the World Development Indicator (WDI) of the World Bank as the sum of oil rents, natural gas rents, coal rents, mineral rents, and forest rents. In the worldwide landscape, the Dutch Disease effects in resource-rich economies have been identified by the majority of evidence. Sachs and Warner (2001) in [4] found that resource-rich economies tended to have higher price levels after controlling for the income effect, and demonstrated further that the subsequent loss of price competitiveness in manufacturing sectors impeded their export-led growth. More recent macroeconomic studies also provided evidence directly to support the Dutch Disease effect. Harding and Venables (2010) [5] indicated that the response to a resource windfall is to decrease non-resource exports by 35-70 percent, and Ismail (2010) [6] revealed that a 10 percent oil windfall is on average associated with a 3.4 percent fall in value added across manufacturing sector. When we look at the recent performances of Asian emerging-market economies, however, they have recorded high economic growth regardless of their abundance of natural resources, and might not fit the Dutch Disease theory. Thus, this study compares the applicability of Dutch Disease hypothesis on resource abundance in 1995-2014 with that in 1980-1995 with the sample of 37 Asian economies, and also investigates capital accumulation effect as well as resource movement effect in both phases.

Section 4 analyses the Dutch Disease effects of "foreign aids" with a focus on the economies of Cambodia, Lao PDR, Myanmar and Vietnam (so-called CLMV). The Dutch Disease theory could, of course, be applied to examine the economic impacts of foreign aids, since the foreign aids constitutes the major elements of capital inflows in the Salter-Swan-Corden-Dornbusch model. There have been, however, very few empirical studies and little consensus on this issue. Rajan and Subramanian (2011) in [7] analyzed the economic impacts of foreign aids on the growth of manufacturing, and showed the evidence for the existence of Dutch Disease effects: foreign aids have negative effects on a country's international competitiveness, as shown in the lower growth rate of exports by manufacturing industries. On the other hand, Adam (2006) in [8] examined the supply-side effect of aid-financed public expenditure rather than the short-run Dutch Disease impacts, and demonstrated the simulation results that public expenditure creates an intertemporal productivity spillover effect. This study aims to provide evidence on the applicability of the Dutch Disease theory to foreign-aid impact assessment. The CLMV economies are focused as analytical samples, since the CLMV have rarely been studied in the literature in this field although their economies have still depended highly on foreign aids. According to the Statistics on Resource Flows to Developing Countries in 2014 by OECD, the CLMV economies show a high presence as the recipients of Official Development Assistance (ODA) in Asia: Asia occupies one-third in the values of net ODA receipts, and the CLMV occupies more than ten percent in their values within Asia. At the same time, the four economies depends heavily on ODA by 2 - 5 percent of their Gross National Income (GNI).

Section 5 investigates the Dutch Disease effects of "emigrant remittances" focusing on Nepal and Bangladesh. The Dutch Disease theory could also be applied to examine the economic impacts of emigrant remittances, since they also constitutes the major elements of capital inflows. There have been, however, relatively few studies and inconclusive on this issue. Acosta, et al. (2009) in [9] applied the Dutch Disease theory for analysing the effects of emigrant remittances by establishing a dynamic stochastic general equilibrium model in the case of El Salvador. They enriched the original model by adding a transmission mechanism of emigrant remittances directly through labour supply: emigrant remittances raise the reservation wage of recipients and, therefore, bring about a decline in labour supply; a declining labour supply raises wages that, in turn, causes a further contraction of the tradable sector. Through their analysis, they confirmed the existence of the Dutch Disease effects of emigrant remittances. From the viewpoint of different time-horizon, however, Bourdet and Falck (2007) in [3] argued that in the longer-term, an increase in remittances might rather enhance capital accumulation. By examining the case of Cape Verde, they argued the Dutch

Disease effects from remittances was not so large, and insisted that growth- and export-oriented policies could mitigate the Dutch Disease effect. This study aims to shed light on what kinds of mechanisms could make the received remittances lead to or not to the Dutch Disease, by sampling the two contrasting economies of Nepal and Bangladesh. The two countries differ in their economic performances though both of them depend highly on remittances. Nepal and Bangladesh represent high presences as the recipients of remittances in the world. According to the dataset of UNCTAD STAT, Bangladesh accounts for 3.6 percent out of the total value of received remittances in the world, which ranks sixth in developing countries. In the remittance-GDP ratio, Nepal records around 30 percent, which ranks first in developing economies. Nepal and Bangladesh, however, show a contrast in their economic performances. Since the 2000s Bangladesh has achieved around 6 percent economic growth whereas Nepal has stayed at about 4 percent growth on the average.

Section 6 finally summarizes the key findings from the empirical analyses in the previous sections and represents some policy implication and recommendation.

2. Theoretical Framework of Dutch Disease

This section describes the theoretical framework of analysing the Dutch Disease effect of capital inflows in small open economies by the Salter-Swan-Corden-Dornbusch model. We first introduce the basic framework that is composed of “spending effect” and “resource movement effect” based on Corden and Neary (1982) in [2]. Then we add “capital accumulation effect” from the longer-term perspective by following Bourdet and Falck (2006) in [3].

In Figure 1, the horizontal axis exhibits non-tradable while the vertical one shows tradable. The curve P-P represents the initial transformation curve between tradable and non-tradable. Point A is an initial equilibrium, where the transformation curve is tangential to the social indifference curve (not drawn) and the slope of the curves, i.e., the relative price of non-tradable to tradable, is fixed at that point.

The transformation curve shifts upwards to P-PF with the introduction of the capital inflows shown at point F, since the supply of non-tradable is constant and the availability of tradable expands with higher disposal income. There would be excess demand for non-tradable with unchanged relatives price of non-tradable to tradable shown at point A’, if we assume positive income elasticity of non-tradable. The price of non-tradable, therefore, has to go up to clear the market, and the relative price of non-tradable to tradable also rises, since the price of tradable is determined in the world market. This effect is referred to as an appreciation of real exchange rate (spending effect). The rise of relative price, then, encourages the movement of production factors from the tradable sector to the non-tradable sector, and leads to an expansion in the output of non-tradable and a decline in that of tradable from point A’ to point B (resource movement effect).

Bourdet and Falck (2006) in [3] added the following story from the longer-term perspective. They considered the role of capital accumulation, and argued that the transformation curve could shift further towards P'-P' when an economy utilized capital inflows for domestic capital accumulation. As a consequence, the relative price of non-tradable might be expected to fall from point B to point C, thereby facilitating the recovery of tradable sector. Thus, the "capital accumulation effect" might offset or mitigate the economic damages caused by original Dutch Disease effect.

To sum up, the basic theory tells us that capital inflows reduce the production of tradable through real currency appreciation. In the longer-term, however, capital inflows would lead to the increase in the outputs of both tradable and non-tradable because of capital accumulation. In short, capital inflows are not compatible with economic growth under Dutch Disease, but can be friendly with growth in the longer-term.

3. Natural Resource Abundance and the Dutch Disease

This section examines the Dutch Disease effects of "natural resource abundance" in Asian economies. We first clarify the sample economies and period for the analysis. We sample 37 economies in Asia for 1980-2014. Regarding the scope of Asia, we follow the definition of UNCTAD STAT.[1] As we stated, we divide sample period into 1980-1995 and 1995-2014 for comparing the Dutch Disease applicability. Regarding an analytical method, this study adopts a vector auto-regression (VAR) model with Granger causality and impulse response tests. The VAR makes it possible to trace directly the causality and dynamic responsive effect from resource abundance to tradable production. For a VAR model estimation, we construct a panel data with 37 Asian economies for 1980-1995 and for 1995-2014.

We next specify the following key variables for the analysis. The first variable is "natural resources rents (*nrr*)" to represent natural resource abundance in an economy. The data is retrieved from WDI of the World Bank as the series of "Total natural resources rents (% of GDP)". In this database, the total natural resources rents are defined as the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. The second variable is "real GDP per capita (*ypc*)" as a partner variable for simply observing the correlation with resource abundance. The data for real GDP per capita is retrieved from the UNCTAD STAT as the series of "GDP by US Dollars at constant prices (2005) and constant exchange rates (2005) per capita". The third variable is "manufacturing-services ratio in GDP base (*mos*)". This variable is introduced as a proxy of tradable non-tradable production ratio as in [10], for identifying "resource movement effect" in the Dutch Disease theory. The

[1] See the website: http://unctadstat.unctad.org/EN/. The 37 Asian economies are Afghanistan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, China, Hong Kong, Macao, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Korea, Kuwait, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syria, Thailand, Turkey, UAE, and Viet Nam. The countries that belong to central Asia are excluded due to their lack of data before 1991.

manufacturing-services ratio is derived by dividing "manufacturing in value-added term" by "services in value-added one", both of which are retrieved from the UNCTAD STAT. The fourth variable is "investment-consumption ratio in GDP base (*ioc*)". This variable is for investigating the capital accumulation effect. The ratio is produced by dividing "gross fixed capital formation" by "final consumption expenditure", both of which are also retrieved from the UNCTAD STAT.

We take an overview on the Dutch Disease applicability in Asian economies by simply observing the relationship between natural resources rents and the growth rates of real GDP per capita. Figure 2 illustrates a scatter diagram between these two variables for the different phases: 1980-1995 and 1995-2014. It shows the negative correlation between natural resources rents and the growth rate of real GDP per capita for both phases, but their weaker correlation for 1995-2014 than that for 1980-1995. It might come from the following alternation of some economies' position from 1980-1995 to 1995-2014. First, although those economies with less resources rents such as Korea, Thailand and Singapore recorded higher growth of real GDP per capita for 1980-1995, they revealed the slowdown of their growth for 1995-2014, probably due to the convergence mechanics. Second, those emerging economies with middle-sized resources rents such as Laos, Vietnam and Myanmar improved their growth rates of real GDP per capita from 1980-1995 to 1995-2014.

We move onto a VAR model estimation. This study specify a VAR model with panel data for estimation in the following way.

$$y_{it} = \mu + V_1 y_{it-1} + \varepsilon_{it} \qquad (1)$$

where y_{it} is a column vector of the endogenous variables with country i and year t, i.e., $y_{it} = (nrr_{it}\ mos_{it})'$ for examining resource movement effect, and $y_{it} = (nrr_{it}\ ioc_{it})'$ for examining capital accumulation effect, μ is a constant vector, V_1 is a coefficient matrix, y_{it-1} is a vector of the lagged endogenous variables, and ε_{it} is a vector of the random error terms in the system. In the model, we insert a vector of the control variable of real GDP per capita (*ypc*), since manufacturing-services ratio might be also affected by development stages of an economy according to the Petty-Clark's Law (see [11]). The lag length (-1) is selected by the minimum Akaike Information Criterion (AIC) with maximum lag equal to (-2) under the limited number of observations. Based on the VAR model (1), we examine the Granger causalities between natural resources rents (*nrr*) and manufacturing-services ratio (*mos*), and between natural resources rents (*nrr*) and investment-consumption ratio (*ioc*), and also investigate the impulse responses of *mos* and *ioc* to the *nrr* shock, so that we can trace the 8-year dynamic effects.

The estimation outcomes of the VAR model, the Granger causalities and the impulse responses are reported in Table 1, Table 2 and Figure 3 respectively. Regarding the Granger causalities shown in Table 2, as far as the causality between natural resources rents (*nrr*) and manufacturing-services ratio (*mos*) is concerned, it was only in 1980-1995 when the causality from *nrr* to *mos* was identified at 99 percent level of significance. Considering the estimated VAR model in Table 1, this causality was supposed to be a "negative" one. As for the causality from natural resources rents (*nrr*) and investment-consumption ratio (*ioc*), on the other hand, it was in 1995-2014 when the positive causality was verified at the significant level. The impulse response analysis shown in Figure 3 was focused on the two cases where the Granger causalities were identified above. The manufacturing-services ratio (*mos*) negatively responded to the shock of natural resources rents (*nrr*) within a 95 percent error band after four-year lags during 1980-1995, and the investment-consumption ratio (*ioc*) positively responded to the shock from the beginning during 1995-2014.

The implications of the estimation outcomes above are summarized as follows. Regarding the applicability of the Dutch Disease, we could argue that Asian economies in 1980-1995 really suffered from the disease in which their resource abundance causes resource movement effect from tradable sector to non-tradable one. On the other hand, the disease could not be identified during the second phase of 1995-2014. As for the capital accumulation effect, the evidence implied that in 1995-2014 Asian economies accumulated domestic capital, whereas the 1980-1995 economies did not. In sum, the Dutch Disease does not seem to fit in with the recent Asian economies.

The next question is what has made the difference in the applicability of the Dutch Disease from the first phase to the second phase. Van der Ploeg (2011) in [12] argued that with good institutions the resource curse could be turned into a blessing. If we follow this argument, we could speculate that Asian economies have improved their institutional quality and transformed the effect of resource abundance on their growth. Figure 4 exhibits the change in institutional quality from 1996 to 2014 in selected resource-rich Asian economies with better economic performance, the natural resources rents of which are more than 6 percent on average and the annual growth rate of real GDP per capita of which is over 2 percent during 1995-2014. The institutional quality is shown as an average of the indexes for "Government Effectiveness", "Regulatory Quality" and "Rule of Law" in the Worldwide Governance Indicators by the World Bank. The index takes the value of -2.5 in the worst quality and of 2.5 in the best one. We could observe that the improvements in institutional quality from 1996 to 2015 are recorded in the oil producing economies such as Iraq, Saudi Arabia and Qatar and also in emerging-market economies with middle-sized resource abundance such as Lao PDR, Vietnam and Myanmar. In fact, the three emerging-market economies that belong to Mekong region has made policy efforts for intensively promoting their industrialization under the framework of the Greater Mekong Sub-region since 1992. We speculate that the improvement of institutional quality and the progress in policy efforts might offset negative economic impacts of the Dutch Disease and even boost capital accumulation effect in the recent Asian economies

In sum, the empirical outcomes identified the existence of the Dutch Disease in 1980-1995, but not in 1995-2014, and also represented capital accumulation effect in 1995-2014, but not in 1980-1995. Thus, the Dutch Disease does not fit in with the recent Asian economies. One of the interpretations on the transformation of the resource effects could come from the improvement of institutional quality and the progress in policy efforts in the recent Asian economies.

4. Foreign Aids and the Dutch Disease

This section analyses the Dutch Disease effects of "foreign aids" with a focus on CLMV. This section also adopts a VAR model as an analytical method. For the estimation, we construct a panel data with the four economies for the period from 1970 to 2013.

We specify the following key variables for the estimation as in Section 3. The first one is "net ODA receipts in real term (*odar*)" to represent foreign aids received by an economy. The nominal data in the form of current US dollars are taken from WDI of the World Bank. The variable is, then, transformed in real term (2005 prices) by GDP deflator. The deflator is produced implicitly by dividing "GDP in US dollars at current prices and current exchange rates" by "GDP in US dollars at constant prices (2005) and constant exchange rates (2005)". Both of them are retrieved from UNCTAD STAT. The second one is "GDP in real term (*gdpr*)". This is also taken from the same source as "GDP in US dollars at constant prices (2005) and constant exchange rates (2005)". The third one is "manufacturing-services ratio in GDP base (*mosr*)", which is introduced for the same reason and from the same source as those in Section 3. The fourth one is "inward foreign direct investment (FDI) in real term (*fdir*). The data is retrieved from UNCTAD STAT, and is also expressed in real term by being deflated in GDP deflator. We insert a variable *fdir* as an exogenous variable in order to control the effects of inward FDI on manufacturing-services ratio and GDP growth, and to derive pure effects of ODA receipts on them.

We then turn to a VAR model estimation. Before the estimation, we investigated the stationary property of the constructed panel data by employing a unit root test, and finally decided to use the first difference series of the panel data based on the test results. We now specify a VAR model for estimation in the following way.

$$y_t = \mu + V_1 y_{t-1} + V_2 z_t + \varepsilon_t \qquad (2)$$

where y_t denotes a column vector of the endogenous variables: $y_t = (d(aidr)_t \; d(mosr)_t \; d(gdpr)_t)'$, y_{t-1} does a vector of the lagged endogenous variables, μ does a constant vector, z_t does a vector of the control variable of $d(fdir)_t$, each of V_1 and V_2 does a coefficient matrix, and ε_t does a vector of the random error terms in the system. The lag length (-1) is chosen by the minimum Akaike Information Criterion (AIC) with maximum lag being equal to (-2) under the limited number of observations. Based on the VAR model (2), we investigate the bilateral Granger causalities among the endogenous variables: $d(aidr)$, $d(mosr)$ and $d(gdpr)$, and also investigate the impulse responses to the shock from net ODA receipts, $d(aidr)$, so that we can trace the 8-year dynamic effects in accumulated terms.

The estimation outcomes of the VAR model (2), the bilateral Granger causalities and the impulse responses are reported in Table 3, Table 4 and Figure 5 respectively. Concerning the bilateral Granger causalities, the causality only from net ODA receipts to real GDP is confirmed at the 95-percent significant level, whereas no causality from net ODA receipts to manufacturing-services ratio is found. This result implies that foreign aid does not influence the output ratio of tradable over non-tradable, thereby suggesting non-existence of the Dutch

Disease. The results also implies that foreign aid has a positive effect on the output of both tradable and non-tradable. The outcome of causality test above brings us to examining the relationship between net ODA and real GDP into the impulse response test. Figure 5 shows that real GDP positively responds to the shock from net ODA receipts at least within a 90 percent error band, although the response loses its significance at a 95 percent error band after four years. Thus, the impulse response analysis also identifies the positive dynamic effect of foreign aid on real GDP.

In sum, the foreign aids received by the CLMV has no Dutch Disease impact, or rather has a positive growth impact on their economies. We speculate this results as follows. The positive output effects of foreign aids received by the CLMV appears to have relationship with the properties of the ODA provided to Asian area. According to Statistics on Resource Flows to Developing Countries in 2014 by OECD, Japan as a donor member gives its ODA to developing countries in Asia and Oceania by more than 70 percent, whereas the United States and EU countries provide their ODA in Africa and Middle East by 50-60 percent. Japan's ODA, thus, focuses on Asian area. At the same time, the major use of Japan's ODA focuses on "Economic Infrastructure" e.g. for transport and communications by around 50 percent, whereas those of the United States and EU countries have a less focus on that purpose. We speculate, from these observations, that the ODA received by the CLMV has been allocated for economic infrastructure to a large degree. The ODA for them, therefore, would give little room to expand consumption of non-tradable, and contribute directly to capital accumulation. We speculate, thus, that the CLMV economies have not suffered from the Dutch Disease and even have enjoyed capital accumulation effect.

5. Emigrant Remittances and the Dutch Disease

This section investigates the Dutch Disease effect of "emigrant remittances" focusing on the economies of Nepal and Bangladesh for the sample period for 1993-2013. This section also uses a VAR model as an analytical instrument.

We clarify the key variables for the estimation. The first one is "remittances as a percentage of GDP (*roy*)". The data for remittances and GDP are retrieved from WDI of the World Bank. The second one is "real exchange rate (*rer*)", which is introduced to represent "spending effect" in the Dutch Disease theory. The real exchange rate is computed in the following way (taking Nepalese one as an example).

$$rer_{Nepal} = \{CPI_{Nepal}/er_{Rupees\ per\ US\ Dollar}\}/WIUV \qquad (3)$$

where *CPI* represents consumer price index (2010=100) in Nepal; *WIUV* does the world import unit value; and *er* does nominal exchange rate in the unit of Rupees per US Dollar. The consumer price index, nominal exchange rate and the world import unit value are retrieved from International Financial Statistics of International Monetary Fund. The third one is "manufacturing-services ratio in GDP base (*mos*)", which is introduced to show "resource movement effect" in the Dutch Disease theory. The data is retrieved from the same source as that in Section 3 and 4.

We then specify a VAR model equation for estimation in the following way.

$$y_t = \mu + Vy_{t-1} + \varepsilon_t \qquad (4)$$

where y_t is a column vector of the endogenous variables: $y_t = (roy_t\ rer_t\ mos_t)'$, μ is a constant vector, V is a coefficient matrix, y_{t-1} is a vector of the lagged endogenous variables, and ε_t is a vector of the random error terms in the system. The lag length (-1) is chosen by the minimum Akaike Information Criterion (AIC) with maximum lag being equal to (-2) under the limited number of observations. Following the VAR model estimation, the Granger causalities among three endogenous variables and the impulse responses to the shock of remittance-GDP ratio are examined for identifying their dynamic effects.

The estimation outcomes of the VAR model (4), the bilateral Granger causalities and the impulse responses are reported in Table 5, Table 6 and Figure 6 respectively. Concerning the Granger causalities shown in Table 6, we identified only the causality from remittances-GDP ratio (*roy*) to manufacturing-services ratio (*mos*) at the conventionally significant level in Nepal. When we consider the estimated VAR model in Table 5, this causality was assumed to be the "negative" one. On the other hand, in Bangladesh we confirmed the weak "positive" causality from remittances-GDP ratio (*roy*) to manufacturing- services ratio (*mos*). Regarding the impulse responses in Figure 6, the manufacturing-services ratio negatively responded to the shock of remittances-GDP ratio within a 95 percent error band in Nepal, whereas the ratio positively responded to that shock in Bangladesh.

The interpretations of the estimation results above are summarized in the following ways. First, The Dutch Disease would occur in Nepal. It should be, however, noted that real currency rate appreciation was not accompanied by an increase in remittances, judging from no causality from the remittances-GDP ratio to the real exchange rate. The existence of the Dutch Disease in Nepal could be interpreted in such a way that tradable sector have been shrunk by remittances directly through a decline in labour supply as Acosta, et al. (2009) in [9] suggested as an additional mechanism. Second, no Dutch Disease effects were found in Bangladesh, and tradable sector was even expanded there. This effect seems to come from capital accumulation as Bourdet and Falck (2007) in [3] suggested as a longer-term impact of remittances, which is shown in Section 2.

The next question then arises what makes a contrast in the Dutch Disease effects of received remittances between Nepal and Bangladesh. The first perspective is the difference in their demand structure. According to the database of UNCTAD STAT, on the average for 2000-2013, the share of "gross fixed capital formation" to GDP as well as that of "exports of goods and services" has been larger in Bangladesh (26.2% and 15.9%) than in Nepal (20.6% and 14.1%), whereas that of "household consumption expenditures" has been larger in Nepal (80.2%) than in Bangladesh (74.6%). This tells us that the received remittances have a tendency to be used more for investment in Bangladesh, thereby leading to capital accumulation there. In Nepal, on the other hand, the remittances have an inclination to be allocated more for consumption. In this respect, Bangladesh would fit the hypothesis of the long-term effects of remittances that Bourdet and Falck (2007) in [3] proposed. The second interpretation is the contrast in government policies for industrial development between Bangladesh and Nepal. Nepalese government has not facilitated effective industrial policies as far as manufacturing sectors are concerned. On the other hand, Bangladesh has adopted a positive strategy to develop manufacturing industries since the 1990s. The strategy was typically found in the policy package in 2010 (see [13]). The package set a clear goal on manufacturing: an expansion in the industry sector's ration relative to GDP from the present 28 % to 40 % by 2021, and an increase in the share of the labours employed in industry relative to the country's total labour forces from the current 16 % to 25 % in 2021. For realizing the target, the government has provided industrial sectors with adequate infrastructure such as gas, water, electricity and other physical facilities such as telecommunications, road and rail transport. The government has also put a priority on setting up industrial zones and export processing areas to attract foreign direct investments in manufacturing industries. This contrast in the policy stances between Nepal and Bangladesh might produce the difference in the Dutch Disease effects of emigrant remittances in both countries. To be specific, the manufacturing-oriented policies in Bangladesh might prevent the Dutch Disease from occurring, whereas no effective strategies in Nepal would allow it to appear.

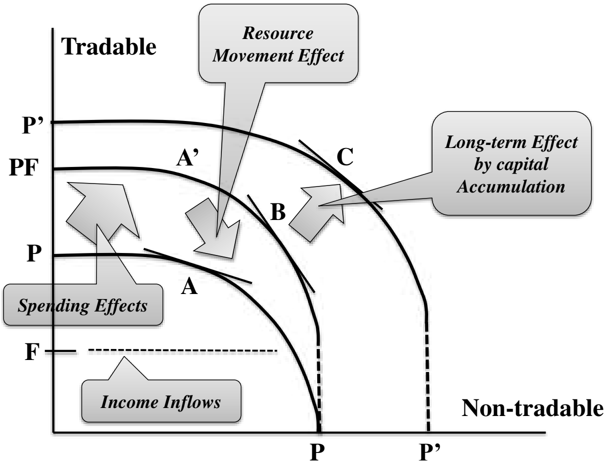
To sum up, the empirical outcomes identified the existence of the Dutch Disease in Nepal, but not in Bangladesh. We speculate that the contrast in the Dutch Disease effects might come from the differences in the demand structure and policy efforts for manufacturing development between both economies.

6. Key Findings and Recommendation

This chapter analysed the effects of "Dutch Disease" on three macroeconomic variables: natural resource abundance, foreign aids and emigrant remittances. The analysis focused on Asian economies that are expected to sustain their growth, and adopted a vector auto-regression model with Granger causality and impulse response tests as an analytical framework. The main finding were as follows. First, from the perspective of natural resource abundance in Asian economies, the Dutch Disease was identified for 1980-1995, but not for 1995-2014, probably because of their institutional improvements. Second, in the economies of Cambodia, Lao PDR, Myanmar and Vietnam, their accepted foreign aids have not caused the Ditch Disease and have rather promoted their economic growth, due to their aid contributions to infrastructure development. Third, regarding the Ditch Disease effects of emigrant remittances, the disease was verified in Nepal but not in Bangladesh, due to their different demand structures and policy efforts.

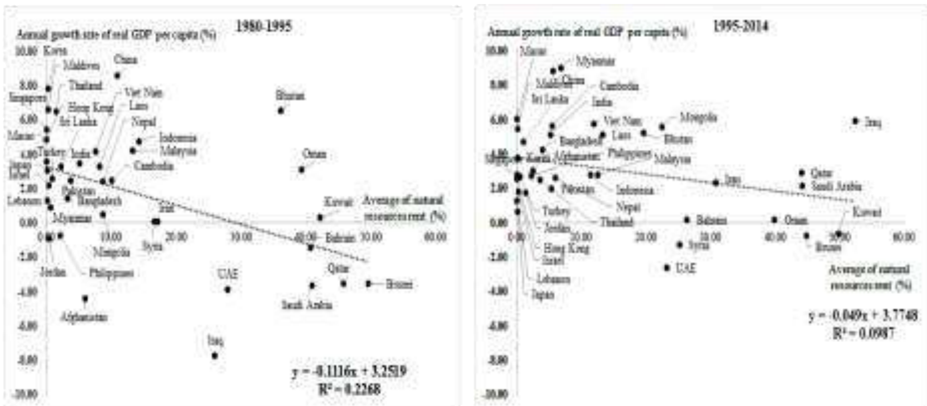
The recommendation from key findings above are the significance in institutional quality and its reformation as Van der Ploeg (2011) in [12] suggested. As long as Asian economies have accepted capital inflows in any forms, they have been accompanied with the risk of the Dutch Disease. To avoid the Dutch Disease risk, Asian economies should put a priority on "capital accumulation effect" from the long-term perspectives as Bourdet and Falck (2006) in [3] argued. It requires infrastructure development, human resource development and industrial policies to facilitate manufacturing production. These policy initiatives might be possible to be realized under qualified institutions with good governance in terms of government effectiveness, regulatory quality and rule of law.

Figure 1 Theoretical Framework of "Dutch Disease"



Note: This diagram is based on Corden and Neary (1982) in [2] and Bourdet and Falck (2006) in [3].

Figure 2 Natural Resources Rents and Growth Rate of Real GDP Per Capita in Asia



Sources: World Development Indicators (World Bank) and UNCTAD STAT

Table 1 Estimated VAR Model

nrr vs. *mos*: 1980-1995	*nrr*	*mos*
nrr_{-1}	0.855*** [73.859]	-0.058*** [-5.427]
mos_{-1}	-0.003 [-0.315]	0.870*** [95.501]
C	-0.415 [-0.434]	4.991*** [5.605]
ypc	0.204* [1.702]	-0.067 [-0.598]
adj. R^2	0.929	0.949

nrr vs. *mos*: 1995-2014	*nrr*	*mos*
nrr_{-1}	0.960*** [96.652]	0.007 [0.935]
mos_{-1}	-0.014 [-1.429]	0.962*** [122.582]
C	0.317 [0.342]	1.230* [1.702]
ypc	0.078 [0.767]	-0.045 [-0.574]
adj. R^2	0.935	0.956

nrr vs. *loc*: 1980-1995	*nrr*	*loc*
nrr_{-1}	0.870*** [81.558]	-0.006 [-0.441]
loc_{-1}	-0.034*** [-3.004]	0.914*** [57.828]
C	2.152*** [4.717]	3.292*** [5.267]
adj. R^2	0.929	0.869

nrr vs. *loc*: 1995-2014	*nrr*	*loc*
nrr_{-1}	0.968*** [97.668]	0.060*** [3.692]
loc_{-1}	-0.011 [-1.4027]	0.929*** [70.960]
C	0.868** [2.569]	2.141*** [3.859]
adj. R^2	0.936	0.889

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: World Development Indicators (World Bank) and UNCTAD STAT

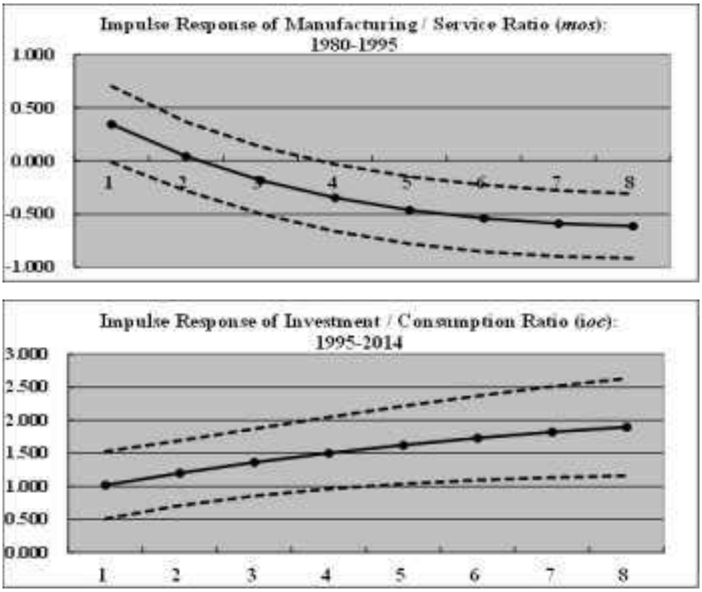
Table 2 Granger Causality Tests

nrr vs. *mos*	Lags	Null Hypothesis	Chi-sq
1980-1995	1	*mos* does not Granger Cause *nrr*	0.099
		nrr does not Granger Cause *mos*	29.456***
1995-2014	1	*mos* does not Granger Cause *nrr*	2.044
		nrr does not Granger Cause *mos*	0.875

nrr vs. *loc*	Lags	Null Hypothesis	Chi-sq
1980-1995	1	*loc* does not Granger Cause *nrr*	9.029***
		nrr does not Granger Cause *loc*	0.195
1995-2014	1	*loc* does not Granger Cause *nrr*	2.038
		nrr does not Granger Cause *loc*	13.631***

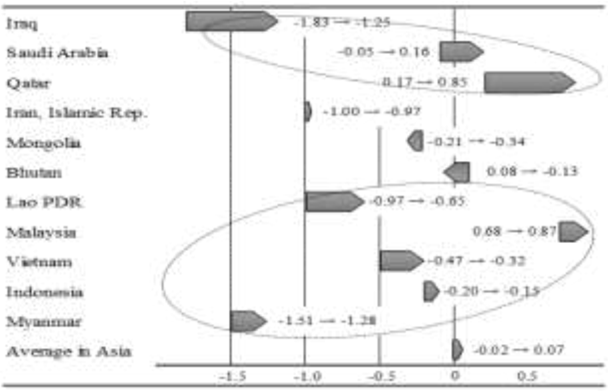
Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: World Development Indicators (World Bank) and UNCTAD STAT

Figure 3 Impulse Responses to Shock of Natural Resources Rents



Note: The dotted lines denote a 95 percent error band over 8-year horizons.
Sources: World Development Indicators (World Bank) and UNCTAD STAT

Figure 4 Change in Institutional Quality from 1996 to 2014



Note: 1) The figures on right and left sides are the ones in 1996 and in 2014 respectively.
2) Institutional quality is an average of the indexes for "Government Effectiveness", "Regulatory Quality" and "Rule of Law" in the Worldwide Governance Indicators by the World Bank.
Sources: Worldwide Governance Indicators (World Bank)

Table 3 Estimated VAR Model for CLMV Economies

	d(aidr)	d(mosr)	d(gdpr)
d(aidr)-1	0.209***	0.007	0.009**
	[2.644]	[0.694]	[1.982]
d(mosr)-1	-0.366	0.069	-0.010
	[-0.640]	[0.883]	[-0.301]
d(gdpr)-1	0.914	0.251*	0.605***
	[0.887]	[1.775]	[9.502]
C	-0.020	0.000	0.021***
	[-0.273]	[-0.011]	[4.598]
d(fdir)	0.049	-0.004	0.001
	[1.102]	[-0.769]	[0.516]
adj. R^2	0.027	0.009	0.345

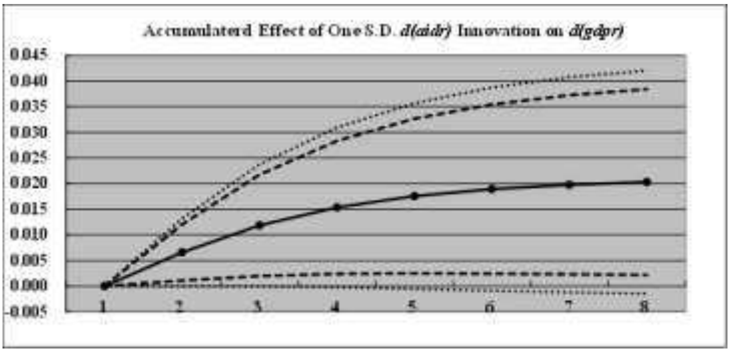
Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD STAT

Table 4 Pairwise Granger Causality Tests for CLMV Economies

Variables	Lags	Null Hypothesis	F-Statistic
odar & gdpr	1	d(odar) does not Granger Cause d(gdpr)	3.93**
		d(gdpr) does not Granger Cause d(odar)	0.51
odar & mosr	1	d(odar) does not Granger Cause d(mosr)	0.18
		d(mosr) does not Granger Cause d(odar)	0.35
mosr & gdpr	1	d(mosr) does not Granger Cause d(gdpr)	0.11
		d(gdpr) does not Granger Cause d(mosr)	3.02*

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD STAT

Figure 5 Impulse Response of real GDP to Aid Shock for CLMV Economies



Note: The coarse and fine dotted lines denote a 90 and 95 percent error band respectively over 8-year horizons.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD Stat

Table 5 Estimated VAR Model for Nepal and Bangladesh

Nepal	*roy*	*rer*	*mos*
roy-1	0.982*** [5.968]	-0.012 [-0.512]	-0.033*** [-2.926]
rer-1	2.571 [1.722]	0.463** [2.133]	-0.041 [-0.398]
mos-1	1.290 [0.951]	-0.328 [-1.662]	0.816*** [8.537]
C	-14.765 [-1.554]	3.322** [2.404]	0.740 [1.106]
adj. R^2	0.926	0.770	0.985

Bangladesh	*roy*	*rer*	*mos*
roy-1	1.017*** [12.264]	-0.088* [-1.948]	0.017 [1.272]
rer-1	0.088 [0.283]	0.519*** [3.048]	-0.154*** [-2.920]
mos-1	-0.528 [-0.666]	0.839* [1.987]	0.697*** [5.187]
C	1.390 [0.537]	-0.341 [-0.383]	1.692*** [3.855]
adj. R^2	0.954	0.434	0.865

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD STAT

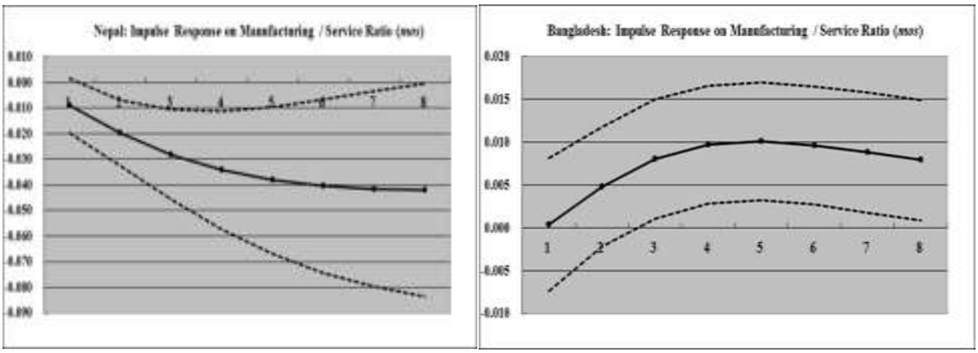
Table 6 Pairwise Granger Causality Tests for Nepal and Bangladesh

Nepal	Lags	Null Hypothesis	F-Statistic
roy & rer	1	*roy* does not Granger Cause *rer*	1.62
		rer does not Granger Cause *roy*	2.08
roy & mos	1	*roy* does not Granger Cause *mos*	8.85***
		mos does not Granger Cause *roy*	0.00

Bangladesh	Lags	Null Hypothesis	F-Statistic
roy & rer	1	*roy* does not Granger Cause *rer*	0.28
		rer does not Granger Cause *roy*	0.01
roy & mos	1	*roy* does not Granger Cause *mos*	4.09*
		mos does not Granger Cause *roy*	0.39

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD STAT

Figure 6 Impulse Response to Remittance Shock for Nepal and Bangladesh



Note: The dotted lines denote a 95 percent error band over 8-year horizons.
Sources: Author´s elaboration using World Development Indicator (World Bank) and UNCTAD STAT

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