51ST ANNUAL MONETARY STUDIES CONFERENCE

Hosted by the Eastern Caribbean Central Bank

Basseterre, St. Kitts and Nevis.

19th —21st November,2019.

The Impact of Remittances on the Real Exchange Rate: Evidence from Haiti

by

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November 2019

Abstract

Migrant workers' remittances to Haiti have been steadily increasing in the last 30 years and accounted to more than a third of the country's GDP in 2017. This has turned Haiti into one of the most remittances' dependent economies in the world, with potential significant effects on its external competitiveness. Using an Error Correction Model approach, this paper investigates the relationship between the increasing flow of remittances and the country's real exchange rate in the Haitian case. Our results suggest that the influx of workers' remittances contributes significantly to the appreciation of Haiti's real exchange rate in the long run, while that relationship is not significant in the short run.

Contents

I. Introduction

Remittances have become a major financial flow on the global stage, reaching the record level of $529 billion in 2018 while overtaking foreign direct investment as the largest inflow of foreign capital to developing countries. The importance of these flows can be particularly observed in Haiti, where the economy has become increasingly reliant on migrants' transfers over the past 30 years. Indeed, remittances to Haiti have increased almost tenfold to $3.1 billion between 1998 and 2018, while their share of GDP went from 8.8% to 32.5% over the same period. By large they have become the country's biggest source of foreign exchange, amounting in 2018 to 3.6 times of exports value, 10 times the flow of foreign aid and 37 times the amount of foreign direct investment.

Figure 1: Evolution of Haiti's remittances as a percentage of GDP
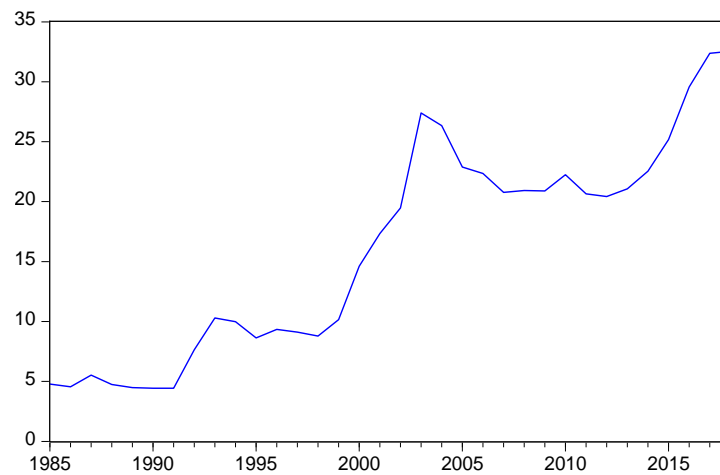
While their importance has been growing, migrants' transfers have been increasingly praised for their positive impact on household consumption and human development outcomes. More precisely, in the case of Haiti they have been credited as one of the reasons behind the decline of the extreme poverty rate from 31 percent of the population in 2000 to

24 percent in 2012[1]. Moreover, migrants' transfers often help pays for school fees and have helped in increasing the primary school enrollment rate from 80 percent in 2001 to over 90 percent currently. Anecdotal evidence also points to their substantial use in paying for medical expenses as the health system in Haiti is mostly private. However, there are also concerns about their potential macroeconomic unintended effects. Indeed, as a major financial flow, it is to be expected that remittances have major impacts on quantities and prices in an economy.

Among these various potential negative effects, a major concern has been the possibility of remittances induced "Dutch Disease" in the receiving countries. The "Dutch Disease" term was coined by *The Economist* in 1977[2] to describe the problems faced by the Dutch economy at that time. Large gas reserves had been discovered in the Netherlands in 1959, leading to a major growth in exports and a corresponding influx of foreign exchange. Ultimately, this made other Dutch made goods more expensive in international markets, amounting to a loss of external competitiveness of the country's tradable sector. The observations from *The Economist* were later analyzed more systematically in an economic model by Corden and Neary (1982). The authors found that the boom in a foreign exchange generating sector (natural gas in the Dutch case) led to severe loss of competitiveness in the tradable sectors of the economy such as manufacturing. Since then, various papers have pointed to the potential adverse impacts of remittances regarding the export and import competing sectors.

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[1] Singh, Raju Jan and Mary Barton-Dock. 2015. Haiti: Toward a New Narrative. Systematic Country Diagnostic. Washington, DC: World Bank
[2] *The Dutch Disease,* The Economist, November 26th 1977, pp-82-3

As the flow of remittances to Haiti is becoming increasingly large, it is therefore important that we understand its impact beyond the household level and investigate its relationship with various macroeconomic indicators. One place to start is to look at the effect of these transfers on the external competitiveness of the country, a concept that is often approximated by the real exchange rate (RER).This study will therefore look at the link between the RER and a set of potential determinants including the remittances received by the Haitian economy. In other words, it would look at whether remittances sent to Haiti could possibly lead to some form of Dutch disease phenomenon. Section 2 of the paper reviews the literature on the relationship between remittances and the RER. Section 3 introduces the data and methodology. We discuss the results in Section 4 and provide our concluding remarks in Section 5.

II. Literature review

The discussion regarding the macroeconomic impacts of large capital flows can be traced back to the "transfer problem" debate between Keynes and Ohlin in the interwar period. Indeed, one aspect of that discussion between the two renowned economists was whether the reparations transfers that Germany had to pay after World War I would have a negative impact on the competitiveness of the industries in the transfer receiving countries.

More recently, studies of the impact of remittances in developing countries have found that they are associated with a wide range of macroeconomic effects. For instance, Fajnzylber and Lopez (2007) found that remittances are associated with lower poverty levels and higher growth rates. Remittances are also found to be associated with lower output

volatility in receiving countries as they are countercyclical (Ratha, 2007). This was observed in following the 2010 earthquake in Haiti, as transfers from Haitians abroad rose by more than 7%, against 0.42% a year earlier, in order to ease the financial hardships faced by family and friends. Furthermore, Abdih, Barajas and Ebeke (2012) have found that they increase aggregate private demand through higher private consumption, while having not much effect on investment. At the same time, they help expand the tax base, raise government revenue and more generally improve the fiscal space. In matters related to public debt, Abdih, et al. (2009) have pointed to how these transfers help reduce country risk and improve the sustainability of government debt. Moreover, large flows of remittances increase bank liquid assets and are associated with weaker monetary policy transmission as highlighted by Barajas et al. (2016). Furthermore, the real appreciation of the domestic currency induced by remittances leads to rising employment in the non-traded goods sector at the expense of traded goods activities such as agriculture and manufacturing (Chami et al, 2018). This may be one of the factor behind the premature deindustrialization trend (Rodrik, 2016) observed in many developing countries.

In a broader political economy sense, remittances have been found to be a potential source of moral hazard as they weaken the incentives for government policy reforms in receiving countries (Barajas, Chami et al., 2018). Indeed, as a source of income largely independent from government initiatives and a cushion in the face of economic shocks, remittances reduce the incentive for citizens to lobby and pressure their government to policies that could be beneficial to them. Thus they decrease the sense of urgency that could have accelerated the pace of structural change.

As a financial inflow, migrants transfers are similar to other foreign exchange flows in an economy and can therefore be analyzed through the dynamics of the Dutch disease phenomenon mentioned earlier. This relationship is often studied through two main models, the Fundamental Equilibrium Real Exchange Rate (FEER) and the Behavioral Equilibrium Real Exchange Rate (BEER). FEER models generally point to a necessary path for the RER in order for the economy to achieve internal and external balance. In order to do this, they usually express the RER as determined by the optimal level of domestic output and sustained capital flows. In contrast, BEER models shed light on major macroeconomic fundamentals (terms of trade, capital flows, openness to trade, …) in their relationship to the RER. This approach pioneered by Clark and Mc Donald (1999) uses a single equation expressing the behavior of the RER in terms of variables susceptible to affect the relative prices of traded and non-traded goods in the economy.

Among notable empirical studies of the determinants of the RER using the BEER approach, one could cite Edwards (1988). This paper develops a dynamic model of real exchange rate behavior in developing economies and highlights the role of devaluations and balance of payments crisis using data from 12 countries. He also argues that only real variables are susceptible to affect the long run equilibrium RER while an excessively loose monetary policycan lead to RER appreciation.

Using a similar BEER framework, Lopez, Molina and Bussolo (2007) investigate the impact of transfers in the Latin American context and find that remittances contribute to significant real exchange rate appreciation. They also provide a succinct review of the mechanisms through which remittances may affect the external competitiveness. To do so,

they consider the case of a small open economy model where an increase in remittances translates into a permanent increase in households' incomes. As the small economies are price takers in international markets, the increase in demand does not raise the price they face for tradables while the domestically-determined price of non-tradables increases. Beside this "spending effect", there is a "resource movement effect". Indeed, the change in relative price makes in the non-tradable sector more profitable. This will fuel the demand for factors of production that are widely used in these sectors. The greater demand for inputs by the most dynamic sectors will be met by factors leaving other sectors (resource movement effect) and will likely result ultimately in higher returns for that factor. The change in price and the movement of resources in favor of non-tradables will affect negatively the competitiveness of export oriented and import competing sectors. The real appreciation of the domestic currency will ultimately translate into increased imports and lower exports.

Among other empirical papers that have investigated the relationship between remittances and the real exchange rate, Amuedo-Dorantes and Pozo (2004) look at the data of 13 Latin American economies found that a doubling of migrants' transfers induces a 22% overvaluation of the exchange rate on average. However, Rajan and Subramanian (2005) concludes that unlike other financial flows such as foreign aid, remittances do not lead to an adverse effect on external competitiveness. More recently Tuuli (2015), studying the impact of remittances on the real exchange rate in Ghana with an error correction model, finds that they cause real appreciation in the long run. Similar results are found for Tunisia by Khaled & Farid (2012).

Following these line of work, our investigation will rely on the BEER approach taking advantage of its relatively easier applicability to empirical investigations and its wide use in the literature. More specifically, we will follow the general approach adopted by studies such as Ahmed (2009), Tuuli (2015) as well as Khaled & Farid (2012) given that they fit well with our available data.

III. Data and methodology

This study uses annual data in order to estimate the long-run and short-run relationships between Haiti's Real Effective Exchange Rate (REER), remittances as a share of GDP (REM) as well as a set of macroeconomic fundamental variables from 1985 and 2018. This set of variable includes: other capital inflows as a share of GDP (CAP), an index of the openness of the economy (LIB), government expenditure as a percentage of GDP (GOV) as well as the country's terms of trade (TOT).

Theoretically, the real exchange rate is supposed to reflect the relative price of tradable to non-tradable goods. Among its many approximations we choose the Real Effective Exchange Rate (REER) computed by the IMF for Haiti. It is obtained using the number of foreign currency units per domestic currency unit (E), adjusted for the relative price differences between Haiti and its main trading partners. This difference is calculated by dividing the domestic CPI(P_d) by an average CPI index for the country's trading partners(P_f). Thus, the REER can be expressed as follows.

$$REER \ = \ E(\frac{P_d}{P_f})$$

It follows that an increase in the ratio illustrates an appreciation of the real exchange rate.

The main relationship we will be looking at will be the one between the REER and

Remittances as a percentage of GDP (REM). That variable is obtained from the World

Development Indicators database.

Figure 2: Evolution of Haiti's Real Effective Exchange Rate
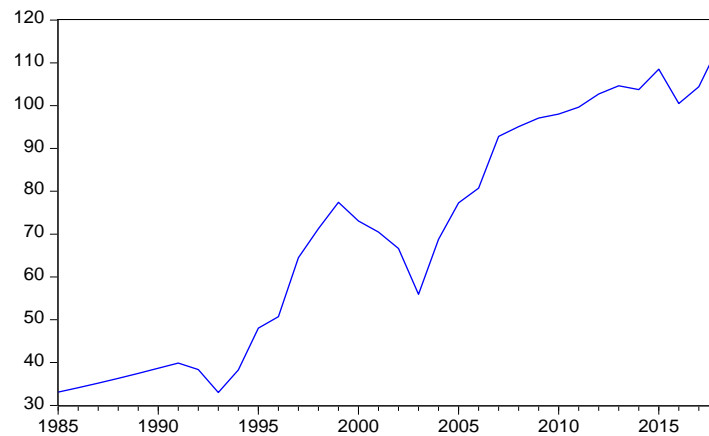
The other main capital inflows to Haiti during the study period have been foreign aid as

measured by Official Development Assistance (ODA), as well as Foreign Direct

Investment (FDI). Therefore, we add these two flows to create the *Capital Flow* (CAP)

variable and use it in the model, given that all major flow of foreign exchange are expected

to lead to real exchange rate appreciation. These data are taken from the Balance of

Payments compiled by the Central Bank of Haiti (BRH).

We also use a measure of the *openness or liberalization of the economy* (LIB). This is

usually approximated by a ratio of imports plus exports to GDP. Generally, it is expected

that a more open economy is able to reap the benefits of global competitiveness in the form

of technology transfers and turn it into lower non-tradable price and ultimately to RER

depreciation. Conversely, a more closed economy through higher tariffs or quotas is expected to be more susceptible to price pressures for imports and tradable goods. Ultimately, this should translate into an appreciation of the RER. The openness variable is taken from the World Development Indicators database.

Government expenditures (GOV) is included in the model as a more expansive fiscal policy is usually associated with inflationary pressures in developing economies. Indeed, given that non-tradables represent a major share of these expenditures (salaries for services provided by civil servants for instance), they particularly fuel non-tradable inflation and are expected to lead ultimately to RER appreciation. The government expenditures data are taken from data compiled by the Central Bank of Haiti.

Finally, we also include a *Term of Trade (TOT)* variable. As the relative price of exports to imports, this variable reflects the impact of foreign demand and supply on the export and import competing sectors of an economy. However, its impact on the RER is ambiguous given its substitution and income effects. Indeed, through the income effect, an improvement in the terms of trade leaves more money to be spent on tradable and non-tradable goods. The latter sector being constrained by domestic supply, its prices are expected to rise, leading to RER appreciation. Through the substitution effect, that TOT improvement, will lead to increased consumption of imports and a decrease in the demand for tradable goods as well as their price. The two effects will therefore translate into opposite impacts on the RER. The TOT variable is obtained from the World Development Indicators database.

IV. Empirical results

Using the above variables, we intend to test the relationship between Haiti's Real Effective

Exchange Rate (REER) and remittances as a share of GDP, with the following equation.

$$REER_t = f(REM_t, CAP_t, LIB_t, GOV_t, TOT_t)$$

In order to address the possibility of non-linear relationships, all variables will be taken in

logarithm form except for CAP, which took negative values during the early 1990s[3]. An

Augmented Dickey-Fuller test shows that the variable are not stationary in levels,

excluding the possibility that ordinary least squares be used.

Table 1: Unit root test with break

Variables	Breaks	Augmented Dickey-Fuller test statistic	Test critical values	Conclusion
CAP		-4.13	-3.61	I(1)
LLIB	2009	-7.80	-4.44	I(1)
LREM	2003	-4.73	-4.44	I(1)
LREER	1997	-4.92	-4.44	I(1)
LTOT	2008	-5.51	-4.44	I(1)
LGOV	1997	-7.24	-4.44	I(1)

Since all the variables were integrated of order one, we proceeded to test for cointegration

using the Johansen cointegration test. The values of the Trace Statistic indicate one

cointegration equation at 5% level.

Table 2: Johansen cointegration results

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[3] Haiti was under an economic and financial embargo at that time and suffered from significant capital outflows.

H_o	H_1	Trace statistic	5% critical Value	Prob.**
r=0	r>0	108.8861*	95.7537	0.0046
r≤1	r>1	66.8981	69.8189	0.0836
r≤2	r>2	37.7657	47.8561	0.3123
r≤3	r>3	18.8458	29.7971	0.5040
r≤4	r>4	6.0810	15.4947	0.6860
r≤5	r>5	1.4673	3.8415	0.2258

Notes: Trace test indicates 1 cointegrating equation(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

We will therefore resort to an error correction model approach by estimating the following

equation.

$$\Delta REER_t = \theta(REER_{t-1} + \beta_1 REM_{t-1} + \beta_2 X_{t-1}) + \delta_0 + \delta_1 \Delta REM_t + \delta_2 \Delta X_t + \varepsilon_t$$

Where X is a set of macroeconomic fundamentals that include the following: other capital

inflows as a share of GDP (CAP), the index of the openness of the economy (LIB),

government expenditure as a percentage of GDP (GOV) as well as the country's terms of

trade (TOT). This method will allow us to test the long run relationship between the

variables as well as the possibility of short term disequilibrium among them. Table 3

reports the results of the long run equation while Table 4 presents the results for the short

run.

Table 3: Long run equation

Dependent variable: D(LREER)			
Variable	Coefficient	Std. error	t-statistic
LREM	0.4488	0.1116	4.0203
LLIB	2.1922	0.3662	5.9870
LGOV	-0.2494	0.1147	-2.1736
LTOT	0.0430	0.1251	0.3434
CAP	0.0263	0.0055	4.7831
Trend	-0.0941	0.0097	-9.7257
C	-10.8765		

The results in table 3 are for the long run relationship. Judging from t-statistic values, we conclude that all the variables significantly affect the real exchange rate, except for the term of trade variable. In the case of the remittances as a percentage of GDP, the long run equation implies that an increase is related to an appreciation of the REER and at 0.45, the coefficient is important relatively to other variables in the model except for the trade openness variable. As expected, other capital flows (CAP) are also positively related to the REER in the long run. However, at 0.03, their coefficient is small relatively to the other variables.

Contrary to the expectations of our analysis, an increase in trade openness is not positively associated with greater external competitiveness. Indeed, the coefficient on this variable is both positive and large, meaning that greater trade openness is associated with increasing real appreciation of the domestic currency in the long run. One possibility might be the presence of a reverse causation issue where real appreciation would lead to increased imports (as the variable is mostly driven by imports instead of exports) and a larger openness index. This observation should be the subject of further investigation given the magnitude and significance of the coefficient. The final result regarding this its dynamics

would also have significant policy implications in terms of external trade policy in the
Haitian context.

Another result that goes against our previous analysis is the coefficient of the Government
Expenditures as a share of GDP. With a negative sign, it shows that a more expansionary
fiscal policy is associated with increased real depreciation in the long run. One explanation
here could be that even if a large share of the government budget is seemingly spent on
non-tradable goods such as labor and services, these amounts are ultimately spent by
employees and contractors on tradable goods, mostly imports. This increased demand for
imports may lead to a nominal depreciation of the domestic currency that doesn't translate
fully into greater domestic inflation.

Table 4: Short run equation

Dependent variable: D(LREER)			
Variable	*Coefficient*	*Std. error*	*t-statistic*
CointEq1	-0.3106	0.0723	-4.2962
C	0.0385	0.017	2.2694
D(LRER(-1))	0.0932	0.1847	0.5048
D(LREM(-1))	0.0977	0.1127	0.8665
D(LLIB(-1))	0.4606	0.1605	2.8701
D(LGOV(-1))	-0.1342	0.0817	-1.643
D(LTOT(-1))	0.213	0.1018	2.0929
D(CAP(-1))	0.0042	0.0031	1.3537
DUM92-93	-0.2065	0.0574	-3.5957
DUM2003	-0.1845	0.0737	-2.502
R-squared	0.6591		
Adj. R-squared	0.5197		
Residual Serial Correlation LM Tests:		Prob = 58.75	

The results in Table 4 are for the short run relationship. Short run relationships may be
different from the long run ones, as transitory factors can push variables away from their
long run equilibrium values. The results in this case show that in the short term, remittances

have a positive but not significant relationship with the REER. The same can be said about the other capital flows variable. The term of trade variable remains significant and positive. As this variable is mainly driven by the price of imports in the Haitian case, its coefficient could be understood as evidence that import prices are quickly reflected into the inflation rate, leading therefore to short run real appreciation of the currency. Also, the Government Expenditure maintains its sign although it loses in terms of significance in the short term. Furthermore, the trade openness remains significant while maintaining a relatively strong positive relationship with the REER. As discussed earlier, the sign exhibited by this coefficient warrants further investigation, especially in terms of a possible reverse causation issue. Finally, dummies for the years 1992, 1993 and 2003 are included in the model. They correspond to periods of major shocks in terms of nominal depreciation of the currency and domestic inflation due to an economic and financial embargo (1992, 1993) as well as political instability (2003). Overall, 66% of the short run movement in the REER can be explained by the specified model and the REER corrects itself toward the long run equilibrium path by 31% in the first period.

V. Concluding remarks and some implications for policymakers

This paper attempts to investigate the relationship between remittances and the real exchange rate in the Haiti. In other words it looks at whether remittances have induced some form of Dutch disease in the Haitian context. Using annual data and controlling for other macroeconomic factors that might affect the country's external competitiveness, our results point to a positive long run relationship between the remittances as a share of GDP and the Real Effective Exchange Rate (REER). Therefore it can be said that the available

evidence leads us to think that migrant transfers to Haiti do induce some form of Dutch Disease.

While the relationship between the REER and some other variables such as trade openness require further investigation, the results raise the issue of what policy makers in Haiti could and should do to mitigate the negative impacts of migrants' transfers' inflows. Indeed, external competitiveness is of paramount importance for small economies looking to accelerate their GDP growth rate. While remittances are helping to increase consumption and improve some development outcomes in Haiti, they may be ultimately detrimental to the country's potential for accelerated growth.

Some authors have pointed to the possible use of sterilization operations but also warn against their cost and sustainability (Lopez et al., 2007). Moreover, given the relative ineffectiveness of monetary policy in remittances' dependent economies, other researchers have mentioned the possibility for these countries to adopt a fixed exchange rate (Barajas et al. 2016). However, this may leave their external competitiveness at the mercy of changes in monetary policy of the anchor currency.

Nevertheless, one possible avenue for government intervention remains microeconomic policies. Such interventions could try to address specific constraints in export and import competing sectors while avoiding economy wide changes in policy. Therefore, some forms of "industrial policy" might be needed in order to overcome the challenges created by the trend in real appreciation of the Haitian currency.

Table 5. Descriptive Statistics

	Mean	Std. Dev.	Maximum	Minimum
CAP	2.29	5.08	24.95	-0.15
LIB	32.01	5.86	47.98	23.28

REM	16.07	8.93	32.54	4.43
REER	70.31	27.60	114.09	33.03
TOT	173.10	73.63	321.69	95.71
GOV	13.18	3.51	20.03	5.76

Table 6. Correlation Matrix

	CAP	*LIB*	*REM*	*REER*	*TOT*	*GC*
CAP	1					
LIB	0.1098	1				
REM	0.3146	0.6633	1			
REER	0.4372	0.7483	0.8361	1		
TOT	0.3540	0.7535	0.4539	0.6420	1	
GOV	0.1339	0.4674	0.1243	0.2261	0.7269	1

Table 7. Variable definitions and notations

	Variable	*Measure*	*Notation*	*Expected effect*
Dependent variable	Real exchange rate	Nominal exchange rate (quoted indirectly) *Non-Tradable price / tradable price $E\dfrac{P_d}{P_f}$	REER	
Determinants	Remittances	Remittances / GDP	REM	Positive
	Terms of trade	Export unit value indexes/ Import unit value indexes	TOT	Ambiguous
	CAP	(capital account +Foreign direct investment) / GDP	CAP	Positive
	LIB	(Exportation + importation)/ GDP	LIB	Negative
	GC	Government expenditures / GDP	GOV	Positive

Figure3 . Evolution of other macroeconomic fundamentals
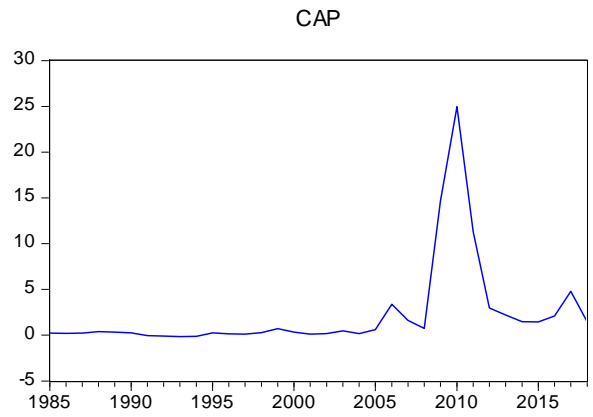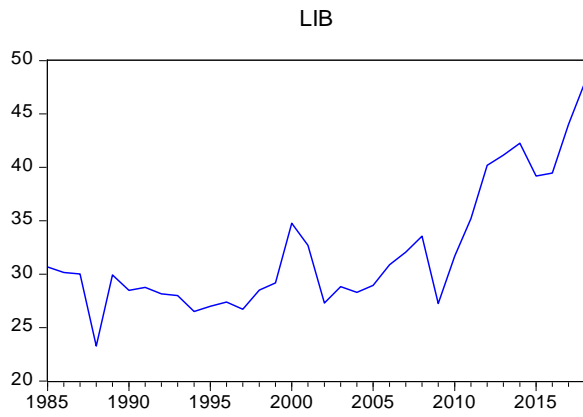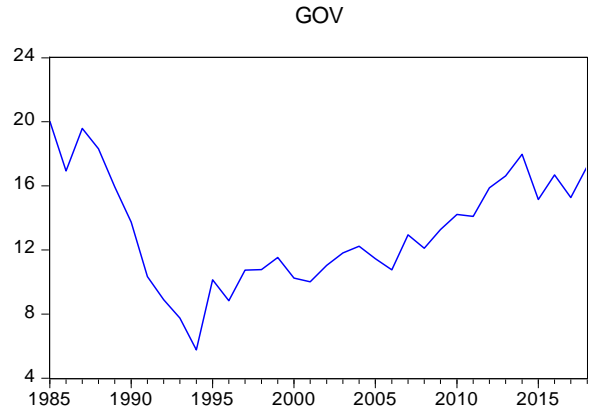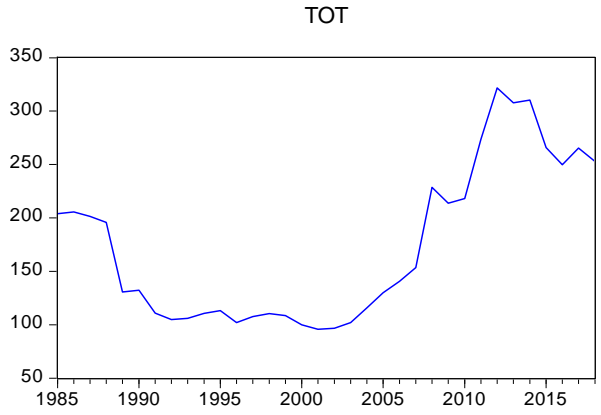
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