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Balance of Payment Dynamic in Indonesia and the Structure of Economy

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Abstract

This paper will assess in aggregate and detail the trend of BOP and its component in Indonesia. Stationarity test will be employed to each component of Indonesian BOP to assess the persistency. This study will calculate the balance of payment constrained growth (BOPC) using Kalman Filter technique (state space model). The BOP, secondary income, and financial account are found to be stationer which means that the data are mean reverting. On the other hand, current account balance, trade balance, service balance, primary income, and capital account balance are unit root. This paper found the evidence of the importance of commodity price to Indonesian current account and export. Indonesian dependency on commodity-based export need to be restructured. Indonesia should also consider the side effect of FDI as a source of financing for current account deficit, without ignoring the positive effect of FDI and the volatility of portfolio investment. The persistency of primary income deficit should also become Indonesian future policy agenda.
Keywords: balance of payment; economic structure; macroeconomics; Indonesian economy

Abstrak

Makalah ini menganalisis secara makro dan rinci tentang neraca pembayaran Indonesia dan komponen-komponennya. Uji stasioner dilakukan pada tiap komponen neraca pembayaran Indonesia untuk mendapatkan ketepatan. Makalah ini mengadopsi perhitungan BOPC (balance of payment constrained growth) dengan teknis Kalman Filter. Hasilnya neraca pembayaran, pendapatan sekunder dan neraca keuangan bersifat stasioner sementara neraca transaksi berjalan, neraca jasa, neraca perdagangan, pendapatan primer dan neraca modal bersifat tidak stasioner. Makalah ini membuktikan bahwa harga komoditi primer sangat penting bagi neraca transaksi berjalan dan ekspor nasional. Ketergantungan Indonesia pada komoditi primer sangat besar sehingga harus dikurangi. Caranya adalah dengan meningkatkan peran investasi asing jangka panjang dan jangka pendek. Upaya mengatasi defisit neraca pendapatan primer harus menjadi agenda jangka panjang utama.
Kata kunci: *neraca pembayaran; struktur ekonomi; makroekonomi; ekonomi Indonesian*

JEL classifications: F32; F41; E60

1. Introduction

IMF (2016) noted that the sum of net non-reserve capital inflows and the current account balance was equal to the changes in foreign reserves under the balance of payments identity. It also stated that the three components of the identity are jointly determined. As an illustration, during the years leading up to the global financial crisis (GFC), there were many commodity-exporting emerging market economies (including Indonesia) that received strong capital inflows during the rising investment opportunities and accumulated reserves, in addition to strong terms-of-trade gains offsetting the impact of rapid import growth on the current account. However, from 2011 onward, the process started to

reverse as the commodity prices declining and the growth prospects becoming more subdued. The explanation of this general pattern by IMF also applied in Indonesia's case.

The ups and downs of commodity prices have been affecting the dynamics of BoPs in several emerging markets, including Indonesia. Besides the commodity prices, the quantitative-easing (QE) shocks also have some effect on the BoP dynamics. There is a strong relationship between the peak periods of large capital inflows (which mostly consists of portfolio inflows) in Indonesia and the United States' QE policy. The declining trend of capital inflows in Indonesia after 2013 has been largely influenced by the exit from the Fed's accommodative monetary policy. Since the beginning of a gradual exit from accommodative monetary policy in the U.S., many countries have been increasingly exposed to fluctuations in global uncertainty. Andaiyani & Falianty (2017) suggested that the increase in global uncertainty was one of the factors that induced fluctuations in the capital flow to Emerging Market Economics (EMEs).

The importance of understanding BoP dynamics is related to the concept of Balance-of-Payments-Constrained (BOPC) Growth. This concept explains the mechanism of how BoP dynamics can influence the dynamics of economic growth. BoP sustainability is considered to be a key factor in achieving sustainable growth. The previous studies related to BOPC growth concept are from Thrillwall (1979), Felipe, Mc Combie & Naqvi (2010), Felipe & Lanzafame (2017).

To smooth the volatility in BoP dynamics, IMF (2016) emphasized the importance of mitigation policies to anticipate global factors that could influence BoP sustainability. Such policies are required to minimize each country's vulnerabilities to global risk factors. These policies include prudent fiscal policies, proactive macro-prudential policies, flexi-

ble exchange-rate, and improved foreign exchange management. In addition to these suggested policies from IMF, we should also consider policies that are related to the economic structure of the country. The structure of a country may have a strong correlation with the BoP dynamics, especially the structure of its international trade. In the case of Indonesia as one of the exporting countries which are highly dependent on primary commodities, the commodity price upswings will greatly influence the trade balance. Indonesia's ongoing structural dependency on the export of primary commodities is classified as a structural factor that needs to be addressed by policymakers. More structural factors would be explored in this research. This paper shall assess the trends of Indonesia's BoP and its components by the aggregates and details. After identifying the patterns of BoP components, we can identify the correlation between the patterns and the structural distortions in the economy of Indonesia.
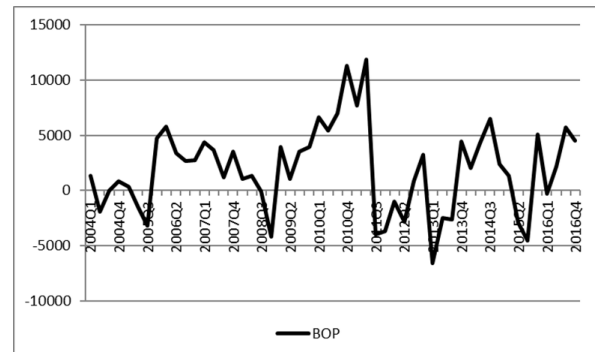
Figure 1: Indonesian Balance of Payment in Million USD, 2004Q1–2016Q4
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia

There are two objectives of this study. The first objective is to identify the dynamics of BoP and BoP components in Indonesia. The second one is to assess the relationship between the BoP dynamics and the economic structure of Indonesia, as well as its correlation to BOPC growth. Understanding BoP dynamics would be essential for measuring the

external sustainability of Indonesia. External sustainability indicator is important as an early warning system indicator which can be used to formulate macroeconomic policy to anticipate future situation. The relationship between BoP dynamics and Indonesia's economic structure is important to emphasize the importance of structural transformation in securing a sustainable external position for Indonesia as well as sustainable economic growth.

2. Literature Review

Internal balance is a term used to describe the macroeconomic goals of producing at potential output (at full employment) or also called normal production and of price stability (low inflation). Unsustainable use of resources (over employment) in which the demand for resources exceeds the available supply tends to increase prices, meanwhile, an underemployment where the available supply is not optimally used is inefficient and tends to decrease prices. Both of which can hinder a country from achieving internal balance by reducing the economy's efficiency. As for external balance, it is achieved when an optimal level of the account balance is attained. Optimal balance refers to the external balance achieved when "a country's current account is neither so deeply in the deficit that the country may be unable to repay its foreign debts, nor it is so strongly in surplus that foreigners are put in that position" (Krugmman & Obstfeld 2003). In other words, external balance can also be defined as the condition in which neither excessive current account deficit nor excessive current account surplus is observed within an economy.

The basic theory of the balance of payment and current account sustainability is needed to understand the framework of BoP dynamics and current account sustainability.

$$Y = C + I + G + X - M \qquad (1)$$

where Y is Gross Domestic Product (GDP), C is aggregate consumption, I is aggregate investment, G is government expenditure, and $X - M$ is trade balance (exports-imports).

As we define $A = C + I + G$, then Equation (1) is reduced to:

$$Y - A = X - M \qquad (2)$$

Equation (2) shows that the difference between domestic production and domestic absorption always equals to the current account of the balance of payment. In this case, Equation (2) assumed that current account is only composed of net exports.

The framework of intertemporal approach to the current account will be addressed next as a part of this study. Standard open-economy identity provides a good starting point for constructing an intertemporal current account framework. Therefore, we will denote net exports or trade balance as NX, the primary income balance as PI, and the secondary income balance as SI, then we can define the current account (CA) balance for Indonesia for any period t, as:

$$CA_t^{INA} = NX_t^{INA} + PI_t^{INA} + SI_t^{INA} \qquad (3)$$

The standard income expenditure identity is given by Equation (2). Note that Y_t^{INA} refers to GDP in period t, C_t^{INA} refers to the household consumption in period t, I_t^{INA} refers to the domestic investment in period t, and G_t^{INA} refers to the government purchases in period t:

$$Y_t^{INA} = C_t^{INA} + I_t^{INA} + G_t^{INA} + NX_t^{INA} \qquad (4)$$

If we add the primary income balance and the secondary income balance and subtract the net taxes
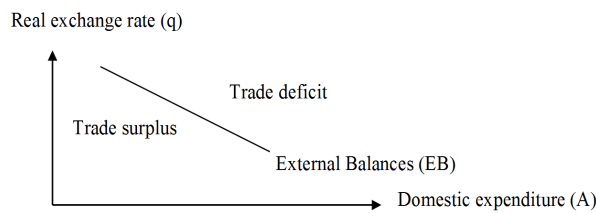
Figure 2: External Balance

(denoted by T_t^{INA}; or also called taxes net of transfers) from both sides of the income-expenditure identity, we obtain:

$$Y_t^{INA} + PI_t^{INA} + SI_t^{INA} - T_t^{INA} = \qquad (5)$$
$$C_t^{INA} + I_t^{INA} + G_t^{INA} + NX_t^{INA} + PI_t^{INA} +$$
$$SI_t^{INA} - T_t^{INA}$$

By combining Equation (1) and (3), and rearranging terms yield:

$$(Y_t^{INA} + PI_t^{INA} + SI_t^{INA} - T_t^{INA} - C_t^{INA}) \qquad (6)$$
$$+ (T_t^{INA} - G_t^{INA}) = I_t^{INA} + CA_t^{INA}$$

The left-hand side of the above equation reflects the sum of private saving $(Y_t^{INA} + PI_t^{INA} + SI_t^{INA} - T_t^{INA} - C_t^{INA})$ and public saving $(T_t^{INA} - G_t^{INA})$, and therefore Equation (4) can be simplified to obtain the important open-economy identity (note: S_t^{INA} denotes the national saving and is equal to the private saving plus public saving):

$$S_t^{INA} = I_t^{INA} + CA_t^{INA} \rightarrow S_t^{INA} - I_t^{INA} = CA_t^{INA} \quad (7)$$

Another crucial open-economy identity can be derived from the BoP accounting system. The following crucial flow identity (based on the double-entry book-keeping approach used in BoP accounting system) holds for each period (t):

$$CA_t^{INA} + KA_t^{INA} + FA_t^{INA} = 0 \qquad (8)$$

The identity states that the sum of the current account, the capital account (KA) as well as a financial account (FA) should be equal to zero. If Indonesia ran a current account deficit ($CA_t^{INA} < 0$ and $S_t^{INA} - I_t^{INA} < 0$), then a financial account surplus (FA_t^INA>0) is unavoidable (given that the capital account is typically quite small and can often be ignored). In other words, Indonesia's current account deficit reflects the net new acquisition of foreign claims on the Indonesian. This study will map the dynamics of the current account balance in Indonesia during the observation period.

According to Thirlwall (1979), countries can run current account deficits in the short run but persistent CA deficits cannot be sustained and will sooner or later lead to the adjustment process. A country's current account deficit can be worse when the domestic assets owned by foreign residents are greater than assets owned by domestic residents. Although a country cannot grow faster than its balance of payments equilibrium growth rate for a very long period, unless the country can finance an ever-growing deficit, there is little to stop a country from growing slower and accumulating large surpluses (Thirlwall 2011). According to his theory, BoP can act as a constraint on long-run growth, so long-run growth must be consistent with the BoP equilibrium. Felipe, McCombie & Naqvi (2010) applied the framework of Balance of Payment Constrained Growth (BoPC growth) for Pakistan. They found that Pakistan's maximum growth rate which was consistent with the equilibrium on the basic balance was approximately 5% per annum. This figure was below the specified target (GDP growth rate target of 7–8% per annum in the long term).

BoPC growth framework has indicated several important implications for Pakistan development policy. The sources of constraints that impede the higher growth of exports were found to be the export structure and the low export complexity (and sophistication performances). With low export complexity, real exchange rate depreciation would not lead to an improvement in the current account. In their study, they gave the recommendation for Pakistan to shift its export structure from the traditional export areas towards more sophisticated manufactured goods with a higher income elasticity of demand.

Freytag (2008) explored the BoP Dynamics in South Africa. He linked the BoP dynamics with the institutions and the economic performance of a country. He identified the institutional and microeconomic perspectives of the current account. The institutional aspects that were covered in the study including the degree of economic freedom, property right, regulations on economic activities, bureaucratic hurdles, governance, equal opportunity, and fairness. Besides BoP dynamics, Freytag (2008) also explained the interaction between the current account and the capital account. He also discussed the policy issues stemmed from the imbalances in BoP.

Asmarani & Falianty (2014) used stationary and Autoregressive Distributed Lag (ARDL) Approach to testing the current account deficit persistency and sustainability. They found that Indonesia's current account deficit was persistent for the period of 2004Q1-2014Q1. They also found that trade and service balance of Indonesia was in an unsustainable condition. The unsustainable condition was more severe in the service sector. Lau et al. (2001) found that five East Asia countries' BoPs were mean reverting, by using the data from 1976Q1–2001Q4. By using data from before and after global financial crisis period (1960Q1–2010Q4), Clower & Ito (2012) examined a panel of 71 sample countries, where they found patterns of persistence in the current account deficits. Indonesia was also included in their country sample countries.

Calderon, Chong & Loayza (1999) provided the evidence of the empirical linkage between current account deficits (as a ratio to GNDI) and a broad set of main economic variables proposed by the literature. They found that a rise in domestic output growth would generate a larger current account deficit which indicated that the domestic growth rate had a greater positive association with the domestic investment than the national saving. They also found that temporary shocks in terms of trade were linked to higher current account deficits. Additionally, they also found that the higher growth rates in industrialized economies or the larger international interest rates led to a reduction in the current account deficits in developing economies. Moreover, Chen (2011) examined the possibility of the current account deficits of OECD countries to be characterized by a unit root process with regime switching. In this study, the econometric methodology of regime-switching has allowed analysts to distinguish periods which were associated with unsustainable outcomes from those in which the intertemporal national long-run budget constraint (LRBC) held. He pointed out that LRBC was not very likely to hold for Australia, the Czech Republic, Hungary, New Zealand, Portugal, Finland, and Spain. Based on his observation in this study, he noted a red flag regarding the current account deficits observed in the studied period which might not be on a sustainable path and might lead the countries to face a serious risk.

In his study, Kumar (2007) Kumar (2007) highlighted some benefits of FDI to emerging economies. He observed that in general, the foreign firms' participation in domestic business encouraged the transfer of advanced technologies to the host country as well as fostered human capital development by providing training for their employees. He also considered FDI to be more stable compared to other types

of capital flows. Many developing countries were observed to pursue FDI for the purpose of export promotion and not for production for the domestic economy. Kumar also remarked on how FDI was an important channel for delivery of services across borders. Additionally, he noted that FDI could finance current account deficits through its effect on investment or offset other financial transactions, such as increases in reserves or capital outflows. On the other hand, the negative effects of FDI were clearly highlighted by Jaffri et al. (2012). This study has contributed to the existing empirical literature showing negative impacts of FDI inflows in Pakistan. The study found that in the case of Pakistan, FDI inflows had worsened the current account balance in Pakistan both for long-run and short-run within the period of 1983–2011. He used Autoregressive Distributed Lag (ARDL) in his study. By using ARDL approach of cointegration, the study found evidence regarding how FDI inflows had worsened, specifically, the income account of the current account balance in Pakistan.

Felipe, Mc.Kombie & Naqvi (2010) discussed the application of Thirlwall's law wherein the long run, no country could grow faster than the rate that was consistent with the balance of the current account unless it could finance its ever-growing deficits. This law implies that there is a growth rate which a country cannot exceed for any length of time because the country will quickly run into balance of payment difficulties if the country ever crosses that certain growth rate. An increase in a country's growth rate through domestic demand policy shall increase the growth in imports through the import demand function, while the export growth is determined largely by the growth of foreign markets, and remains unaffected.

In addition, Tsen (2014) investigated the impact of public sector budget on external balance in Malaysia. He focused on the impacts of consolidated public-sector finance and federal government finance on the balance of trade, the balance of services, the balance of the current account and the balance of payments in Malaysia. He found that a budget may reduce the imbalance of certain goods and services, or one component of the balance of payments but not others due to different elasticities of goods and services. In short run, Malaysian government might cut public spending to address the issues in the external balance. In the long-run, the focus should be on improving productivity and the quality of products and services through technological advancement to enhance the export competitiveness of Malaysia. Ajayi (2015) explored the determinants of the balance of payments in Nigeria. The result suggested that a larger exchange rate and a lesser monetary policy rate would raise the balance of payments of the Nigerian economy.

3. Research Method and Data

Stationarity test would be applied to the BoP and its components in time series mode using unit root Augmented Dickey-Fuller (ADF diagnostic) in order to check the persistence of the balance of payment components. In addition, graphical representation would be used to complement the analysis in order to check the trends of the BoP and its components. The volatility of each component would be observed using a coefficient variation. The failure to reject the unit root hypothesis could be interpreted as an evidence for the non-mean reverting behavior of BoP components. The non-reverting behavior of BoP components could become a warning sign for policymakers for either the persistence of deficit or persistence of surplus. From these two types of trends, the most worrying concern is if there is a persistence of deficit. The initial hypothesis for this part of the analysis is that there is a persistent behavior of some components of BoP.

The following equation refers to Sastre (2015) to

explain the basic aspects of the current account behavior as one of the focus of this study.

The net trade is expressed as:

$$X_T - tc1T * M_T \qquad (9)$$

If B_T is the amount of Net Foreign Assets held, assuming zero inflation and perfect mobility of capital, the rates of return would be equal to the real interest rate, therefore:

$$X_T - tc1T * M_T + r * B_{T-1} = \Delta B_T \qquad (10)$$

where $r * B_{T-1}$ denotes payments on net foreign capital holdings and ΔB_T the net foreign asset position, while X_T, M_T, and tcr denote exports, imports, and exchange rate respectively, all variables expressed in real prices. The left-hand side of the equation is the current account position and the right-hand side the capital account.

Considering (10), the long-run equilibrium of net foreign assets, when the initial net asset holding is given, must satisfy the following:

$$X_T - tcIT * M_T + r * B_T = B_{T+1} + tcrMT - B_T$$

$$B_T = \frac{B_{T+1} + tcrM_T - X_T}{1 + r} \qquad (11)$$

If tcr_t, X_T, and M_T are constant, in the steady state, the net foreign asset holdings should satisfy

$$X_T - tcrM_T + rB_T = 0 \qquad (12)$$

Provided the transversality condition

$$\sum_{S=1}^{\infty} \frac{B_T + S}{(1+r)^s} = \sum_{S=1}^{\infty} \frac{X_{T+S} - tcrM_{T+S}}{(1+r)^s} = 0 \qquad (13)$$

The implication of these equations is that if the trade deficit is larger than this, the current account would be unsustainable. In this point, we must distinguish the current account sustainability from the

intertemporal approach to the current account. In a dynamic general equilibrium model, the optimality of consumption and savings decisions must be considered by combining the BoP with a simple intertemporal model of consumption (see Obstfeld & Rogoff 1996).

If we define domestic savings S_T as $S_T = Y_T - I_T - G_T = C_T + X_T - tcrM_T$

$$B_T = -\frac{X_T - tcrM_T}{r}$$

$$B_T = -\frac{X_T - tcrM_T}{r} - \sum_{S=1}^{\infty} \frac{X_{T+S} - tcrM_{T+S}}{(1+r)^s}$$

$$B_T = -\sum_{S=0}^{\infty} \frac{X_{T+S} - tcrM_{T+S}}{(1+r)^{s+1}} = -\sum_{S=0}^{\infty} \frac{S_{T+S} - C_{T+S}}{(1+r)^{s+1}} \qquad (14)$$

If we derive consumption from the life cycle theory, we get:

$$C_T = \frac{r}{1+r} W_T$$

Where wealth in the open economy is

$$W_T = \sum_{S=0}^{\infty} \frac{S_{T+S}}{(1+r)^s} + B_T$$

with the current account being

$$CA_T = S_T + rB_T - C_T \qquad (15)$$

Substituting in the current account would give:

$$CA_T = -\sum_{S=0}^{\infty} \frac{S_T - S_{T+S}}{(1+r)^s} \qquad (16)$$

$$= -\sum_{S=0}^{\infty} \frac{X_T - tcrM_T + C_T - [X_{T+S} - tcrM_{T+S} + C_{T+S}]}{(1+r)^s}$$

$$= \sum_{S=0}^{\infty} \frac{tcr[M_T - M_{T+S}] - [X_T - X_{T+S}] + C_{T+S} - C_T}{(1+r)^s}$$

Thus, in order to be sustainable, a current account deficit must be offset by the present value

of changes in the current and future domestic savings. This study would map the trend of current account balance. The period of observation for this study would be from 2004 to 2016, using quarterly data. The data of BoP and its components are collected from the External Statistics of Central Bank of Indonesia. Meanwhile, the international macroeconomic data as a supporting empirical evidence are taken from World Bank database and Bank for International Settlement (BIS) database.

To complement this analysis, we also would run OLS regression model for testing the significance of the commodity prices to Indonesia's export which is derived from the model in Senhadji & Montenegro (1998) and Falianty (2015). Granger causality test also would be applied to see the correlation between FDI and the current account variables based on a study by Tobing (2014). The regression model for the export equation is stated by the following equation:

$$
\begin{aligned}
\mathrm{Log(EXPORT)} = {} & \beta_0 + \beta_1 \mathrm{Log(GDPF)} \\
& + \beta_2 \mathrm{Log(EXCH\_RATE)} \\
& + \beta_3 \mathrm{Log(COMPRICE)}
\end{aligned}
\tag{17}
$$

EXPORT is the export rate of goods and services, EXCH_RATE is the nominal exchange rate, and GDPF is the world income, and COMPRICE is the international commodity price. Our initial hypothesis is that β_3 have a positive and significant effect. This hypothesis implies that the export rate of Indonesia depends on the commodity prices. Furthermore, for the Granger causality test, we predict that there is a causality between FDI as a component of the financial account and the Current Account.

For the second part of the complementary analysis, we would run the state space model (Kalman Filter or linear quadratic estimation) and Hodrick-Prescott Filter to obtain the balance of payment equilibrium growth rate.

$$
\mathrm{Xt} = \left(\frac{\mathrm{P_{dt}}}{\mathrm{P_{ft}}} \right)^{\eta} \mathrm{Z}^{\varepsilon}
\tag{18}
$$

$$
\mathrm{Mt} = \left(\frac{\mathrm{P_{dt}}}{\mathrm{P_{ft}}} \right)^{\theta} \mathrm{Y}^{\pi}
\tag{19}
$$

where:

X : exports;
M : imports;
Y : domestic income;
Z : world income;
$\mathrm{P_d}$: domestic price;
$\mathrm{P_f}$: foreign price;
η : elasticity of export to price ratio;
ε : elasticity of export to world income;
θ : elasticity of import to price ratio;
π : elasticity of import to domestic income.

In a growing economy, the long-run constraint of the BoP equilibrium requires the export rate and import rate to grow at the same rate.

$$
\eta(\mathrm{P_{dt}} - \mathrm{P_{ft}}) + \varepsilon \mathrm{Z_t} = \theta(\mathrm{P_{dt}} - \mathrm{P_{ft}}) + \pi \mathrm{g_t}
\tag{20}
$$

The assumption of purchasing power parity in the long-run will result $\mathrm{P_{dt}} - \mathrm{P_{ft}} = 0$, so we get

$$
\varepsilon \mathrm{Z_t} = \pi \mathrm{g_t}
\tag{21}
$$

Equation (18) can be rearranged as:

$$
\mathrm{g_t} = \frac{\varepsilon \mathrm{Z_t}}{\pi}
\tag{22}
$$

Because $\mathrm{g_t}$ is the growth rate of GDP which equalizes the rates of growth of exports and imports, $\mathrm{g_t}$ is the BOPC growth rate. Equation (19) identifies the factors that determine the BOPC growth rate namely the elasticity of export to the world income (ε), the world income (z), and the elasticity of import to domestic income (π).

Following Felipe & Lanzafame (2017)), we would like to find the time-varying BOPC growth rate for Indonesia. Previously, the BOPC growth rate typically was assumed to be constant, however, unless x_t or z_t is constant, the value of g_t would change over time with the change in the trends of export. The benefit of using time-varying estimator is the fact that we can account for changes in the structural features. In his study, Felipe used Kalman Filter method which also would be applied in this study. This study would use a state-space model with time-varying parameters, consisting of the following equations:

$$m_t = \theta_t rp_t + \pi_t g_t + u_t \tag{23}$$

$$\theta_t = \theta_{t-1} + v_t \tag{24}$$

$$\pi_t = \pi_{t-1} + v_t \tag{25}$$

To eliminate the short-run fluctuations, HP Filter is used to obtaining the long run trend of the growth rate of export, import, and output. The parameters of θ_t and π_t in Equation (24) are respectively the time-varying price and income elasticity of imports. To estimate both parameters, Kalman Filter method would be used.

4. Results and Analysis

In the first stage Stationarity test is employed to the main part component of BoP and BoP itself in aggregate. The result of this stationarity test is summarized in Table 1. Non-stationary behavior is represented in the current account balance, trade balance, services balance, primary income, and capital account. On the other hand, the stationary behavior is captured in aggregate BoP, secondary income, and financial account (even for financial account is weakly stationary).

The results of stationarity tests in Table 1 and 2 are also confirmed by Figure 3, 4, and 5. The current account balance persistency is shown by the diverging trend from its mean, especially since 2008. The capital and financial account in aggregate also show the diverging trend since the 2008-2009 global financial crisis. However, there is a peculiar characteristic to the capital and financial account of which persistence is not as strong as the persistence of the current account balance. The result of stationarity test for the capital and financial account is almost rejected, which means that the probability value is very close to 10% significance level (see Table 1 and Appendix Part I).

World Bank (2017) noted the importance of commodity prices to Indonesia's BoP and CAB performance. World Bank described an example of evidence in 2016Q4 where the prices for Indonesia's key export commodities improved. It is also found that commodity prices were significantly affecting Indonesia's export in the period of observation. The regression result shows the significance of the commodity prices along with the World GDP (GDPF)

$$\begin{aligned} \text{Log(EXPORT)} = &-47.235 + 2.450\log(\text{GDPF}) \\ &- 0.245\log(\text{EXCH\_RATE}) \\ &+ 0.510\log(\text{COMPRICE}) \end{aligned}$$

t stat   (-9.470)***   (9.400)***   (-1.830)* (7.840)***

Adj R2= 0.975   DW=2.118   n=51

The elasticity of export to commodity prices is 0.510, which means 1 percent increase in the commodity prices could increase the export rate of Indonesia by 0.510 percent. The commodity prices are a significant factor that determines the export rate. The significance of the commodity prices to Indonesia's export has previously been noted in the study of Falianty (2015). In her study, by using monthly data for the period of January 1995–December 2014,

Table 1: Stationarity Test of BOP and Its Component

Variables	Descriptions	Unit root test hypothesis	Coefficient Variation
BOP	Balance of payment	Rejected	2.038
CAB	Current Account Balances	Cannot be rejected	2.739
KFA	Capital and Financial Account	Almost rejected	1.329
TB	Trade Balances	Cannot be rejected	0.542
SB	Services Balances	Cannot be rejected	0.273
PI	Primary Income	Cannot be rejected	0.357
SI	Secondary Income	Rejected	0.258
KA	Capital Account	Cannot be rejected	1.462
FA	Financial Account	Almost rejected	1.347

Note: The test using standard ADF test statistic with 10% level of significance

Table 2: Stationarity Test of Detailed BoP Components

Category	BOP Component	Unit Root Hypothesis	Coefficient Variation
Goods	Non-oil and gas	Rejected	0.403
	Oil and gas	Cannot be rejected	**385.505**
Services	Manufacturing Services	Rejected	12.548
	Maintenance and Repair Services	Rejected	0.805
	Transportation	Rejected	0.333
	Travel	Cannot be rejected	0.889
	Construction	Rejected	2.539
	Insurance and pension	Rejected	0.442
	Financial	Rejected	0.581
	Charges for the use of intellectual property	Cannot be rejected	0.338
	Telecommunications, computer, and information services	Cannot be rejected	2.277
	Other business services	Rejected	0.828
	Personal, cultural, and recreational services	Cannot be rejected	1.225
Primary income	Employee compensation	Cannot be rejected	0.660
	Investment income	Cannot be rejected	0.349
Secondary income	General government	Cannot be rejected	2.240
	Others sectors	Rejected	**0.278**
Financial account	Direct investment	Rejected	0.873
	Portfolio investment	Rejected	1.196
	Other investment	Rejected	3.950
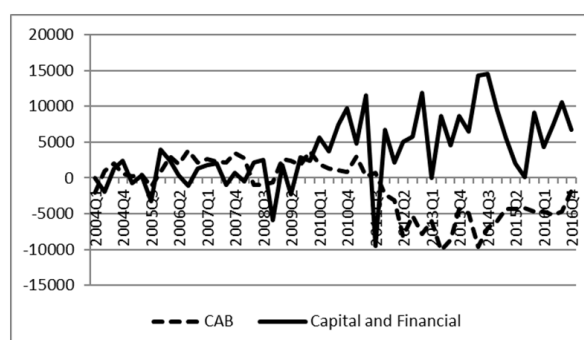
Figure 3: Current Account Balance vs. Capital and Financial Account Balance
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia

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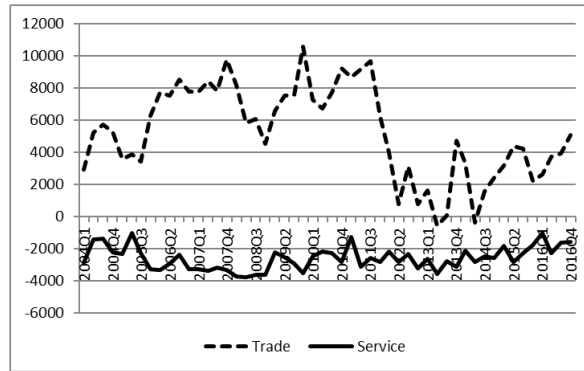
Figure 4: Trade and Service Balances in BoP of Indonesia, 2004Q1–2016Q4
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia
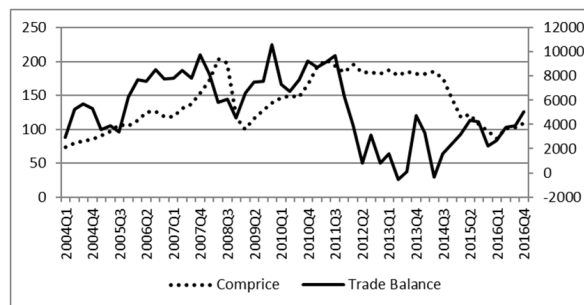
Figure 5: Commodity Prices and Trade Balance
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia combined with IMF Commodity Price Database

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she found that the elasticity of export to the commodity prices was 0.914.

The elasticity of Indonesia's export to US_GDP is higher than to commodity prices. In this study, Indonesia's export is found to be elastic. However, the commodity prices have significantly higher elasticity than US_GDP. Felipe et al. (2012) and Felipe, McCombie & Naqvi (2010) stressed the importance of export elasticity if the country wanted to grow faster without being constrained by the BoP. We then checked the progress of Indonesia's export elasticity by dividing Export Regression into two periods. The period of global financial crisis is chosen as the structural break for the export regression of the changes in export elasticity.

From Table 3 we can conclude that there is no significant improvement in Indonesia's export elasticity to World GDP (GDPF). On the other hand, Indonesia's export tends to be more elastic to commodity prices (COMPRICE). The export elasticity has increased from 0.468 to 0.514 (all coefficients are statistically significant). Indonesia's dependence on the commodity prices can become a constraint in bolstering Indonesian economic growth.

The Figure 6 confirms the significance of the commodity prices to export. The co-movement of export and the commodity price index shows that the two variables are closely related. Athukorala (2006) created surveys about the trends and patterns of Indonesia's export performance, focusing specifically on the comparative experience in major commodity categories and the changing revealed comparative advantage. He examined the implications of China's emergence as a major competitor in the world trade and explored the factors contributing to the post-crisis export slowdown. His research showed that Indonesia's poor export performance in the post-crisis era was largely supply driven.

Referring to Figure 6 and Table 2, the primary income has a diverging trend and unit root. The deficit of primary income has had a tendency to be persistent especially since 2008. According to Balance of Payment Manual 6 from IMF (2010), the primary income account shows the primary income flows between resident and nonresident institutions. Primary income represents the return that accrues for institutional units for their contribution to the production process of for the provision of labor, financial assets and renting natural resources to other institutional units. Primary income consists of compensation of employees, dividends, reinvested earnings, interest, rent, investment income attributable to policyholders in insurance, standardized guarantees, and pension funds, as well as taxes and subsidies on production and product.

It is a common knowledge that the volatility of portfolio investment is higher than the volatility of foreign direct investment (FDI). It can be seen from the ownership composition of Indonesia's stock market recorded in C-BEST that foreign investors still dominate the ownership composition with 64% of total ownership. Therefore, Indonesia's stock market is very vulnerable to the negative sentiment of the global market. The empirical evidence found on Indonesia's case is consistent with this statement. By referring to Table 2, it can be observed that the coefficient variation of FDI is lower than the coefficient variation for portfolio investment. The coefficient variation of FDI is 0.873, meanwhile, the coefficient variation of portfolio investment is slightly larger with 1.196. There are more discussions on finding the best instruments to finance Indonesia's current account deficits due to the fact that Indonesia's current account has suffered from a deficit since the fourth quarter of 2011. There is a belief that the foreign direct investment (FDI) is the best alternative to finance current account deficit, aside from the offshore loans and portfolio investments. However, several studies showed that FDI flows have apparently contributed to the current account deficit in many countries.

Table 3: Export Elasticity

Variable	Before GFC	After GFC
GDPF	2.502***	2.591***
EXCH_RATE	0.392**	-0.515***
COMPRICE	0.468***	0.514***
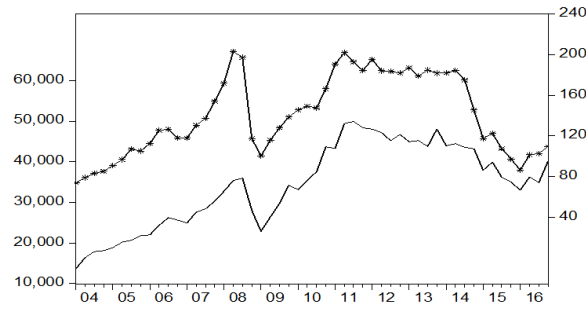
Figure 6: Co-movement between Export and Commodity Price Index
Note: LHS is Export Value, RHS is Commodity Price Index.
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia combined with IMF Commodity Price Database
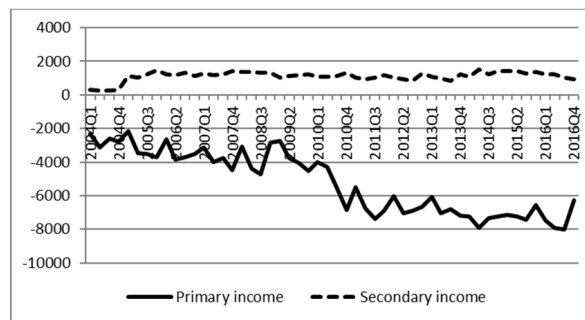
Figure 7: The Primary Income and Secondary Income
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia
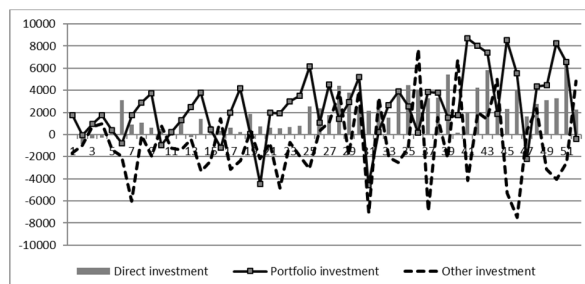
Figure 8: Financial Account Component (Direct Investment, Portfolio Investment, and Other Investment)
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia

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The study by Tobing (2014) for Central Bank of Indonesia working paper showed that from the economic sector side, imports by the manufacturing sector largely contributed to the current account deficit. Hence, it is perceived that in the future the overall impact of FDI in Indonesia would put more pressures on the deficits of the current accounts. The empirical results using Toda-Yamamoto VAR Model shows that there is an evidence to support that the capital account affects the current account both in the short-run and long-run for Indonesia. Furthermore, there is a one-way causality from FDI to the current account in the short-run and long-run. The results show that FDI has a one-way causality to the exports, imports, and profit transfers, and the impact of the causality was dominated more by imports than exports.

Both investment income and employee compensation have been widening in term of the deficit. Indonesia's current account deficit is structurally affected by the increasing outflow of investment income and employee compensation. By using Granger Causality Test, we also found the evidence for the significance of FDI to Indonesia's current account with 4 lags. FDI (-4) has a significant and negative effect on the current account. (The results can be seen in Appendix).

Regarding the BoP analysis and the current account sustainability, we should take a look at the Net International Investment Position (NIIP). In Equation (12), NIIP is equal to the present value of future trade balances. If $\text{NIIP}_t < 0$, then at some point in the future the economy is expected to generate sufficient trade surpluses to pay off the initial foreign debt. So, one of important homework for Indonesia is to create sufficient trade surplus. According to Equation (12), Figure 9, and the result in Table 1, to recover NIIP to its equilibrium level we need to boost export over import. Trade surplus could increase the net foreign asset holding (note NIIP). Besides boosting export, Indonesia also should increase the

primary income inflows (The net international investment position provides a measure of net financial claims with nonresidents in addition to using gold bullion as monetary gold. If BoP is a flow concept, NIIP is a stock concept). According to BoP and IIP manual of IMF (2010), *The international investment position (IIP) is a statistical statement that shows at a point in time the value and composition of (a) financial assets of residents of an economy that are claims on nonresidents and gold bullion held as reserve assets, and (b) liabilities of residents of an economy to nonresidents.*. The difference between an economy's external financial assets and liabilities is the economy's net IIP, which might be positive or negative.

4.1. Balance of Payment Constrained Growth (BOPC Growth)

From the steps described in the methodology section, we managed to obtain the BOPC growth in Figure 10. It can be observed that BOPC growth declined dramatically in the period of 2011–2015. After 2015, BOPC growth has recovered to the normal trend. The balance of payment condition generally affects Indonesia's economic growth. The explanation of BOPC growth is in line with the declining trade balance and the persistence of primary income deficit since 2011. Therefore, we can conclude that one of the main constraints on Indonesia's economic growth is its economic structure which is specifically represented in BoP components (export that depends on primary commodity and persistence of primary income deficit).

5. Conclusions

Understanding the dynamics of the BoP and its components can help policymakers in designing a
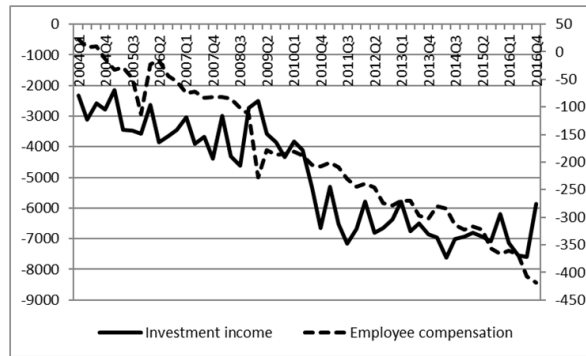
Figure 9: Primary Income (Employee Compensation and Investment Income)
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia
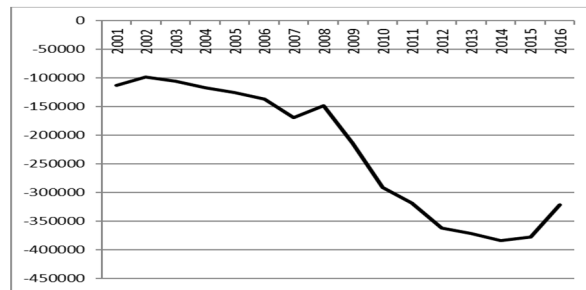
Figure 10: Net International Investment Position of Indonesia
Source: External Statistics, Economics and Finance Statistics, Central Bank of Indonesia
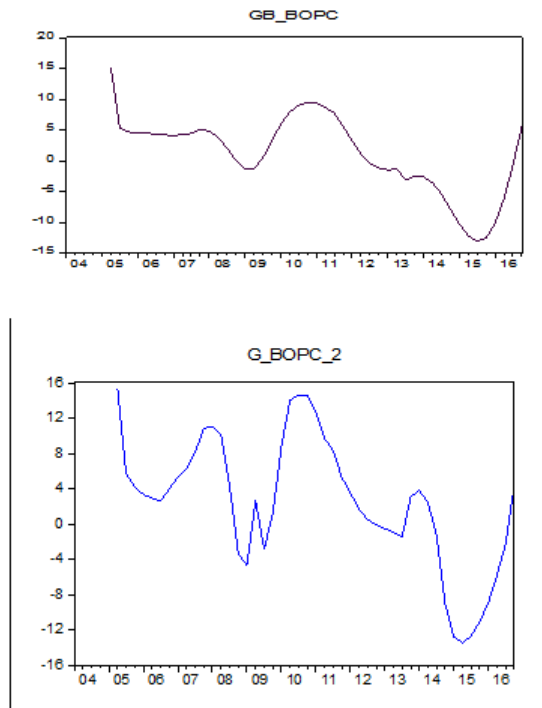
Figure 11: Balance of Payment Constrained Growth Estimation
Source: Estimated from Equation (19)

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policy to maintain the BoP stability and achieve the external balances. There are three parts of the conclusion that can be derived from this study. The first conclusion is that the current account component behavior, BoP, secondary income, and financial account are found to be stationary which means the data are mean reverting. On the other hand, the current account balance, trade balance, service balance, primary income and capital account balance are non-reverting and persistent. In the more detailed BoP components, it is observed that there are highly persistent components of BoP, which are oil and gas (goods category), travel, intellectual property, telecommunication, computer, and information, personal, cultural, recreational services (services category), investment income and employee compensation (primary income), and general government (secondary income category). The second conclusion is that all the components of the financial account are mean reverting. The third conclusion explains two important pieces of evidence in the current account and financial account. First the evidence of the importance of the commodity prices to export rate (as expected in the hypothesis). Second, the persistence of the primary income deficit related to the side effect of FDI (financial account) as a source of financing for the current account deficit. Both of the evidence can create a constraint on Indonesia's economic growth. To improve Indonesia's economic growth (with the framework of BOPC growth), Indonesia should improve the dependency of its export of primary commodities and Indonesia should focus on reducing its primary income deficit.

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Appendix

Appendix Part I

Table A1: BOP unit root test

Null Hypothesis: BOP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.484.574	0.0007
Test critical values:	1% level	-3.565.430	
	5% level	-2.919.952	
	10% level	-2.597.905	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BOP)
Included observations: 51 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BOP(-1)	-0.586166	0.130707	-4.484.574	0.0000
C	1.157.210	5.646.049	2.049.592	0.0458
R-squared	0.291000	Mean dependent var		6.181.176
Adjusted R-squared	0.276530	S.D. dependent var		4.273.879
S.E. of regression	3.635.234	Akaike info criterion		1.927.316
Sum squared resid	6.48E+08	Schwarz criterion		1.934.892
Log likelihood	-4.894.656	Hannan-Quinn criter.		1.930.211
F-statistic	2.011.140	Durbin-Watson stat		2.056.728
Prob(F-statistic)	0.000044			

Table A2: Current account balance unit root test

Null Hypothesis: CAB has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.887.314	0.3356
Test critical values:	1% level	-3.565.430	
	5% level	-2.919.952	
	10% level	-2.597.905	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CAB)
Method: Least Squares
Included observations: 51 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAB(-1)	-0.135421	0.071753	-1.887.314	0.0650
C	-1.885.018	2.980.413	-0.632469	0.5300
R-squared	0.067767	Mean dependent var		3.520.588
Adjusted R-squared	0.048742	S.D. dependent var		2.051.193
S.E. of regression	2.000.580	Akaike info criterion		1.807.869
Sum squared resid	1.96E+08	Schwarz criterion		1.815.445
Log likelihood	-4.590.065	Hannan-Quinn criter.		1.810.764
F-statistic	3.561.955	Durbin-Watson stat		2.223.473
Prob(F-statistic)	0.065049			

Table A3: Trade Balances unit root test

Null Hypothesis: TRADE_BALANCE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.368.061	0.1557
Test critical values:	1% level	-3.565.430	
	5% level	-2.919.952	
	10% level	-2.597.905	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRADE_BALANCE)
Method: Least Squares
Sample (adjusted): 2004Q2 2016Q4
Included observations: 51 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_BALANCE(-1)	-0.198315	0.083746	-2.368.061	0.0219
C	1.089.760	5.029.699	2.166.650	0.0352
R-squared	0.102691	Mean dependent var		4.245.020
Adjusted R-squared	0.084378	S.D. dependent var		1.787.765
S.E. of regression	1.710.678	Akaike info criterion		1.776.559
Sum squared resid	1.43E+08	Schwarz criterion		1.784.135
Log likelihood	-4.510.226	Hannan-Quinn criter.		1.779.454
F-statistic	5.607.715	Durbin-Watson stat		1.956.303
Prob(F-statistic)	0.021871			

Table A4: Service Balances

Null Hypothesis: SERVICES_BALANCE has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.987669	0.7505
Test critical values:	1% level	-3.574.446	
	5% level	-2.923.780	
	10% level	-2.599.925	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SERVICES_BALANCE)
Method: Least Squares
Sample (adjusted): 2005Q1 2016Q4
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SERVICES_BALANCE(-1)	-0.169875	0.171996	-0.987669	0.3288
D(SERVICES_BALANCE(-1))	-0.531946	0.176483	-3.014.148	0.0043
D(SERVICES_BALANCE(-2))	-0.351565	0.166908	-2.106.336	0.0410
D(SERVICES_BALANCE(-3))	-0.433374	0.138884	-3.120.396	0.0032
C	-4.307.596	4.661.394	-0.924100	0.3606
R-squared	0.454160	Mean dependent var		1.419.896
Adjusted R-squared	0.403385	S.D. dependent var		7.416.255
S.E. of regression	5.728.381	Akaike info criterion		1.563.742
Sum squared resid	14110172	Schwarz criterion		1.583.233
Log likelihood	-3.702.980	Hannan-Quinn criter.		1.571.108
F-statistic	8.944.427	Durbin-Watson stat		1.660.809
Prob(F-statistic)	0.000024			

Table A5: Primary income

Null Hypothesis: PRIMARY_INCOME has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.275.032	0.6335
Test critical values:	1% level	-3.577.723	
	5% level	-2.925.169	
	10% level	-2.600.658	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PRIMARY_INCOME)
Method: Least Squares
Sample (adjusted): 2005Q2 2016Q4
Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIMARY_INCOME(-1)	-0.072818	0.057111	-1.275.032	0.2095
D(PRIMARY_INCOME(-1))	-0.442155	0.157214	-2.812.440	0.0075
D(PRIMARY_INCOME(-2))	-0.361597	0.169989	-2.127.179	0.0395
D(PRIMARY_INCOME(-3))	-0.185434	0.169245	-1.095.656	0.2796
D(PRIMARY_INCOME(-4))	0.321472	0.152773	2.104.254	0.0415
C	-5.595.893	3.176.859	-1.761.454	0.0856

R-squared	0.418746	Mean dependent var	-8.725.340
Adjusted R-squared	0.347861	S.D. dependent var	8.226.043
S.E. of regression	6.642.951	Akaike info criterion	1.595.407
Sum squared resid	18092809	Schwarz criterion	1.619.026
Log likelihood	-3.689.207	Hannan-Quinn criter.	1.604.295
F-statistic	5.907.422	Durbin-Watson stat	1.911.301
Prob(F-statistic)	0.000336		

Table A6: Secondary income

Null Hypothesis: SECONDARY_INCOME has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.612.703	0.0088
Test critical values:	1% level	-3.565.430	
	5% level	-2.919.952	
	10% level	-2.597.905	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SECONDARY_INCOME)
Method: Least Squares
Sample (adjusted): 2004Q2 2016Q4
Included observations: 51 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SECONDARY_INCOME(-1)	-0.320499	0.088714	-3.612.703	0.0007
C	3.718.315	1.026.493	3.622.349	0.0007

R-squared	0.210335	Mean dependent var	1.259.902
Adjusted R-squared	0.194219	S.D. dependent var	2.027.323
S.E. of regression	1.819.832	Akaike info criterion	1.328.413
Sum squared resid	1622777.	Schwarz criterion	1.335.989
Log likelihood	-3.367.454	Hannan-Quinn criter.	1.331.308
F-statistic	1.305.163	Durbin-Watson stat	2.392.005
Prob(F-statistic)	0.000713		

Table A7: Capital Financial

Null Hypothesis: CAPITAL_FINANCIAL has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.566.074	0.1067
Test critical values:	1% level	-3.568.308	
	5% level	-2.921.175	
	10% level	-2.598.551	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CAPITAL_FINANCIAL)
Method: Least Squares
Sample (adjusted): 2004Q3 2016Q4
Included observations: 50 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAPITAL_FINANCIAL(-1)	-0.403185	0.157121	-2.566.074	0.0135
D(CAPITAL_FINANCIAL(-1))	-0.445082	0.131604	-3.381.979	0.0015
C	1.743.728	8.234.104	2.117.690	0.0395
R-squared	0.492225	Mean dependent var		1.738.610
Adjusted R-squared	0.470617	S.D. dependent var		5.876.863
S.E. of regression	4.275.927	Akaike info criterion		1.961.751
Sum squared resid	8.59E+08	Schwarz criterion		1.973.224
Log likelihood	-4.874.379	Hannan-Quinn criter.		1.966.120
F-statistic	2.278.034	Durbin-Watson stat		1.991.450
Prob(F-statistic)	0.000000			

Table A8: Capital

Null Hypothesis: CAPITAL_ACC has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.268.746	0.6352
Test critical values:	1% level	-3.596.616	
	5% level	-2.933.158	
	10% level	-2.604.867	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CAPITAL_ACC)
Method: Least Squares
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAPITAL_ACC(-1)	-0.159751	0.125913	-1.268.746	0.2125
D(CAPITAL_ACC(-1))	-0.503858	0.165213	-3.049.742	0.0042
D(CAPITAL_ACC(-2))	-0.683219	0.124991	-5.466.137	0.0000
D(CAPITAL_ACC(-3))	-0.350646	0.136230	-2.573.935	0.0142
C	0.025995	7.589.292	0.003425	0.9973
R-squared	0.574269	Mean dependent var		-1.591.667
Adjusted R-squared	0.528244	S.D. dependent var		5.269.050
S.E. of regression	3.619.022	Akaike info criterion		1.012.680
Sum squared resid	48460.10	Schwarz criterion		1.033.366
Log likelihood	-2.076.628	Hannan-Quinn criter.		1.020.262
F-statistic	1.247.731	Durbin-Watson stat		1.773.626
Prob(F-statistic)	0.000002			

Table A9: Financial

Null Hypothesis: FINANCIAL has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.543.464	0.1116
Test critical values:	1% level	-3.568.308	
	5% level	-2.921.175	
	10% level	-2.598.551	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FINANCIAL)
Method: Least Squares
Sample (adjusted): 2004Q3 2016Q4
Included observations: 50 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FINANCIAL(-1)	-0.397470	0.156271	-2.543.464	0.0143
D(FINANCIAL(-1))	-0.446981	0.131538	-3.398.103	0.0014
C	1.708.426	8.175.177	2.089.772	0.0421
R-squared	0.490082	Mean dependent var		1.738.610
Adjusted R-squared	0.468383	S.D. dependent var		5.865.264
S.E. of regression	4.276.486	Akaike info criterion		1.961.778
Sum squared resid	8.60E+08	Schwarz criterion		1.973.250
Log likelihood	-4.874.444	Hannan-Quinn criter.		1.966.146
F-statistic	2.258.581	Durbin-Watson stat		1.992.015
Prob(F-statistic)	0.000000			

Appendix Part II

Table A10: Regression of Export Determinant

Dependent Variable: LOG(EXPORT)
Method: Least Squares
Sample (adjusted): 2004Q2 2016Q4
Included observations: 51 after adjustments
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.340.813	9.036.138	-1.483.834	0.1447
LOG(US_GDP)	2.306.932	0.973984	2.368.553	0.0221
LOG(EXCH_RATE)	-0.081721	0.177258	-0.461027	0.6470
LOG(COMPRICE)	0.493862	0.081586	6.053.256	0.0000
AR(1)	0.875392	0.057224	1.529.770	0.0000
R-squared	0.974004	Mean dependent var		1.040.873
Adjusted R-squared	0.971743	S.D. dependent var		0.313523
S.E. of regression	0.052702	Akaike info criterion		-2.955.420
Sum squared resid	0.127767	Schwarz criterion		-2.766.026
Log likelihood	8.036.322	Hannan-Quinn criter.		-2.883.047
F-statistic	4.308.750	Durbin-Watson stat		2.450.272
Prob(F-statistic)	0.000000			
Inverted AR Roots	.88			

Table A11: Period : 2004–2008

Dependent Variable: LOG(EXPORT)
Method: Least Squares
Sample: 2004Q1 2008Q4
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.808.189	7.723.052	-3.636.113	0.0022
LOG(US_GDP)	3.205.636	0.832541	3.850.425	0.0014
LOG(EXCH_RATE)	0.517109	0.202248	2.556.810	0.0211
LOG(COMPRICE)	0.571136	0.089245	6.399.618	0.0000
R-squared	0.975146	Mean dependent var		1.007.365
Adjusted R-squared	0.970486	S.D. dependent var		0.261945
S.E. of regression	0.045001	Akaike info criterion		-3.187.386
Sum squared resid	0.032402	Schwarz criterion		-2.988.240
Log likelihood	3.587.386	Hannan-Quinn criter.		-3.148.511
F-statistic	2.092.521	Durbin-Watson stat		1.216.490
Prob(F-statistic)	0.000000			

Table A12: Period: 2009–2016

Dependent Variable: LOG(EXPORT)
Method: Least Squares
Sample: 2009Q1 2016Q4
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.208.375	2.261.520	-9.765.005	0.0000
LOG(US_GDP)	3.665.103	0.328538	1.115.581	0.0000
LOG(EXCH_RATE)	-0.587637	0.117446	-5.003.480	0.0000
LOG(COMPRICE)	0.553205	0.046879	1.180.064	0.0000
R-squared	0.950137	Mean dependent var		1.059.046
Adjusted R-squared	0.944794	S.D. dependent var		0.187832
S.E. of regression	0.044133	Akaike info criterion		-3.286.758
Sum squared resid	0.054536	Schwarz criterion		-3.103.541
Log likelihood	5.658.812	Hannan-Quinn criter.		-3.226.026
F-statistic	1.778.454	Durbin-Watson stat		1.739.966
Prob(F-statistic)	0.000000			

Appendix Part III

Granger Causality Test

Table A13: Foreign Direct Investment

VEC Granger Causality/Block Exogeneity Wald Tests
Sample: 2004Q1 2016Q4
Included observations: 47

Dependent variable: D(FDI)			
Excluded	Chi-sq	df	Prob.
D(CAB)	4.326778	4	0.3636
All	4.326778	4	0.3636
Dependent variable: D(CAB)			
Excluded	Chi-sq	df	Prob.
D(FDI)	6.704485	4	0.1524
All	6.704485	4	0.1524

Table A14: Portfolio Investment

VEC Granger Causality/Block Exogeneity Wald Tests
Sample: 2004Q1 2016Q4
Included observations: 47

Dependent variable: D(PORTFOLIO)			
Excluded	Chi-sq	df	Prob.
D(CAB)	5.376025	4	0.2508
All	5.376025	4	0.2508
Dependent variable: D(CAB)			
Excluded	Chi-sq	df	Prob.
D(PORTFOLIO)	6.930886	4	0.1396
All	6.930886	4	0.1396

Table A15: FDI

Dependent Variable: CAB
Sample (adjusted): 2005Q1 2016Q4
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.685.777	6.107.194	0.603514	0.5494
FDI(-1)	0.252353	0.231045	1.092.222	0.2810
FDI(-2)	-0.030854	0.235998	-0.130740	0.8966
FDI(-3)	-0.248067	0.230295	-1.077.170	0.2876
FDI(-4)	-0.419154	0.227582	-1.841.770	0.0726
CAB(-1)	0.772275	0.109122	7.077.186	0.0000
R-squared	0.792036	Mean dependent var	-1.576.908
Adjusted R-squared	0.767278	S.D. dependent var	4.006.568
S.E. of regression	1.932.819	Akaike info criterion	1.808.781
Sum squared resid	1.57E+08	Schwarz criterion	1.832.172
Log likelihood	-4.281.076	Hannan-Quinn criter.	1.817.621
F-statistic	3.199.156	Durbin-Watson stat	2.290.260
Prob(F-statistic)	0.000000		

Dependent Variable: FDI
Sample (adjusted): 2005Q1 2016Q4
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.585.746	3.478.655	4.558.504	0.0000
CAB(-1)	-0.307484	0.112134	-2.742.106	0.0089
CAB(-2)	0.093283	0.128114	0.728128	0.4706
CAB(-3)	0.050500	0.125832	0.401330	0.6902
CAB(-4)	-0.043525	0.102284	-0.425534	0.6726
FDI(-1)	0.126344	0.163023	0.775009	0.4427
R-squared	0.398614	Mean dependent var	2.184.153
Adjusted R-squared	0.327021	S.D. dependent var	1.656.116
S.E. of regression	1.358.599	Akaike info criterion	1.738.276
Sum squared resid	77523287	Schwarz criterion	1.761.667
Log likelihood	-4.111.864	Hannan-Quinn criter.	1.747.116
F-statistic	5.567.742	Durbin-Watson stat	2.043.531
Prob(F-statistic)	0.000506		

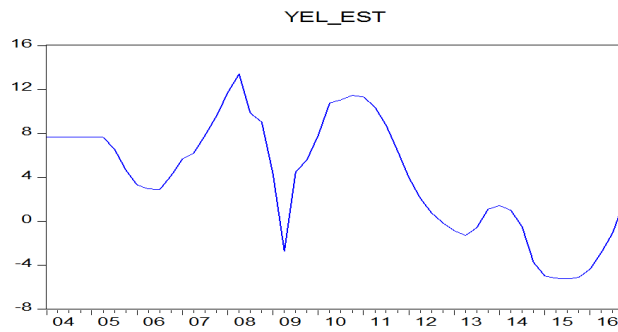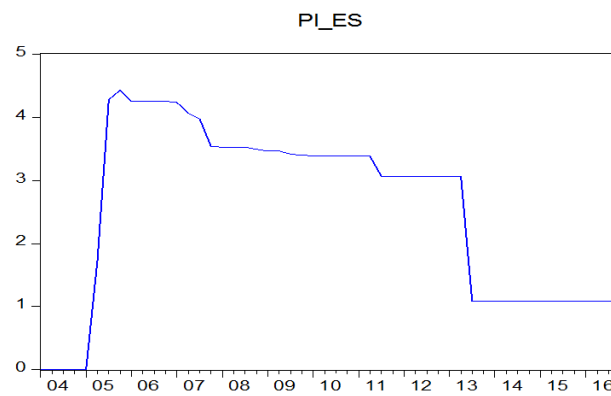## Appendix Part IV

Export and Import Elasticity

Figure A1: YEL EST (Export elasticity)

Figure A2: PI ES (Import Elasticity)