Bank of PNG: working paper

Title: Macroeconomic Impact of Budget Deficits in Papua New Guinea

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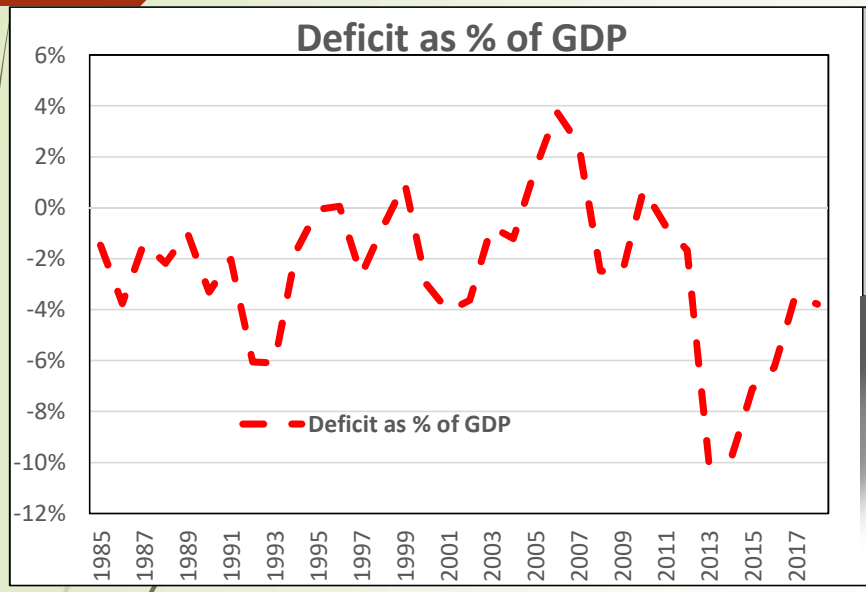
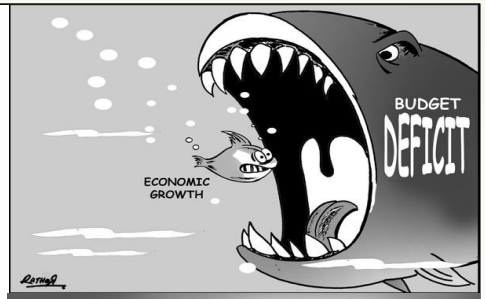
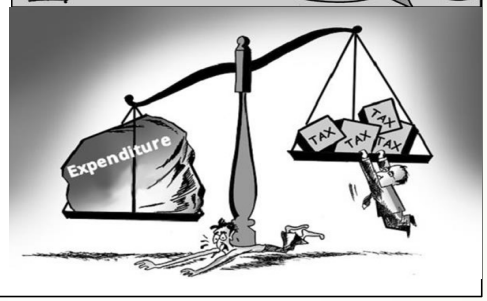
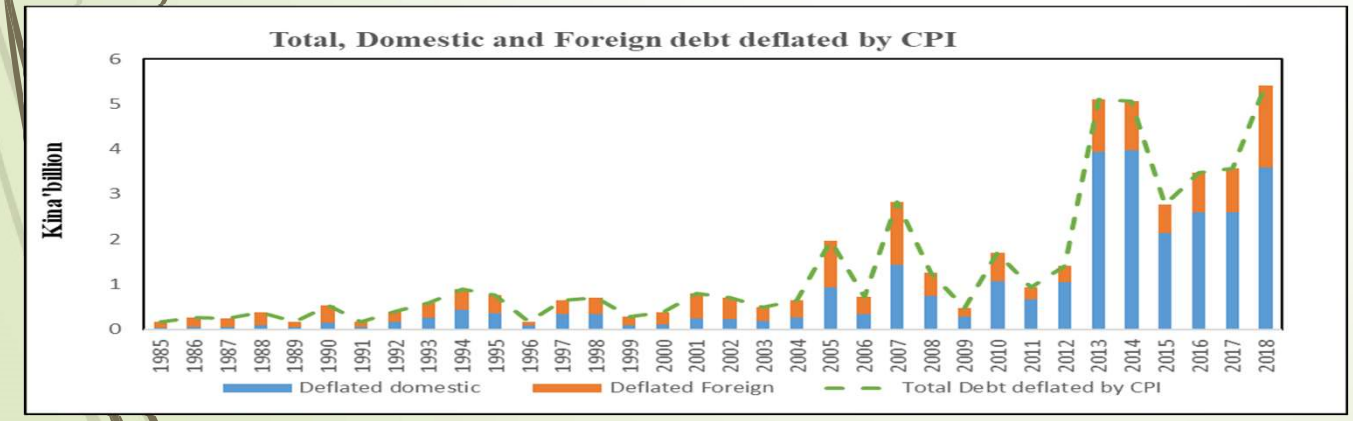
1. Background





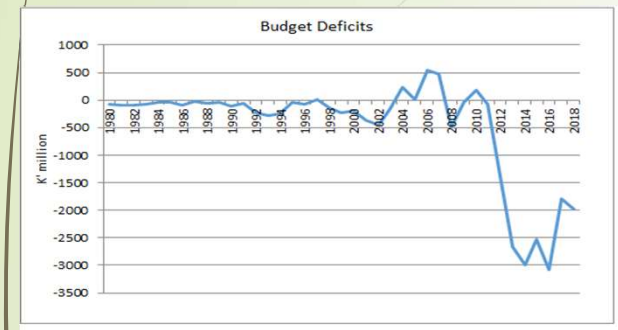


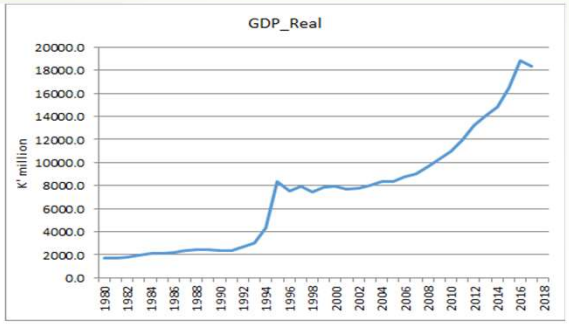


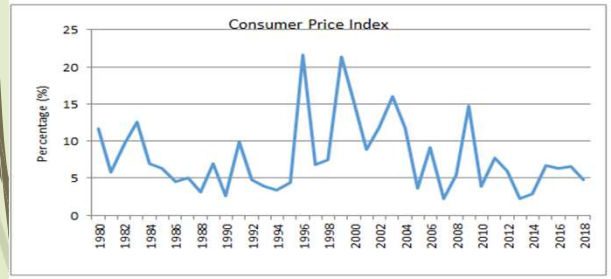
- Budget deficits arise when Government's spend beyond their revenue in a budgetary fiscal year.
- Depends on the fiscal policies and objectives pursued (Auerbach 2009). Its impact on an economy depends on how its financed and expended.
- Since 1980 to 2000 as PNG developed, investments in public infrastructure were prominent, leading to steady increase in expenditure. From 2013 to 2018 large increase in expenditure (Government borrowed heavily in anticipation of future LNG revenue).
- As a result ratio of expenditure-to-GDP rose from 35.7% (1985) tp 82.9% (2018), while revenue rose from 34.1% to 72.4%, implying a financing gap.
- From 1985 to 2003, real foreign debt fluctuated mildly peaking at election periods. The first half of 1990s a large proportion of this domestic finance was provided by the central bank. After 2004, the fluctuations became larger with spikes in 2005 and 2007 before surging in 2013. During these periods, the increase in real total debt reflected heavy reliance on domestic financing.

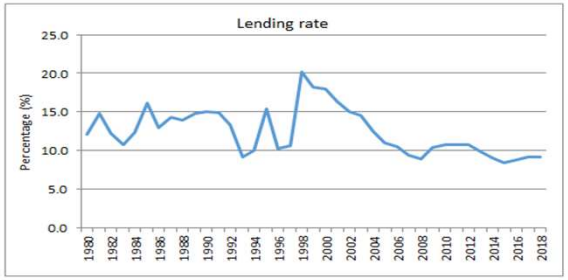
2. Motivation

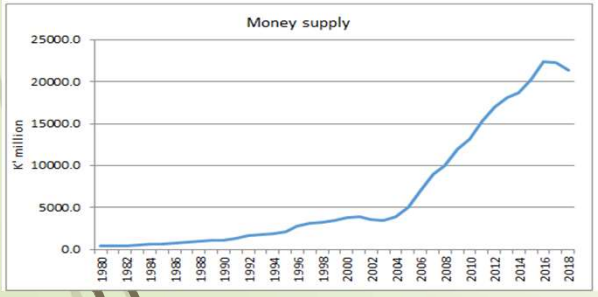
- **Macroeconomic Indicators**

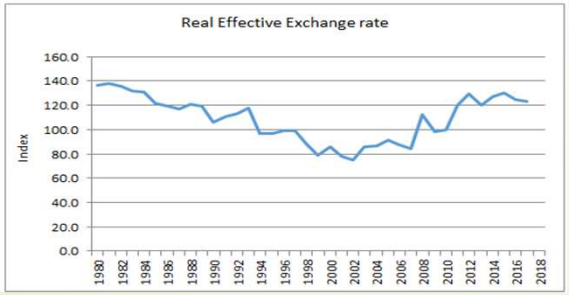






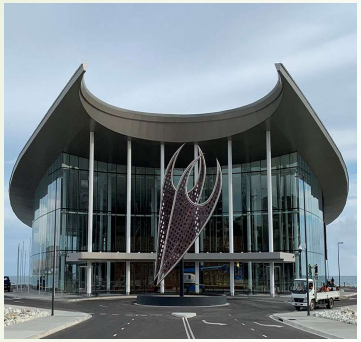


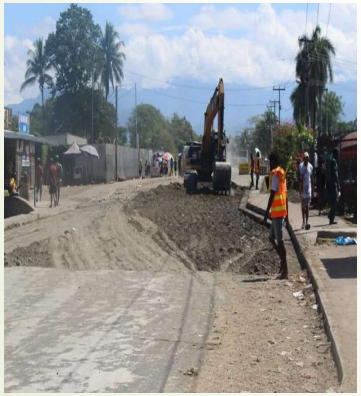




- There is linkage between budget deficits and other macroeconomic variables, that's why its important we study it.
- What has been the impact of budget deficits on the major macroeconomic indicators, its influence on inflation, money supply, exchange rates, interest rates and GDP growth
- Studies on fiscal deficits are numerous for PICs economies, there is limited literature with specific reference to PNG

3. Research question

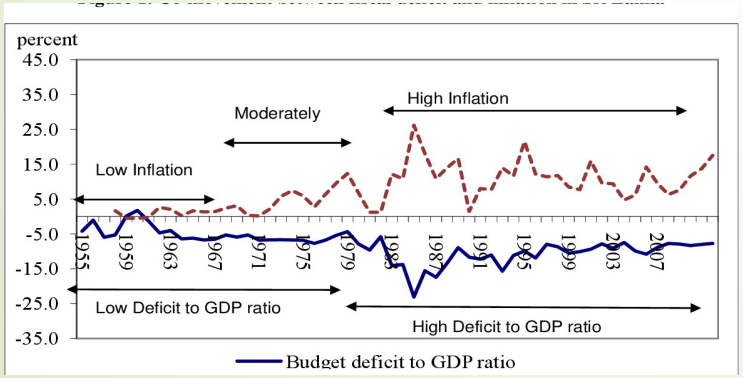



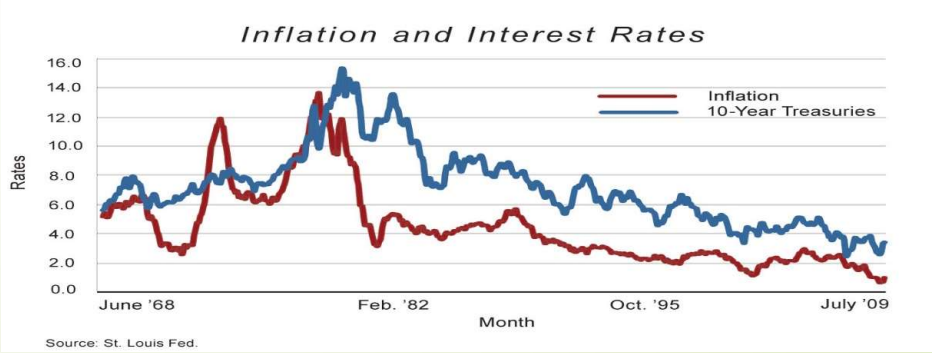




- **What are the macroeconomic impact of budget deficits in PNG?**
- *Objective: To examine the impact of budget deficits in PNG on selected macroeconomic variables using the VECM and VAR models, for the sample periods 1980-2018.*

4. Literature Review

- Catao and Terrones, 2015 - Strong link between deficits and inflation across 107 industrialized countries
- McMillin (1986), Nguyen (2014), Wire and Nampewo (2014) – show budget deficits are inflationary across South East Asia, sub-Saharan Africa and Uganda, respectively.
- Hoelscher (1986) and Cebula and Koch (1989) – Budget deficits contribute to higher interest rates.
- Sachs (1985) and Krugman (1995) lower budget deficits depreciates the value of currency.
- Allen and Smith (1983)- budget deficits contribute to money supply, inflation and crowing out private sector credit.
- Patrick and Longa (2014)- Lack of policy coordination between fiscal and monetary policy negatively affects macroeconomic outcomes, with the former the dominating policy.
- Gani (1997)- Deficits exert negative effects on economic growth, in the Pacific Island Countries.
- Jarayama and Lau (2008)- Causal relationship running from budget deficits to exports and in turn output; and a short run bi-directional causal relationship between economic growth and external debt.





5(a). Data & Methodology

- *Employed a Vector Error Correction Model (VECM) and Structural Vector Autoregressive (VAR) model*
- *Dependent variable:* Fiscal balance
- *Independent variables:* Broad money supply, real effective exchange rate, real GDP growth rates, inflation and lending rates.

VAR model (Variance Decomposition)

$$LBD = \delta_0 + \sum_{j=1}^{k} \delta_{1j} LBD_{t-j} + \sum_{j=1}^{k} \delta_{2j} LMS_{t-j} + \sum_{j=1}^{k} \delta_{3j} LREER_{t-j} + \sum_{j=1}^{k} \delta_{4j} LRGDP_{t-j} + \sum_{j=1}^{k} \delta_{5j} CPI_{t-j} + \sum_{j=1}^{k} \delta_{6j} RATE_{t-j} + \varepsilon_{1t}$$

Vector Error Correction Model

$$\Delta LBD_t = \sum_{j=1}^{k} \delta_{1j} \Delta LBD_{t-j} + \sum_{j=1}^{k} \delta_{2j} \Delta LMS_{t-j} + \sum_{j=1}^{k} \delta_{3j} \Delta LREER_{t-j} + \sum_{j=1}^{k} \delta_{4j} \Delta LRGDP_{t-j} + \sum_{j=1}^{k} \delta_{5j} \Delta CPI_{t-j} + \sum_{j=1}^{k} \delta_{6j} \Delta RATE_{t-j} + \delta_7 C_t + \vartheta_1 LBD_{t-j} + \vartheta_2 LMS_{t-j} + \vartheta_3 LREER_{t-j} + \vartheta_4 LRGDP_{t-j} + \vartheta_5 CPI_{t-j} + \vartheta_6 RATE_{t-j} + u_{1t}$$

5(b). Variables and model

Model diagnostics – Passed all tests

- ADF & PP test for unit root
- Heteroscedasticity & serial correlation test (Breusch Pagan Godfrey)
- Model stability (CUSUM & CUSUM squared)
- Lag selection criteria (AIC, HQ & LR)

5(c). Results and discussion

VECM

Variables that are statistically significant at **1%**

- Price, GDP and money supply in the past three quarters.

Variables that are statistically significant at **5 %**

- Money Supply and real exchange rate

Sign on the coefficient of the error correction term is negative as expected and is statistically significant.

Around 33.0 per cent of the deviation from the long-run equilibrium is corrected in every period. This confirms that there is a statistically significant long-run cointegrating relationship between budget deficits and the macroeconomic variables of interest.

VAR (Variance decomposition)

- real exchanges and inflation shocks are most notable, in driving the movements in budget deficit suggesting that the cost factors of meeting both domestic and external debt obligations largely explain movements in budget deficits.
- The budget deficit shock is still the most important factor driving budget deficits, which would suggest that fiscal policy is set independently of other economic forces.

6. Conclusion, policy considerations & further research

- For Fiscal policy budget deficits aimed at stimulating economic growth may be negligible, suggesting that overall government spending remains sluggish.
  - Excess investment by the government may bring about a negative effect on the economy, due to government investment crowding-in from the monopoly of government activities that causes the allocation of resources to be not fully utilized.
  - The growth motivations are further constrained when lending rates increase in response to deficits. Budget deficits remain unsustainable and less effective as suggested by recent rise in debt levels and low growth.
  - Gradual fiscal consolidation and effective government spending may be pursued in the short to medium term to rein in rising debt levels and assist with sustainable macroeconomic policies.
- Monetary policy, the ability to influence money supply, lending rates and inflation remains a challenge in the presence of persistent budget deficits – given elements of fiscal dominance.
  - The pass-through to inflation is observed directly and via its impact on money supply and exchange rates.

Further research

- integrating commodity cycles using a fiscal and monetary policy mix setting.
- look at other key variables such as international commodity prices, employment and the evolution of interest rate spreads in PNG, and how government revenues and expenditures respond to these changes.

End of presentation

Thank you. Any questions?