Natural Resource Extraction and *Dutch disease*: Application to Papua New Guinea *


I. Introduction

- The concept of Dutch Disease: Definition, Causes and Consequences.

II. Model Driven Policy Simulation Results

  – Policy Simulations Under a Narrow Definition of Dutch Disease
    
    • Inter-sectoral spending profile: Tradables Vs Non-Tradables
    • Inter-temporal spending profile
    • Monetary Policy
    • SWF

  – Policy Simulations Under a Broad Definition of Dutch Disease
    
    • Inter-sectoral spending profile: Tradables Vs. Non-Tradables
    • Inter-sectoral spending profile: Consumption Vs. Investment
    • Monetary Policy
    • SWF

III. Conclusion
Introduction

• The Concept of *Dutch Disease*: Definition, Causes and Consequences.

  – Term coined in the 1800s with the discovery of large quantities of oil in the North Sea by the Netherlands. It arose from fears that the resulting oil revenues would negatively impact the manufacturing sector of the Dutch economy;
  – The perception was the rising oil revenues to the Dutch Government would result in an appreciation of the Dutch guilder, making imports cheaper and simultaneously making its export sector (including its manufacturing sector) less competitive;
  – Putting these together, it is a situation that results from a large positive shock to an economy that initially sees an appreciation of the local currency and has the simultaneous effect of shrinking the tradable sector of the economy.
Policy Simulations

• The natural resource revenues that is the subject of these investigations is in the form resource revenues to the Government;
• This is the shock that is applied to the steady state of the economy;
• That the resulting macroeconomic effects are from how the Government spends these resource revenues;
• That the different policy simulations, apart from monetary policy, are in effect different fiscal policy choices: inter-sectoral policy simulation: tradable vs non-tradable; inter-temporal policy simulation and SWF are all fiscal policy choices;
Policy Simulations cont...

• The benchmark for judging whether a given policy setting improves macroeconomic outcomes will be the degree of macroeconomic volatility generated by the different scenarios, with lower volatility being more desirable;

• Macroeconomic stability is a widely accepted objective of fiscal and monetary policy, so aiming for low macroeconomic volatility makes a natural benchmark;
Policy Simulations cont ...

• Baseline Scenario
  – The baseline scenario is the worst case scenario;
  – In this case, the worst case scenario is when the Government spends all the resource revenues it collects on consumption;
  – Specifically we assume it spends 90 percent of the resource revenues on consumption;
  – 70 percent of which is met by the non-tradable sector;
  – So the baseline scenario depicts the impact of this Government spending profile/fiscal policy choice on the macroeconomy;
  – The subsequent simulations/different fiscal policy choices are meant to be an improvement to the baseline.
Policy Simulations

• Policy Simulations Under a Narrow Definition of *Dutch Disease*:
  – Real appreciation of the local currency⁵;
  – Shrinkage of the tradable sector of the economy

⁵. Two measures: Nominal CPI-deflated exchange rate & non-tradable/tradable price ratio.
Figure 1: Baseline Scenario: Summary of Results
Intersectoral Spending Scenario (Tradable vs Non-tradable)

- Variation in fiscal policy choice of consumption spending between the tradable and non-tradable sectors of the economy;
- Assumptions
  - Change the composition of spending from 70% on non-tradables to 80% on tradables;
  - All other assumptions remain as per the baseline;
Figure 2: Inter-sectoral spending profile: Summary of Results
Intertemporal Spending Scenario

• Fiscal policy choice between a front loaded Government consumption spending profile and a smooth Government consumption spending profile;

• Assumptions
  – Vary the speed of spending comparing a scenario with front-loaded spending with an alternative scenario with a smooth spending profile;
  – All other assumptions remain as per the baseline.
Monetary Policy

• What are the macroeconomic outcomes when monetary policy leans against the real appreciation compared to the baseline scenario?

• Assumptions
  – The central bank accumulates 70 percent of the FX reserves that comes into the country;
  – To offset the effect on domestic money, the central bank sterilises it impact by issuing securities, causing nominal interest rates to rise, limiting the sizeable nominal appreciation, and in turn the real appreciation;
Figure 5: The role of monetary policy:

Summary of Results
Sovereign Wealth Fund

• Fiscal Policy Choice of Investing Resource Revenues in an Offshore Investment Fund compared to the baseline scenario;
• All other assumptions as per the Baseline;
Figure 7: Savings through an SWF: Summary of Results
Policy Simulations Under a Broad Definition of *Dutch Disease*

- Real appreciation of the local currency;
- Shrinkage of the tradable sector of the economy;
- Introduce the presence of Learning By Doing (LBD) Externalities.
Baseline Scenario (With LDB Externalities)

- Features of the baseline simulation remain as the narrow definition, now this baseline scenario includes LDB externalities;
Intersectoral Spending Profile: Tradables vs Non-tradables (With LDB Externalities)

• Maintains the full fiscal spending of all revenues, but assesses whether a variation in the composition of fiscal spending between tradables and non-tradables could prevent Dutch Disease effects from occurring;
Inter-sectoral Spending Profile: Consumption Vs. Investment (With LDB Externalities)

- This scenario maintains full spending of all oil revenues but redirects government spending towards public investment.
Public Spending and Spending on Tradables
Monetary Policy

• How monetary policy can prevent Dutch Disease effects in the presence of LDB externalities.
Sovereign Wealth Fund

• Almost identical to the simulation under the narrow definition of Dutch disease effects, this time in the presence of LDB externalities.
Conclusions

Specific Conclusions

• Fiscal spending on non-tradables is what drives the macroeconomic effects (as seen in the Baseline scenario);

• Vice-versa, concentrating spending on tradables minimizes Dutch disease effects (as seen in the inter-sectoral spending scenario);

• Front-loading of expenditures is both disruptive and costly, especially if there are bottlenecks in the economy (as seen in the inter-temporal spending scenario);

• Monetary policy cannot undo the effects of fiscal policy without costs; attempting to do so through reserve accumulation by the central bank in order to stem appreciation pressures will crowd out private sector investment due to the need to pursue a tight monetary stance for containing inflationary pressures;

• Smoothing of the spending profile over time by saving a significant part of the natural resource inflows in a Sovereign Wealth Fund is very effective in avoiding Dutch disease effects (inter-temporal spending scenario and SWF scenario);

• If strong LDB externalities are present in the tradable sector, concentrating spending on public investment can be effective in the long run in mitigating Dutch disease effects;
• Overall Conclusions

– In the narrow sense, Dutch disease itself may not be a bad thing, a real appreciation accompanied by a shrinkage of the tradable sector maybe seen as a correction as the economy moves to a new steady state;
– If there are LDB externalities present in the tradable sector and resource inflows leads to a permanent decline in the tradable sector and overall economic output, then Dutch disease (broad sense) is a bad thing;
– Dutch disease effects, to the extent that it is an impediment to economic development, can be mitigated by concentrating spending on tradables and public investment as well as smoothing the spending profile through the use of a Sovereign Wealth Fund;
– Monetary policy alone is not effective in mitigating Dutch disease effects, at least not without crowding out the private sector.
Conclusion cont...

- Shortcomings of the model
  - A major shortcoming of the model is the assumption of frictionless labour mobility;
  - Another major shortcoming is DSGE specific – simulations in DSGE models will always return to a pre-defined steady state in the medium term;
  - The commercial banking sector is not accounted for in the model for PNG;
  - This model for PNG should only be used for qualitative rather than quantitative purposes.