

## The Impact of Skilled Emigration from South Africa: A CGE Analysis

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## Introduction

- What would the impact of skilled emigration from South Africa be on the local economy?
- We use a recursive-dynamic CGE model to investigate this scenario
- This forms part of a larger study looking at the impact of policies designed to slow both illegal immigration and skilled emigration

## The Model

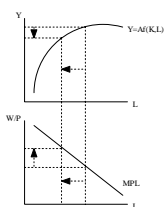
- Recursive-dynamic CGE model of the South African economy based on the ORANIG-RD model developed by Horridge (2000; 2002) and solved using GEMPACK
- 2006 South African database with 27 industries and commodities, and 11 occupation groups

## Simulation Scenarios

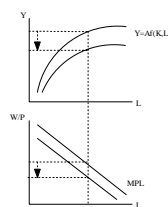
- Simulation 1 reduces employment in the two skilled labour occupation categories (2007-2009)
- Simulation 2 reduces primary factor productivity (2007-2008)
- Simulation 3 combines the two above scenarios
- For the purpose of this paper we run these simulation over an eight year period (2007-2014)

## Simulation Scenarios

Simulation 1



Simulation 2



## Understanding the Model

- Let's first use BOTE equations to understand the basic functioning of the model given the shock to L in Simulation 1

$$\frac{W}{P_c} = A \cdot MP_L \left( \frac{K}{L} \right)^{\text{positive}}$$

- L ↓ (with K and A held constant in the short run)
- MPL ↑ and therefore Real Wage ↑

## Understanding the Model

- With  $L \downarrow$  this requires  $K \downarrow$  to keep the RoR constant in the long run

$$\frac{Q}{P_i} = A \cdot MP_k \left( \frac{K}{L} \right)^{negative}$$

- But  $K$  is fixed in the first period, which results in a large fall in the rental price of capital ( $Q$ )
- With  $Q \downarrow \dots$   $RoR \downarrow \dots$   $ERoR \downarrow \dots$   $I \downarrow$

## Understanding the Results

- From the supply side... using factor shares and the size of the shock we estimate that GDP should fall by around 0.4 %
- From the expenditure side...  $C$  &  $M$  closely linked to GDP and  $G$  follows  $C$  in the model

$$y = S_c \cdot c + S_i \cdot i + S_g \cdot g + S_x \cdot x - S_m \cdot m$$

- With the shock to  $L$  we can expect  $K$  to fall in the long run which would necessitate a relatively large fall in  $I$
- The movement in  $X$  can now be treated as a residual

## BOTE Analysis

- Without looking at the actual model results we are able to make a good approximation using our BOTE analysis
- Need to know size of expenditure shares in the database and, in the case of investments, its sensitivity to changes in the rate of return
- We can therefore not be sure using our simple BOTE analysis in which direction the BoT ( $X-M$ ) will move

## Model Results

- Simulation 1 results (fall in skilled employment)

Variable	2007	2008	2009	2010	2011	2012	2013	2014
CPI	0.15	0.16	0.09	0.02	0.03	0.10	0.18	0.27
Terms of Trade	0.11	0.13	0.11	0.07	0.08	0.12	0.16	0.21
Real Wages	1.31	2.09	2.35	2.11	1.90	1.73	1.58	1.45
Employment	-0.79	-1.32	-1.58	-1.58	-1.58	-1.58	-1.58	-1.58
Capital	0.00	-0.05	-0.15	-0.29	-0.44	-0.58	-0.70	-0.81
Rental Price	-0.69	-1.21	-1.46	-1.37	-1.19	-0.95	-0.71	-0.49
Priv. Consumption	-0.20	-0.40	-0.57	-0.68	-0.77	-0.85	-0.91	-0.96
Investment	-1.04	-2.22	-3.04	-3.27	-3.18	-2.93	-2.64	-2.37
Gov. Consumption	-0.20	-0.40	-0.57	-0.68	-0.77	-0.85	-0.91	-0.96
Exports	-0.55	-0.65	-0.54	-0.35	-0.40	-0.58	-0.81	-1.05
Imports	-0.43	-0.85	-1.15	-1.28	-1.33	-1.33	-1.30	-1.26
GDP	-0.39	-0.67	-0.84	-0.91	-0.98	-1.04	-1.10	-1.15

## Model Results

- Most results are in line with our BOTE expectations, with the fall in  $I$  not large enough to necessitate an increase in the BoT

$$(-0.4) = (-0.36) + S_x(x - m)$$

- $C$  falls by less than GDP due to the terms of trade effect
- For the BoT  $\downarrow \dots$   $X \downarrow$  by more than than the fall in  $M \dots$  ToT  $\uparrow$

$$\frac{P_c \cdot C}{P_y \cdot Y} = APC \qquad \frac{C}{Y} = APC \cdot \frac{P_y}{P_c}$$

## Model Results

- Simulation 2 results (fall in primary factor productivity)

Variable	2007	2008	2009	2010	2011	2012	2013	2014
CPI	0.19	0.26	0.06	-0.03	-0.05	-0.03	0.01	0.05
Terms of Trade	0.18	0.28	0.15	0.08	0.05	0.04	0.03	0.02
Real Wages	-0.92	-2.04	-2.44	-2.82	-3.19	-3.54	-3.88	-4.21
Employment	0	0	0	0	0	0	0	0
Capital	0.00	-0.05	-0.19	-0.37	-0.57	-0.76	-0.93	-1.09
Rental Price	-0.73	-1.54	-1.62	-1.54	-1.37	-1.16	-0.94	-0.75
Priv. Consumption	-0.93	-1.95	-2.13	-2.30	-2.46	-2.61	-2.75	-2.88
Investment	-1.20	-3.00	-3.85	-4.15	-4.14	-3.98	-3.77	-3.57
Gov. Consumption	-0.93	-1.95	-2.13	-2.30	-2.46	-2.61	-2.75	-2.88
Exports	-0.92	-1.42	-0.75	-0.40	-0.24	-0.19	-0.16	-0.12
Imports	-0.92	-2.01	-2.31	-2.49	-2.60	-2.67	-2.72	-2.76
GDP	-0.98	-1.99	-2.06	-2.16	-2.26	-2.36	-2.46	-2.55

## An Improved Framework

- Implement the Dixon *et al* (2008) labour market mechanism
- Allows for a sophisticated treatment of labour supply by birthplace and legal status
- Includes illegal immigrant sources and skilled emigrant destinations
- How would policies that affect migrant flows impact on the local economy?

## Conclusions

- Skilled emigration hurts the local economy (GDP down 3.7% over eight years compared to the basecase scenario) with industries using skilled labour or closely linked to investment hurt more than average
- As always, results depend on the assumptions of the model
- In future work an improved labour supply mechanism will allow interesting work on policy questions regarding both illegal immigration and skilled emigration