Ex S1:6 Policy Analysis Example Report

Background

There are many examples of politicians and economists arguing that trade liberalization and globalization will promote economic growth, e.g., via pro-competitive benefits. Moreover, many countries, especially developing/lower income, are repeatedly advised/induced, by international organisations, that liberalising trade will promote development. However, all policy changes that involve changes in tax regimes can result in winners and losers and may enhance or reduce tax efficiency, e.g., border taxes may be relatively cheap to collect whereas VAT may be more costly to collect although such efficiency effects may be poorly captured in CGE analyses.

A brief review of the trade and tax structure reveals some of the features of trade and tax policies in South Africa at the time. Exports and imports were consistent with a relatively open economy. Marked shares of minerals and manufacturing production (by commodity) were exported, especially so for minerals, while agriculture and food were less export focused (Table 1). Similarly agricultural and food commodities had smaller import shares in domestic demand while trade in other commodities was more import as a source of supply (Table 1). However, over 50% of the value of domestic supply came from services and trade services with no other commodity accounting for more than 8% of domestic supply (by value) (Table 1).

Tax rates tell a somewhat different story. Tax revenues are dominated by VAT and income taxes (Table 2), which is consistent with what would be expected in an advanced economy (these are taxes that are argued to be less distortionary than other taxes). Import duties account for less than 5% of total tax revenues so it would be expected that changes in import duty rates might have limited implications for government revenues. But import duty rates on textiles, food and agriculture are relatively high, which suggests that changes in import duties may have appreciable implications for domestic producers and consumers of those commodities.

At the time of this SAM, South Africa still had (legacy) agricultural policies that were still focused on supporting agricultural producers, part of which involved protection of the domestic food processors.

Table 1 Shares and Import Duty Rates by Commodity

	Export	Import	Domestic Supply	Rates
cagric	0.12	0.06	0.03	0.07
cmins	0.72	0.50	0.06	0.00
cfood	0.09	0.09	0.05	0.10
ctext	0.14	0.24	0.02	0.23
cmprod	0.34	0.16	0.06	0.03
comanu	0.25	0.35	0.05	0.05
cpetchem	0.19	0.20	0.08	0.04
cmach	0.36	0.63	0.02	0.03
cveh	0.23	0.37	0.04	0.04
cutil	0.00	0.00	0.02	
ccns	0.00	0.00	0.05	
ctrad	0.05	0.06	0.20	
cserv	0.03	0.03	0.33	0.00

Table 2 Tax Revenues

Tax	Value	Shares
Import duties	8.31	0.04
Sales tax	5.26	0.02
Sales Subsidy	-0.39	0.00
Excise tax	24.28	0.11
VAT	78.93	0.36
Factor tax	-18.35	-0.08
Production tax	3.06	0.01
Income taxes	119.51	0.54
Total	220.61	1.00

Simulations and Elasticities

The simulations run for this analysis included reducing import duties on all commodities by 25%, 50% and 75%, and 50% cuts in import duties on agricultural, mining, food, other manufacturing and service commodities. Three closures were run: a base closure with no tax replacement, and two closures with income taxes and VAT as alternate tax replacement instruments for which the internal balance was fixed. For all closures the external balance was

fixed, investment was saving driven, all other tax rates were fixed, with the government's share of absorption fixed, technology was fixed and full employment with mobile factors was assumed.

This resulted in 9 simulations over three closures, i.e., 27 experiments.

The elasticities used were those in the base database.

Table 3 Elasticities in Trade

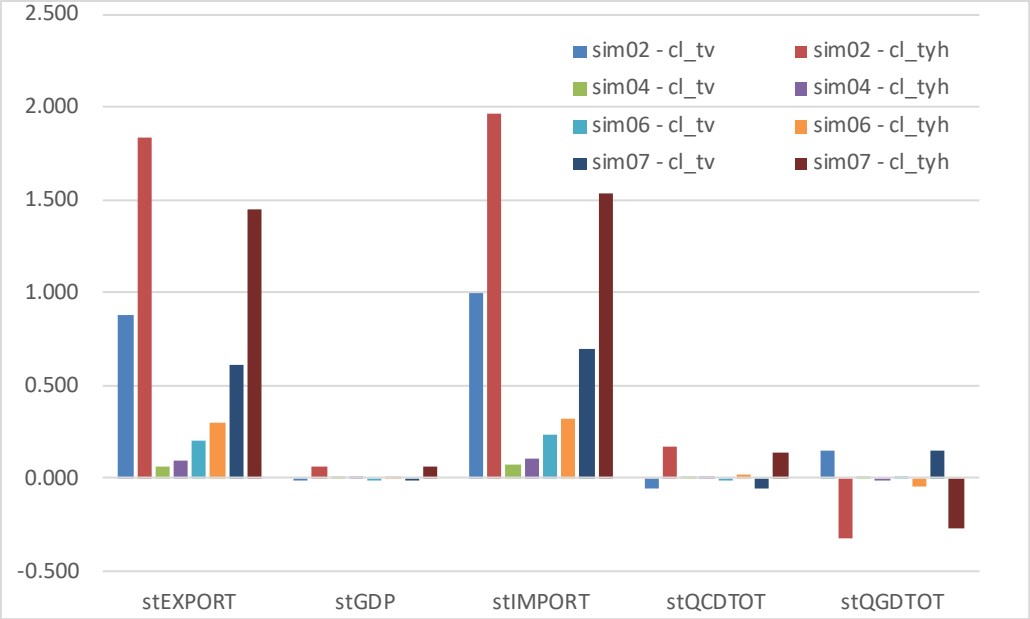
	Imports	Exports
Agriculture	1.75	2
Minerals	1.5	1.5
Food products	1.5	1.75
Textiles	1.75	2
Petroleum and chemical products	1.25	2
Metal and mineral products	0.9	1.1
Machinery	0.75	1.2
Vehicles	0.8	1.25
Other manufacturing	1.1	1.1
Utilities	2	2
Construction	0.75	0.75
Trade transport and communications	1.5	1.5
Services	1.5	1.5

Analysis

The summary results, see Figure 1, indicate that changes in trade taxes will have minimal impacts on real GDP, with some evidence that if income taxes are the tax replacement instrument the impacts may be positive for some duty changes but otherwise are marginally negative. Similarly, the implications for real private (stQCDTOT) and government consumption (stQGDTOT) are ambiguous, which suggests differences in the changes in prices faced by households and government. On the other hand, real export and import values are subject to much greater changes and the differences associated with different tax replacement instruments are marked. Liberalisation with respect to manufacturing (sim07) clearly accounts for a greater share of the changes found with an across-the-board liberalisation (sim02); an unsurprising result given the trade shares. These results reflect the

changes in the exchange rate required to retain the external (current) account balance; note how the signs on the exchange rate variable are different for the different closures.[1]

Figure 1 Summary Measures (Real; % change)



Since trade liberalisations are supposed to be welfare enhancing the impacts on households deserve consideration. The changes in real household incomes positive for all representative household groups (RHG) but vary appreciably across RHG but a largely unaffected by different simulations and closures (Figure 2). But when considering the welfare implications, using Slutsky Equivalent Variations[2], the differences across RHG are substantial (Figure 3). There are several factors driving these results. First, in no order, with VAT as the tax replacement instrument the effects depend on consumption patterns by RHG, whereas income tax changes impact disproportionately on wealthier RHG[3]. Second, savings need to adjust to satisfy the internal balance; both changes in savings and income tax need subtracting from household income to produce the amount left for consumption. Third, changes in factor prices (WF) often report different signs for the different closures. And fourth, changes in trade

1 NB: the exchange rate is defined in the US way; appreciation negative, depreciation positive (this tends to confuse everyone – including Americans!!!)

2 The EV measure accounts for changes in disposable income and changes in prices (crudely the cost of living),

3 If the income tax change has been additive the results will the markedly different.

taxes feed through into purchaser prices for RHGs and other domestic agents, so while the patterns of demand by RHGs respond other agents are less responsive.

Figure 2 Household Income (Real; % change)

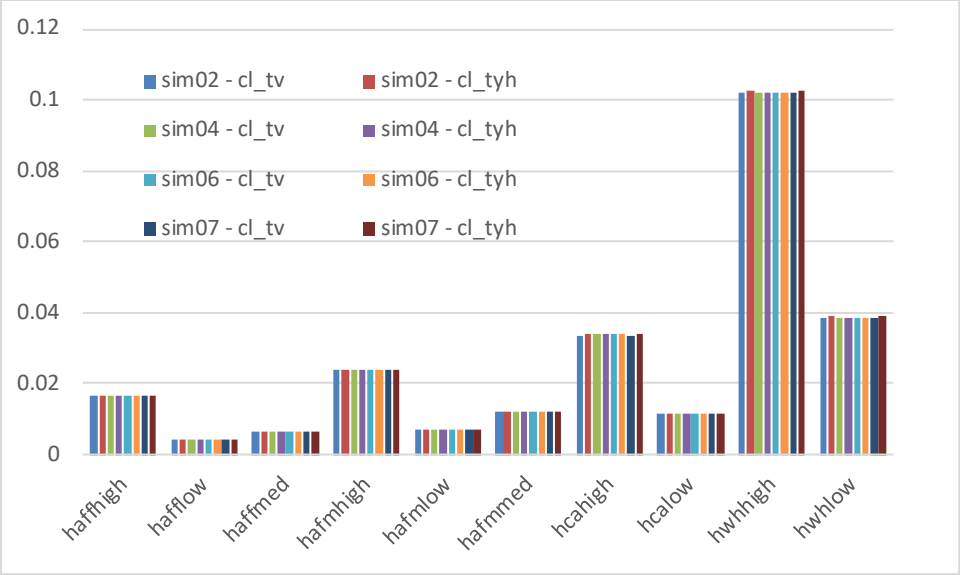
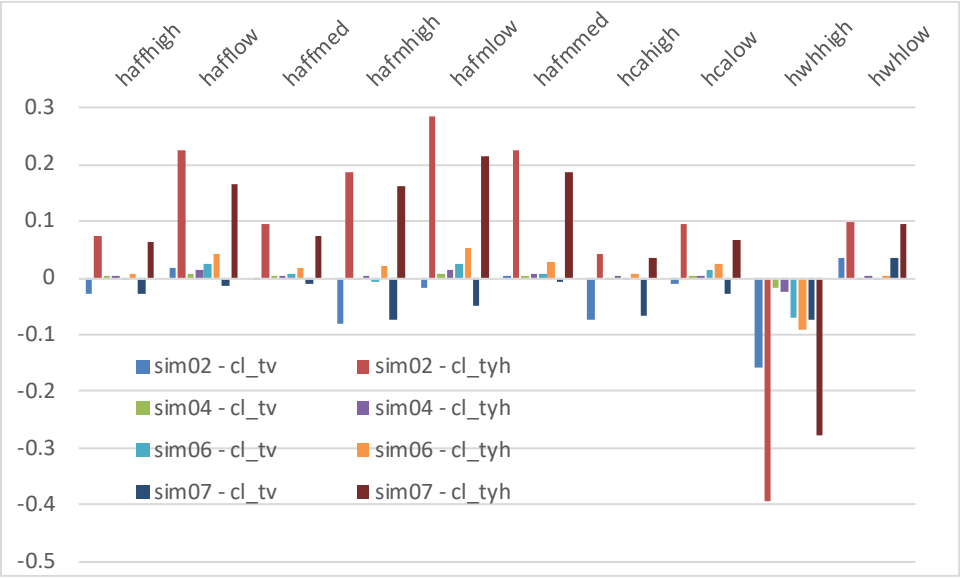


Figure 3 Welfare (Slutsky Equivalent variation)



The changes in import duties in duce changes in domestic production, both in aggregate (including exports) and domestic output destined for the domestic market (QD) (Figure 4). This reflects the increased exposure of protected activities from foreign competition, especially for textiles, and the impacts of changes in factor prices and the exchange rate. The

interactions between the causes are complex but a first step on the root to explanation might involve looking at the results for PVA – the aggregate return to primary inputs (Figure 5). The immediate and obvious feature is that the signs on the percent changes in PVA are dominated by the closure assumption, the choice of tax replacement instrument matters!!

Figure 4 Domestic Output to Domestic Market (% change)

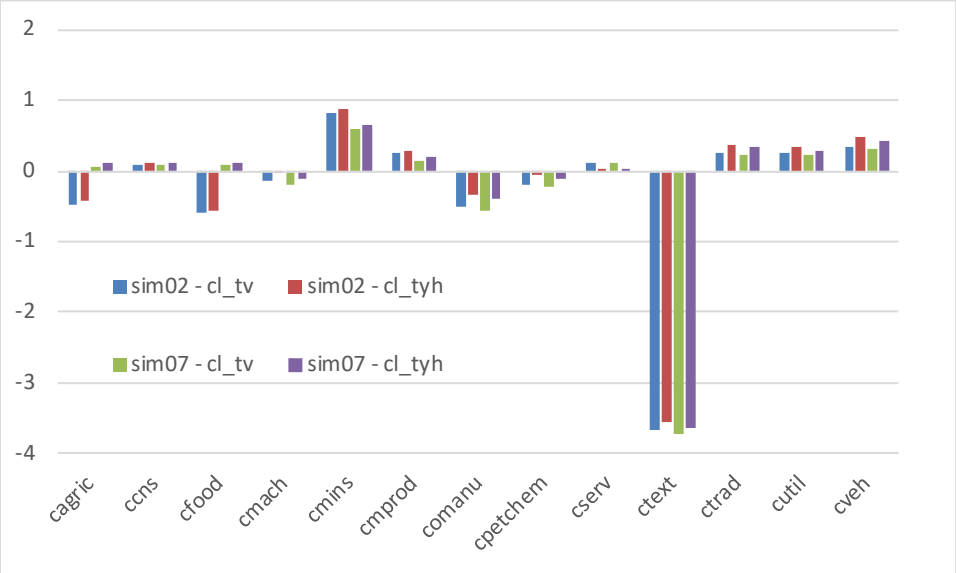
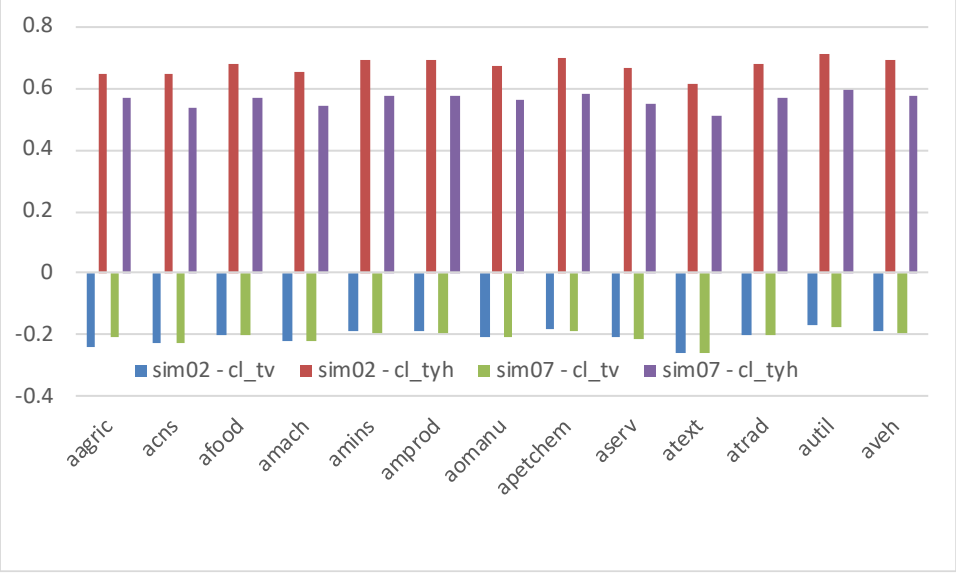


Figure 5 Price of Value Added (% change)



Examining the changes in RHG and enterprise savings rates shows they are all negative, which reflects the fact that the RHG and enterprise need to save less to meet the demand for investible funds for investment demand.

Concluding Notes

While the results are broadly consistent with expectations about the results at an aggregate level there are marked distributional implications and changes in production structure. It may have been less expected that the results were so sensitive to the choice of closure; it is surprising how often this is the case with CGE models, which highlights the importance of exploring how different assumptions etc., impact of the results.