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THE MACROECONOMIC, INDUSTRIAL,
DISTRIBUTIONAL AND REGIONAL EFFECTS
OF GOVERNMENT SPENDING PROGRAMS
IN SOUTH AFRICA

by

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General Paper No. G-109 April 1995

ISSN 1031 9034B

ISSN 0 7326 0724 8

The Centre of Policy Studies (COPS) is a research centre at Monash University devoted to quantitative analysis of issues relevant to Australian economic policy. The Impact Project is a cooperative venture between the Australian Federal Government and Monash University, La Trobe University, and the Australian National University. During the three years January 1993 to December 1995 COPS and Impact will operate as a single unit at Monash University with the task of constructing a new economy-wide policy model to be known as MONASH. This initiative is supported by the Industry Commission on behalf of the Commonwealth Government, and by several other sponsors. The views expressed herein do not necessarily represent those of any sponsor or government.

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ABSTRACT

A computable general equilibrium model of the South African economy (IDC-GEM) is outlined. The model is used to analyse the effects on the economy of increases in government spending such as are at the core of the new government's Reconstruction and Development Program. The analysis concentrates on the implications of alternative methods of finance for the program. Results are reported for macroeconomic variables, for the prospects of industries and regions, and for income distribution.

Keywords: economic modelling, South Africa, government spending, income distribution, industrial effects, regional effects, macroeconomic effects

J.E.L. Classification numbers: C68, D31, D48, E62, O55, R13

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1. Introduction

This paper describes simulations conducted with the IDC-GEM model. IDC-GEM is a computable general equilibrium model of the South African economy, based closely on the Australian ORANI-F model (Horridge, Parmenter and Pearson, 1993). A brief outline of the model is given in section 2.

The simulations explore the effects of increases in government spending under a variety of financing assumptions. In broad terms, although not in detail, they illustrate some issues arising from the Reconstruction and Development plans of the new South African government. Details of the simulations and results for macroeconomic variables, for output by sector, for gross regional product in 9 regions and for the distribution of real consumption over 24 households are in section 3. Section 4 contains a summary of our main findings and some concluding comments on the policy relevance of results such as we are able to generate with IDC-GEM.

2. IDC-GEM

2.1. Theory

The theoretical structure of IDC-GEM is modelled closely on that of ORANI-F. Its main characteristics are listed below.

* This is a condensed version of a paper prepared for the Workshop on Economy-Wide Models of the South African Economy held at the Development Bank of Southern Africa, Johannesburg, 14-16 July 1994; see Cameron et al (1994).

2.1.1. Assumptions about producers

Production is assumed to take place in single-product industries composed of producers who are price takers and who minimise costs subject to constant-returns-to-scale nested Leontief/CES production functions allowing substitution between:

- sources of produced inputs (i.e., domestic production and imports);
- labour, capital and land;
- occupations; and
- race groups.

2.1.2. Assumptions about investors

Investors are assumed to produce capital goods for current production using domestically produced and imported investment goods. They are assumed to be price takers who minimise costs subject to constant-return-to-scale production functions allowing substitution between sources of the investment goods. Aggregate investment is normally exogenous but its industrial composition depends on relative rates of return.

2.1.3. Assumptions about households

The household sector is disaggregated by race group and income level. Aggregate spending for the representative household in each race/income group is proportional to its disposable income. The representative households are assumed to maximise a nested Klein-Rubin/CES utility function subject to its aggregate spending constraint. Hence, households substitute between commodities and between sources of commodities *via* nested LES-CES demand systems.

2.1.4. International exports

The model includes downward-sloping foreign demand curves for individual traditional exports and for a composite non-traditional export which is a fixed-proportion combination of manufactured commodities and services.

2.1.5. Government

The level and composition of government consumption is exogenous. Revenue sources are fully articulated.

2.1.6. Trade and transport margins

The model includes usage of trade and transport services in the transfer of commodities from their producers to their purchasers. The technological assumption is that trade and transport services are required in fixed proportions to commodity flows which they facilitate.

2.1.7. Prices

Zero-pure-profits conditions and constant returns to scale imply that basic values of outputs are functions just of input prices. Purchasers' prices are the sums of basic values, sales taxes and the costs of trade and transport margins.

2.1.8. *Market clearing*

Commodity markets are assumed to clear. Labour markets need not clear, a common short-run assumption being that real or nominal wage rates are fixed with labour in excess supply.

2.1.9. *Identities defining macro variables*

The model includes numerous identities defining macroeconomic variables (e.g., GDP, the trade balance, price indexes) as explicit aggregates of their microeconomic components. The macro equation system is structured around a social accounting matrix (SAM).

2.1.10. *Regional disaggregation*

A tops-down disaggregation procedure is used to disaggregate economy-wide results to results for the nine provinces of the new South Africa. The procedure takes account of differences in the industrial structures of the regions and allows for regional multipliers operating through regional-balance constraints imposed on local service industries (see Dixon, Parmenter, Sutton and Vincent, 1982, chapter 6).

Note that IDC-GEM contains more disaggregated specifications of the labour market and of the household sector than does ORANI-F. The workforce is disaggregated by occupation, and segmentation by race group is recognised. The model's nested production functions specify an industry's aggregate labour input as a CES combination of occupation-specific labour inputs, each of which is a CES combination of labour drawn from the different race groups. Hence, if relative wages change, employers will substitute between occupations and between race groups. The household sector in IDC-GEM is also disaggregated by race group. Within each race group are recognised income levels, defined as divisions of the group's income distribution. With these labour-market and household disaggregations, the model can project the effects of economic developments on the distribution of employment and income in South Africa.

Another special feature of IDC-GEM is its treatment of the gold industry. In our data (see section 2.2), the *Gold Mining* industry (industry 3) includes the extraction of gold ore and its refinement. For heuristic purposes, the output of the industry can be thought of as "ounces of refined gold" not "tons of gold ore"¹. Except for a small amount sold to the domestic *Jewellery* industry, all of the output is exported.

The IDC-GEM specification recognises that in the short run employment in the *Gold Mining* industry and the amount of ore extracted are unresponsive to

¹ More precisely, the quantity units in the model are base-period dollarsworths rather than "ounces" or "tons".

variations in the Rand gold price net of ore-extraction and refining costs². It also recognises that industry policy is to vary the quality of the ore extracted with the net gold price. That is, if the net price rises (falls), poorer (richer) ore is accessed, with the result that the profitability of the extraction/refining process is approximately constant. Hence, there is a *negative* short-run relationship between the net gold price and the output of refined gold! In the model this is achieved by:

- the inclusion of an equation linking the percentage changes in the rental rate on the industry's capital and the average wage which it pays for labour; and
- endogenising the industry's all-input-using rate of technical change.

Moreover, the export-demand elasticity for gold is set at -100 so that variations in export volumes have no effect on the foreign-currency gold price.

2.2. Data

IDC-GEM contains 103 industries, 2 margins commodities, 65 categories of labour (13 occupations by (4 races *plus* migrant workers)) and 24 households (4 races by six income levels). The input-output database was compiled by Claude van der Merwe of Economic Analysis Systems Pty Ltd, working from Van Seventer, Eckert and de Lange (1992). Van der Merwe also supplied data for the occupational and race disaggregation of employment and for the race and income-level disaggregation of the household sector. To date no program for econometric estimation of the elasticities required for the model has been undertaken. Elasticities for this first version of the model were assigned on the basis of literature reviews or guesstimation. "Armington" elasticities of substitution between domestically produced commodities and imports, the elasticity of substitution between primary factors in non-mining industries, the elasticity of substitution between occupations and the elasticities in the household demand system were all adapted from the ORANI-F data files. The elasticity of substitution between race groups in labour demand was set at 2. For mining industries, the elasticity of substitution between primary factors in short-run simulations was set at 0.1. Export demand elasticities were set at -5 for traditional exports (except gold, see section 2.1) and -10 for the composite non-traditional export.

² Note that changes in this net gold price could be generated by changes in the foreign-currency gold price, by changes in the Rand/foreign-currency exchange rate or by changes in input costs (wages, for example).

3. Simulations: Short-Run Effects of a 10 Per Cent Increase in Real Government Spending

3.1. Details of the simulations

The main issue to be explored *via* the simulations is the implications of different methods of financing an increase in public spending. A secondary issue is the sensitivity of the results to the composition of the government-spending increase. We restrict ourselves to projecting the short-run comparative-static effects. The model in its present form is also capable of long-run comparative statics and, following recent developments, of dynamic simulations in the style of MONASH (Adams, Dixon, McDonald, Meagher and Parmenter, 1994; Dixon and Parmenter, 1994).

The main features common to all the short-run comparative-static closures used for the simulations are:

- capital stock fixed in each industry;
- slack labour markets for all labour categories;
- household consumption moves with disposable income for all households; and
- the industrial structure of private investment responds to changes in relative rates of return.

Features of the closures specific to individual simulations are given in Table 1.

To look at the financing issue, we concentrate on the case of a 10 per cent across-the-board increase in public spending, current and capital. We conduct the six simulations labelled with the prefix A in Table 1.

Monetary variables are not explicit in the model. The assumption in simulations A.1-A.5 that there is no constraint on foreign borrowing is represented by allowing the trade balance to move freely towards deficit in response to the increase in domestic absorption which is generated by the increase in government spending. Implicitly, capital inflows rise to finance the move to deficit in the trade account without increases in domestic interest rates. Hence, we set aggregate private investment exogenously -- it is not crowded out by the increase in government spending.

Simulations A.2-A.5 deal with different ways of tax financing the increase in government spending. In each case, some tax rates adjust to ensure that the real value (deflated by the GDP price index) of government borrowing is unaffected by the increase in government spending. As in A.1, the trade balance is endogenous, i.e., there is no constraint on foreign borrowing.

For the case of income-tax financing (simulations A.4 and A.5), we address the issue of whether workers manage to secure increases in pre-tax wage rates in compensation for the rise in income-tax rates. In A.4, it is assumed that no compensation is secured. Full compensation is assumed in A.5.

Simulation A.6 has the same assumptions about tax rates and government borrowing as simulation A.1. However, in A.6 we assume that the trade balance cannot move towards deficit, i.e., implicitly that foreign borrowing cannot increase. Private investment adjusts to accommodate the trade-balance constraint. Implicitly, the increase in government borrowing raises domestic interest rates, crowding out private investment.

Simulations A.2 to A.5 were first computed under closures of the model which differ from that used for simulation A.1 by the swapping of a tax variable (consumption-tax power or income-tax rate) with real government borrowing in the assignment of exogenous and endogenous variables. For example, in A.2 the powers of all taxes on household consumption (which are exogenous in A.1) are endogenous and real government borrowing (which is endogenous in A.1) is exogenous. The closure for simulation A.5 includes another swap -- the average real (CPI-deflated) post-tax wage rate (which is endogenous in all the other simulations, including A.1) is exogenous and the real pre-tax wage rate (which is exogenous in all other simulations) is endogenous.

In these computations we calculate the changes in tax rates required to finance the increase in government spending. Once these have been calculated, we can present all our results in terms of the closure of simulation A.1. For example, we can recompute simulation A.2 in the closure of A.1 with a pair of shocks -- a 10 per cent increase in government spending and an increase in the powers of the consumption taxes. The value of the latter shock is derived from the original computation of A.2, i.e., the computation in its own closure. For simulation A.5 we require three shocks -- the 10 per cent increase in government spending, the increase in income tax rates calculated in the original computation of A.5 and the increase in the pre-tax real wage calculated in that original computation.

Note that we can use a similar procedure to recompute simulation A.6 in the closure of A.1. In this case, the two shocks which we require are the 10 per cent increase in government spending and the decline in aggregate private investment which the original computation of A.6 revealed as necessary to offset the effects of the government-spending increase on the trade balance.

Presenting everything in the closure of simulation A.1 facilitates the exposition of the results. For example, it allows us to explain differences between simulations A.2, A.3 and A.4 just in terms of differences in the effects of

different tax increases. To get to A.5 from A.4 we need to explain just the effects of an increase in real pre-tax wage rates. Similarly, to explain the difference between the results of simulations A.1 and A.6, we need to explain just the effects of a fall in private investment.

The role of simulation B is to allow us to assess the sensitivity of the results to changes in the composition of government spending. Simulation B has the same closure as simulation A.1. In this closure we compute in B the effects of increasing government consumption and government investment by the same *absolute* amounts, not by the same *percentages*. As in A.1, the increase in aggregate government spending is 10 per cent. Since in our data government consumption exceeds government investment, the percentage increase in investment in B is larger than in A.1 and the percentage increase in consumption is smaller. By comparing the two simulations, we can assess the sensitivity of the results to an increase in the weight of investment in the aggregate spending increase.

We present the results of the simulations in the tables headed with the prefix R. Table 2 contains a key to the tables. Tables R1 and R2 each have seven columns. These contain results for simulations A.1 - A.6 and B. Corresponding to the *i*th of these columns is a Table R5.i showing the corresponding matrix of distributional results, a Table R6.i showing the corresponding matrix of consumption-price-index results and a Table R7.i decomposing the deviations of provincial from national growth rates into sectoral contributions. We use Tables R3 and R4 to explain the results. These latter tables show the effects on macroeconomic and structural variables of the different financing measures underlying the results in Tables R1 and R2.

3.2. Simulation A.1: foreign financing

3.2.1. Macroeconomic results (Table R1)

With our data, a 10 per cent across-the-board increase in government spending is a shock equivalent to 2.5 per cent of GDP. In column A.1 of Table R1 this spending increase requires an increase in government borrowing of about 27 per cent (row 3) or about 2.2 per cent of GDP. The rest of the government financing requirement (about 0.3 per cent of GDP) is accounted for by the expansion of real government revenue as tax bases expand in line with the expansion of real GDP (row 12).

Adding the consumption response (row 13) to the increase in government spending, and noting that we have held private investment fixed, we find that the increase in real domestic absorption is equivalent to about 3.9 per cent of GDP. This is accommodated in approximately equal shares by an increase in real GDP increases (row 12) a deterioration in the trade balance (row 4).

Because the increase in government spending falls predominantly on domestic goods, real appreciation (row 18) is required to produce the move to deficit in the trade balance. This reduces exports (row 16) and stimulates imports (row 17). Because exports fall, the terms of trade improve (row 25).

Terms-of-trade improvement reduces the consumption price index (row 20) relative to the price of domestic-output (row 18). With nominal wage rates tied to the consumption index, the producers' real wage falls. Together with the labour intensity of production for government spending relative to the traded-goods production which is crowded out, the fall in the producers' real wage explains the increase in employment and GDP which occur in the simulation.

Among the aspects of these results which should be treated with caution is our assumption that private investment remains unchanged. If we allowed investment to increase along with the expansion of the economy, the deterioration of the trade account would be larger.

3.2.2. Sectoral results (Table R2)

Column A.1 of Table R2 includes projections of the effects of the foreign-debt-financed increase in government spending on the structure of South African industry. IDC-GEM contains 103 industries but for ease of presentation we have aggregated the industry results to the 36-sector classification shown in the table.

Examples of the factors underlying the sectoral results are as follows. Exports decline because of the appreciation of the real exchange rate. This translates into declines in output for most of the traditional export sectors (e.g., 3, 4 and 19) and for sectors in which non-traditional exports are significant shares of total sales (e.g., 11 and 24). The exception among the traditional export sectors is *Gold Mining* (sector 2). As explained in section 2.1, we assume that, in response to the real appreciation, gold miners tap richer ore sources. Hence, with employment fixed and no change in the tonnage of ore mined, output of refined gold *increases*.

The major import-competing sectors (e.g., 7, 10, 16, 20, 21 and 24) also suffer output declines because of the appreciation of the real exchange rate. Sectors which contribute directly to the expansion of government spending (e.g., 34, 26 and 27) all expand strongly. Sectors 6 and 35 are both dependent on the domestic market and face little or no import competition. The stark difference between the effects on these two sectors is accounted for by a difference in the household-expenditure elasticities for their products.

3.2.3. Provincial results (Tables R2 and R7.1)

Projections of the effects of the foreign-debt-financed spending increase on provincial gross products are included at the bottom of column 1A.1 of Table R2. For comparison, we also include in the last row the effect on factor-cost

GDP³. The Western Cape (1), the Eastern Cape (2), Northern Transvaal (6), Kwa Zulu/Natal (8) and the Orange Free State (9) are relatively favourably affected. Gross product in Northern Cape (3), the PWV (4) and Eastern Transvaal (5) is projected to expand less rapidly than GDP.

With our tops-down methodology, differences in the provincial projections depend primarily on differences in the industrial structures of the provinces. A province's gross product will tend to expand more rapidly than GDP if the province has large shares (relative to the corresponding national shares) of rapidly expanding industries and small shares of slowly expanding sectors. Similarly, small shares of rapidly expanding sectors and large shares of slowly expanding sectors tend to reduce a province's share in GDP.

The last row in Table R7.1 shows the percentage-point deviations between provincial and the national changes in gross product in simulation A.1. The preceding rows show sectors' contributions to these deviations. The i th element in the table is the i th term from the sum on the RHS of equation (1).

$$g_r - g_N = \sum_i \{ (S_{ir} - S_{iN})(g_{iN} - g_N) + S_{ir}(g_{ir} - g_{iN}) \}. \quad (1)$$

In (1):

g_r and g_N are percentage changes in gross provincial product in province r and in GDP;

S_{ir} and S_{iN} are the shares of sector i in gross provincial product in province r and in GDP; and

g_{ir} and g_{iN} are percentage changes in value added in sector i in province r and nationally.

With our tops-down method the second term in the curly bracket on the RHS of the equation is zero except for industries producing commodities (mainly services) which are not traded between provinces.

According to our results, the Northern Transvaal is the province which is stimulated most strongly by the spending increase in simulation A.1. From Table R7.1, we see that sector 34 makes the strongest contribution to this result. This strongly stimulated government sector has a large share (33.5 per cent) in Northern Transvaal's gross product relative to the corresponding share in GDP (15.7 per cent). An offsetting factor is the large share (13.9 per cent) of the adversely affected *Other Mining* sector (3) in the gross product of Northern Transvaal relative to the corresponding share in GDP (4.3 per cent).

³ Note that this measure of GDP differs slightly from the expenditure-side measure reported in row 12 of Table R1.

Eastern Transvaal is the sector most adversely affected in simulation A.1. The relatively large shares of the relatively poorly affected sectors 3 and 25 (15.1 and 15.5 per cent compared to the GDP shares 4.3 and 4.3 per cent) is an important factor. In addition the share of the *Government* sector (34) in the province's gross product is only 11.3 per cent, slightly below the corresponding GDP share (15.7 per cent).

3.2.4. Distributional results (Tables R5.1 and R6.1)

Table R5.1 shows that the spending increase in simulation A.1 has very little effect on the distribution of real consumption. Table R6.1 shows that there is even less variation across households in the effects of the increase on consumption price indexes. What variation there is across households in Table R5.1 is explained primarily by the effect of the shock on the employment prospects of the households. For example, low-income Asians, which experience the smallest increases in consumption, are relatively heavily concentrated in the textile sector, a sector which is adversely affected by the spending increase. On the other hand, high-income Coloureds, which experience the largest increases in consumption, are relatively heavily concentrated in government industries.

3.3. Simulations A.2 to A.5: tax financing

In explaining the macroeconomic and sectoral results of the tax-financed increases in real government spending, we rely on explaining the effects of the different tax options. These are set out in columns 2 through 5 of tables R3 and R4. The effects of the tax-financed government-spending packages can then be calculated by adding the effects of the tax options to the effects of the foreign-borrowing-financed spending increase. For example, to get the macroeconomic effects of the 10 percent increase in government spending financed by a general consumption tax, we add column 2 of Table R3 to column 1 of Table R1. For convenience we repeat the effects of the foreign-borrowing-financed spending increase in the first column of Tables R3 and R4. For the provincial and distributional dimensions, we proceed by explaining the effects of the tax-financed spending packages directly.

3.3.1. Macroeconomic results (Table R3)

The first column of Table R3 repeats the first column of Table R1, i.e., it shows the macroeconomic effects of increasing government spending with constant tax rates and no trade-balance constraint. Note that real government borrowing is projected to increase by 27.42 per cent. The next four columns show the effects of four different methods of raising sufficient additional tax revenue to offset the effect on real government borrowing of the spending increase, namely:

a 6.88 per cent across-the-board increase in the powers of taxes on household consumption⁴;

a 10.80 per cent increase in powers of taxes on household consumption of all items except food, clothing, footwear, electricity, water supply, housing and medical services;

a 23.79 per cent increase in the average income tax rate assuming that pre-tax wage rates are unaffected; and

a 33.04 per cent increase in the average income tax rate assuming that pre-tax wage rates rise to ensure that real post-tax wage rates are unaffected.

By adding each of these four columns of Table R3 to the first column, we obtain columns A.2 to A.5 of Table R1, i.e., we obtain our projections of the macroeconomic effects of tax-financed increases in government spending.

The macroeconomic effects of the general consumption tax, the luxury tax and the income tax with wage compensation are all very similar. Each leads to a fall in disposable income and hence in aggregate consumption of about 4.5 per cent. The consumption taxes raise the prices paid by consumers relative to the prices received by producers. With nominal wages assumed to move with consumer prices this leads to a rise in the producers' real wage, generating a decline in employment of about 3 per cent and a decline in real GDP of about 2 per cent. The wage-compensated income tax leads to a similar rise in the producers' real wage, although in this case nominal wage rates rise to compensate workers for the effects on their disposable incomes of the income tax rather than to compensate them for increases in consumer prices. In our data, the share of consumption in GDP is about 0.6, hence the decline in consumption is worth about 2.7 per cent of GDP and the trade balance improves by about 0.8 per cent of GDP. Most of the improvement in the trade balance is achieved *via* the direct effects of the fall in households' demand for imports. Only small adjustments in the real exchange rate are required.

Compared to the general consumption tax, the luxury tax discriminates against consumption of commodities which are relatively labour intensive. The main reason is the exemption from the luxury tax of electricity, water supply and housing, which are all very capital intensive and which together account for about 12 per cent of total household spending. This is why in our short-run simulations the luxury tax leads to a slightly greater contraction of employment and GDP than does the general consumption tax.

⁴ The power of a tax is one plus the ad valorem rate. By adjusting the powers rather than the rates, we impose tax increases on all commodities whether or not they were taxed in the data.

Because the general consumption tax does not alter relative commodity prices, we might expect its effects to be identical to those of the wage-compensated income tax. The difference between the macroeconomic effects of the two taxes in our simulations follows from differences in their distributional effects. According to our data, income taxes are levied predominantly on White households, especially those in the higher income brackets, and on high-income Asian households. Hence, these groups bear the brunt of income-tax financing of increases in government spending (cf. Tables R5.2 and R5.5). Housing and commodities such as motor vehicles which are relatively heavily imported account for relatively large shares in the consumption of the groups paying income taxes. Because of these differences in consumption patterns the wage-compensated income tax, compared to the general consumption tax, favours consumption of domestically produced commodities which are relatively labour intensive. Hence, it leads to slightly less contraction of GDP and employment.

The effects of the income tax without wage compensation differ sharply from the effects of the other three tax options. Without wage compensation, the income tax causes almost no change in the producers' real wage and almost no change in output and employment⁵. Real consumption declines by about the same amount as under the other three tax options. Hence, there is a sharp improvement in the trade balance. This requires depreciation of the real exchange rate, stimulating exports and causing imports to contract more rapidly than GDP.

3.3.2. Sectoral results (Table R4)

The sectoral results in columns 2-5 of Table R4 follow straightforwardly from the macroeconomic results in the corresponding columns of Table R3. We take the case of the general consumption tax (column 2) as the benchmark. Output contracts in almost all sectors with the contractions being greatest for labour-intensive sectors relying on sales to households and facing large household-expenditure elasticities. Sectors 35 (*Domestic Servants*) and 33 (*Community Services*) are the main examples. Because government spending and aggregate investment are assumed unaffected by the tax increase, sectors which serve these elements of domestic demand show little movement. Examples are sectors 34 (*Government Industries*), 26 (*Construction*) and 27 (*Civil Engineering*). Output in sector 2 (*Gold Mining*) increases as the industry accesses higher grade ore in response to the erosion of its profitability produced by the rise in the nominal wage rate.

⁵ The real GDP index reported in Table R3 is computed from the expenditure side. The corresponding change in real aggregate value added in the fourth column of the table is -0.05.

Under the luxury tax, the exempt commodities enjoy a relative price advantage, inducing households to substitute towards them. This explains why the falls in output for sectors 4 (*Food*), 8 (*Clothing*), 10 (*Footwear*) and 25 (*Electricity*) are smaller under the luxury tax than under the general consumption tax. *Housing and Medical services*, which are also exempt under the luxury tax, are included in sectors 32 (*Finance*) and 33 (*Community services*) respectively. Output of both these exempt commodities contracts less under the luxury tax than under the general consumption tax, but at the sectoral level this is swamped by the relatively larger contractions experienced by other activities included in the relevant sectors.

The sectoral effects of the wage-compensated income tax do not vary much from those of the general consumption tax. Some symptoms of the differences in the distributional effects of the two taxes are that sectors 4 (*Food*), 10 (*Footwear*) and 30 (*Transport*) contract less under the income tax than under the consumption tax and that sector 28 (*Trade*) contracts more. The shares of the former group of sectors in the consumption bundles of the households which lose from the income tax are smaller than their shares in the bundles of households who do not pay income tax. On the other hand, sector 28 (*Trade*) accounts for a relatively large share of consumption for the income-tax-paying households.

All sectors, except *Gold Mining* (2) and *Government Industries* (34), fare better under the income tax without wage compensation than under the other tax options. On average we should expect the difference between industries' growth rates under the uncompensated and compensated income taxes, for example, to be about 1.5 percentage points, approximately the difference between the two corresponding GDP results. Traded-goods sectors, which benefit from the real depreciation which is generated by the uncompensated income tax, fare better than this. Examples are *Textiles* (sector 7), *Wood* (sector 11) and the metals and machinery sectors (19 through 24). The relative advantage for sectors supplying domestic demand without international competition tends to be less than average. *Construction* (26), *Civil Engineering* (27) and *Government Industries* (34) are the main examples. Sectors 33 (*Community services*) and 35 (*Domestic servants*) are also dependent on sales to domestic demand and face no international competition. The improvement in their prospects under the uncompensated compared to the compensated income tax is greater than average because, being very labour intensive, their relative prices are lower under the uncompensated tax. The output of *Gold Mining* (sector 2) *declines* under the uncompensated tax and *increases* under the compensated tax. This is an implication of our assumptions about the industry's policy of accessing lower grade ore when the net Rand gold price is high (see section 2.1).

3.3.3. Provincial results (Tables R2, R7.2 through R7.5)

Provincial results for the simulations of tax-financed increases in government spending, i.e., for simulations A.2 through A.5, are reported in Table R2. Tables R7.2 through R7.5 disaggregate the deviations of provincial from national changes in gross product in these simulations into sectoral contributions.

Under tax financing with wage compensation (simulations A.2, A.3 and A.5), there is very little change in GDP and all provinces experience less expansion in gross product than under foreign-debt financing (simulation A.1). The main changes in the pattern of relative gains and losses is that the Orange Free State and the North West Transvaal improve their relative positions under wage-compensated tax financing. As can be seen from columns 2, 3 and 5 of Table R4, the contractionary effects of the general consumption tax, the luxury tax and the wage-compensated income tax are all much less severe on these two provinces than they are for the other seven. By comparing Table R7.2, R7.3 or R7.5 with R7.1, we see that the main reason for the improvement in the relative positions of the Orange Free State and the North West Transvaal is that the *Gold Mining* industry makes much larger contributions. *Gold Mining* accounts for relatively high shares of gross product in the Orange Free State and the North West Transvaal (28 per cent and 24 per cent respectively, compared to its 5 per cent share in GDP). As we explained in section 3.3.2, the wage-compensated taxes increase output in the *Gold Mining* industry but reduce output in almost all other sectors (see Table R1.4).

Under income-tax financing without wage compensation (simulation A.4), the expansion of GDP is close to that under foreign-debt financing. The main differences in the pattern of the provincial effects is that the relative positions of both the Orange Free State and the North West Transvaal decline under uncompensated income-tax financing. By comparing Tables R7.4 and R7.1, we see that changes in the contributions of the *Gold Mining* industry are, once again, the main explanation. As noted in section 3.3.2, the uncompensated income tax generates a marked reduction in gold output (see Table R4). Note that changes in the contributions of the *Gold Mining* industry also account for most of the *improvement* in the relative positions of the Eastern and Northern Capes under uncompensated income tax financing. *Gold Mining* has zero shares in gross product in both these provinces. Hence, the contraction of the sector under the uncompensated income tax has no effect on their gross products, implying increases in their shares of GDP.

3.3.4. Distributional results (Tables R5.2 through R5.5 and R6.2 through R6.5)

Tables R5.2 through R5.5 report the distribution of changes in real household consumption for the simulations of tax-financed increases in government spending, i.e., for simulations A.2 through A.5. Tables R6.2 through R6.5 report the corresponding changes in household-specific consumption-price indexes.

The first thing to notice is that there is not much inter-household variation in the consumption-price-index results, even for the case of the luxury tax (Table R6.3). The variation in the real-consumption results for the case of the two consumption-tax-financed spending increases (Tables R5.2 and R5.3) is caused mainly by variation in the employment results. These favour the employment of Coloureds and, to a lesser extent, Blacks relative to employment of Whites and Asians. The distribution of consumption moves even more strongly against rich White households under luxury-tax financing than it does under general-consumption-tax financing. This is because of the slight discrimination of the cost-of-living effects of the luxury tax against rich White households (see Table R6.3).

By comparing Tables R5.2 and R5.3 with Tables R5.4 and R5.5, we see that the distributional effects of income-tax financing are quite different from those of consumption-tax financing (general or luxury). Whereas under consumption-tax financing all households experience reductions in real consumption, under income-tax financing reductions in consumption are skewed heavily towards White and rich Asian households. According to our data, these are the groups upon which income taxes are levied. In increasing average income tax rates to finance the increase in government spending, we have assumed that the distribution of the tax remains unaltered from its historical pattern.

3.4. Simulation A.6: financing by domestic borrowing

3.4.1. Macroeconomic results (Table R3)

The last column of Table R3 shows the macroeconomic effects of a 18.36 per cent contraction of domestic private investment (row 10). This is sufficient to produce an improvement in the trade balance worth 1.94 per cent of GDP, exactly offsetting the trade-balance deterioration generated by the 10 per cent increase in government spending if all tax rates are held constant and there is no restriction on foreign borrowing (simulation A.1, reported in column 1 of Table R3 or R1). Combining the first and last columns of Table R3 gives our projections of the effects of the increase in government spending with tax rates constant but with a tight constraint on foreign borrowing (simulation A.6, reported in the penultimate column of Table R1). Under these assumptions, government borrowing to finance increased government spending would raise domestic interest rates, crowding out investment.

Unlike the consumption taxes or the wage-compensated income tax, financing government spending by domestic borrowing does not directly increase the producers' real wage. Hence, we should expect it to be less contractionary in the short run than these tax financing options and more closely comparable to financing by the uncompensated income tax. Note that the improvement in the trade balance which is generated by the uncompensated income tax is very similar to that produced by domestic borrowing. Essentially the uncompensated income tax finances government spending by crowding out household consumption with no direct effect on the producers' real wage, whereas financing by domestic borrowing crowds out private investment, again with no direct effect on the producers' real wage. Relative to household consumption, private investment is labour intensive. Hence, the short-run reduction in employment and GDP is larger under the cut in investment than under the uncompensated income tax. Private investment is also relatively import intensive. Hence, with the cut in private investment the real depreciation required to produce the trade-balance improvement is smaller than under the uncompensated income tax, imports contract more and exports expand less.

3.4.2. Sectoral results (Table R4)

The sectoral effects of the reduction in private investment required to make room for increased government spending under the domestic-borrowing scenario, are reported in the last column of Table R4. Suppliers of investment goods contract. Examples are the construction sectors (26 and 27), *Non-metallic Minerals* (18), *Wood Products* (11), *Fabricated Metals* (20) and *Machinery* (21 and 22). Contractions in these sectors generated by the contraction of private investment outweigh the stimulus which they receive from the expansion in public investment (see column A.6 of Table R2).

The industries which are stimulated by the fall in private investment are exporters (e.g., 3, 4, 19 and 24) and import-competing sectors (e.g., *Textiles* and *Footwear*, 7 and 10) which benefit from depreciation of the real exchange rate. Because of our assumptions about the industry's ore-grade policy, the depreciation leads to a fall in the output in *Gold Mining*.

3.4.3. Provincial results (Tables R2 and R7.6)

The pattern of the provincial results in simulation A.6 is similar to that in simulation A.4 (the case of income-tax financing without wage compensation). The Northern Transvaal, which has gross-product expansion more rapid than GDP expansion in both simulations, expands more strongly in simulation A.6. One reason is that *Other Mining* (sector 3) contracts less sharply relative to GDP. Mining has a relatively large share in the economy of the Northern Transvaal. Another reason is that the investment-related sectors (18-22 and 27) all contract more relative to GDP. The shares of these sectors in the gross product of the Northern Transvaal are smaller than the corresponding GDP shares.

The North Western Transvaal and the Orange Free State also expand more strongly relative to GDP in simulation A.6 than in simulation A.4. *Gold Mining*, which has relatively large shares in the gross products of these provinces, provides most of the explanation. Recall from section 3.4.1 that the cut in investment causes less real depreciation than does the uncompensated income tax. Hence, it has a less adverse effect on the *Gold Mining* sector.

The Eastern Cape expands less rapidly in simulation A.6 than in simulation A.4. One explanatory factor is the provinces relatively low share of *Gold Mining*. *Gold Mining* expands less rapidly than GDP in both simulations and hence makes positive contributions to Eastern Cape's relative gross-product expansion. The extent to which *Gold Mining* expands less rapidly than GDP is smaller in A.6 than in A.4. Hence, its contribution to Eastern Cape's relative gross-product expansion is also smaller in A.6. Changes in the contributions of sectors 18, 20-22 and 24 also contribute to the decline in Eastern Cape's relative gross-product expansion between simulations A.4 and A.6. All these sectors decline more relative to GDP in A.6 than in A.4. Their shares in the gross product of the Eastern Cape are all greater than their shares in GDP.

3.4.4. *Distributional results (Tables R1.5.6 and R1.6.6)*

Tables R1.5.6 and R1.6.6 indicate that, as in the cases of foreign-debt financing and consumption tax financing, an increase in government spending financed by domestic borrowing has only minor effects on the distribution of real consumption between households.

3.5. Simulation B: sensitivity to the composition of government spending

In columns B of Tables R1 and R2 we report the effects of a 10 percent increase in government spending with a heavier weight on capital spending than in the 10 per cent uniform increase in column A.1. From table R1 we see that the macroeconomic results are not very sensitive to the compositional change. The main implication follows from the fact that public investment is less labour intensive and more import intensive than public consumption. Because of this, the increase in government spending with the larger investment component stimulates less expansion of employment and GDP in the short run and more expansion of imports.

The sectoral effects in Table R2 are straightforward. Investment-related sectors such as construction (26 and 27) expand more strongly in simulation B than under the uniform increase in government spending and the industries which supply inputs to public consumption (sector 34) expand less.

The most notable feature of the sensitivity of the provincial results to the compositional change is the extent to which increasing public investment at the expense of public consumption reduces the expansion of gross product in the Northern Transvaal. The explanation is the relatively large share of the government sector (34) in the province's gross product.

Tables R5.7 and R6.7 indicate that, as was the case for the uniform increase in government spending (Tables R5.1 and R6.1), the increase in government spending with a high investment component has only minor implications for the distribution of real household consumption.

4. Summary and Conclusion

4.1. Summary of results

The results of our simulations indicate that, with no constraints on government borrowing or foreign borrowing, an increase in government spending (at constant tax rates) expands GDP and real consumption. It induces an appreciation of the real exchange rate which restricts exports and promotes imports. Industries producing non-traded goods, especially for government demands, expand relative to export and import-competing sectors. Provinces which are dependent on export sectors tend to lose shares in GDP, unless as in the case of Northern Transvaal they have relatively large shares of government industries. The income-distribution effects are small.

If taxes are to be raised to finance the increase in government spending it does not matter much, for macroeconomic variables, whether consumption taxes or income taxes are used so long as there is wage compensation if income taxes are used. However:

- the form of the consumption tax matters slightly because of possible changes in relative prices inducing substitution effects; and
- the form of compensation matters slightly *via* effects on income distribution.

There are differences in the structural effects of the different forms of tax financing *via* relative-price and distributional mechanisms. The income-distribution effects of the different tax packages are quite marked, especially for income *vs* consumption taxes.

The effects for all variables are quite different for the case of an uncompensated income tax. Imposing an uncompensated income tax reduces the producer real wage rate, which is employment generating.

With a constraint on foreign borrowing, any increase in government spending not financed by taxation crowds out private investment. Private investment is relatively import intensive implying that an appreciation of the real exchange rate will be required to preserve trade balance.

4.2. Policy relevance of model simulations

Our results illustrate how CGE models can provide information on the likely effects of particular policy packages on many dimensions of the economy. We have attempted to identify the mechanisms in the model which are responsible for the results. We believe that properly understood by policy advisers such results can be useful as aids to thinking about the effects of policy changes and as means for estimating the broad magnitudes of the effects. The role of the modeller should be to explain to the policy adviser why the model produces the results, what factors are included in the analysis and what is left out. It is the advisers responsibility to judge whether the story which the model tells captures interesting parts of the economic environment.

The results should be approached with caution and with a sceptical attitude to the empirical content of the model. For example, the user should bear in mind that the elasticity file for IDC-GEM reflects only limited empirical work on South African data. These limitations, however, do not distinguish CGE modelling from rival methods for policy analysis. It is just that the formal modelling framework insists that the analyst is explicit about the empirical content of his/her analysis. Moreover, the model provides a vehicle for testing the sensitivity of the conclusions to variations in the empirical input and to other aspects of the analysts assumptions. The real questions are:

- are the results which the model is capable of generating of policy interest; and
- if so, what alternatives are available to provide information about these effects?

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Table 1: Details of simulations

Simulation	Comments
A.1	10 per cent across-the-board increase in public spending Real wage rates (CPI-deflated) fixed Aggregate private investment exogenous All tax rates exogenous (no constraint on government borrowing) Trade balance endogenous (no constraint on foreign borrowing)
A.2	10 per cent across-the-board increase in public spending Real wage rates (CPI-deflated) fixed Aggregate private investment exogenous Across-the-board adjustment in powers of consumption taxes to stabilise real government borrowing Trade balance endogenous (no constraint on foreign borrowing)
A.3	10 per cent across-the-board increase in public spending Real wage rates (CPI-deflated) fixed Aggregate private investment exogenous Adjustment in powers of taxes on the consumption of luxuries to stabilise real government borrowing Trade balance endogenous (no constraint on foreign borrowing)
A.4	10 per cent across-the-board increase in public spending Aggregate private investment exogenous Across-the-board adjustment in average income tax rates to stabilise real government borrowing No adjustment in pre-tax wages to compensate for income-tax rise Trade balance endogenous (no constraint on foreign borrowing)
A.5	10 per cent across-the-board increase in public spending Aggregate private investment exogenous Across-the-board adjustment in average income tax rates to stabilise real government borrowing Pre-tax wage rates adjust to compensate for income-tax rise Trade balance endogenous (no constraint on foreign borrowing)
A.6	10 per cent across-the-board increase in public spending Real wage rates (CPI-deflated) fixed No constraint on government borrowing Trade balance exogenous (no increase in foreign borrowing) Aggregate private investment endogenous
B	5.79 per cent increase in public consumption and 36.71 per cent increase in public investment Real wage rates (CPI-deflated) fixed Aggregate private investment exogenous All tax rates exogenous (no constraint on government borrowing) Trade balance endogenous (no constraint on foreign borrowing)

Table 2: Key to results tables for simulations

Table	Description
R1	Macroeconomic effects of a 10 per cent increases in government spending under different financing assumptions
R2	Structural effects of a 10 per cent increases in government spending under different financing assumptions
R3	Macroeconomic effects of a 10 per cent across-the-board increase in government spending and of different financing options
R4	Structural effects of a 10 per cent increases in government spending and of different financing options
R5.1 -R5.7	Effects on real consumption by household of a 10 per cent increases in government spending under different financing assumptions
R6.1 -R6.7	Effects on consumption price indexes by household of a 10 per cent increases in government spending under different financing assumptions
R7.1 -R7.7	Contributions to deviations of provincial growth rates from the national growth rate generated by a 10 per cent increases in government spending under different financing assumptions

Table R1 Macroeconomic effects of a 10% increase in government spending under different financing options (% changes)

Row	Variable	SIMULATION						B
		A.1	A.2	A.3	A.4	A.5	A.6	
1	Real Government Consumption	10.00	10.00	10.00	10.00	10.00	10.00	5.79
2	Real Government Investment	10.00	10.00	10.00	10.00	10.00	10.00	36.71
3	Real Government Borrowing	27.42	0.00	0.00	0.00	0.00	28.54	26.64
4	(Balance of Trade)/GDP	-1.94	-1.19	-1.20	-0.09	-0.99	0.00	-2.07
5	Powers of General Consumption Tax	0.00	6.88	0.00	0.00	0.00	0.00	0.00
6	Powers of Luxury Consumption Tax	0.00	0.00	10.80	0.00	0.00	0.00	0.00
7	Average Income Tax Rate	0.00	0.00	0.00	23.79	33.04	0.00	0.00
8	Real Wage Rate (Pre-Tax)	0.00	0.00	0.00	0.00	5.27	0.00	0.00
9	Real Wage Rate (Post-Tax)	0.01	0.04	0.04	-3.81	0.01	0.00	0.01
10	Real Private Investment	0.00	0.00	0.00	0.00	0.00	-18.36	0.00
11	Aggregate Employment	2.79	-0.24	-0.86	2.90	0.02	1.88	2.06
12	Real GDP (Expenditure Side)	1.94	0.11	-0.25	1.58	0.21	1.17	1.51
13	Real Household Consumption	2.46	-1.94	-2.51	-1.40	-1.95	1.48	1.91
14	Aggregate Real Investment	2.24	2.24	2.24	2.24	2.24	-12.02	8.21
15	Real Government Consumption	10.00	10.00	10.00	10.00	10.00	10.00	5.79
16	Export Volume Index	-6.57	-5.14	-5.65	0.49	-4.65	-1.27	-6.44
17	Import Volume Index	2.43	-0.05	-0.56	0.72	-0.01	-1.60	3.28
18	Factor Cost Deflator	3.38	3.13	3.81	-0.32	2.72	1.08	3.10
19	GDP Price Index (Expenditure Side)	3.19	6.32	7.07	-0.29	2.50	1.01	2.94
20	Consumer Price Index	3.09	7.21	8.09	-0.65	1.20	1.17	2.74
21	Investment Price Index	2.12	2.77	3.09	0.15	2.46	-0.75	2.67
22	Government Consumption Price Index	3.76	6.46	7.19	0.43	5.86	1.83	3.13
23	Exports Price Index	0.90	0.76	0.84	-0.07	0.69	0.15	0.89
24	Imports Price Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	Terms of Trade	0.90	0.76	0.84	-0.07	0.69	0.15	0.89
26	Producers' Real Wage	-0.29	4.08	4.27	-0.33	3.75	0.09	-0.36

Table R2 Structural effects of a 10% increase in govt spending under different financing options (% changes)

Row	Variable	SIMULATION						B
		A.1	A.2	A.3	A.4	A.5	A.6	
Sector Outputs								
1	AGRIC	-0.38	-1.73	-1.91	0.07	-1.43	-0.04	-0.39
2	GOLD	2.89	6.02	6.85	-0.58	5.40	1.04	2.60
3	OTH_MINING	-0.61	-1.06	-1.20	0.12	-0.94	-0.21	-0.55
4	FOOD	-0.97	-2.83	-2.51	-0.03	-2.44	0.05	-1.06
5	BEVRG	0.86	-2.47	-3.51	-0.47	-2.00	0.77	0.55
6	TOBAC	0.67	-2.46	-3.55	-0.49	-1.94	0.66	0.39
7	TEXTILE	-2.23	-5.15	-5.06	0.33	-4.52	-0.57	-2.11
8	CLOTHING	0.10	-3.22	-2.39	-0.15	-2.98	0.50	-0.14
9	LEATHER	0.21	-4.53	-6.15	-0.09	-3.45	0.68	-0.11
10	FOOTWEAR	-0.65	-2.50	-2.17	0.10	-2.18	0.01	-0.70
11	WOOD	-1.46	-3.53	-4.42	1.37	-2.99	-3.80	0.38
12	FURNIT	0.92	-2.88	-4.14	0.02	-2.37	0.57	0.66
13	PAPER	-0.48	-1.72	-2.08	0.23	-1.52	-0.07	-0.48
14	PRINTING	1.56	-2.79	-3.95	-0.02	-2.59	1.04	1.16
15	CHEMICAL	-0.36	-2.96	-3.75	0.27	-2.66	-0.13	-0.31
16	RUBBER	-1.00	-2.70	-3.23	0.58	-2.48	-1.35	-0.35
17	PLASTIC	0.33	-2.06	-2.66	0.30	-1.79	-1.16	0.94
18	NONMETMIN	0.12	-1.00	-1.42	1.89	-0.68	-5.88	3.18
19	BASIC_METAL	-2.06	-3.01	-3.71	0.77	-2.65	-1.68	-1.37
20	FABRIC_METAL	-1.27	-2.59	-3.17	1.51	-2.24	-4.10	0.73
21	MACHINERY	-0.86	-2.37	-3.19	1.59	-2.14	-3.20	0.36
22	ELEC_MACHIN	0.39	-0.77	-1.37	2.47	-0.73	-3.85	1.95
23	TRANSP_EQP	-0.15	-1.22	-1.57	0.78	-1.09	0.08	-0.18
24	OTH_MANUF	-2.67	-4.61	-5.24	1.37	-4.19	-0.71	-2.41
25	ELECTRCTY	0.39	-1.98	-1.41	-0.12	-1.81	0.13	0.35
26	CONSTRUCT	2.83	2.52	2.60	2.62	2.50	-9.59	8.03
27	CIVIL_ENG	2.96	2.56	2.66	2.81	2.56	-8.06	7.39
28	TRADE	0.99	-1.85	-2.35	-0.31	-1.99	0.05	1.02
29	ACCOM	-0.88	-3.55	-4.52	-0.14	-3.39	0.12	-1.01
30	TRANSPORT	-1.21	-4.66	-5.91	-0.13	-4.00	-0.14	-1.22
31	COMMUN	0.67	-2.43	-3.31	0.36	-1.78	0.31	0.57
32	FINANCE	0.38	-1.16	-1.39	0.62	-1.10	0.43	0.19
33	COMMUN_SERV	2.46	-4.55	-5.77	-1.75	-4.53	1.61	1.84
34	GOV_INDS	10.00	10.00	10.00	10.00	10.00	10.00	5.79
35	SERVANTS	3.86	-9.16	-12.85	-2.27	-7.71	2.33	2.99
36	N_CLASS	-0.07	-1.79	-2.24	0.37	-1.63	-0.75	0.30
Provincial Gross Products								
1	WCape	2.41	0.29	-0.07	2.20	0.46	1.73	1.78
2	ECape	2.12	0.15	-0.31	2.37	0.35	1.48	1.62
3	NCape	1.65	0.31	0.00	1.91	0.51	1.50	1.07
4	PWV	1.34	-0.44	-0.85	1.39	-0.32	0.52	1.10
5	ETVL	1.03	-0.65	-0.86	1.07	-0.49	0.63	0.89
6	NTVL	4.41	3.16	2.92	3.94	3.22	4.05	2.95
7	NWTVL	1.82	1.57	1.53	0.99	1.52	0.95	1.35
8	KwaZN	2.34	0.25	-0.15	2.37	0.44	2.05	1.60
9	OFS	2.58	2.14	2.12	1.39	2.08	1.70	1.90
10	South Africa	1.84	0.15	-0.18	1.74	0.28	1.20	1.39

Table R3 Macroeconomic effects of a 10 percent increase in government spending and of different financing options (% changes)

Row	Variable	SIMULATION					
		Simulation A.1	General Consumption Tax	Luxury Tax	Income Tax No wage compensation	Income Tax Full wage compensation	Cut in Private Investment
1	Real Government Consumption	10.00	0.00	0.00	0.00	0.00	0.00
2	Real Government Investment	10.00	0.00	0.00	0.00	0.00	0.00
3	Real Government Borrowing	27.42	-27.42	-27.42	-27.42	-27.42	1.12
4	(Balance of Trade)/GDP	-1.94	0.76	0.75	1.86	0.95	1.94
5	Powers of General Consumption Tax	0.00	6.88	0.00	0.00	0.00	0.00
6	Powers of Luxury Consumption Tax	0.00	0.00	10.80	0.00	0.00	0.00
7	Average Income Tax Rate	0.00	0.00	0.00	23.79	33.04	0.00
8	Real Wage Rate (Pre-Tax)	0.00	0.00	0.00	0.00	5.27	0.00
9	Real Wage Rate (Post-Tax)	0.01	0.03	0.03	-3.82	0.00	-0.01
10	Real Private Investment	0.00	0.00	0.00	0.00	0.00	-18.36
11	Aggregate Employment	2.79	-3.02	-3.65	0.11	-2.76	-0.90
12	Real GDP (Expenditure Side)	1.94	-1.83	-2.19	-0.36	-1.73	-0.78
13	Real Household Consumption	2.46	-4.40	-4.97	-3.86	-4.41	-0.98
14	Aggregate Real Investment	2.24	0.00	0.00	0.00	0.00	-14.26
15	Real Government Consumption	10.00	0.00	0.00	0.00	0.00	0.00
16	Export Volume Index	-6.57	1.43	0.92	7.06	1.92	5.30
17	Import Volume Index	2.43	-2.48	-3.00	-1.71	-2.44	-4.03
18	Factor Cost Deflator	3.38	-0.24	0.44	-3.69	-0.65	-2.30
19	GDP Price Index (Expenditure Side)	3.19	3.13	3.88	-3.49	-0.69	-2.18
20	Consumer Price Index	3.09	4.13	5.00	-3.74	-1.88	-1.92
21	Investment Price Index	2.12	0.65	0.97	-1.97	0.34	-2.87
22	Government Consumption Price Index	3.76	2.70	3.43	-3.33	2.10	-1.93
23	Exports Price Index	0.90	-0.14	-0.06	-0.97	-0.21	-0.75
24	Imports Price Index	0.00	0.00	0.00	0.00	0.00	0.00
25	Terms of Trade	0.90	-0.14	-0.06	-0.97	-0.21	-0.75
26	Producers' Real Wage	-0.29	4.37	4.56	-0.04	4.04	0.38

Table R4 Macroeconomic effects of a 10 percent increase in government spending under different financing assumptions

Row	Variable	SIMULATION					
		Simulation	General	Luxury	Income	Income	Cut In
		A.1	Consn Tax	Tax	Tax: No wage compenssn	Tax: Full wage compenssn	Private Invest
Sector Outputs							
1	AGRIC	-0.38	-1.35	-1.53	0.44	-1.05	0.34
2	GOLD	2.89	3.13	3.95	-3.47	2.51	-1.86
3	OTH_MINING	-0.61	-0.45	-0.60	0.73	-0.33	0.39
4	FOOD	-0.97	-1.87	-1.54	0.94	-1.48	1.01
5	BEVRG	0.86	-3.33	-4.37	-1.34	-2.86	-0.09
6	TOBAC	0.67	-3.12	-4.21	-1.16	-2.60	0.00
7	TEXTILE	-2.23	-2.91	-2.82	2.56	-2.29	1.67
8	CLOTHING	0.10	-3.31	-2.49	-0.25	-3.08	0.41
9	LEATHER	0.21	-4.74	-6.36	-0.30	-3.66	0.47
10	FOOTWEAR	-0.65	-1.85	-1.52	0.75	-1.53	0.65
11	WOOD	-1.46	-2.07	-2.96	2.83	-1.53	-2.34
12	FURNIT	0.92	-3.81	-5.06	-0.90	-3.30	-0.35
13	PAPER	-0.48	-1.24	-1.61	0.71	-1.05	0.41
14	PRINTING	1.56	-4.35	-5.51	-1.58	-4.16	-0.52
15	CHEMICAL	-0.36	-2.60	-3.40	0.62	-2.30	0.23
16	RUBBER	-1.00	-1.69	-2.22	1.58	-1.48	-0.35
17	PLASTIC	0.33	-2.39	-2.99	-0.03	-2.12	-1.49
18	NONMETMIN	0.12	-1.11	-1.54	1.77	-0.80	-6.00
19	BASIC_METAL	-2.06	-0.96	-1.65	2.83	-0.59	0.38
20	FABRIC_METAL	-1.27	-1.32	-1.90	2.78	-0.97	-2.83
21	MACHINERY	-0.86	-1.51	-2.33	2.45	-1.28	-2.34
22	ELEC_MACHIN	0.39	-1.16	-1.76	2.08	-1.12	-4.24
23	TRANSP_EQP	-0.15	-1.06	-1.42	0.93	-0.94	0.23
24	OTH_MANUF	-2.67	-1.94	-2.57	4.04	-1.52	1.96
25	ELECTRCTY	0.39	-2.36	-1.79	-0.51	-2.19	-0.26
26	CONSTRUCT	2.83	-0.31	-0.22	-0.20	-0.32	-12.42
27	CIVIL_ENG	2.96	-0.40	-0.30	-0.15	-0.40	-11.02
28	TRADE	0.99	-2.84	-3.35	-1.30	-2.99	-0.95
29	ACCOM	-0.88	-2.67	-3.64	0.74	-2.51	1.00
30	TRANSPORT	-1.21	-3.45	-4.71	1.08	-2.79	1.07
31	COMMUN	0.67	-3.10	-3.98	-0.31	-2.45	-0.36
32	FINANCE	0.38	-1.54	-1.78	0.24	-1.48	0.05
33	COMMUN_SERV	2.46	-7.01	-8.22	-4.21	-6.99	-0.85
34	GOV_INDS	10.00	0.00	0.00	0.00	0.00	0.00
35	SERVANTS	3.86	-13.02	-16.70	-6.13	-11.56	-1.53
36	N_CLASS	-0.07	-1.72	-2.17	0.44	-1.56	-0.68
Provincial Gross Products							
1	WCape	2.41	-2.12	-2.48	-0.21	-1.95	-0.68
2	ECape	2.12	-1.96	-2.43	0.26	-1.77	-0.64
3	NCape	1.65	-1.34	-1.65	0.26	-1.15	-0.16
4	PWV	1.34	-1.78	-2.19	0.05	-1.66	-0.82
5	ETVL	1.03	-1.67	-1.89	0.04	-1.52	-0.39
6	NTVL	4.41	-1.25	-1.49	-0.47	-1.19	-0.36
7	NWTVL	1.82	-0.25	-0.29	-0.83	-0.30	-0.87
8	KwaZN	2.34	-2.08	-2.49	0.03	-1.89	-0.29
9	OFS	2.58	-0.44	-0.46	-1.19	-0.50	-0.88
10	South Africa	1.84	-1.69	-2.03	-0.10	-1.56	-0.64

Table R5.1
Percentage effects on real household consumption in Simulation A.1

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	2.02	2.29	1.58	2.46	2.11
Q2	2.00	2.30	1.50	2.37	2.13
Q3	2.23	2.37	1.61	2.45	2.29
Q4	2.11	2.57	2.15	2.68	2.35
D9	2.19	3.10	2.54	3.19	2.68
D10	1.88	3.78	3.13	3.17	2.72
Average	2.07	2.90	2.22	2.88	2.46

Table R5.2
Percentage effects on real household consumption in Simulation A.2

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	-3.25	-1.83	-2.52	-1.93	-2.83
Q2	-2.56	-1.88	-2.69	-2.18	-2.38
Q3	-1.65	-1.92	-2.34	-2.01	-1.82
Q4	-2.51	-1.47	-1.32	-1.95	-2.18
D9	-1.78	-0.70	-0.89	-1.04	-1.36
D10	-3.78	0.77	-0.74	-0.73	-1.79
Average	-2.59	-0.88	-1.55	-1.39	-1.94

Table R5.3
Percentage effects on real household consumption in Simulation A.3

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	-3.66	-2.35	-2.57	-2.40	-3.25
Q2	-2.98	-2.21	-3.16	-2.55	-2.77
Q3	-2.27	-2.44	-2.72	-2.42	-2.35
Q4	-3.23	-2.04	-1.82	-2.50	-2.81
D9	-2.56	-1.26	-1.29	-1.50	-1.98
D10	-4.67	0.19	-1.41	-1.11	-2.40
Average	-3.27	-1.41	-2.01	-1.82	-2.51

Table R5.4

Percentage effects on real household consumption in Simulation A.4

Group	WHITE	COLOURED	ASIAN	BLACK	Average
Q1	-0.53	2.07	1.01	1.34	0.14
Q2	-2.64	1.53	0.59	1.53	-0.72
Q3	-3.31	1.41	-0.01	1.62	-1.18
Q4	-3.78	-0.01	-0.69	1.78	-1.39
D9	-5.11	-0.93	-1.66	1.93	-1.83
D10	-6.05	-0.25	-3.66	1.23	-1.89
Average	-3.99	0.31	-1.11	1.55	-1.40

Table R5.5

Percentage effects on real household consumption in Simulation A.5

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	-1.50	2.67	1.60	1.58	-0.37
Q2	-3.94	1.92	1.16	2.36	-1.07
Q3	-4.25	1.77	0.54	2.52	-1.35
Q4	-5.47	0.10	-0.20	2.56	-1.97
D9	-6.80	-1.08	-1.79	2.88	-2.29
D10	-9.37	0.02	-4.88	2.10	-2.78
Average	-5.80	0.52	-1.08	2.40	-1.95

Table R5.6

Percentage effects on real household consumption in Simulation A.6

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	1.18	1.28	0.74	1.10	1.16
Q2	1.23	1.16	0.69	1.00	1.13
Q3	1.51	1.08	0.85	1.04	1.30
Q4	1.35	1.31	1.46	1.30	1.33
D9	1.49	1.92	1.95	2.02	1.75
D10	1.06	2.95	2.47	2.06	1.76
Average	1.31	1.80	1.51	1.63	1.48

Table R5.7

Percentage effects on real household consumption in Simulation B

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	1.59	1.84	1.33	2.11	1.70
Q2	1.54	1.91	1.27	2.06	1.74
Q3	1.64	2.01	1.31	2.13	1.82
Q4	1.59	2.12	1.59	2.24	1.87
D9	1.62	2.39	1.77	2.44	2.01
D10	1.49	2.60	2.13	2.39	2.05
Average	1.58	2.23	1.63	2.29	1.91

Table R6.1

Percentage effects on household consumption price indexes in Simulation A.1

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	3.12	2.95	3.08	2.72	3.03
Q2	3.26	2.92	3.08	2.76	3.05
Q3	3.27	2.89	3.13	2.76	3.06
Q4	3.26	3.01	3.20	2.79	3.07
D9	3.33	3.04	3.37	2.90	3.14
D10	3.25	3.34	3.15	2.95	3.11
Average	3.26	3.07	3.18	2.86	3.09

Table R6.2

Percentage effects on household consumption price indexes in Simulation A.2

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	7.30	7.31	7.29	7.17	7.28
Q2	7.31	7.24	7.28	7.15	7.25
Q3	7.32	7.24	7.25	7.15	7.25
Q4	7.26	7.25	7.13	7.22	7.24
D9	7.30	7.17	7.23	7.14	7.22
D10	7.25	7.07	7.09	7.06	7.14
Average	7.28	7.19	7.19	7.13	7.21

Table R6.3

Percentage effects on household consumption price indexes in Simulation A.3

Income Group	WHITE	COLOURED	Ethnic Group ASIAN	BLACK	Average
Q1	8.02	8.12	7.59	7.87	7.98
Q2	8.04	7.85	8.00	7.67	7.89
Q3	8.22	8.05	7.87	7.74	8.04
Q4	8.30	8.11	7.90	8.00	8.17
D9	8.40	8.08	7.95	7.89	8.15
D10	8.50	8.08	8.14	7.80	8.11
Average	8.29	8.06	7.95	7.84	8.09

Table R6.4

Percentage effects on household consumption price indexes in Simulation A.4

Income Group	WHITE	COLOURED	Ethnic Group ASIAN	BLACK	Average
Q1	-0.68	-0.63	-0.67	-0.57	-0.65
Q2	-0.71	-0.62	-0.66	-0.57	-0.65
Q3	-0.71	-0.61	-0.67	-0.58	-0.65
Q4	-0.70	-0.63	-0.67	-0.58	-0.65
D9	-0.72	-0.63	-0.72	-0.59	-0.66
D10	-0.68	-0.70	-0.65	-0.60	-0.64
Average	-0.70	-0.65	-0.67	-0.59	-0.65

Table R6.5

Percentage effects on household consumption price indexes in Simulation A.5

Income Group	WHITE	COLOURED	Ethnic Group ASIAN	BLACK	Average
Q1	-1.93	-1.63	-1.80	-1.29	-1.78
Q2	-2.11	-1.57	-1.82	-1.33	-1.78
Q3	-2.12	-1.54	-1.90	-1.38	-1.82
Q4	-2.18	-1.72	-2.04	-1.41	-1.87
D9	-2.27	-1.81	-2.22	-1.59	-1.96
D10	-2.19	-2.34	-2.07	-1.69	-1.95
Average	-2.16	-1.85	-2.01	-1.53	-1.88

Table R6.6

Percentage effects on household consumption price indexes in Simulation A.6

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	1.21	1.15	1.22	1.08	1.18
Q2	1.28	1.13	1.19	1.09	1.20
Q3	1.26	1.10	1.22	1.08	1.19
Q4	1.23	1.14	1.22	1.07	1.16
D9	1.27	1.14	1.31	1.10	1.19
D10	1.19	1.26	1.16	1.08	1.14
Average	1.24	1.16	1.22	1.08	1.17

Table R6.7

Percentage effects on household consumption price indexes in Simulation A.7

Income Group	Ethnic Group				Average
	WHITE	COLOURED	ASIAN	BLACK	
Q1	2.76	2.60	2.71	2.39	2.67
Q2	2.87	2.57	2.72	2.42	2.69
Q3	2.89	2.57	2.76	2.43	2.71
Q4	2.90	2.68	2.84	2.47	2.73
D9	2.96	2.71	2.97	2.57	2.78
D10	2.91	2.97	2.82	2.64	2.78
Average	2.89	2.73	2.82	2.53	2.74

Table R7.1

Sectoral contributions to deviations of provincial from national growth rates in simulation A.1

Sector	PROVINCE								
	WCape	ECape	NCape	PWV	ETVL	NTVL	NWTVL	KwaZN	OFS
1 AGRIC	-0.0246	-0.0190	-0.2359	0.0721	-0.0672	-0.0726	-0.1303	0.0158	-0.0732
2 GOLD	-0.0522	-0.0522	-0.0522	-0.0025	-0.0153	-0.0363	0.1878	-0.0522	0.2268
3 OTH_MINING	0.0907	0.1031	-0.4016	0.0785	-0.3117	-0.2297	-0.2957	0.0493	0.0372
4 FOOD	-0.0298	-0.0047	0.0360	0.0056	0.0235	0.0223	0.0243	-0.0248	0.0190
5 BEVRG	-0.0064	-0.0010	0.0077	0.0012	0.0050	0.0048	0.0052	-0.0053	0.0041
6 TOBAC	-0.0007	-0.0001	0.0008	0.0001	0.0005	0.0005	0.0006	-0.0006	0.0004
7 TEXTILE	-0.0410	-0.0116	0.0208	0.0181	0.0252	0.0230	0.0330	-0.0527	0.0165
8 CLOTHING	-0.0140	-0.0040	0.0071	0.0062	0.0086	0.0078	0.0113	-0.0180	0.0056
9 LEATHER	-0.0018	-0.0005	0.0009	0.0008	0.0011	0.0010	0.0015	-0.0023	0.0007
10 FOOTWEAR	-0.0081	-0.0023	0.0041	0.0036	0.0050	0.0046	0.0066	-0.0105	0.0033
11 WOOD	-0.0043	-0.0026	0.0074	0.0003	-0.0021	0.0010	0.0073	-0.0019	0.0059
12 FURNIT	-0.0009	-0.0005	0.0016	0.0001	-0.0004	0.0002	0.0015	-0.0004	0.0012
13 PAPER	-0.0229	0.0072	0.0381	-0.0048	0.0201	0.0265	0.0308	-0.0191	0.0317
14 PRINTING	-0.0014	0.0005	0.0024	-0.0003	0.0013	0.0017	0.0019	-0.0012	0.0020
15 CHEMICAL	0.0170	-0.0301	0.0854	-0.0045	-0.0455	0.0594	0.0527	0.0037	-0.0287
16 RUBBER	0.0020	-0.0034	0.0098	-0.0005	-0.0052	0.0068	0.0060	0.0004	-0.0033
17 PLASTIC	0.0017	-0.0030	0.0085	-0.0004	-0.0045	0.0059	0.0052	0.0004	-0.0029
18 NONMETMIN	0.0019	-0.0035	-0.0018	-0.0053	0.0085	0.0063	-0.0055	0.0051	0.0108
19 BASIC_METAL	0.0832	0.0799	0.0690	-0.0743	-0.0325	0.0761	0.0885	0.0197	0.0912
20 FABRIC_METAL	0.0120	-0.0385	0.0272	-0.0174	0.0228	0.0299	0.0266	0.0078	0.0359
21 MACHINERY	0.0110	-0.0350	0.0247	-0.0159	0.0207	0.0273	0.0242	0.0071	0.0327
22 ELEC_MACHIN	0.0037	-0.0118	0.0083	-0.0053	0.0070	0.0092	0.0082	0.0024	0.0110
23 TRANSP_EQP	0.0220	-0.0704	0.0500	-0.0320	0.0417	0.0548	0.0487	0.0143	0.0657
24 OTH_MANUF	0.0051	-0.0296	0.0160	-0.0071	0.0164	0.0177	0.0157	-0.0006	0.0169
25 ELECTRICTY	0.0191	0.0295	-0.0082	0.0105	-0.1720	0.0127	0.0364	0.0256	0.0006
26 CONSTRUCT	0.0347	0.0186	-0.0372	-0.0032	-0.0320	0.0178	-0.0491	0.0155	-0.0137
27 CIVIL_ENG	0.0135	0.0092	-0.0209	-0.0010	-0.0185	0.0017	-0.0245	0.0128	-0.0062
28 TRADE	0.0956	-0.0023	0.0541	-0.0901	-0.0251	0.3598	0.0012	0.0661	0.0758
29 ACCOM	-0.0081	-0.0010	0.0062	-0.0006	0.0052	0.0184	0.0042	-0.0063	0.0143
30 TRANSPORT	0.0552	-0.0026	-0.1355	-0.0206	0.0113	0.1797	0.0857	-0.0646	0.0585
31 COMMUN	-0.0095	-0.0073	-0.0161	-0.0034	0.0178	0.0132	0.0079	0.0038	0.0056
32 FINANCE	0.0163	0.0683	0.0906	-0.1178	0.1060	0.1923	0.0888	0.0838	0.0917
33 COMMUN_SERV	0.0303	0.0124	-0.0075	-0.0260	-0.0465	0.1887	-0.0215	0.0356	-0.0052
34 GOV_INDS	0.2547	0.2748	0.1383	-0.2514	-0.3709	1.4381	-0.2964	0.3776	0.0028
35 SERVANTS	0.0189	0.0088	0.0092	-0.0132	-0.0198	0.0897	-0.0143	0.0069	0.0039
36 N_CLASS	0.0035	-0.0028	0.0033	-0.0013	0.0037	0.0049	0.0005	-0.0012	-0.0021
All Sectors	0.5664	0.2726	-0.1894	-0.5018	-0.8176	2.5652	-0.0251	0.4919	0.7366

Table R7.2

Sectoral contributions to deviations of provincial from national growth rates in simulation A.2

Sector	WCape	ECape	NCape	PWV	PROVINCE			KwaZN	OFS
					ETVL	NTVL	NWTVL		
1 AGRIC	-0.0208	-0.0161	-0.1998	0.0611	-0.0569	-0.0614	-0.1104	0.0134	-0.0620
2 GOLD	-0.2923	-0.2923	-0.2923	-0.0140	-0.0855	-0.2032	1.0515	-0.2923	1.2702
3 OTH_MINING	0.0470	0.0519	-0.1499	0.0414	-0.2069	-0.0924	-0.1064	0.0182	0.0184
4 FOOD	-0.0317	-0.0050	0.0383	0.0060	0.0250	0.0237	0.0259	-0.0264	0.0202
5 BEVRG	-0.0169	-0.0027	0.0205	0.0032	0.0133	0.0127	0.0138	-0.0141	0.0108
6 TOBAC	-0.0015	-0.0002	0.0019	0.0003	0.0012	0.0011	0.0013	-0.0013	0.0010
7 TEXTILE	-0.0533	-0.0151	0.0271	0.0236	0.0328	0.0299	0.0429	-0.0685	0.0214
8 CLOTHING	-0.0270	-0.0076	0.0137	0.0119	0.0166	0.0151	0.0217	-0.0347	0.0108
9 LEATHER	-0.0052	-0.0015	0.0026	0.0023	0.0032	0.0029	0.0042	-0.0067	0.0021
10 FOOTWEAR	-0.0087	-0.0025	0.0044	0.0038	0.0053	0.0049	0.0070	-0.0112	0.0035
11 WOOD	-0.0047	-0.0028	0.0083	0.0003	-0.0024	0.0011	0.0081	-0.0021	0.0066
12 FURNIT	-0.0030	-0.0018	0.0052	0.0002	-0.0015	0.0007	0.0051	-0.0013	0.0041
13 PAPER	-0.0185	0.0058	0.0307	-0.0039	0.0162	0.0214	0.0249	-0.0155	0.0256
14 PRINTING	-0.0150	0.0047	0.0249	-0.0032	0.0132	0.0173	0.0201	-0.0125	0.0207
15 CHEMICAL	0.0241	-0.0425	0.1208	-0.0063	-0.0643	0.0839	0.0745	0.0053	-0.0406
16 RUBBER	0.0020	-0.0035	0.0098	-0.0005	-0.0052	0.0068	0.0060	0.0004	-0.0033
17 PLASTIC	0.0025	-0.0044	0.0124	-0.0006	-0.0066	0.0086	0.0077	0.0005	-0.0042
18 NONMETMIN	0.0013	-0.0023	-0.0012	-0.0035	0.0057	0.0042	-0.0037	0.0034	0.0072
19 BASIC_METAL	0.0675	0.0648	0.0560	-0.0603	-0.0264	0.0618	0.0719	0.0160	0.0740
20 FABRIC_METAL	0.0106	-0.0339	0.0239	-0.0153	0.0200	0.0264	0.0234	0.0068	0.0316
21 MACHINERY	0.0102	-0.0327	0.0231	-0.0149	0.0193	0.0254	0.0226	0.0066	0.0305
22 ELEC_MACHIN	0.0023	-0.0075	0.0053	-0.0034	0.0044	0.0058	0.0052	0.0015	0.0070
23 TRANSP_EQP	0.0151	-0.0484	0.0345	-0.0221	0.0286	0.0377	0.0334	0.0098	0.0451
24 OTH_MANUF	0.0054	-0.0312	0.0169	-0.0075	0.0173	0.0187	0.0166	-0.0007	0.0179
25 ELECTRICTY	0.0259	0.0419	-0.0119	0.0149	-0.2407	0.0171	0.0550	0.0344	0.0024
26 CONSTRUCT	0.0332	0.0190	-0.0293	-0.0082	-0.0312	0.0410	-0.0252	0.0073	0.0081
27 CIVIL_ENG	0.0103	0.0080	-0.0085	-0.0029	-0.0178	0.0007	-0.0117	0.0106	0.0043
28 TRADE	0.0551	-0.0093	0.1454	-0.1089	0.0134	0.4412	0.1271	0.0350	0.1484
29 ACCOM	-0.0113	-0.0015	0.0108	-0.0005	0.0063	0.0213	0.0097	-0.0097	0.0193
30 TRANSPORT	0.0320	-0.0270	-0.0673	-0.0351	0.0839	0.2457	0.1659	-0.1039	0.0919
31 COMMUN	-0.0209	-0.0161	-0.0356	-0.0076	0.0393	0.0290	0.0174	0.0083	0.0123
32 FINANCE	0.0103	0.0629	0.0905	-0.1148	0.0954	0.1983	0.0987	0.0802	0.1026
33 COMMUN_SERV	0.0139	0.0226	0.0892	-0.0217	-0.0847	0.1611	0.0616	-0.0305	0.0809
34 GOV_INDS	0.3075	0.3317	0.1669	-0.3035	-0.4478	1.7360	-0.3578	0.4558	0.0034
35 SERVANTS	-0.0110	-0.0029	-0.0342	-0.0051	0.0123	0.0527	0.0089	0.0166	-0.0006
36 N_CLASS	0.0036	-0.0028	0.0034	-0.0013	0.0038	0.0050	0.0005	-0.0012	-0.0022
All Sectors	0.1381	-0.0003	0.1564	-0.5962	-0.8009	3.0021	1.4173	0.0977	1.9894

Table R7.3

Sectoral contributions to deviations of provincial from national growth rates in simulation A.3

Sector	PROVINCE								
	WCape	ECape	NCape	PWV	ETVL	NTVL	NWTVL	KwaZN	OFS
1 AGRIC	-0.0191	-0.0147	-0.1833	0.0560	-0.0522	-0.0564	-0.1013	0.0123	-0.0569
2 GOLD	-0.3503	-0.3503	-0.3503	-0.0168	-0.1025	-0.2435	1.2601	-0.3503	1.5222
3 OTH_MINING	0.0402	0.0439	-0.1121	0.0356	-0.1893	-0.0717	-0.0781	0.0136	0.0155
4 FOOD	-0.0243	-0.0038	0.0293	0.0046	0.0191	0.0182	0.0198	-0.0202	0.0154
5 BEVRG	-0.0215	-0.0034	0.0260	0.0040	0.0169	0.0161	0.0176	-0.0179	0.0137
6 TOBAC	-0.0020	-0.0003	0.0024	0.0004	0.0016	0.0015	0.0016	-0.0016	0.0013
7 TEXTILE	-0.0490	-0.0139	0.0249	0.0217	0.0302	0.0274	0.0395	-0.0630	0.0197
8 CLOTHING	-0.0177	-0.0050	0.0090	0.0078	0.0109	0.0099	0.0142	-0.0227	0.0071
9 LEATHER	-0.0066	-0.0019	0.0034	0.0029	0.0041	0.0037	0.0053	-0.0085	0.0027
10 FOOTWEAR	-0.0065	-0.0018	0.0033	0.0029	0.0040	0.0036	0.0052	-0.0083	0.0026
11 WOOD	-0.0055	-0.0033	0.0095	0.0003	-0.0027	0.0013	0.0093	-0.0024	0.0075
12 FURNIT	-0.0039	-0.0023	0.0068	0.0002	-0.0019	0.0009	0.0066	-0.0017	0.0054
13 PAPER	-0.0187	0.0059	0.0311	-0.0040	0.0164	0.0216	0.0252	-0.0156	0.0259
14 PRINTING	-0.0191	0.0060	0.0318	-0.0041	0.0168	0.0221	0.0257	-0.0160	0.0265
15 CHEMICAL	0.0276	-0.0487	0.1385	-0.0072	-0.0738	0.0963	0.0854	0.0060	-0.0466
16 RUBBER	0.0021	-0.0037	0.0105	-0.0005	-0.0056	0.0073	0.0065	0.0005	-0.0035
17 PLASTIC	0.0028	-0.0049	0.0139	-0.0007	-0.0074	0.0097	0.0086	0.0006	-0.0047
18 NONMETMIN	0.0014	-0.0025	-0.0013	-0.0038	0.0061	0.0045	-0.0039	0.0037	0.0077
19 BASIC_METAL	0.0751	0.0721	0.0623	-0.0670	-0.0293	0.0687	0.0799	0.0178	0.0823
20 FABRIC_METAL	0.0115	-0.0368	0.0260	-0.0166	0.0218	0.0287	0.0255	0.0074	0.0344
21 MACHINERY	0.0122	-0.0389	0.0275	-0.0177	0.0230	0.0303	0.0269	0.0079	0.0363
22 ELEC_MACHIN	0.0030	-0.0096	0.0068	-0.0043	0.0057	0.0075	0.0066	0.0019	0.0090
23 TRANSP_EQP	0.0153	-0.0490	0.0349	-0.0224	0.0290	0.0381	0.0338	0.0099	0.0457
24 OTH_MANUF	0.0057	-0.0332	0.0180	-0.0079	0.0184	0.0198	0.0176	-0.0007	0.0190
25 ELECTRICTY	0.0158	0.0245	-0.0014	0.0080	-0.1459	0.0144	0.0337	0.0212	0.0026
26 CONSTRUCT	0.0416	0.0164	-0.0384	-0.0056	-0.0407	0.0347	-0.0319	0.0069	0.0053
27 CIVIL_ENG	0.0126	0.0063	-0.0130	-0.0013	-0.0210	-0.0030	-0.0153	0.0110	0.0029
28 TRADE	0.0627	-0.0224	0.1598	-0.1205	0.0298	0.4660	0.1489	0.0351	0.1675
29 ACCOM	-0.0131	-0.0024	0.0123	-0.0004	0.0083	0.0224	0.0114	-0.0115	0.0222
30 TRANSPORT	0.0334	-0.0407	-0.0697	-0.0402	0.1136	0.2759	0.1981	-0.1243	0.1050
31 COMMUN	-0.0252	-0.0195	-0.0430	-0.0092	0.0475	0.0350	0.0210	0.0101	0.0148
32 FINANCE	0.0175	0.0552	0.0806	-0.1142	0.0906	0.1952	0.0933	0.0842	0.1007
33 COMMUN_SERV	0.0132	0.0215	0.1035	-0.0226	-0.0846	0.1562	0.0742	-0.0403	0.0956
34 GOV_INDS	0.3181	0.3431	0.1727	-0.3140	-0.4632	1.7958	-0.3701	0.4715	0.0035
35 SERVANTS	-0.0174	-0.0076	-0.0492	-0.0034	0.0242	0.0401	0.0133	0.0203	-0.0029
36 N_CLASS	0.0038	-0.0029	0.0035	-0.0014	0.0040	0.0053	0.0006	-0.0013	-0.0023
All Sectors	0.1157	-0.1285	0.1864	-0.6614	-0.6782	3.1036	1.7148	0.0353	2.3031

Table R7.4

Sectoral contributions to deviations of provincial from national growth rates in simulation A.4

Sector	PROVINCE								
	WCape	ECape	NCape	PWV	ETVL	NTVL	NWTVL	KwaZN	OFS
1 AGRIC	-0.0185	-0.0143	-0.1778	0.0544	-0.0506	-0.0547	-0.0982	0.0119	-0.0552
2 GOLD	0.1154	0.1154	0.1154	0.0055	0.0338	0.0802	-0.4151	0.1154	-0.5014
3 OTH_MINING	0.0588	0.0676	-0.2888	0.0506	-0.1801	-0.1619	-0.2146	0.0355	0.0246
4 FOOD	-0.0191	-0.0030	0.0231	0.0036	0.0151	0.0143	0.0156	-0.0160	0.0122
5 BEVRG	-0.0143	-0.0022	0.0173	0.0027	0.0113	0.0107	0.0117	-0.0119	0.0091
6 TOBAC	-0.0013	-0.0002	0.0016	0.0002	0.0010	0.0010	0.0011	-0.0011	0.0008
7 TEXTILE	-0.0142	-0.0040	0.0072	0.0063	0.0088	0.0080	0.0115	-0.0183	0.0057
8 CLOTHING	-0.0151	-0.0043	0.0077	0.0067	0.0093	0.0085	0.0122	-0.0195	0.0061
9 LEATHER	-0.0020	-0.0006	0.0010	0.0009	0.0012	0.0011	0.0016	-0.0026	0.0008
10 FOOTWEAR	-0.0054	-0.0015	0.0027	0.0024	0.0033	0.0030	0.0043	-0.0069	0.0022
11 WOOD	-0.0005	-0.0003	0.0008	0.0000	-0.0002	0.0001	0.0008	-0.0002	0.0007
12 FURNIT	-0.0017	-0.0010	0.0029	0.0001	-0.0008	0.0004	0.0029	-0.0008	0.0023
13 PAPER	-0.0149	0.0047	0.0247	-0.0031	0.0131	0.0172	0.0200	-0.0124	0.0206
14 PRINTING	-0.0090	0.0028	0.0149	-0.0019	0.0079	0.0104	0.0120	-0.0075	0.0124
15 CHEMICAL	0.0114	-0.0201	0.0572	-0.0030	-0.0305	0.0397	0.0353	0.0025	-0.0192
16 RUBBER	0.0008	-0.0014	0.0040	-0.0002	-0.0021	0.0028	0.0025	0.0002	-0.0013
17 PLASTIC	0.0016	-0.0028	0.0081	-0.0004	-0.0043	0.0056	0.0050	0.0004	-0.0027
18 NONMETMIN	-0.0002	0.0003	0.0001	0.0004	-0.0007	-0.0005	0.0005	-0.0004	-0.0009
19 BASIC_METAL	0.0207	0.0199	0.0172	-0.0185	-0.0081	0.0189	0.0220	0.0049	0.0227
20 FABRIC_METAL	0.0009	-0.0028	0.0020	-0.0013	0.0017	0.0022	0.0019	0.0006	0.0026
21 MACHINERY	0.0006	-0.0019	0.0014	-0.0009	0.0012	0.0015	0.0013	0.0004	0.0018
22 ELEC_MACHIN	-0.0019	0.0060	-0.0042	0.0027	-0.0035	-0.0046	-0.0041	-0.0012	-0.0056
23 TRANSP_EQP	0.0106	-0.0339	0.0240	-0.0153	0.0200	0.0264	0.0234	0.0069	0.0316
24 OTH_MANUF	0.0004	-0.0024	0.0013	-0.0006	0.0013	0.0014	0.0013	-0.0001	0.0014
25 ELECTRCTY	0.0225	0.0371	-0.0141	0.0133	-0.2063	0.0125	0.0446	0.0302	0.0000
26 CONSTRUCT	0.0149	0.0170	-0.0010	-0.0121	0.0045	0.0500	-0.0235	0.0123	-0.0116
27 CIVIL_ENG	0.0060	0.0085	0.0047	-0.0059	0.0002	0.0092	-0.0120	0.0109	-0.0057
28 TRADE	0.0314	0.0565	0.0841	-0.0587	0.0229	0.2355	-0.0156	0.0495	-0.0012
29 ACCOM	-0.0021	0.0014	0.0041	-0.0011	0.0000	0.0101	-0.0003	-0.0011	0.0057
30 TRANSPORT	0.0188	0.0215	-0.0264	-0.0170	-0.0004	0.0923	0.0213	-0.0027	-0.0005
31 COMMUN	-0.0112	-0.0086	-0.0190	-0.0041	0.0210	0.0155	0.0093	0.0045	0.0066
32 FINANCE	0.0055	0.0672	0.0828	-0.0852	0.0732	0.1449	0.0617	0.0588	0.0584
33 COMMUN_SERV	0.0107	0.0271	0.0621	-0.0132	-0.0652	0.0928	0.0190	-0.0101	0.0401
34 GOV_INDS	0.2579	0.2783	0.1400	-0.2546	-0.3756	1.4563	-0.3002	0.3824	0.0028
35 SERVANTS	-0.0001	0.0082	-0.0138	-0.0039	0.0005	0.0426	-0.0132	0.0132	-0.0145
36 N_CLASS	0.0025	-0.0020	0.0024	-0.0009	0.0027	0.0036	0.0004	-0.0008	-0.0015
All Sectors	0.4601	0.6320	0.1699	-0.3521	-0.6748	2.1970	-0.7536	0.6267	-0.3502

Table R7.5

Sectoral contributions to deviations of provincial from national growth rates in simulation A.5

Sector	PROVINCE								
	WCape	ECape	NCape	PWV	ETVL	NTVL	NWTVL	KwaZN	OFS
1 AGRIC	-0.0189	-0.0146	-0.1812	0.0554	-0.0516	-0.0557	-0.1001	0.0121	-0.0563
2 GOLD	-0.2550	-0.2550	-0.2550	-0.0123	-0.0746	-0.1773	0.9173	-0.2550	1.1081
3 OTH_MINING	0.0471	0.0523	-0.1594	0.0414	-0.2005	-0.0968	-0.1140	0.0194	0.0186
4 FOOD	-0.0289	-0.0045	0.0350	0.0054	0.0228	0.0217	0.0236	-0.0241	0.0184
5 BEVRG	-0.0148	-0.0023	0.0178	0.0028	0.0116	0.0110	0.0120	-0.0123	0.0094
6 TOBAC	-0.0013	-0.0002	0.0016	0.0002	0.0010	0.0010	0.0011	-0.0011	0.0008
7 TEXTILE	-0.0483	-0.0137	0.0245	0.0214	0.0297	0.0270	0.0389	-0.0621	0.0194
8 CLOTHING	-0.0261	-0.0074	0.0133	0.0116	0.0161	0.0146	0.0211	-0.0336	0.0105
9 LEATHER	-0.0041	-0.0012	0.0021	0.0018	0.0026	0.0023	0.0033	-0.0053	0.0017
10 FOOTWEAR	-0.0081	-0.0023	0.0041	0.0036	0.0050	0.0045	0.0065	-0.0104	0.0032
11 WOOD	-0.0042	-0.0025	0.0074	0.0003	-0.0021	0.0010	0.0072	-0.0019	0.0058
12 FURNIT	-0.0026	-0.0016	0.0045	0.0002	-0.0013	0.0006	0.0044	-0.0012	0.0036
13 PAPER	-0.0178	0.0056	0.0296	-0.0038	0.0156	0.0206	0.0239	-0.0149	0.0247
14 PRINTING	-0.0146	0.0046	0.0243	-0.0031	0.0129	0.0169	0.0197	-0.0122	0.0203
15 CHEMICAL	0.0227	-0.0402	0.1141	-0.0060	-0.0608	0.0793	0.0704	0.0050	-0.0384
16 RUBBER	0.0019	-0.0033	0.0095	-0.0005	-0.0051	0.0066	0.0059	0.0004	-0.0032
17 PLASTIC	0.0023	-0.0041	0.0116	-0.0006	-0.0062	0.0081	0.0072	0.0005	-0.0039
18 NONMETMIN	0.0011	-0.0020	-0.0010	-0.0030	0.0048	0.0035	-0.0031	0.0029	0.0060
19 BASIC_METAL	0.0624	0.0600	0.0518	-0.0558	-0.0244	0.0571	0.0664	0.0148	0.0685
20 FABRIC_METAL	0.0098	-0.0312	0.0220	-0.0141	0.0185	0.0243	0.0216	0.0063	0.0291
21 MACHINERY	0.0098	-0.0314	0.0222	-0.0143	0.0186	0.0244	0.0217	0.0063	0.0293
22 ELEC_MACHIN	0.0026	-0.0082	0.0058	-0.0037	0.0049	0.0064	0.0057	0.0017	0.0077
23 TRANSP_EQP	0.0151	-0.0483	0.0345	-0.0221	0.0286	0.0376	0.0334	0.0098	0.0451
24 OTH_MANUF	0.0050	-0.0293	0.0159	-0.0070	0.0163	0.0175	0.0155	-0.0006	0.0168
25 ELECTRICTY	0.0254	0.0411	-0.0114	0.0145	-0.2353	0.0166	0.0536	0.0337	0.0023
26 CONSTRUCT	0.0313	0.0197	-0.0243	-0.0104	-0.0252	0.0444	-0.0227	0.0082	0.0082
27 CIVIL_ENG	0.0099	0.0084	-0.0056	-0.0041	-0.0146	0.0021	-0.0106	0.0109	0.0043
28 TRADE	0.0527	-0.0026	0.1551	-0.1093	0.0267	0.4219	0.1230	0.0372	0.1397
29 ACCOM	-0.0107	-0.0012	0.0108	-0.0007	0.0060	0.0202	0.0090	-0.0090	0.0186
30 TRANSPORT	0.0326	-0.0196	-0.0591	-0.0338	0.0672	0.2262	0.1462	-0.0888	0.0829
31 COMMUN	-0.0167	-0.0129	-0.0284	-0.0061	0.0314	0.0232	0.0139	0.0066	0.0098
32 FINANCE	0.0092	0.0669	0.0963	-0.1179	0.1008	0.2011	0.1013	0.0816	0.1037
33 COMMUN_SERV	0.0135	0.0239	0.0917	-0.0217	-0.0831	0.1524	0.0611	-0.0302	0.0810
34 GOV_INDS	0.3035	0.3274	0.1647	-0.2996	-0.4419	1.7135	-0.3532	0.4499	0.0033
35 SERVANTS	-0.0080	-0.0010	-0.0257	-0.0065	0.0089	0.0567	0.0070	0.0155	0.0003
36 N_CLASS	0.0035	-0.0027	0.0033	-0.0013	0.0037	0.0049	0.0005	-0.0012	-0.0021
All Sectors	0.1814	0.0663	0.2225	-0.5987	-0.7732	2.9394	1.2389	0.1591	1.7971

Table R7.6

Sectoral contributions to deviations of provincial from national growth rates in simulation A.6

Sector	WCape	ECape	NCape	PWV	PROVINCE			KwaZN	OFS
					ETVL	NTVL	NWTVL		
1 AGRIC	-0.0137	-0.0106	-0.1313	0.0401	-0.0374	-0.0404	-0.0725	0.0088	-0.0408
2 GOLD	0.0081	0.0081	0.0081	0.0004	0.0024	0.0056	-0.0292	0.0081	-0.0353
3 OTH_MINING	0.0521	0.0593	-0.2349	0.0450	-0.1756	-0.1339	-0.1732	0.0288	0.0214
4 FOOD	-0.0123	-0.0019	0.0148	0.0023	0.0097	0.0092	0.0100	-0.0102	0.0078
5 BEVRG	-0.0028	-0.0004	0.0034	0.0005	0.0022	0.0021	0.0023	-0.0023	0.0018
6 TOBAC	-0.0003	0.0000	0.0004	0.0001	0.0002	0.0002	0.0003	-0.0003	0.0002
7 TEXTILE	-0.0178	-0.0050	0.0090	0.0079	0.0109	0.0099	0.0143	-0.0228	0.0071
8 CLOTHING	-0.0056	-0.0016	0.0028	0.0025	0.0034	0.0031	0.0045	-0.0072	0.0022
9 LEATHER	-0.0006	-0.0002	0.0003	0.0003	0.0004	0.0003	0.0005	-0.0007	0.0002
10 FOOTWEAR	-0.0039	-0.0011	0.0020	0.0017	0.0024	0.0022	0.0031	-0.0050	0.0016
11 WOOD	-0.0064	-0.0039	0.0112	0.0004	-0.0032	0.0015	0.0110	-0.0029	0.0089
12 FURNIT	-0.0006	-0.0004	0.0011	0.0000	-0.0003	0.0001	0.0010	-0.0003	0.0008
13 PAPER	-0.0125	0.0039	0.0207	-0.0026	0.0110	0.0144	0.0168	-0.0104	0.0173
14 PRINTING	-0.0008	0.0002	0.0013	-0.0002	0.0007	0.0009	0.0011	-0.0007	0.0011
15 CHEMICAL	0.0103	-0.0181	0.0514	-0.0027	-0.0274	0.0358	0.0317	0.0022	-0.0173
16 RUBBER	0.0017	-0.0031	0.0088	-0.0005	-0.0047	0.0061	0.0054	0.0004	-0.0029
17 PLASTIC	0.0026	-0.0046	0.0132	-0.0007	-0.0070	0.0092	0.0081	0.0006	-0.0044
18 NONMETMIN	0.0079	-0.0143	-0.0072	-0.0217	0.0350	0.0258	-0.0226	0.0210	0.0441
19 BASIC_METAL	0.0613	0.0589	0.0509	-0.0548	-0.0240	0.0561	0.0652	0.0145	0.0672
20 FABRIC_METAL	0.0205	-0.0655	0.0463	-0.0296	0.0388	0.0510	0.0453	0.0132	0.0611
21 MACHINERY	0.0179	-0.0572	0.0403	-0.0259	0.0338	0.0445	0.0395	0.0115	0.0533
22 ELEC_MACHIN	0.0129	-0.0411	0.0290	-0.0185	0.0243	0.0320	0.0284	0.0083	0.0383
23 TRANSP_EQP	0.0124	-0.0395	0.0280	-0.0179	0.0234	0.0307	0.0273	0.0080	0.0368
24 OTH_MANUF	0.0021	-0.0125	0.0068	-0.0030	0.0070	0.0075	0.0066	-0.0003	0.0072
25 ELECTRCTY	0.0143	0.0218	-0.0025	0.0067	-0.1271	0.0120	0.0268	0.0204	0.0010
26 CONSTRUCT	-0.0625	0.0163	0.0495	-0.0183	0.0139	0.0568	-0.0089	0.0476	0.0189
27 CIVIL_ENG	0.0025	0.0224	-0.0148	-0.0155	-0.0073	0.0674	-0.0118	0.0155	0.0084
28 TRADE	0.0677	0.0186	0.0939	-0.1155	0.0083	0.3891	-0.0081	0.1187	0.0827
29 ACCOM	-0.0007	0.0001	0.0037	-0.0032	0.0007	0.0169	0.0002	0.0021	0.0057
30 TRANSPORT	0.0332	0.0058	-0.0303	-0.0347	-0.0028	0.1258	0.0256	0.0199	0.0340
31 COMMUN	-0.0072	-0.0055	-0.0122	-0.0026	0.0135	0.0100	0.0060	0.0029	0.0042
32 FINANCE	0.0357	0.0452	0.0641	-0.0945	0.0555	0.1386	0.0460	0.0875	0.0639
33 COMMUN_SERV	0.0246	0.0079	0.0011	-0.0353	-0.0356	0.2072	-0.0184	0.0526	-0.0001
34 GOV_IND	0.2749	0.2965	0.1492	-0.2713	-0.4002	1.5518	-0.3198	0.4074	0.0030
35 SERVANTS	0.0142	0.0059	0.0181	-0.0163	-0.0138	0.0942	-0.0113	0.0131	0.0076
36 N_CLASS	0.0036	-0.0028	0.0034	-0.0013	0.0038	0.0050	0.0005	-0.0012	-0.0022
All Sectors	0.5330	0.2816	0.2997	-0.6786	-0.5652	2.8490	-0.2483	0.8488	0.5052

Table R7.7

Sectoral contributions to deviations of provincial from national growth rates in simulation A.7

Sector	PROVINCE									
	WCape	ECape	NCape	PWV	ETVL	NTVL	NWTVL	KwaZN	OFS	
1	AGRIC	-0.0196	-0.0151	-0.1885	0.0576	-0.0537	-0.0580	-0.1041	0.0126	-0.0585
2	GOLD	-0.0602	-0.0602	-0.0602	-0.0029	-0.0176	-0.0418	0.2166	-0.0602	0.2616
3	OTH_MINING	0.0717	0.0815	-0.3154	0.0621	-0.2480	-0.1806	-0.2321	0.0387	0.0294
4	FOOD	-0.0259	-0.0041	0.0313	0.0049	0.0204	0.0194	0.0212	-0.0216	0.0165
5	BEVRG	-0.0054	-0.0009	0.0066	0.0010	0.0043	0.0041	0.0044	-0.0045	0.0035
6	TOBAC	-0.0006	-0.0001	0.0007	0.0001	0.0005	0.0004	0.0005	-0.0005	0.0004
7	TEXTILE	-0.0352	-0.0100	0.0179	0.0156	0.0217	0.0197	0.0284	-0.0453	0.0141
8	CLOTHING	-0.0122	-0.0035	0.0062	0.0054	0.0075	0.0069	0.0099	-0.0157	0.0049
9	LEATHER	-0.0017	-0.0005	0.0008	0.0007	0.0010	0.0009	0.0013	-0.0021	0.0007
10	FOOTWEAR	-0.0068	-0.0019	0.0035	0.0030	0.0042	0.0038	0.0055	-0.0088	0.0027
11	WOOD	-0.0013	-0.0008	0.0023	0.0001	-0.0006	0.0003	0.0022	-0.0006	0.0018
12	FURNIT	-0.0007	-0.0004	0.0012	0.0000	-0.0004	0.0002	0.0012	-0.0003	0.0010
13	PAPER	-0.0184	0.0058	0.0306	-0.0039	0.0162	0.0213	0.0248	-0.0154	0.0255
14	PRINTING	-0.0012	0.0004	0.0019	-0.0002	0.0010	0.0013	0.0015	-0.0010	0.0016
15	CHEMICAL	0.0132	-0.0232	0.0660	-0.0034	-0.0351	0.0459	0.0407	0.0029	-0.0222
16	RUBBER	0.0012	-0.0021	0.0060	-0.0003	-0.0032	0.0042	0.0037	0.0003	-0.0020
17	PLASTIC	0.0005	-0.0009	0.0025	-0.0001	-0.0013	0.0017	0.0015	0.0001	-0.0008
18	NONMETMIN	-0.0020	0.0036	0.0018	0.0055	-0.0088	-0.0065	0.0057	-0.0053	-0.0111
19	BASIC_METAL	0.0589	0.0566	0.0489	-0.0526	-0.0230	0.0539	0.0627	0.0140	0.0646
20	FABRIC_METAL	0.0026	-0.0082	0.0058	-0.0037	0.0048	0.0064	0.0056	0.0016	0.0076
21	MACHINERY	0.0042	-0.0133	0.0094	-0.0061	0.0079	0.0104	0.0092	0.0027	0.0124
22	ELEC_MACHIN	-0.0014	0.0046	-0.0032	0.0021	-0.0027	-0.0036	-0.0032	-0.0009	-0.0043
23	TRANSP_EQP	0.0173	-0.0553	0.0392	-0.0252	0.0327	0.0431	0.0382	0.0112	0.0516
24	OTH_MANUF	0.0043	-0.0249	0.0135	-0.0059	0.0139	0.0149	0.0132	-0.0005	0.0143
25	ELECTRCTY	0.0136	0.0211	-0.0072	0.0078	-0.1215	0.0082	0.0255	0.0177	0.0001
26	CONSTRUCT	0.0875	0.0496	-0.0596	-0.0260	-0.0077	0.1024	-0.1089	0.0275	-0.0422
27	CIVIL_ENG	0.0215	0.0155	-0.0092	-0.0082	0.0033	-0.0060	-0.0504	0.0265	-0.0186
28	TRADE	0.0799	0.0060	0.0265	-0.0600	-0.0027	0.2380	-0.0269	0.0342	0.0366
29	ACCOM	-0.0080	-0.0007	0.0050	0.0004	0.0057	0.0125	0.0037	-0.0072	0.0124
30	TRANSPORT	0.0459	0.0003	-0.1274	-0.0107	0.0172	0.1382	0.0739	-0.0708	0.0440
31	COMMUN	-0.0067	-0.0051	-0.0113	-0.0024	0.0125	0.0092	0.0055	0.0027	0.0039
32	FINANCE	0.0063	0.0562	0.0678	-0.0865	0.0906	0.1436	0.0683	0.0546	0.0667
33	COMMUN_SERV	0.0218	0.0119	-0.0082	-0.0144	-0.0275	0.1123	-0.0180	0.0168	-0.0065
34	GOV_INDS	0.1375	0.1483	0.0746	-0.1357	-0.2002	0.7762	-0.1600	0.2038	0.0015
35	SERVANTS	0.0144	0.0082	0.0019	-0.0077	-0.0129	0.0559	-0.0127	0.0026	-0.0004
36	N_CLASS	0.0020	-0.0016	0.0019	-0.0007	0.0021	0.0028	0.0003	-0.0007	-0.0012
	All Sectors	0.3967	0.2368	-0.3163	-0.2905	-0.4994	1.5615	-0.0409	0.2090	0.5118