CHAPTER 10

SHORT-RUN POLICY SIMULATION RESULTS

10.1   INTRODUCTION

This chapter reports and explains the results of the short-run policy simulations. Each policy simulation affects numerous macro- and micro economic variables. The idea of this report is not to indicate how each one of these variables has changed, but to report and explain changes in certain macroeconomic and industry specific variables that would be of interest to both policy makers and economic agents who have interest in policies. These variables include macroeconomic aggregates such as gross domestic product, consumption, exports, employment and prices of certain inputs. Apart from this, the effect of each policy simulation on selected industries is also reported.

The results of the short-run simulations 1, 2 and 3 are reported in sections 10.2, 10.3 and 10.4 respectively. Section 10.5 contains a brief comparison of the macroeconomic results from each policy simulation.

10.2   A FIFTY PERCENT TAX ON COAL (SIMULATION 1)

10.2.1   Macroeconomic results

Before examining the simulation results from the first policy proposal, it would be informative to obtain a prior expectation of the macroeconomic effects of the coal tax proposal. A stylised model proposed by Adams (2003) is used for this purpose. The stylised model represents a single-country and allows for exogenous changes in the positions of foreign demand schedules for exports and foreign supply schedules for imports and also allows changes in the global rate of return on capital. This model is representative of a model such as ORANI (Adams, 2003). The complete model is summarised in Appendix Three and reference is made to the relevant equations from the stylised model to form an expectation prior to the simulation results.

Equation (16) of the stylised model indicates that the increase in the indirect tax on coal should increase the cost of skilled and informal sector labour (variable factors of production) if the terms of trade remains unchanged or decreases. This result also follows from the assumption that real wages are fixed in the short run. Simulation results indicate that the terms of trade effect is indeed

negative (the terms of trade decreases). It is therefore clear from equation (16) that the price of the variable factor of production will increase as a result of the tax proposal.

$$RP_V \uparrow = F_{RPV}(\overline{RW},(\frac{1}{TOT \downarrow}),(1+T \uparrow)) \tag{16}$$

Equation (15), which relates the price of the variable factors of production to that of the fixed factors (capital, land, highly skilled and skilled labour), indicates that the increase in the price of the variable factors should result in a decrease in the price of the fixed factors.

$$RP_V^{S_V} \uparrow = RP_F^{-S_F} \downarrow \tag{15}$$

The increase in the price ratio between the price of the variable factor of production and that of the fixed factor of production implies that the quantity of the variable factor that is employed will decrease. This is indicated by equation (14) which relates the relative factor inputs to relative factor prices.

$$\frac{\overline{F}}{V \downarrow} = \frac{RP_V \uparrow}{RP_F \downarrow} \tag{14}$$

As indicated by equation (2), the decrease in the use of variable factors of production will result in a decrease in gross domestic product (GDP) at factor costs.

$$Y^{FC} \downarrow = F_Y(V \downarrow, \overline{F}) \tag{2}$$

Our simulation results indicate that the increase in the quantity of GDP on which indirect taxes are applied is less than the fall in the gross domestic product at market prices, and a fall in GDP at market prices is observed.

$$Y^{MP} \downarrow = Y^{FC} \downarrow + Y^{TAX} \tag{3}$$

The effect of the fall in GDP at market prices on the demand side aggregates is, once again, a function of the closure assumptions and the terms of trade. As mentioned above, the policy simulation results in a fall in the terms of trade. Because the nominal exchange rate is fixed (by assumption), the fall in the terms of trade will result in an increase in the trade balance. The fall in

gross domestic product at market prices and the increase in the trade balance implies then that consumption should decrease.

$$Y^{MP} \downarrow = C \downarrow + \bar{I} + \bar{G} + (X - M) \uparrow \qquad (1)$$

The prior expectations are confirmed by the simulation results. Table 10.1 reflects the actual results from the CGE simulation. As expected, gross domestic product, consumption and employment decrease. Because highly skilled and skilled labour are fixed by assumption, the decrease in employment represents a decrease in the use of unskilled and informal sector labour in the production process. The prices of capital, land, highly skilled and skilled labour fall. As mentioned above, the terms of trade decreases, which is the result of a fall in the price of exports. The fall in the terms of trade results in an increase in exports. The increase in exports allows the trade balance to increase.

Table 10.1:   The estimated macroeconomic effects of imposing a 50 percent tax on the intermediate use of coal (percentage changes)

| Real GDP	-0.099
Employment	-0.028
Consumption	-0.632
Exports	0.388
Imports	0.144
Terms of trade	-0.265
Price of exports	-0.265
Price of capital	-2.029
Price of highly skilled labour	-2.299
Price of skilled labour	-2.162

10.2.2   The terms of trade

It is evident from the macroeconomic results that the fall in the terms of trade holds significant (positive) consequences for South Africa's exports and therefore also for the country's competitiveness. If anything, the result seems somewhat counter-intuitive for a tax policy

simulation, as one would expect the intermediate tax hike to increase export prices, which should have a negative effect on South Africa's competitiveness.

Analysis of the change in the terms of trade indicates that the fall in export prices can be contributed to two important factors. The first is the fact that the tax on coal is not directly raised on the export product, but on the intermediate use of coal. Although the intermediate tax could raise the export price, its inflationary effect on export prices is less severe than it would be if the tax were directly levied on exports. The second is that the significant fall in the price of the fixed factors of production offsets the inflationary effect of the tax increase. It seems as if South Africa's biggest export products are intensive in the use of unskilled labour and in the use of land. These industries represent mostly the primary sector of South Africa's production and include the gold mining, other mining and agricultural sectors. The significant decrease in the price of land therefore reduces the export prices of these products. Although the bulk of South Africa's exports are from the primary sector (about 30 percent), the database indicates that another sector that contributes significantly towards the exports is the services sector. The services sector makes relatively intensive use of capital and skilled-labour in the production process and the fall in the prices of these fixed factors of production results in a decrease in the export prices of these goods and services. Figure 10.1 illustrates the relative changes in the exports of a select number of industries that experience a significant increase in their exports.

Figure 10.1: The increase in the exports of a select number of industries
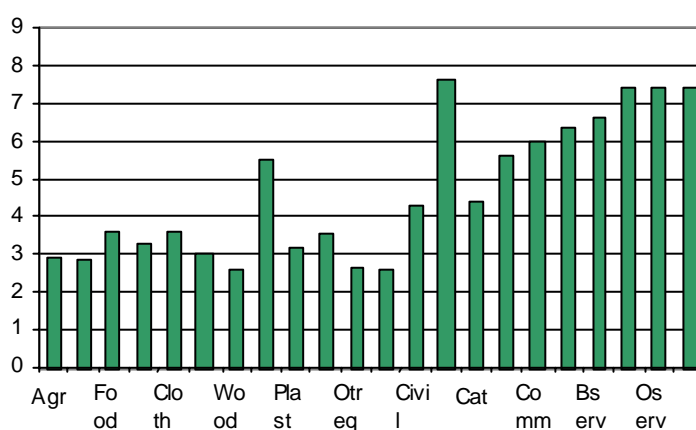
10.2.3   Consumption

Despite the positive effect that the tax has on the competitiveness of the South African economy, it has a negative effect on aggregate consumption in South Africa. If consumption is taken as a proxy for welfare, the decrease in consumption implies that welfare in South Africa decreases as a result of the tax.

Apart from the fall in aggregate consumption, further analysis of individual household consumption indicates that the tax on coal has a negative effect on the redistribution of welfare in the South African economy. The simulation results indicate that the consumption of households in the lowest income groups would decrease more than that of the households in the higher income groups. The fall in household consumption is a result of the fall in household income, which is a result of the fall in labour income. Labour income decreases because of a decrease in the wages of highly skilled and skilled labour and a decrease in the level of employment of unskilled and informal sector labourers. However, because high-income households consume more capital-intensive products, these households experience a significant decrease in their consumer price baskets (once-again because of the fall in the prices of the fixed factors of production). In fact, the fall in consumer prices of households in the highest income group is enough to offset the decrease in nominal income. Households in the highest income group therefore experience an increase in real consumption. On the other hand, the consumer basket of the lower income households consists mostly of labour (unskilled) intensive products. As a result these households do not experience the same fall in their consumer price baskets, and their real consumption declines. Table 10.2 summarises the change in the real consumption of individual households and their consumer price baskets, while Figure 10.2 compares the consumer baskets of the households in the lowest income group with the households in the highest income group. It is evident from Figure 10.2 that a far greater portion of the expenditure of high-income households is on capital-intensive products, such as financial services.

Table 10.2: **Changes in real consumption and consumer price baskets of household groups**

Income group	Decrease in consumption	Decrease in consumer price basket
D0	1.22	0.57
D1	1.14	0.65
D2	1.05	0.73
D3	0.99	0.79
D4	0.94	0.84
D5	0.92	0.87
D6	0.88	0.91
D7	0.88	0.91
D8	0.87	0.91
D91	0.85	0.94
D921	0.83	0.96
D922	0.80	0.98
D923	0.81	0.98
D924	0.74	1.05

Figure 10.2: **A comparison of the lowest and highest income group expenditures**
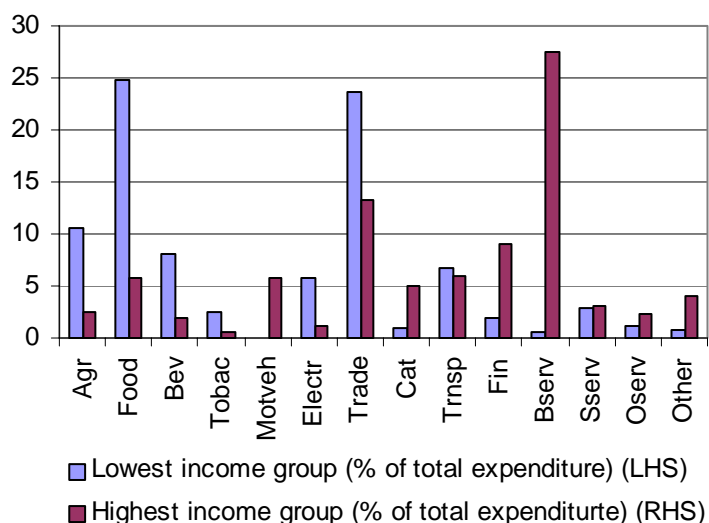
10.2.4   The effect on the demand for coal

The effect that the tax has on the demand for coal appears to be relatively small. The domestic demand for coal falls by only 1.39 percent. The decrease is mainly the result of a fall in domestic demand for coke and refined petroleum products, basic iron and steel products, and electricity. Due to the fact that the structure of the South African economy does not provide any other source of energy for these industries, the tax increase is passed on to the final user. The higher prices for end users result in a decrease in the demand for these products and subsequently in a decrease in the domestic demand for coal. However, because the elasticity of demand for these products is relatively low, the fall in the demand for coal intensive products is limited and the positive dividend that arises from the tax is small.

The simulation results, therefore, indicate that the tax policy does not improve the pollution problem significantly. The cost of the environmental benefit could, therefore, be high (in terms of the loss in employment and welfare).

10.2.5   Industry-specific results

Apart from the effect that the tax has on macroeconomic aggregates, it is evident from the simulation results that the coke and refined petroleum industry, the basic iron and steel industry and the electricity industry will suffer the most under the proposed tax, as these are the industries that rely most on coal as an input in the production process. The output of the coke and refined petroleum industry, the basic iron and steel industry and the electricity industry will decrease by 1.42 percent, 3.37 percent and 1.24 percent respectively. This decrease is a result of a fall in the intermediate-, household- and export demands for these products. Table 10.3 summarises the changes in respective demand categories in these industries.

Table 10.3   Change in intermediate-, household and export demand in selected industries

	Intermediate demand	Household demand	Export demand
Coke and refined petroleum	-0.07	-0.61	-0.73
Basic iron and steel	-0.12	0	-3.25
Electricity	-0.32	-0.85	-0.06

The macroeconomic results indicate that there is an increase in aggregate exports. The decrease in the prices of fixed factors of production is not enough, however, to offset the inflationary effect of the tax increase on the industries that make intensive use of coal in the production process. The export price of these industries therefore increases and, as a result, exports decline. The decline in the output of the said industries implies a fall in employment of unskilled and informal sector labour in these industries. The simulation results indicate that employment in the coke and refined petroleum industry declines by 5 percent, while employment in the basic iron and steel and electricity industries decline by 8.10 and 3.27 percent respectively.

The increase in exports implies that there should be industries that benefit from the proposed tax. These are the industries that make relatively little use of coal in the production process. The simulation results indicate that the machinery and equipment, and motor vehicle equipment industries would reap the most benefit from the tax proposal. The machinery industry increases its exports by 1.42 percent, while the exports of motor vehicle equipment increase by 2 percent.

10.3   A FIFTY PERCENT TAX ON COAL, AND A LUMP SUM TRANSFER TO LOW INCOME HOUSEHOLDS (SIMULATION 2)

10.3.1   Macroeconomic results

The result of Simulation 1 indicates that the tax on coal raises revenue of R 5.044 billion for the government in the form of indirect taxes. The second policy simulation evaluates the effect of a lump-sum transfer to households that are within the lowest three income groupings of the South African economy. The revenue for the transfer is obtained from the indirect tax revenue raised by the taxation of coal.

In this policy simulation the stylised model for the CGE (Appendix 3) indicates that the intermediate tax will increase the cost of the variable factor of production. However, analysis of the effect of the policy proposal on the terms of trade indicates that it increases. This increase in the terms of trade slightly offsets the effect of the tax increase in the stylised model. As a result the fall in employment and the decrease in GDP is slightly less than is the case of the previous policy simulation. With reference to the stylised model in Appendix 3, the result of the policy shock is once again that:

i.   The tax increases the cost of the variable factor of production.

ii.   The increase in the cost of the variable factor of production results in a decrease in the cost of the fixed factor of production.

iii.   The relative factor price movements result in a fall in the quantity of the variable factor that is employed.

iv.   The decrease in the employment of the variable factor of production results in a fall in GDP.

v.   The fall in GDP is reflected by a fall in exports (as a result of the positive terms of trade effect). The policy results indicate, however, that consumption increase as a result of the lump sum transfer to the households at the lower end of the income distribution.

Table 10.4 reports the effects of this policy simulation on selected macroeconomic variables.

Table 10.4:   The estimated macroeconomic effect of a 50 percent tax on coal and a lump-sum transfer to low-income households (percentage change)

Real GDP	-0.019
Employment	-0.020
Consumption	0.893
Exports	-1.868
Imports	-0.028
Terms of trade	0.472
Price of exports	0.472
Price of capital	-0.265
Price of land	-0.745
Price of highly skilled labour	-0.549

Price of skilled labour	-0.209

10.3.2   The terms of trade

The tax results in an increase in the price of intermediate goods, and, although there are economy-wide decreases in the prices of the fixed factors of production, these decreases are not enough to offset the intermediate price increases.   As a result the aggregate price of exports increases. Because the nominal exchange rate is fixed by assumption, the price of exports increases which results in a decrease in aggregate exports.

The fall in the prices of the fixed factors of production is less than the fall experienced in the benchmark simulation (Simulation 1) because the lump-sum transfer to lower income households results in an increase in the demand for products which are relatively capital, land and skilled labour intensive.   The increase in the demand for these factors supports the prices of the factors of production that are used in the industries that produce these products.

10.3.3   Consumption

The simulation results indicate that the policy proposal will result in an increase in aggregate consumption. This increase in consumption is the result of the lump-sum transfer to the lowest income households, which offsets the negative effects of a decrease in household income and an increase in consumer prices. Household income decreases as a result of a decrease in the real wages of highly skilled and skilled labour, and the decrease in employment of unskilled and informal sector labour. On the other hand, consumer prices increase because of the inflationary effect of the intermediate tax. It is therefore not surprising that households that do not receive the lump-sum transfer are negatively affected.   Table 10.5 summarises the effects of the policy proposal on household consumption and consumer prices.

Table 10.5:   Change in household consumption and consumer prices

Income group	Change in consumption	Change in the consumer price basket
D0	42.65	1.41
D1	30.05	1.29

D2	21.47	1.16
D3	-1.22	1.06
D4	-1.14	0.97
D5	-1.07	0.91
D6	-0.99	0.83
D7	-0.94	0.78
D8	-0.86	0.70
D91	-0.77	0.60
D921	-0.69	0.52
D922	-0.68	0.51
D923	-0.66	0.49
D924	-0.57	0.40

As mentioned above, the prices of goods and services that make intensive use of the fixed factors of production decrease relative to the prices of other goods and services. Because of this relative price change, the households that receive the lump-sum transfer direct their expenditure towards the relatively "cheaper" capital and land intensive goods. The simulation results indicate that the lowest income group will increase their consumption of televisions, motor vehicles, furniture and financial services significantly. Figure 10.3 reflects the change in consumption of goods and services for lowest income households.

Figure 10.3:   Change in consumption of selected goods and services for lowest income households
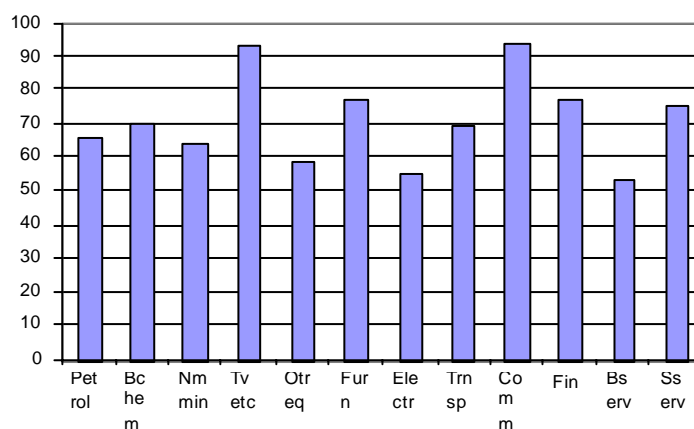
10.3.4   The effect on the demand for coal

For the same reasons as mentioned in the results for the benchmark simulation (Simulation 1), the demand for coal falls, but only by 1.31 percent. The decrease is a result of a fall in output of the industries that make relatively intensive use of coal in the production process, and not because of a more efficient production process. Once again the conclusion can be reached that the tax on coal will be more efficient if there is an improvement in technology or an alternative to the use of coal in the production process.

10.3.5   Industry-specific results

The taxation of coal has an inflationary effect on the final demand prices of those products that are relatively intensive in the use of coal. The output of the coke and refined petroleum industry, the basic iron and steel industry and the electricity industry are negatively affected. The outputs of these industries fall by 1.53, 5.05 and 0.17 percent respectively. The fall in the output of the electricity industry is cushioned by an increase in the demand for electricity by households that receive the lump-sum transfer. In spite of this, all three of these industries are negatively affected by a fall in their exports. Table 10.6 reflects the changes in the respective demand categories for these industries. The exports of the iron and steel industry are, once again, significantly affected.

Table 10.6   Change in intermediate-, household and export demand for selected industries (coal-intensive)

	Intermediate demand	Household demand	Export demand
Coke and refined petroleum	-0.10	-0.19	-1.24
Basic iron and steel	-0.76	0	-4.29
Electricity	-0.53	0.50	-0.14

As mentioned above, the lump-sum transfer to households results in an increase in household demand for certain products and, although the lowest income households increase their expenditure on products that are relatively intensive in the use of capital, land and skilled labour in the production process, overall household demand for agricultural, food and beverage products increases significantly. Table 10.7 reflects the changes in the demand for these products.

Table 10.7   Change in intermediate-, household and export demand for selected industries

	Intermediate demand	Household demand	Export demand
Agriculture	0.32	1.11	-0.83
Food	0.09	1.74	-0.67
Beverages	0.02	1.58	-1.24

10.4   A FIFTY PERCENT INCREASE IN THE TAX ON COAL, AND A DECREASE IN THE INTERMEDIATE TAXATION OF FOOD AND AGRICULTURAL PRODUCTS (SIMULATION 3)

10.4.1   Macroeconomic results

In the third policy simulation the revenue that is raised through the tax on coal is returned to the economy by reducing the intermediate tax rate on food and agricultural products. The revenue that is raised by the tax on coal allows for a 4 percent reduction in the intermediate tax rate of food and agricultural products. With reference to equation 16 of the stylised model (Appendix 3), the reduction in the intermediate tax on food and agricultural products implies that the change in intermediate tax collection should be close to zero and the change in the terms of trade seems to drive the macroeconomic results of this policy simulation. The simulation results indicate that the policy proposal has a positive terms of trade effect (the price of exports increase relative to the price of imports). With this in mind, the stylised model (Appendix 3) gives insight into the following macroeconomic changes:

i.   The change in real wages paid to the variable factor of production is zero by assumption while the net effect of this policy proposal is that the change in intermediate taxes should be zero. Equation (16) indicates that an increase in the terms of trade will result in a decrease in the price of the variable factor of production.

ii.   As indicated by equation (15), the decrease in the price of the variable factor of production results in an increase in the price of fixed factors of production.

iii.   Equation (14) indicates that the relative price changes of the factors of production will result in an increase in the use of the variable factor of production.

iv.   The increase in the use of the variable factor of production translates into an increase in gross domestic product as indicated by the production function (equation 2).

v.   The positive terms of trade effect results in a fall in the trade balance (decrease in exports). The increase in GDP implies that consumption will increase if the trade balance is decreasing.

The results that are reported in Table 10.8 confirm the prior expectations generated by the stylised model.

Table 10.8: The estimated macroeconomic effects of imposing a revenue-neutral tax on the South African economy (percentage change)

|	
Real GDP	0.02
Employment	0.06
Consumption	0.15
Exports	-0.39
Imports	-0.15
Terms of trade	0.10
Price of exports	0.10
Price of capital	-0.64
Price of land	0.24
Price of highly skilled labour	-0.94
Price of skilled labour	-0.53

It is interesting that the prices of all the fixed factors of production decrease, with the exception of the price of land. The increase in the price of land should be enough to offset the decreases in the prices of other fixed factors of production.   This results in a slight increase in the price of fixed factors of production.

10.4.2   The terms of trade

The terms of trade increases by 0.1 percent. This slight increase is the result of South Africa's export composition. The inflationary effect of the tax on coal is not completely offset by the decrease in the prices of food and agricultural products. The inflationary effect is also higher because the basic iron and steel industry contributes significantly towards South Africa's exports. The slight increase in the prices of fixed factors of production should also add to the price of

exports, despite of the decrease in the price of variable factors of production. The increase in the price of land contributes significantly to the increase in the price of exports. The reason for this is that exports of primary factor products contribute significantly towards South Africa's aggregate exports. Figure 10.4 reflects South Africa's export composition.

Figure 10.4:   Contribution towards South African exports (% of total exports)
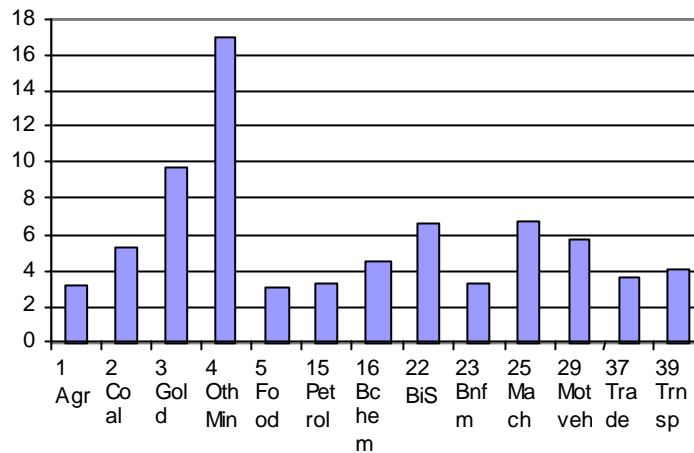
10.4.3   Consumption

The macroeconomic results indicate that aggregate consumption increases. An analysis of this increase shows that low-income households increase their consumption expenditure, while the consumption expenditure of high-income households actually falls. Household income decreases because of the fall in the wages of skilled and highly skilled labour, despite the small increase in the employment of unskilled labour. The differences in the changes of household consumption are attributed to differences in composition of household consumer baskets. As indicated in the previous chapter, households in the lower income brackets spend a far greater proportion of their income on food and agricultural products than higher income households. It was also shown that the high-income households spend a greater proportion of their budgets on products that are relatively capital, land and skilled-labour intensive. Given the decrease in the price of food and agricultural products, the households in the lower income groups experience a greater decrease in their consumer baskets than high-income households. In the case of low-income households, the decrease in consumer prices is enough to offset the fall in nominal income, which results in an increase in real consumption. Table 10.9 summarises the changes in household consumption and consumer prices as a result of the proposed policy.

Table 10.9   Change in household consumption and consumer prices

Income group	Change in consumption	Change in the consumer price basket
D0	1.04	-1.70
D1	1.02	-1.68
D2	0.97	-1.62
D3	0.89	-1.55
D4	0.74	-1.40
D5	0.60	-1.26
D6	0.43	-1.10
D7	0.26	-0.93
D8	0.03	-0.71
D91	-0.11	-0.55
D921	-0.22	-0.44
D922	-0.20	-0.46
D923	-0.19	-0.48
D924	-0.15	-0.51

It is interesting to note that low-income households will increase their expenditure on agricultural and food products by 2.3 percent and 2.6 percent respectively, while there is also an increase in expenditure on televisions and furniture. There is, however, a significant decrease in expenditure on coal (25 percent) and electricity (1.53 percent), which could have consequences for welfare that are not reflected by increased consumption expenditure.

10.4.4   The effect on the demand for coal

The effect on the demand for coal is, once again, small. The domestic demand for coal decreases by 1.43 percent. The reason for the small decrease is (as in the previous simulations) the lack of an alternative input in the production process. The decrease in the use of coal is therefore a result of a decrease in the output of the industries that make intensive use of coal in their production processes. Once again, it is the outputs of the coke and refined petroleum industries, the basic iron and steel industry and the electricity industry that decrease significantly.

10.4.5   Industry-specific results

There are clear "winners and losers" in this policy simulation, and it is not surprising that the industries that are closely linked to the agriculture and food industries are the "winners", while those industries that are linked to the coal industry are the "losers". The higher price of coal results in higher consumer and export prices of coal intensive industries, while lower food and agriculture prices result in lower consumer and export prices of the industries that are closely linked to the food and agricultural industry. As is the case in the other short-run simulations, the coke and refined petroleum, basic iron and steel and electricity industries are negatively affected by the policy proposal. The output of these industries decreases by 1.43 percent, 4.29 percent and 1.10 percent respectively. The industries that are positively affected by the policy simulation are the agricultural, food and leather industries. The output of these industries increases by 1.00 percent, 1.96 percent and 2.55 percent respectively. Table 10.10 reflects the changes in the selected demand components of these industries.

Table 10.10   Change in intermediate-, household and export demand in selected industries

	Intermediate demand	Household demand	Export demand
The "losers"			
Coke and refined petroleum	-0.02	-0.30	-1.10
Basic iron and steel	-0.46	0	-3.83
Electricity	-0.41	-0.59	-0.09
The "winners"			
Agriculture	0.62	0.69	-0.30
Food	0.27	1.44	0.24
Leather	0.59	0.13	1.81

Apart from changes in the demand components of these industries, it is also interesting to note the changes in employment in each of these industries. Table 10.11 summarises the change in employment of the different industries.

Table 10.11   Change in employment: policy "winners" and "losers"

	Percentage change	**Employment opportunities**
Coke and refined petroleum	-5.06	-723
Basic iron and steel	-10.23	-420
Electricity	-2.90	-2 256
Agriculture	2.96	23 525
Food	3.87	6 203
Leather	4.42	362
Total		**26 691**

Although there are positive changes in the levels of employment in some other industries, it is evident that the change in the levels of employment in the agricultural industry is significant and is the biggest contributor to the increase in the overall level of employment.

10.4.6   A comparison of the short-run simulation results

The discussion above indicates that the three different policy simulations have different consequences for the South African economy in the short run. The only similarity between the three simulations is the effect that each one has on the domestic demand for coal. The decrease in the domestic demand for coal is around 1.40 percent in each one of the simulations. A comparison of the respective macroeconomic results gives further insight into the policy proposal which should find favour with policy makers over the short run. Table 10.12 highlights the differences for the macroeconomic aggregates by comparing the results of the respective policy simulations.

Table 10.12:   A comparison of the short-run macroeconomic results

	Simulation 1	**Simulation 2**	**Simulation 3**
Real GDP	-0.099	-0.019	0.02
Employment	-0.028	-0.020	0.06
Consumption	-0.632	0.893	0.15
Exports	0.388	-1.868	-0.39
Imports	0.144	-0.028	-0.15
Terms of trade	-0.265	0.472	0.10

Price of exports	-0.265	0.472	0.10
Price of capital	-2.029	-0.265	-0.64
Price of land	-0.052	-0.745	0.24
Price of highly skilled labour	-2.299	-0.549	-0.94
Price of skilled labour	-2.162	-0.209	-0.53

From the above comparison it would appear that Simulation 3 holds the most favourable outcome for the South African economy over the short run. Simulation 3 is the only policy proposal that has a positive effect on both employment and economic growth. Apart from this, Simulation 3 has a positive effect on aggregate consumption, which should translate into a positive effect on aggregate welfare. Although the policy proposal that is tested in Simulation 2 has a positive effect on aggregate consumption, the increase in consumption is accompanied by a decrease in employment and economic growth. Both the second and third policy proposals result in losses in external competitiveness, which are the consequence of increased export prices.

It is also evident from Table 10.12 that a policy proposal in which the government increases its savings will have significant negative consequences for the economy. Economic growth will decrease, employment will fall and consumption will falter. The only positive effect of this policy is an increase in exports. This would, however, be the consequence of a significant fall in the price of the fixed factors of production, which would only sustain higher exports in the short run.

10.5   CONCLUSION

There are a few interesting results that are worth mentioning at the conclusion of this chapter. The first is that the results from all three policy simulations indicate that, over the short run, a tax on coal will decrease domestic demand for coal. This decrease should have a positive effect on the environment (a positive first dividend). Although the decrease in demand for coal is encouraging, it seems small in comparison to the magnitude of the measure taken to reduce the use of coal. Policy makers will have to ask themselves whether such drastic measures are worth the small gain for the environment. It is clear that the lack of an alternative energy input is the main reason for the small decline in the domestic use of coal. A tax on coal would therefore be relatively "sterile" if there is no technological development that could reduce the use of coal.

Apart from the small (but positive) effect that the tax on coal has on the South African economy, the simulation results have also indicated that the use of the revenue that is obtained from the tax holds important consequences for the economy. A policy that reduces the cost of agricultural products and food will have a small positive benefit on the economy in terms of an increase in aggregate consumption, economic growth and employment. Such a policy will also have positive benefits on the welfare distribution of the country because it decreases the prices of those products that low-income households purchase most.