9. Terms of Trade Shocks and Alternative Adjustment Policy Effects: Simulation Results

9.1 Introduction

In Chapter 8, the terms of trade shocks that affected the Kenyan economy during the period under study have been discussed using the Kenyan economy general equilibrium model developed in Chapter 6. Some of the government economic policies implemented during the period of the external shocks were then analysed to investigate how they affected the outcome of the terms of trade shocks. In this chapter, some additional experiments are described and the results from these experiments are discussed. The main objective in carrying out these experiments is to explain the effects of the external shocks on the Kenyan economy if the government pursued different policies from those previously discussed.

From Chapter 8, it is clear that the government pursued an expansionary fiscal policy as evidenced by higher government spending. In this chapter then, the alternative policies analysed are those dealing with adjustment through the exchange rate and a contractionary fiscal policy. Hence, the joint terms of trade simulation described in the previous chapter is still the reference simulation and is combined with the alternative economic policies being analysed. The individual simulation results of changes in particular domestic policy variables are reported. However, it is the results that combine each domestic policy variable change with the joint terms of trade shock (the reference simulation) that are at the centre of the discussion.

This chapter also addresses the question of the robustness of simulation results reported both in Chapter 8 and in this chapter. This is done through a sensitivity analysis of key parameters in the model. The sensitivity analysis involves re-running the reference joint terms of trade simulation for different values of some of the key parameters in KEGEM.

The chapter is organised as follows. Section 9.2 analyses the effects of adjustments through the exchange rate policy on the outcome of the terms of trade shocks. Two experiments are undertaken. In the first experiment, the shilling is revalued and in the second experiment, the shilling is devalued. Section 9.3 undertakes an analysis that

looks at what would have been the outcome of the external shocks had the government pursued an adjustment through contractionary fiscal policy. The fiscal adjustment is implemented through three different experiments which vary the rates of import tariffs, indirect taxes and level of government spending. Section 9.4 discusses sensitivity analysis results of key model parameters in an attempt to illustrate the robustness of the results of the reference joint terms of trade simulation used in Chapter 8 and in this chapter. Section 9.5 presents the chapter's concluding remarks.

9.2 Adjustments Through the Exchange Rate Policy

9.2.1 Effects of an overvalued exchange rate

Because of the first oil-crisis and the down-turn in the economy brought about by a negative terms of trade shock, the Kenyan government devalued the shilling by 14 per cent in September 1975. This resulted from IMF pressure that for any support to finance the balance of payments to be given to Kenya be preceded by a devaluation of the shilling. Having succumbed reluctantly to the IMF conditionality, the Kenyan government did not view the exchange rate as a policy instrument during the coffee boom.

This section seeks to investigate the likely outcome if the government had decided to take advantage of the coffee-boom to reverse the devaluation of September 1975. This is done by revaluing the shilling by ten per cent. The results for this simulation individually and when combined with the joint terms of trade are shown respectively in the columns labelled SAPPR and APPR in Tables 9.1 and 9.2. The simulations were defined as follows:

- JTOT = The joint terms of trade reference simulation combining the 12 per cent increase in world manufacturing import prices with the 25 per cent increase in the world agricultural export prices.
- SAPPR = 10 per cent revaluation of the shilling.
- APPR = 10 per cent revaluation of the shilling combined with the joint terms of trade.

It can be observed that the economy would have contracted and almost all the gains from the export boom wiped out. In fact, real GDP decreased marginally by 0.5 per cent in the short run as opposed to the 3.2 per cent increase without such an intervention. This contraction implies that the effect of a stronger currency on reducing exports was very significant. From Table 9.1, agricultural exports expanded only by 12.2 per cent compared to 20.9 per cent in the reference simulation.

An unexpected outcome from the revaluation is its effect on imports. Only demand for agricultural imports increased by an amount greater than the level attained in the reference simulation. Demand for manufactured and service imports actually deteriorated. The contraction in GDP led to the significant declines in demand for manufactured and service imports. The other reason for low import demand is the contraction in these two sectors as seen in reduction in their outputs. The effects of the overvaluation of the shilling on output is such that the agricultural sector is the only one with some positive growth while the manufacturing and service sectors had poorer levels of output from the reference simulation. The lower outputs must have contributed to this low import demand. The overall results of the revaluation, when combined with the joint terms of trade, is that the trade balance worsened from an improvement equivalent to 0.03 per cent of base year GDP to an insignificant improvement equivalent to 0.03 per cent of base year GDP.

The other significant result is that the currency overvaluation led to reduced sectoral investment compared with the reference joint terms of trade change (column APPR, Table 9.1). Investment in each of the three sectors actually reduced when the shilling was revalued. These reductions once again can be explained by the contraction of production that resulted from the stronger currency. Lower production meant reduced employment demand resulting in lower savings and hence the negative effect on investment.

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	JTOT	SAPPR	APPR
Real GDP	3.23	-3.46	-0.49
Output			
Agriculture	4.98	-2.29	2.42
Manufacturing	2.33	-3.86	-1.66
Services	1.71	-2.56	-0.92
Exports			
Agriculture	20.90	-7.66	12.23
Manufacturing	-3.17	-5.00	-7.89
Services	0.69	-3.95	-3.27
Imports			
Agriculture	5.24	4.36	9.46
Manufacturing	1.01	-2.71	-1.96
Services	3.56	-0.03	3.41
Investment			
Agriculture	2.13	-2.92	-0.56
Manufacturing	7.71	-9.94	-1.96
Services	15.86	-18.75	-3.85
Employment			
Agriculture	7.78	-3.45	3.73
Manufacturing	6.00	-9.29	-4.10
Services	2.27	-3.36	-1.22
Employment by Category			
Unskilled	4.74	-4.69	-0.36
Skilled	4.05	-5.97	-2.36
Semi-professional	3.09	-4.43	-1.61
Professional	2.87	-4.18	-1.54
Self-employed	6.10	-3.58	2.06
Aggregate prices			
Nominal wage	1.95	-1.97	-0.15
Real wage	-4.40	4.75	0.35
Consumer price index	6.63	-6.42	-0.50
Producer price index	7.24	-6.67	-0.29
Consumer prices			
Agriculture	8.95	-6.78	1.14
Manufacturing	9.67	-9.07	-0.42
Services	3.68	-4.85	-1.53
Producer prices	2		
Agriculture	12.78	-5.95	5.09
Manufacturing	8 02	-9 52	-2.39
Services	3.50	-5.65	-2.46
Balance of trade (per cent of base year GDP)	0.66	-0.50	0.03

Table 9.1: Effects of an Overvalued Shilling on Terms of Trade Shocks' Impacts(Percentage Changes From Initial Solution).

In addition to the stronger shilling resulting in lower positive effects from the improvements in the terms of trade, it also contributed to a contraction in employment demand. Employment in the agricultural sector increased only by 3.7 per cent compared with 7.8 per cent in the joint terms of trade simulation. The manufacturing and service sectors' employment demand moved from positive growth in the reference joint terms of trade simulation to reductions of 4.1 and 1.2 per cent respectively.

In terms of the effect of the overvaluation on distribution of employment between different labour categories, the stronger currency substantially suppressed the increase in labour demand for all workers. The unskilled and skilled workers had the largest declines from the reference simulation levels. This appears to be a result of the large contraction in the manufacturing sector. The demand for services of semi-professional and professional workers also showed some substantial reductions. The self-employed workers are the only ones to still show some positive growth in the demand for their services. This is explained by the still positive growth taking place in the agricultural sector where most are employed.

The effects of the revaluation of the currency on prices warrants discussion. An overvaluation of the shilling is evidently deflationary. This can be seen from the reduction in the increase in the CPI from 6.6 per cent in the reference simulation (column JTOT, Table 9.1) to a fall of half a percentage point when combined with a revaluation of the shilling (column APPR, Table 9.1). This results in an overall increase in the real wage with the 30 per cent indexation.

An interesting outcome is observed with regard to producer prices. The producer price index in the reference terms of trade simulation showed an increase of 7.2 per cent. However, with a strong currency effected through the revaluation, the producer price index actually declined by a third of a percentage point. Individual producer prices actually fell in the case of the manufacturing and services sectors. The agricultural sector's producer prices showed only a 5.1 per cent increase compared to the 12.8 per cent in the reference simulation. These falls in producer prices can be further linked to contractions in production in the short run. This outcome on prices indicates the strongly negative effect an overvalued currency is likely to have on an agricultural

economy such as Kenya's. The overvaluation means less competitive export prices which lead to lower producer prices, eventually acting as a disincentive to producers.

In terms of the revalued currency impact on the effects of the terms of trade shocks on income distribution, the scenario on employment is replayed (Table 9.2). All labour categories had reduced income in nominal terms compared to the situation without an overvalued currency. This was because of declines in employment demand in the manufacturing and services sectors and smaller increase in employment in the agricultural sector.

Table 9.2: Effects of an Overvalued Shilling on Terms of Trade Shocks' Impactson Income Distribution (Percentage Changes From Initial Solution).

	JTOT	SAPPR	APPR
Labour incomes			
Unskilled labour	6.78	-6.56	-0.51
Skilled labour	6.08	-7.83	-2.51
Office workers and semi-professionals	5.10	-6.32	-1.75
Professional workers	4.87	-6.06	-1.68
Self-employed and family labour	8.16	-5.48	1.90
Household incomes			
Urban households (low income)	5.90	-6.36	-1.11
Urban households (middle income)	5.82	-6.76	-1.57
Urban households (high income)	8.09	-8.17	-0.90
Rural households (<0.5ha)	6.46	-4.52	1.31
Rural households (<0.5ha + income)	5.43	-4.36	0.53
Rural households (>0.5ha but <1ha)	6.39	-4.34	1.43
Rural h'holds (>0.5ha but <1ha + income)	5.14	-4.06	0.57
Rural households (>1ha but <8ha)	6.30	-4.59	1.09
Rural households (>8ha)	5.33	-3.76	1.05
Rural households (other)	4.78	-4.84	-0.56
Sectoral profits and government revenue			
Agriculture	44.82	-14.79	22.17
Manufacturing	8.00	-43.36	-37.85
Services	-3.45	-24.39	-27.27
Government revenue	11.25	-11.67	-2.20

Urban households and rural households classified as 'other' are affected most by an overvalued shilling during the export boom. As for rural households, their nominal incomes do not fall by the same large magnitudes as in urban households. Consequently, all six rural household categories in agricultural production still witnessed positive nominal income increases.

The results from the policy experiment with an overvaluation led to several observations. Had the government opted to revalue the currency, the economy would have been worse off compared to the no revaluation position. Urban household incomes would not have been maximised if the currency was revalued. The benefit to urban households from the boom in the agricultural sector is almost wiped out.

The positive influence such revaluation would have had on the cost of imports hence lower costs of production does not materialise. Hence, an attempt by the government to retain an overvalued currency in the hope of securing lower costs of production in the domestic economy does not justify the losses that would have been made as a result of a more subdued expansion of exports. This policy appears even less appealing considering that the boom was a transitory phenomenon. An overvaluation of the currency might eventually have led to a worsening of the balance of trade after the boom had died down. There is a strong indication from these results that, for Kenya to develop, emphasis must be on ensuring the existence of an appropriate exchange rate. The gains that are to be made from an exchange rate that acts as an incentive to export producers (as with agricultural exports) exceed any possible gains from a currency level that favours imports.

9.2.2 Effects of a devaluation of the exchange rate

The second exchange rate adjustment experiment seeks to answer questions about outcomes if the government viewed the boom as a temporary phenomenon whose advantage could be exploited by devaluing the shilling by a further 10 per cent as a follow-up to the 1975 devaluation. The individual devaluation experimental results are shown under column SDEVA in Tables 9.3 and 9.4 and the combined simulation of the devaluation with joint terms of trade in column DEVA. The simulations were as follows:

- JTOT = The joint terms of trade reference simulation combining the 12 per cent increase in world manufacturing import prices with the 25 per cent increase in the world agricultural export prices.
- SDEVA = 10 per cent devaluation of the shilling.
- DEVA = 10 per cent devaluation of the shilling combined with the joint terms of trade shocks.

It is clear from the previous section that an overvalued currency during the boom would have contributed to lower increases in GDP, outputs, exports, employment and hence labour incomes. In particular, this would have caused urban households to be worse off compared to if there was no revaluation.

The story with a devaluation is as might be expected. Devaluation causes exports to be cheaper in the world market and is expansionary as can be seen under column SDEVA. This expansionary effect complements the 25 per cent increase in agricultural export prices. This resulted in an overall increase in all exports with agricultural exports increasing as much as 29 per cent (column DEVA in Table 9.3).

The expected contraction in manufactured and service imports as they become more expensive under a devaluation does not occur. The manufactured imports which form the largest component of total imports increased by four per cent which is more than their increases under the joint terms of trade changes without exchange rate adjustment. This suggests that the positive effects of the devaluation on export expansion outweigh the negative effects of higher import prices. That is, the contraction in imports was not large enough to cancel increases in exports. The higher increases in investment did assist in outweighing the negative impacts of higher import prices. Consequently, total production increased and, in agriculture in particular, increased by 7.4 per cent whereas manufacturing and services also improved their outputs significantly. These positive effects passed through to GDP which increased in real terms by about 6.8 per cent.

	JTOT	SDEVA	DEVA
Real GDP	3.23	3.33	6.84
Output			
Agriculture	4.98	2.18	7.41
Manufacturing	2.33	3.59	6.10
Services	1.71	2.36	4.17
Exports			
Agriculture	20.90	7.24	29.01
Manufacturing	-3.17	4.56	1.12
Services	0.69	3.66	4.38
Imports			
Agriculture	5.24	-3.60	1.80
Manufacturing	1.01	2.62	3.98
Services	3.56	0.08	3.79
Investment			
Agriculture	2.13	2.34	4.35
Manufacturing	7.71	8.51	16.19
Services	15.86	17.60	34.67
Employment			
Agriculture	7.78	3.36	11.72
Manufacturing	6.00	9.36	16.33
Services	2.27	3.14	5.57
Employment by Category			
Unskilled	4.74	4.57	9.77
Skilled	4.05	5.88	10.46
Semi-professional	3.09	4.27	7.67
Professional	2.87	4.00	7.14
Self-employed	6.10	3.45	10.02
Aggregate prices			
Nominal wage	1.95	1.87	3.95
Real wage	-4.40	-4.24	-8.64
Consumer price index	6.63	6.38	13.78
Producer price index	7.24	6.69	14.84
Consumer prices			
Agriculture	8.95	6.76	16.79
Manufacturing	9.67	9.10	19.85
Services	3.68	4.77	8.85
Producer prices			
Agriculture	12.78	6.07	20.62
Manufacturing	8.02	9.57	18.58
Services	3.50	5.59	9.43
Balance of trade (per cent of base year GDP)	0.66	0.56	1.34

Table 9.3: Effects of a Devaluation on the Outcome of Terms of Trade Shocks(Percentage Changes From Initial Solution).

The CPI increased by 13.8 per cent and the producer price index rose by 14.8 per cent under the devaluation while the nominal wage increased by four per cent. This did not prevent employment from rising since producer prices actually rose in the economy. The agricultural producer price rose by 20.6 per cent while the manufacturing producer price increased by 18.6 per cent. These higher producer prices increased incentives for production and this explains why inflationary pressures on costs resulting from the devaluation did not deter growth in demand for labour. Agricultural employment still experienced a significant increase of 11.7 per cent. In terms of distribution, employment among the self-employed increased by ten per cent. Employment demand increase was highest in the skilled labour category. This was as a result of the boom in the agricultural sector resulting in better performance of the manufacturing sector employment as explained in the previous chapter.

In terms of income distribution, the expansion in the economy resulting from better export performance contributed to higher nominal incomes among all labour categories and consequently in household incomes (column DEVA, Table 9.4). In other words, the expansionary effect of the devaluation meant positive impacts on nominal household incomes.

Compared with the reference joint terms of trade simulation, nominal wages are higher (and real wages are lower) under a devaluation and, coupled with higher employment demand, this meant significantly higher nominal incomes. Both rural and urban households gain from the devaluation as it appears to further strengthen the positive effects of high agricultural export prices rather than making the negative effect of increased import prices worse. Rural households gain because the devaluation increased export demand for agriculture. The urban rich in particular gained because devaluation increased labour incomes resulting from high investment demand. All urban household nominal incomes increased in magnitudes greater than those of the joint terms of trade. Urban poor in particular experienced nominal income increases of 17 per cent. All rural households were better off in nominal terms under a devaluation scenario. The income of the rural poor (< 0.5 ha) increased by 11.6 per cent. The latter is due to improved performance of the agricultural sector as a result of a better export sub-sector which

contributed to higher employment demand. Government revenue was also higher under a devaluation compared to the reference run.

Table 9.4:	Effects of a Devaluation on the Impacts of Terms of Trade Shocks on
	Income Distribution (Percentage Changes From Initial Solution).

	JTOT	SDEVA	DEVA
Labour incomes			
Unskilled labour	6.78	6.53	14.10
Skilled labour	6.08	7.87	14.82
Office workers and semi-professionals	5.10	6.22	11.92
Professional workers	4.87	5.95	11.36
Self-employed and family labour	8.16	5.39	14.36
Household incomes			
Urban households (low income)	5.90	6.33	12.96
Urban households (middle income)	5.82	6.70	13.24
Urban households (high income)	8.09	8.05	17.04
Rural households (<0.5ha)	6.46	4.46	11.57
Rural households (<0.5ha + income)	5.43	4.31	10.32
Rural households (>0.5ha but <1ha)	6.39	4.28	11.30
Rural h'holds (>0.5ha but <1ha + income)	5.14	4.01	9.70
Rural households (>1ha but <8ha)	6.30	4.53	11.47
Rural households (>8ha)	5.33	3.71	9.58
Rural households (other)	4.78	4.79	10.11
Sectoral profits and government revenue			
Agriculture	44.82	16.02	69.15
Manufacturing	8.00	46.80	58.33
Services	-3.45	25.58	21.53
Government revenue	11.25	12.22	25.45

The results suggest that a devaluation might have been an effective means of maximising the welfare effects of the export boom and this would have assisted in addressing external imbalances facing the Kenyan economy following the import price shock. The devaluation would also have resulted in improved government revenue. Unlike in the experiment with an overvalued currency, it was hard to tell whether failure to carry it out was justifiable. Assuming that the government knew that the boom was temporary, then it would have been a positive step to devalue the currency further. The problem with such a move is that the inflationary effects of the devaluation would have resulted in falls in real incomes of rural households engaged in agricultural production. However, a trade-off would need to be made between resulting growth in the economy and the inflationary effects on real incomes.

9.3 Adjustment Through a Contractionary Fiscal Policy

9.3.1 Fiscal adjustment through reduction in import tariffs

As discussed in Chapter 8, the Kenyan government increased import tariffs during the export boom period. A measure that seems to have been a part of the government's expansionary policy (given the rapid increase in government spending at the time) even though, as highlighted in Chapter 8, the tariff increases were more to try and curtail the rising import bill created by the oil-crisis. A simulation of an alternative adjustment path once the government realised that the boom existed was needed to establish how the economy would have performed. This was done by reversing the tariff increases the government had effected. Therefore, import duties were reduced by 50 per cent which acted as a partial liberalisation of trade, a move that would have been supported through the prevailing export boom. But, this tariff reduction would cause a decrease in government revenue and hence a reduction in the amount available to the government for spending. A 50 per cent tariff reduction is equivalent to a 9.92 per cent fall in government revenue which is a shortfall of Kshs 657 million for planned expenditures. Therefore, this simulation of a reduction in import tariffs needs to be accompanied with this concomitant reduction in government spending which will ensure that the presimulation government fiscal balance is maintained. The results are reported under columns labelled SDUTY and DUTY in Tables 9.5 and 9.6 and the simulations undertaken were as follows:

 JTOT = The joint terms of trade reference simulation combining the 12 per cent increase in world manufacturing import prices with the 25 per cent increase in the world agricultural export prices.

- SDUTY = 50 per cent reduction in import duties combined with a 9.92 per cent reduction in government spending.
- DUTY = 50 per cent reduction in import duties, 9.92 per cent reduction in government spending combined with the joint terms of trade shocks.

A reduction in import tariff is expected to lead to a rise in imports. Alternatively, a reduction in government spending is likely to lead to a reduction in imports. In this experiment, the 50 per cent reduction in import duties together with the reduction in government spending was not big enough to counteract the negative effect of high world import prices and the import reduction effects of reduced government spending on all sectors, since imports for the three sectors deteriorated. The reduction in imports and the other effects of reduced government spending impacted negatively on production as reduction in outputs from the three sectors occurred.

On a sectoral basis, production decreased marginally from the reference simulation in the agricultural sector while it fell by larger amounts for the manufacturing and service sectors. This indicates that while liberalising trade might have increased competition in the two sectors, the reduction in government spending necessitated by the fall in tariff revenue was overwhelming and led to the declines in output.

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	JTOT	SDUTY	DUTY
Real GDP	3.23	-1.58	1.92
Output			
Agriculture	4.98	-0.67	4.40
Manufacturing	2.33	-1.97	0.34
Services	1.71	-5.04	-3.25
Exports			
Agriculture	20.90	1.33	22.44
Manufacturing	-3.17	1.47	-1.68
Services	0.69	-4.08	-3.26
Imports			
Agriculture	5.24	-1.58	3.65
Manufacturing	1.01	-1.41	-0.39
Services	3.56	-6.63	-3.15
Investment			
Agriculture	2.13	-0.95	1.23
Manufacturing	7.71	-3.31	4.41
Services	15.86	-6.46	8.93
Employment			
Agriculture	7.78	-1.01	6.85
Manufacturing	6.00	-4.83	0.86
Services	2.27	-6.57	-4.27
Employment by Category			
Unskilled	4.74	-4.52	0.19
Skilled	4.05	-5.67	-1.73
Semi-professional	3.09	-6.11	-3.05
Professional	2.87	-6.25	-3.40
Self-employed	6.10	-2.76	3.39
Aggregate prices			
Nominal wage	1.95	-1.11	0.81
Real wage	-4.40	2.64	-1.87
Consumer price index	6.63	-3.65	2.74
Producer price index	7.24	-3.17	3.92
Consumer prices		0117	0.72
Agriculture	8.95	-3.11	5.68
Manufacturing	9.67	-6.01	3.13
Services	3 68	-2.78	0.76
Producer prices	0.00	2.7.0	
A griculture	12.78	-1 52	11.37
Manufacturing	8.02	-4.71	2.84
Services	3.50	-3.38	-0.02
Balance of trade (ner cent of hase year GDP)	0.66	2.53	3 56
Services Balance of trade (per cent of base year GDP)	3.50 0.66	-3.38 2.53	-0.02 3.56

Table 9.5: Effects of a Fall in Import Tariffs on the Impacts of External Shocks(Percentage Changes From Initial Solution).

On the other hand, reduction in import tariffs, together with reduced government spending, led to marginal increases in exports over the increases that occurred in the reference run for the agriculture and manufacturing sectors. Since import tariffs add to the domestic currency cost of imports, the reduction in tariffs was seen in the smaller 2.7 per cent increase in the CPI as compared to the 6.6 per cent in the reference simulation. This improvement in the inflation level can also be partly attributed to lower government expenditure. The increase in exports can be linked to this fall in the costs of production associated with a lower increase in the CPI compared to the level under the reference simulation. Since this result shows that there was no net significant shift in demand towards imports, there was some improvement in the balance of trade. There was an improvement in the trade balance equivalent to 3.5 per cent of 1976 GDP.

Investment in the economy was lower for all the sectors when compared to the reference simulation. One explanation for this fall is the effect that trade liberalisation has on the government's fiscal position. The reduction in import tariffs affected the fiscal position of the government through lower government revenue which eventually led to a decrease in aggregate savings available for investment. This explanation is based on the fact that the reduction in government spending accompanying lower import tariffs creates a downturn in the economy which has a negative effect on the government revenue.

As one might expect, compared to the sole joint terms of trade experiment, a reduction in import duties and government spending led to declines in employment when compared with the reference simulation. The declines could be due to lay-offs in the import competing sector resulting from lack of competitiveness of Kenyan producers as they are exposed to foreign competition. Also, it could be due to retrenchments that are likely to accompany lower government spending. Sectorally, the largest decline in labour demand occurs in the services sector. This is not surprising as the reduction in government spending necessitated by tariff reductions is likely to affect this sector most. This trend is also discernible from the falls in employment demand by category. The semiprofessionals and professional workers that are mostly employed in the services sectors are worst affected. Overall, it is only the unskilled and self-employed labourers who still show positive employment growth, albeit lower when compared to the sole joint terms of trade experiment. Reducing import duties together with government spending led to lower nominal labour and household incomes compared to those in the reference experiment (Table 9.6). This was attributable to the fall in employment demand for all labour categories. The largest falls occurred in the office-workers and semi-professionals category as well as professionals. This is attributed to reductions in government expenditure that had to be effected if the government was to accommodate the tariff reduction without leading to a deterioration in its fiscal position. The skilled and unskilled labour incomes also deteriorated by a significant amount from their levels in the reference simulation. These deteriorations can be explained by the negative effects of higher tariffs on the import competing manufacturing sector. Self-employed labour income was expected to improve with lower tariffs as agriculture is the main export producing sector. However, this positive effect was undermined by the reduction in government spending. The effects these two policy moves have on reducing the level of inflation in the economy, which should favour export producers, was not sufficient to counteract any negative indirect effects lower government spending had on the agricultural sector.

The distribution of income to the various households shows that lower tariffs when accompanied with lower government spending would have resulted in all the households being worse-off from their gains from the terms of trade shocks, more specifically the export boom. The urban households that benefited significantly from the boom suffer most from lower tariffs. This, as explained above, is due to the effects these tariffs have on the import competing manufacturing sector. Moreover, these households contribute labour to the services sector which is also adversely affected by a cut in government spending. The rural households still showed some positive growth in nominal income but the gains from lower tariffs to the agricultural sector were undermined by reduced government spending affecting agricultural production directly through provision of agricultural services such as research and extension.

In terms of sectoral profits, the manufacturing and services sectors showed falls in nominal profits. Import tariffs and the government spending reduction led to a three per cent fall in manufacturing profits compared to the eight per cent increase in the reference simulation. This means that as tariffs and government spending have a substantial impact on the outcome of the terms of trade shock, they substantially influence the profitability of the manufacturing sector reflecting, presumably, their impact on its competitiveness.

Table 9.6:	Effects of Lower Tariffs on the Outcome of External Shocks on Income
	Distribution (Percentage Changes From Initial Solution).

	JTOT	SDUTY	DUTY
Labour incomes			
Unskilled labour	6.78	-5.58	1.00
Skilled labour	6.08	-6.71	-0.93
Office workers and semi-professionals	5.10	-7.15	-2.26
Professional workers	4.87	-7.29	-2.61
Self-employed and family labour	8.16	-3.84	4.23
Household incomes			
Urban households (low income)	5.90	-5.78	-0.08
Urban households (middle income)	5.82	-6.80	-1.20
Urban households (high income)	8.09	-8.30	-0.44
Rural households (<0.5ha)	6.46	-3.30	3.08
Rural households (<0.5ha + income)	5.43	-3.51	1.82
Rural households (>0.5ha but <1ha)	6.39	-3.09	3.23
Rural h'holds (>0.5ha but <1ha + income)	5.14	-3.23	1.82
Rural households (>1ha but <8ha)	6.30	-3.45	2.76
Rural households (>8ha)	5.33	-2.75	2.51
Rural households (other)	4.78	-4.67	-0.03
Nominal sectoral profits and government revenue			
Agriculture	44.82	-0.78	44.71
Manufacturing	8.00	-8.87	-2.98
Services	-3.45	-8.00	-11.09
Government revenue	11.25	-14.39	-4.78

From an equity standpoint, all rural households would have been worse off with lower tariffs accompanied by reduced government spending. Intuitively, rural households gain from lower tariffs as they produce exportable commodities. It appears that the negative impact of lower government expenditure erases any such gains. For government, the impact of the fall in tariff revenue was pronounced with government revenue decreasing by 4.8 per cent compared to an 11.3 per cent increase in the reference run. Hence, a fiscal policy through lower tariffs would have lowered gains from the export boom if

government spending was to be reduced at the same time. The results suggest that changes in the rate of import tariffs combined with reduced government spending would have altered the effect of the export boom. The implication is that reduction of import duties could only be used for policy if the government was prepared to run a fiscal deficit or was already enjoying a budget surplus that would have supported the tariffs reduction without lowering government spending.

9.3.2 Fiscal adjustment through reductions in indirect taxes

As noted in Chapter 8, indirect taxes rose by 31 per cent in 1976. This simulation lowers indirect taxes by the same amount. As in the case of reducing import tariffs, a cut in indirect taxes obviously results in a decrease in government revenue. This, as intimated earlier with tariffs reductions, implies a fall in the amount available to the government for expenditure. Consequently, undertaking a policy simulation that reduces only indirect taxes is not enough unless the government is willing to pay the economic price of a deterioration in its fiscal balance position. In order not to worsen the government fiscal balance, this simulation level of the fiscal balance is maintained. In effect, the 31 per cent reduction in indirect taxes is accompanied with a reduction in total government spending, equivalent to the revenue the government is likely to loose from tax cuts. The results are reported under columns SFISC and FISC in Tables 9.7 and 9.8. The simulations were as defined below:

- JTOT = The joint terms of trade reference simulation combining the 12 per cent increase in world manufacturing import prices with the 25 per cent increase in the world agricultural export prices.
- SFISC = 31 per cent reduction in indirect taxes combined with 10.27 per cent reduction in government spending.
- FISC = 31 per cent reduction in indirect taxes, 10.27 per cent reduction in government spending combined with the joint terms of trade shocks.

It appears that a policy of lowering indirect taxes, accompanied with a concomitant reduction in government spending would have resulted in a poor performance from the economy. This is despite indirect taxes forming a substantial component of production costs in the manufacturing and service sectors. Lowering indirect taxes by 31 per cent, together with a reduction in government spending during the export boom, led to a 1.8 per cent increase in the real GDP (column FISC Table 9.7) compared with a 3.2 per cent increase of the same in the reference simulation.

However, manufacturing production increased by 3.2 per cent which is greater than the expansion in the reference joint terms of trade simulation. This better performance can be attributed to lower costs of production. The agricultural and services sectors, which benefit most from higher government spending, experienced lower production increases than they had under a sole joint terms of trade with indirect taxes unchanged. However, the agricultural output was not much affected as its growth remained steady at five per cent increase as in the reference simulation. The services sector was most affected given the role of government in the sector. The output in this sector fell by 1.8 per cent (column FISC, Table 9.7) compared with the 1.7 per cent increase in the reference simulation.

The effect of this policy on the outcome of the external shocks in terms of exports and imports was mixed. In the case of import tariffs, their reduction, accompanied by a fall in government expenditure, would have undermined agricultural exports. In this case of indirect taxes, the agricultural and manufacturing sectors actually registered better export performance from lower indirect taxes and reduced government spending. Two reasons explain this performance. First, in the case of the manufacturing sector, lower indirect taxes meant lower direct production costs hence better export performance. Second, and in a more indirect manner, lower indirect taxes and government spending led to a fall in inflation which increased by 4.2 per cent compared with the 6.6 per cent increase in the reference simulation.

	JTOT	SFISC	FISC
Real GDP	3.23	-1.50	1.83
Output			
Agriculture	4.98	-0.07	4.98
Manufacturing	2.33	0.94	3.23
Services	1.71	-3.57	-1.80
Exports			
Agriculture	20.90	1.02	22.08
Manufacturing	-3.17	3.80	0.50
Services	0.69	-2.75	-1.96
Imports			
Agriculture	5.24	-1.35	3.89
Manufacturing	1.01	-1.87	-0.93
Services	3.56	-5.03	-1.52
Investment			
Agriculture	2.13	-0.04	2.03
Manufacturing	7.71	-0.15	7.35
Services	15.86	-0.31	15.10
Employment			
Agriculture	7.78	-0.11	7.77
Manufacturing	6.00	2.37	8.40
Services	2.27	-4.68	-2.37
Employment by Category			
Unskilled	4.74	-1.77	3.03
Skilled	4.05	-1.46	2.63
Semi-professional	3.09	-3.29	-0.16
Professional	2.87	-3.65	-0.74
Self-employed	6.10	-1.40	4.78
Aggregate prices			
Nominal wage	1.95	-0.68	1.25
Real wage	-4.40	1.62	-2.86
Consumer price index	6.63	-2.26	4.23
Producer price index	7.24	-2.48	4.64
Consumer prices			
Agriculture	8.95	-1.05	7.89
Manufacturing	9.67	-3.90	5.43
Services	3.68	-2.16	1.40
Producer prices			
Agriculture	12.78	-0.83	12.02
Manufacturing	8.02	-3.66	3.96
Services	3.50	-2.87	0.52
Balance of trade (per cent of base year GDP)	0.66	0.96	1.76

Table 9.7: Effects of a Reduction in Indirect Taxes on External Shocks' Impacts(Percentage Changes From Initial Solution).

This indirectly lowers the cost of production and explains the slightly better performance in agricultural and manufactured exports. Since the increases in import demand in the reference simulation in the three sectors actually fell, there was an improvement in the trade balance equivalent to 1.8 per cent of the 1976 GDP (column FISC, Table 9.7) as compared to an improvement equivalent to 0.7 per cent of the 1976 GDP (column JTOT, Table 9.7).

Lower indirect taxes and associated government spending reduction did not improve investment even though more resources were freed for investment purposes. All sectors did not benefit from lower indirect taxes in terms of investment as the contribution of government savings to total investment was affected by this policy. Reduced government spending created a poor performance in the economy in general hence investment increased by marginally smaller magnitudes from those in the reference simulation.

The impact of lower indirect taxes on employment is such that labour demand was slightly higher in the manufacturing sector than demand in the reference run. Agricultural and service sectors employment demand deteriorated because of lower government spending rather than lower indirect taxes. This effect on sectoral employment demand meant that the net effect was that employment levels by categories deteriorated. The demand for semi-professionals and professional labour registered 0.2 and 0.7 per cent falls respectively. Again this was because of the fall in aggregate employment in the services sector.

Since there was some fall in the rise in nominal wage, all labour categories showed decreases in the amount by which nominal income grew as a result of lower indirect taxes (column FISC, Table 9.8). This meant lower household incomes in nominal terms. Urban household nominal incomes increased by much smaller magnitudes compared with the reference simulation. Rural households also felt the effects of lower government spending associated with lower indirect taxes but still benefited in nominal terms in spite of contractionary fiscal policy.

	JTOT	SFISC	FISC
Labour incomes			
Unskilled labour	6.78	-2.44	4.32
Skilled labour	6.08	-2.14	3.91
Office workers and semi-professionals	5.10	-3.95	1.09
Professional workers	4.87	-4.31	0.50
Self-employed and family labour	8.16	-2.07	6.09
Household incomes			
Urban households (low income)	5.90	-2.54	3.33
Urban households (middle income)	5.82	-3.33	2.45
Urban households (high income)	8.09	-4.57	3.47
Rural households (<0.5ha)	6.46	-1.75	4.71
Rural households (<0.5ha + income)	5.43	-1.76	3.66
Rural households (>0.5ha but <1ha)	6.39	-1.66	4.73
Rural h'holds (>0.5ha but <1ha + income)	5.14	-1.63	3.50
Rural households (>1ha but <8ha)	6.30	-1.79	4.50
Rural households (>8ha)	5.33	-1.45	3.88
Rural households (other)	4.78	-2.39	2.37
Nominal sectoral profits and government revenue			
Agriculture	44.82	0.42	45.89
Manufacturing	8.00	25.12	33.81
Services	-3.45	-3.88	-6.99
Government revenue	11.25	-10.77	-0.60

 Table 9.8: Effects of Lower Indirect Taxes on the Impacts of External Shocks on Income Distribution (Percentage Changes From Initial Solution).

The results of this simulation indicate that one way the manufacturing sector could have been supported given high import prices from the oil crisis was with lower indirect taxes. Reduction in these taxes also may have been a better alternative to reducing import duties for the manufacturing sector. However, like the case of import tariffs, reductions in government spending required to offset adverse effects in fiscal balance makes it difficult for the economy to reap the benefits of the measure. This means that the government must weigh whether short term gains from lower taxes outweigh short term losses associated with reduced government spending.

9.3.3 Fiscal adjustment through reduced government spending

Given that the government was aware of the boom, a contractionary fiscal policy seems to be an economically sensible alternative for a government that was trying to create internal economic balance. An experiment was carried out that cut government expenditure by 20 per cent, the amount by which it was observed to have increased during the boom period. This cut in spending does not affect tax rates and does not effect spending cuts through lower taxes. The rationale of the policy is to try to investigate what would happen if the government decided to take advantage of the boom to reduce spending.

The columns SRGOV and RGOV in Tables 9.9 and 9.10 show the results of a simulation of a 20 per cent reduction in government consumption and one combined with the joint terms of trade respectively. The simulations were as follows:

- JTOT = The joint terms of trade reference simulation combining the 12 per cent increase in world manufacturing import prices with the 25 per cent increase in the world agricultural export prices.
- SRGOV = 20 per cent reduction in government spending.
- RGOV = 20 per cent reduction in government spending combined with the joint terms of trade shocks.

Results of this simulation show that a 20 per cent reduction in government expenditure, accompanied by the joint terms of trade changes, would have led to an unexpectedly dramatic contraction in the economy. Due to lower demand, production in all sectors, in spite of the export boom in the agricultural sector, contracted. This is a result of the major contraction in the service sector of 8.1 per cent including government services, and this was made worse by reduced expansion in the agricultural and manufacturing sectors. The contraction in production led to reduced trade flows in terms of exports, as might be expected, but only in the manufacturing and services sectors.

Agricultural exports increased by 22.1 per cent which was better than the 20.9 per cent increase in the reference simulation. A reason for this expansion in agricultural exports is that reduced government spending leads to a lower general price level which reduces costs, improving exports competitiveness. Imports also declined, with manufacturing and services showing largest declines, while the agricultural imports had a small decrease

of 0.02 per cent. The contraction in production was carried through to GDP which declined in real terms by two per cent.

Investment grew in all sectors. Due to the high fixed share of total savings going to the service sector, investment in the sector increased by 17 per cent. The increase in investment may be linked to increased savings by government as a result of reduced government expenditure on goods and services.

The simulation results showing the effect of a 20 per cent reduction in government expenditure on employment were not surprising. The contraction taking place was accompanied by reductions in employment with the service sector (which combines public and private services) experiencing a 10.5 per cent decline in labour demand. In terms of reduced demand for different labour categories, it was semi-professionals (including office workers) and professionals who lost most. Demand in both of these categories of labour fell by 8.4 per cent and nine per cent respectively. Skilled labour also suffered a 5.9 per cent reduction in demand. Demand for unskilled labour decreased by 3.7 per cent and self-employed labour experienced only a 0.3 per cent increase.

	JTOT	SRGOV	RGOV
Real GDP	3.23	-5.63	-2.04
Output			
Agriculture	4.98	-1.81	3.29
Manufacturing	2.33	-2.71	-0.33
Services	1.71	-9.95	-8.13
Exports			
Agriculture	20.90	1.08	22.14
Manufacturing	-3.17	0.00	-3.13
Services	0.69	-8.67	-7.78
Imports			
Agriculture	5.24	-5.17	-0.02
Manufacturing	1.01	-5.37	-4.19
Services	3.56	-12.20	-8.75
Investment			
Agriculture	2.13	0.22	2.26
Manufacturing	7.71	0.78	8.22
Services	15.86	1.54	16.97
Employment			
Agriculture	7.78	-2.73	5.10
Manufacturing	6.00	-6.60	-0.83
Services	2.27	-12.80	-10.51
Employment by Category			
Unskilled	4.74	-8.43	-3.71
Skilled	4.05	-9.82	-5.86
Semi-professional	3.09	-11.42	-8.35
Professional	2.87	-11.81	-8.96
Self-employed	6.10	-5.82	0.31
Aggregate prices			
Nominal wage	1.95	-1.14	0.82
Real wage	-4.40	2.71	-1.88
Consumer price index	6.63	-3.75	2.75
Producer price index	7.24	-3.82	3.37
Consumer prices			
Agriculture	8.95	-4.30	4.52
Manufacturing	9.67	-4.11	5.36
Services	3.68	-3.23	0.36
Producer prices			
Agriculture	12.78	-2.21	10.76
Manufacturing	8.02	-3.86	3.94
Services	3.50	-4.78	-1.38
Balance of trade (per cent of base year GDP)	0.66	1.28	2.17

Table 9.9: Effects of Lower Government Spending on the Impacts of External
Shocks (Percentage Changes From Initial Solution).

Therefore, the impact of reductions in government expenditure on goods and services fell mainly on urban households employed by the public administration in semi-professional and professional labour categories. Nominal incomes of all urban households fell as a result of reduced government spending. This was because of reduced nominal labour income in the first four labour categories where labour incomes of semi-professional and professional workers fell significantly (column RGOV Table 9.10). Nominal unskilled and skilled labour incomes also fell. However, not all rural household incomes fell because of the 1.1 per cent increase in nominal income of the self-employed and family labour where most of the rural households derive their incomes.

Table 9.10:	Effects of Lower Government Spending on Impacts of External Shocks
	on Income Distribution (Percentage Changes from Initial Solution).

	JTOT	SRGOV	RGOV
Labour incomes			
Unskilled labour	6.78	-9.47	-2.93
Skilled labour	6.08	-10.85	-5.09
Office workers and semi-professionals	5.10	-12.43	-7.60
Professional workers	4.87	-12.81	-8.21
Self-employed and family labour	8.16	-6.90	1.13
Household incomes			
Urban households (low income)	5.90	-9.76	-4.10
Urban households (middle income)	5.82	-11.63	-6.08
Urban households (high income)	8.09	-14.52	-6.75
Rural households (<0.5ha)	6.46	-5.87	0.46
Rural households (<0.5ha + income)	5.43	-6.14	-0.84
Rural households (>0.5ha but <1ha)	6.39	-5.53	0.74
Rural h'holds (>0.5ha but <1ha + income)	5.14	-5.66	-0.64
Rural households (>1ha but <8ha)	6.30	-6.11	0.06
Rural households (>8ha)	5.33	-4.89	0.34
Rural households (other)	4.78	-8.07	-3.48
Sectoral profits and government revenue			
Agriculture	44.82	-3.62	41.58
Manufacturing	8.00	-20.85	-15.32
Services	-3.45	-20.65	-23.96
Government revenue	11.25	-6.88	4.04

A conclusion from this analysis is that if there had been no export boom and the government opted to create internal balance by cutting expenditures then there would

have been a substantial contraction in the Kenyan economy. Even with the export boom, a reduction in government expenditure would have left all the households worse off due to significant contractions in nominal income.

9.4 Sensitivity Analysis of the Key Parameters of the Model

As explained in Chapter 7, due to a lack of econometric estimates of the elasticity parameters required for KEGEM implementation, values for various elasticity parameters were borrowed from previous studies. The rest of the parameters were determined by calibrating the model to the benchmark data. This section presents results from a sensitivity analysis carried out using KEGEM. The sensitivity analysis evaluate the robustness of simulation results by examining effects of the reference joint terms of trade shocks for different values of key elasticity parameters and the wage indexation parameter. The key elasticity parameters used in carrying out the sensitivity analysis are the trade elasticities. These are the elasticities of transformation that determine export supply and the Armington elasticities which influence import demand in KEGEM. The joint terms of trade simulation incorporated in all the results evaluating impacts of different policies on the outcome of external shocks. The sensitivity analysis involved changing the values of these key parameters and re-running the joint terms of trade simulation.

9.4.1 Sensitivity analysis of the elasticities of transformation

In order to evaluate the sensitivity of the results to the elasticity of transformation parameter, the simulation JTOT reported in this chapter and earlier in Chapter 8 was rerun under different values for the elasticities of transformation for the three sectors. The different values for the elasticities of transformation are shown in Table 9.11 and were determined by increasing the original values under JTOT, by 50, 75, 100, 200 and 300 per cent. The results of the combined effects of the joint terms of trade simulation for the different values of elasticities of transformation are presented in Tables 9.12 and 9.13. The JTOT simulation increases the manufactured imports prices by 12 per cent and the agricultural exports price by 25 per cent, capturing the effects of the oil-price shock and the coffee boom respectively.

	JTOT	TES1	TES2	TES3	TES4	TES5
Agriculture	1.3	1.95	2.275	2.6	3.9	5.2
Manufacturing	0.8	1.2	1.4	1.6	2.4	3.2
Services	0.3	0.45	0.525	0.6	0.9	1.2

Table 9.11: Different Values for Elasticities of Transformation Used to Re-Run theJoint Terms of Trade Simulation.

The results of the sensitivity analysis in Table 9.12 indicate that the magnitude of the elasticity of transformation has some influence on the outcome of the terms of trade shocks. As the elasticity of transformation is increased, the more expansionary is the joint terms of trade shock in terms of real GDP. In terms of sectoral output however, the sensitivity analysis shows that the 'Dutch disease' phenomenon resulting from the booming agricultural sector is more pronounced the higher the levels of the elasticity of transformation. This phenomenon is visible from the continued contraction of the production in the manufacturing sector with the observed expansion in agricultural sector output.

The decline in non-agricultural exports as the elasticity of transformation is increased imply that the extent to which Kenya as a primary commodity exporting country suffers from the 'Dutch disease' depends to some extent on the responsiveness of its primary exports to relative price changes in the export supply function. As agricultural exports increased with higher elasticities of transformation, non-agricultural exports from the manufacturing and services sectors fell. However, the fall in the non-agricultural exports was outweighed by the increase in the agricultural exports as the balance of trade improved with higher elasticities of transformation despite the increases in all imports.

JTOT TES1 TES2 TES3 TES4 TES5 Real GDP 3.23 3.90 4.14 4.33 4.80 5.00 Output Agriculture 4.98 6.66 7.36 7.98 9.92 11.28 Manufacturing 2.34 2.33 2.28 2.19 1.70 1.13 Services 1.71 1.97 2.03 2.07 2.04 1.87 Exports 20.90 Agriculture 28.16 31.24 34.02 42.91 49.35 Manufacturing -3.17 -6.23 -7.77 -9.30 -14.98 -19.90 Services 0.69 0.30 0.03 -0.26 -2.85 -1.54 Imports 5.24 6.52 7.03 7.47 8.74 9.53 Agriculture 1.01 1.92 2.08 Manufacturing 1.70 2.32 2.24 3.56 4.28 4.71 4.75 Services 4.10 4.42 Investment 2.13 2.35 2.43 2.49 2.65 2.72 Agriculture 7.71 8.54 8.83 9.07 9.66 9.92 Manufacturing 15.86 17.64 18.28 18.80 20.08 20.64 Services Employment 7.78 10.50 12.67 15.91 18.23 Agriculture 11.64 4.34 6.00 6.02 5.86 5.63 2.88 Manufacturing 2.27 2.61 2.70 2.75 2.71 2.49 Services *Employment by Category* Unskilled 4.74 5.72 6.07 6.35 7.03 7.29 4.31 4.31 4.27 Skilled 4.05 3.76 3.05 3.09 3.53 Semi-professional 3.43 3.51 3.36 2.97 Professional 2.87 3.20 3.27 3.29 3.13 2.77 Self-employed 6.10 8.04 8.83 9.54 11.69 13.15 Aggregate prices Nominal wage 1.95 2.20 2.29 2.37 2.59 2.70 -4.40 -4.94 -5.15 -5.32 -5.78 -6.03 Real wage Consumer price index 6.63 7.51 7.85 8.13 8.88 9.29 Producer price index 7.24 7.99 8.27 8.50 9.09 9.39 Consumer prices 8.95 11.13 12.01 12.79 15.11 16.65 Agriculture 9.67 10.11 10.24 10.34 10.50 10.46 Manufacturing Services 3.68 4.01 4.11 4.18 4.29 4.25 **Producer** prices 14.42 15.09 15.68 17.48 18.70 Agriculture 12.78 8.74 8.80 8.62 Manufacturing 8.02 8.51 8.65 Services 3.50 3.84 3.95 4.03 4.17 4.16 BOT (% GDP) 0.66 0.95 1.06 1.16 1.44 1.62

Table 9.12: Effects of the Terms of Trade Shocks for Different Values of the
Elasticities of Transformation (Percentage Changes From Initial
Solution)

The other variables reported in Table 9.12 are not as sensitive as the agricultural output and exports to the different values of the elasticity of transformation. For instance, employment changes follow the behaviour of outputs and exports. Hence, agricultural sector employment increases with higher levels of elasticity of transformation as would be expected from growth in agricultural output and exports. Due to the prominence of the 'Dutch disease' phenomenon, the manufacturing sector employment falls with increasing elasticities of transformation as resources, in this case labour, are diverted to the booming agricultural sector.

As would be expected, rural households income increases with higher levels of the elasticity of transformation (Table 9.13). This is as a result of the increased demand for their labour services. The urban households, contributing labour to the manufacturing and services sector experience very small increases in their incomes compared to the substantial growth in rural households income.

The general outcome of this sensitivity analysis is that the results reported in this chapter and previously in Chapter 8 are substantially robust as far as the values of elasticities of transformation used in the model are concerned. The results reported both in Tables 9.12 and 9.13 suggest that the different values in the elasticity of transformation do not significantly alter the direction the economy moves as a result of the terms of trade shock. Moreover, the magnitudes of these changes are not very different from the ones reported under JTOT column for most of the variables.

	JTOT	TES1	TES2	TES3	TES4	TES5
Labour incomes						
Unskilled labour	6.78	8.04	8.50	8.88	9.79	10.19
Skilled labour	6.08	6.60	6.71	6.74	6.44	5.84
Semi professionals	5.10	5.71	5.88	5.99	6.03	5.75
Professional workers	4.87	5.46	5.63	5.74	5.80	5.55
Self-employed	8.16	10.41	11.33	12.13	14.58	16.21
Household incomes						
Uhh1 (low income)	5.90	6.82	7.12	7.36	7.82	7.86
Uhh2 (middle income)	5.82	6.62	6.86	7.03	7.26	7.11
Uhh3 (high income)	8.09	9.57	10.10	10.52	11.54	11.93
Rhh1 (<0.5ha)	6.46	8.19	8.88	9.50	11.33	12.53
Rhh2 (<0.5ha + income)	5.43	6.72	7.23	7.66	8.90	9.65
Rhh3 (>0.5ha but <1ha)	6.39	8.13	8.84	9.46	11.34	12.58
Rhh4 (>0.5ha but < 1ha +inc.)	5.14	6.38	6.87	7.29	8.50	9.25
Rhh5 (>1ha but <8ha)	6.30	7.93	8.58	9.15	10.84	11.92
Rhh6 (>8ha)	5.33	6.75	7.32	7.82	9.31	10.29
Rhh7 (other)	4.78	5.63	5.93	6.18	6.75	6.95
Sectoral profits						
Agriculture	44.82	50.61	53.02	55.17	61.88	66.58
Manufacturing	8.00	8.86	8.70	8.28	5.13	1.07
Services	-3.45	-3.19	-3.11	-3.06	-3.03	-3.77
Government revenue	11.25	12.35	12.72	13.00	13.58	13.68

Table 9.13: Income Distribution Effects of External Shocks for Different Values of
the Elasticities of Transformation (Percentage Changes from Initial
Solution)

9.4.2 Sensitivity analysis for the Armington elasticities

The other important parameters used in KEGEM for sensitivity analysis are the Armington elasticities influencing the level of import demand. In a similar fashion to the sensitivity analysis using the elasticities of transformation, the Armington elasticities used to implement KEGEM were increased by 50, 75, 100, 200 and 300 per cent in rerunning the reference joint terms of trade simulation. The Armington elasticities used in the sensitivity analysis are shown in Table 9.14.

	JTOT	AES1	AES2	AES3	AES4	AES5
Agriculture	0.8	1.2	1.4	1.6	2.4	3.2
Manufacturing	0.6	0.9	1.05	1.2	1.8	2.4
Services	0.4	0.6	0.7	0.8	1.2	1.6

Table 9.14: Different Values for Armington Elasticities Used to Re-run the JointTerms of Trade Simulation

The simulation results for the reference joint terms of trade simulation under different values of Armington elasticities are reported in Tables 9.15 and 9.16. These results indicate that KEGEM is even less sensitive to different values of Armington elasticities compared with the elasticities of transformation. Higher elasticities of substitution between imports and domestic commodities led to an insignificant change in the real GDP. The direction of the results show that higher elasticities lead to the joint terms of trade shock being slightly more expansionary in GDP terms. However, in terms of effects of the external shocks on production, the agricultural and services sectors' production slightly declines for higher Armington elasticities. Alternatively, the manufacturing sector's production increases slightly with higher substitution elasticities. The production trend accompanying increases in the elasticities is similar for export performance. Higher Armington elasticities lead to slightly lower agricultural export expansion while manufactured exports improve by a small magnitude.

In terms of imports, the higher Armington elasticities make the negative effects of higher manufactured import prices more pronounced hence the deterioration of manufactured imports. This may explain the slight improvement in manufacturing production as domestic output in the sector increased its market share as a result of lower manufactured imports.

	JTOT	AES1	AES2	AES3	AES4	AES5
Real GDP	3.23	3.41	3.49	3.56	3.78	3.95
Output						
Agriculture	4.98	4.95	4.93	4.91	4.83	4.73
Manufacturing	2.33	2.54	2.63	2.71	3.00	3.24
Services	1.71	1.70	1.69	1.68	1.61	1.53
Exports						
Agriculture	20.90	20.88	20.87	20.86	20.82	20.80
Manufacturing	-3.17	-3.11	-3.08	-3.05	-2.95	-2.86
Services	0.69	0.67	0.66	0.64	0.57	0.48
Imports						
Agriculture	5.24	8.26	9.79	11.34	17.62	24.04
Manufacturing	1.01	0.35	0.04	-0.25	-1.35	-2.32
Services	3.56	4.41	4.84	5.27	6.99	8.70
Investment						
Agriculture	2.13	2.15	2.15	2.16	2.18	2.20
Manufacturing	7.71	7.78	7.81	7.84	7.92	7.96
Services	15.86	16.02	16.08	16.14	16.31	16.41
Employment						
Agriculture	7.78	7.73	7.70	7.67	7.53	7.37
Manufacturing	6.00	6.53	6.78	7.00	7.78	8.41
Services	2.27	2.26	2.25	2.23	2.14	2.03
Employment by Category						
Unskilled	4.74	4.83	4.87	4.90	4.99	5.03
Skilled	4.05	4.28	4.38	4.47	4.76	4.97
Semi-professional	3.09	3.17	3.21	3.23	3.30	3.32
Professional	2.87	2.93	2.95	2.96	3.00	2.98
Self-employed	6.10	6.07	6.06	6.04	5.94	5.82
Aggregate prices						
Nominal wage	1.95	1.96	1.97	1.97	1.99	2.00
Real wage	-4.40	-4.43	-4.44	-4.45	-4.49	-4.51
Consumer price index	6.63	6.68	6.70	6.72	6.78	6.81
Producer price index	7.24	7.31	7.34	7.36	7.43	7.48
Consumer prices						
Agriculture	8.95	9.04	9.08	9.12	9.23	9.30
Manufacturing	9.67	9.60	9.56	9.52	9.38	9.23
Services	3.68	3.77	3.81	3.85	3.97	4.07
Producer prices						
Agriculture	12.78	12.77	12.76	12.75	12.71	12.66
Manufacturing	8.02	8.23	8.32	8.40	8.69	8.92
Services	3.50	3.54	3.56	3.57	3.60	3.62
BOT (% GDP)	0.66	0.83	0.91	0.98	1.24	1.44

Table 9.15: Effects of the Terms of Trade Shocks for Different Values of the
Armington Elasticities (Percentage Changes From Initial Solution)

As for the performance of other variables in the model, their sensitivity to changes (increases) in Armington elasticities was limited. The general direction of the changes in the economy as a result of the increases in the elasticities is similar to the effect witnessed on real GDP. Hence, investment, employment and prices have a positive relationship with the magnitude of the Armington elasticities. However, agricultural and services sectors' demand for labour from the joint terms of trade shock falls with an increase in the elasticities. Hence a slightly poor performance of self employed labour is observed.

The conclusion from these results regarding the sensitivity of the model to different values for Armington elasticities is that the results are robust since there are very small changes in the magnitudes of endogenous variables from the joint terms of trade simulation. This conclusion is supported by results on income distribution effects of the same shocks under different values of Armington elasticities shown in Table 9.16. The changes in magnitudes by which household incomes respond to the joint terms of trade simulation under different values of Armington elasticities are insignificant compared to the results reported under the JTOT column.

	JTOT	AES1	AES2	AES3	AES4	AES5
Labour incomes						
Unskilled labour	6.78	6.89	6.93	6.97	7.08	7.12
Skilled labour	6.08	6.32	6.43	6.52	6.84	7.07
Semi professionals	5.10	5.20	5.24	5.27	5.35	5.38
Professional workers	4.87	4.94	4.97	4.99	5.04	5.04
Self-employed	8.16	8.15	8.14	8.13	8.04	7.93
Household incomes						
Uhh1 (low income)	5.90	6.03	6.08	6.13	6.26	6.34
Uhh2 (middle income)	5.82	5.95	6.00	6.05	6.18	6.25
Uhh3 (high income)	8.09	8.18	8.21	8.24	8.29	8.27
Rhh1 (<0.5ha)	6.46	6.46	6.46	6.45	6.40	6.32
Rhh2 (<0.5ha + income)	5.43	5.46	5.47	5.48	5.48	5.44
Rhh3 (>0.5ha but <1ha)	6.39	6.38	6.37	6.36	6.30	6.21
Rhh4 (>0.5ha but < 1ha +inc.)	5.14	5.17	5.17	5.18	5.17	5.13
Rhh5 (>1ha but <8ha)	6.30	6.31	6.31	6.31	6.27	6.20
Rhh6 (>8ha)	5.33	5.33	5.33	5.33	5.28	5.22
Rhh7 (other)	4.78	4.84	4.87	4.89	4.94	4.96
Sectoral profits						
Agriculture	44.82	44.68	44.62	44.54	44.25	43.93
Manufacturing	8.00	10.17	11.16	12.08	15.30	17.94
Services	-3.45	-3.64	-3.73	-3.83	-4.22	-4.62
Government revenue	11.25	11.31	11.33	11.35	11.38	11.37

Table 9.16:Income Distribution Effects of the External Shocks for Different
Values of the Armington Elasticities (Percentage Changes from
Initial solution)

9.4.3 Sensitivity analyses of the wage indexation parameter

Dixon et al. (1982) observe that because of institutional arrangements under which wages are determined in Australia, it is of interest to analyse effects of policy or other changes under various assumptions about wage indexation. KEGEM adopts the same view with regard to the Kenyan economy. The involvement of the government through a tri-partite agreement ensures that there is some level of control on wages to forestall any inflation-wages spiral effect. For this reason, it was important to investigate the sensitivity of the joint terms of trade shock to different levels of wage indexation. To do this, the reference joint terms of trade simulation was re-run with the wage indexation parameter fixed at 0, 0.7 and 1.0. The results from these simulations are reported in

Tables 9.17 and 9.18. The JTOT column in the two tables indicate the results reported in earlier sections of this chapter and previously in Chapter 8 based on a 30 per cent wage indexation.

The results show that if money wages were fixed by setting the indexation parameter at zero, then the reference joint terms of trade simulation would have been more expansionary and less inflationary (column WIS1 as compared to column JTOT). The employment gains from the joint terms of trade shock would have been higher since fixing money wages meant that the expanding agricultural sector would have been able to hire more labour as a result of the export boom. These results differ significantly with the outcome of the external shocks if the real wages had been fixed instead by setting the indexation parameter at one. In this latter case, all the gains that could have been made from the export boom are completely wiped out as the economy contracts in real GDP terms. The joint terms of trade changes would also have been very inflationary (column WIS3). Employment growth would have been lower than one percentage point as it would have been more expensive for producers to hire more workers given the large increase in money wages.

The importance of the assumption regarding wage indexation to household incomes is evident from Table 9.18. Where money wages are fixed through an indexation parameter of zero, then nominal household incomes would have been substantially lower than when the money wages are indexed fully to the consumer price index.

	WIS1	ITOT	WIS2	WIS3
Real GDP	3.86	3.23	1.87	-0.08
Output	5.00	5.45	1.07	-0.00
Agriculture	5.77	4.98	3.24	0.64
Manufacturing	2.69	2.33	1 54	0.37
Services	1.99	1.71	1.08	0.14
Exports				••••
Agriculture	22.97	20.90	16.32	9.54
Manufacturing	-2.29	-3.17	-5.15	-8.10
Services	1.35	0.69	-0.76	-2.95
Imports				
Agriculture	4.69	5.24	6.49	8.47
Manufacturing	0.81	1.01	1.51	2.33
Services	3.16	3.56	4.47	5.89
Investment				
Agriculture	2.22	2.13	1.93	1.65
Manufacturing	8.04	7.71	6.97	5.93
Services	16.58	15.86	14.30	12.11
Employment				
Agriculture	9.04	7.78	5.01	0.97
Manufacturing	6.95	6.00	3.93	0.94
Services	2.65	2.27	1.43	0.18
Employment by Category				
Unskilled	5.51	4.74	3.05	0.59
Skilled	4.70	4.05	2.62	0.54
Semi-professional	3.59	3.09	1.98	0.34
Professional	3.33	2.87	1.83	0.30
Self-employed	7.09	6.10	3.92	0.74
Aggregate prices				
Nominal wage	0.00	1.95	6.46	13.72
Real wage	-5.17	-4.40	-2.65	0.00
Consumer price index	5.46	6.63	9.36	13.72
Producer price index	6.23	7.24	9.61	13.43
Consumer prices				
Agriculture	7.63	8.95	12.02	16.96
Manufacturing	9.02	9.67	11.18	13.57
Services	2.33	3.68	6.82	11.83
Producer prices				
Agriculture	12.04	12.78	14.51	17.37
Manufacturing	7.22	8.02	9.89	12.88
Services	2.21	3.50	6.50	11.33
BOT (% GDP)	1.18	0.66	-0.50	-2.28

 Table 9.17: Effects of the Terms of Trade Shocks for Different Values of the Wage Indexation Parameter^a (Percentage Changes From Initial Solution)

^a WIS1 = 0 per cent wage indexation; JTOT = 30 per cent wage indexation; WIS2 = 70 per cent wage indexation; and WIS3 = 100 per cent wage indexation.

	WIS1	JTOT	WIS2	WIS3
Labour incomes				
Unskilled labour	5.51	6.78	9.71	14.38
Skilled labour	4.70	6.08	9.25	14.33
Semi professionals	3.59	5.10	8.57	14.10
Professional workers	3.33	4.87	8.41	14.06
Self-employed	7.09	8.16	10.64	14.55
Household incomes				
Uhh1 (low income)	4.64	5.90	8.81	13.46
Uhh2 (middle income)	4.37	5.82	9.18	14.52
Uhh3 (high income)	6.24	8.09	12.37	19.17
Rhh1 (<0.5ha)	5.57	6.46	8.52	11.78
Rhh2 (<0.5ha + income)	4.56	5.43	7.45	10.64
Rhh3 (>0.5ha but <1ha)	5.53	6.39	8.35	11.47
Rhh4 (>0.5ha but < 1ha +inc.)	4.33	5.14	7.01	9.98
Rhh5 (>1ha but <8ha)	5.39	6.30	8.39	11.71
Rhh6 (>8ha)	4.59	5.33	7.04	9.74
Rhh7 (other)	3.74	4.78	7.18	11.01
Sectoral profits				
Agriculture	47.68	44.82	38.50	29.22
Manufacturing	7.94	8.00	8.34	9.40
Services	-0.89	-3.45	-9.19	-17.91
Government revenue	11.31	11.25	11.18	11.21

Table 9.18:Income Distribution Effects of the External Shocks for Different
Values of the Wage Indexation Parameter^a (Percentage Changes
from Initial Solution)

^a WIS1 = 0 per cent wage indexation; JTOT = 30 per cent wage indexation; WIS2 = 70 per cent wage indexation; and WIS3 = 100 per cent wage indexation.

The general conclusion that can be drawn from these results showing the sensitivity of the results to wage indexation is that the level of indexation chosen matters significantly. This means that for the results to be valid, it is important to choose a value of the indexation parameter that would closely reflect the institutional arrangements under which wages are formed. The results reported in this study where a 30 per cent indexation is adopted are felt to be a good representation of the wage bargaining arrangements in Kenya. Real wages have been progressively falling in the country due to failure of the money wages to keep up with the rate of inflation. Hence, a 30 per cent indexation is considered a good estimate which removes the possibility of using the unreasonable assumption that money wages are fully fixed in the economy.

9.5 Concluding Remarks

In this chapter, alternative policies to the ones the Kenyan government pursued, as discussed in Chapter 8, have been analysed. A sensitivity analysis of key parameters in the model has also been undertaken. With regard to alternative policies, in general terms, the analysis shows that if the government had decided to revalue the currency then the gains from the existing export boom would have been almost wiped out. However, if the government had considered the export boom to be a transitory effect and devalued the currency then the gains from the gains from the positive terms of trade shock would have been maximised.

With regard to fiscal policy, the results indicate that a fiscal policy implemented through either lower import tariffs or indirect taxes accompanied with concomitant reductions in government spending would have reduced gains to the economy from the external shocks in the short term. Lower growth in the economy and lower increases in nominal incomes of households would have occurred if government had pursued such a policy. It seems safe to conclude that cuts in government spending accompanying these tax reductions caused significant reductions in expansion of the economy that should have been expected from the terms of trade shocks. In other words, cuts in government spending needed to maintain fiscal balance made it difficult for lower import tariffs and indirect taxes to maximise the positive impacts of the external shocks. However, the need for fiscal balance to be maintained, or at least not made worse, needs to be underscored as this is an important constraint for the government if these policies are to be implemented. The government must be willing to lower spending if tariffs or indirect taxes are to be cut.

With regard to sensitivity analysis for key parameters, the simulation results of the key reference joint terms of trade shock accompanying evaluation of actual and alternative policies in this chapter and previously in Chapter 8 can be said to be robust with respect to the Armington elasticities. The reference terms of trade simulation results did not vary substantially under different values. The robustness of the results towards elasticities of transformation is also acceptable, as the direction of the changes in the economy as a result of the external shocks does not change with increases in their values. However in terms of magnitudes, one important result is that the prominence of the

'Dutch disease' phenomenon depends on the level of elasticities of transformation chosen. Higher elasticities of transformation for a primary commodity exporting economy like Kenya magnify the 'Dutch disease' which results when a primary commodity producing sector like agriculture is booming.

Due to the robustness of the results to the key trade elasticities and given the 30 per cent wage indexation is reasonable, the conclusions and hence policy implications to be drawn from the results can be taken with some confidence. However, before outlining the conclusions and policy implications of the empirical results, the issue of World Bank and IMF policy recommendations needs to be addressed. This is the focus of the next chapter.

10. Terms of Trade Shocks and Structural Adjustment Policies in mid-1980s: Simulation Results

10.1 Introduction

The previous analysis and discussion of results explained the economic events that faced the Kenyan economy in the mid-1970s. Chapter 8 explained the effects of the terms of trade shocks that affected the economy after the oil-price shock and the boom in the agricultural sector as a result of the rise in coffee and tea prices. The chapter also analysed the effects of prevailing government policies on the outcome of the external shocks. This was followed in Chapter 9 by an analysis of the likely effects of alternative government policies on the outcome of the external shocks.

This chapter uses an updated database for KEGEM to analyse two issues relevant to the Kenyan economy in the 1980s. First, there were movements in the world commodity markets in the mid-1980s that may have had a bearing on the economy. The effects of these external events are analysed in this chapter. The question is whether the Kenyan economy was as vulnerable to external shocks in the 1980s as was the case in the 1970s as discussed in Chapter 8.

The mid-1980s was the start of a new policy direction for the Kenya government as it started considering implementing the structural adjustment and macroeconomic stabilisation policies prescribed by the World Bank and the International Monetary Fund (IMF). Most of the recommended policy changes were not implemented until towards the end of the 1980s even after being identified by the government in *Sessional Paper Number 1 of 1986 on Economic Management for Renewed Growth* (Kenya, Republic of 1986). It was actually at the beginning of this decade that the government took seriously the need for economic reforms. For this reason, the policy question addressed is mainly what the effects would have been if the government had implemented some of the policies recommended by the World Bank and the IMF. Since the commodity price changes that occurred in 1986 were very short-lived, the policy evaluations will be carried out without considering terms of trade changes.

In order for the events in the 1980s and the likely effects of particular policies to be analysed, there was a need to update 1976 input-output tables and the social accounting matrix. The year 1986 was chosen as the new base year as this is when more recent input-output tables and social accounting matrix became available¹.

The chapter contains three sections. Section 10.2 analyses the effects of two external shocks that faced the Kenyan economy in the mid-1980s. Then Section 10.3 analyses what effects some of the policy recommendations made to the Kenyan government by the World Bank and the IMF might have had on the Kenyan economy. The chapter concludes with Section 10.4.

10.2 Analysis of Effects of the External Shocks in the mid-1980s on the Kenyan Economy

The Kenyan economy as discussed in Chapter 8 was very sensitive to external shocks in the 1970s. This makes it important to understand whether this had changed by analysing how the economy was affected by the external shocks of the 1980s. In 1986, there was a severe drought in Brazil which raised world coffee prices, Kenya's principal export commodity at the time, by nearly 40 per cent. The suspension of coffee quotas by the International Coffee Organisation that followed also helped Kenya increase the quantity of coffee exports. Consequently, coffee export earnings grew by 68 per cent. At the same time, the decline in world oil prices helped Kenya lower the import bill by almost 37 per cent (Kenya, Republic of 1988).

The resultant favourable terms of trade are simulated using the new database whose base solution is 1986. The simulation of these terms of trade effects is through the changes in world prices of agricultural exports and manufactured imports. The magnitudes for the two shocks were computed from price index information in Arne and Njuguna (1992). The mini-coffee boom effect is simulated through a 7.6 per cent increase in world prices

¹ The 1986 input-output tables are an update of the 1976 tables using the RAS technique undertaken by the Long Range Planning Unit (LRPU) of the Ministry of Economic Planning contained in Damus and Johnson (1989). 1986 social accounting matrix utilising the 1986 input-output tables was prepared in the same unit and are contained in Damus (1990). The 1986 database has not been utilised in any CGE model besides the attempt by LRPU (Damus et. al. 1990).

of agricultural exports. The collapse in oil-prices is simulated through a 5.7 per cent reduction of world manufactured import prices. The results showing the effects of these favourable terms of trade are reported under column CTOT in Tables 10.1 and 10.2. The simulation is defined as follows:

• CTOT = External shocks through 7.6 per cent increase in agricultural export prices and 5.7 per cent fall in manufactured imports prices.

The results in Table 10.1 show that the favourable terms of trade the economy enjoyed in 1986 resulted in a 2.3 per cent increase in real GDP. However, the output response was more pronounced in the manufacturing sector than in the other two sectors. In the manufacturing sector producer prices increased 2.1 per cent and may have contributed to output growth. More importantly, lower manufactured import prices may have contributed most to the 1.5 per cent expansion in the manufacturing sector. The miniboom in the agricultural sector contributed only to a 0.2 per cent expansion in agricultural output. This is despite the 5.2 per cent increase in agricultural producer prices. This may be explained by the much lower proportion of coffee in Kenyan exports despite the fact that it was still the principal export commodity. Hence, the 3.2 per cent increase in agricultural exports did not contribute much to agricultural output. The manufacturing sector's export supply was stable and this implies that the output expansion was domestically absorbed rather than exported. The boom in the agricultural sector may also have contributed to an expansion in domestic demand hence the stability of manufactured exports. The services sector benefited from the favourable terms of trade being enjoyed by the other two sectors with output expanding by 0.9 per cent.

Lower prices of manufactured imports led to a 6.4 per cent increase in demand for manufactured imports. This must have contributed to the observed expansion in manufacturing output through intermediate capital imports. The agricultural and services imports were commensurate with their production levels.

CI	ТОТ
Real GDP 2.	.28
Output	
Agriculture 0.	.21
Manufacturing 1.	.47
Services 0.	.93
Exports	
Agriculture 3.	.23
Manufacturing 0.	.00
Services 0.	.46
Imports	
Agriculture 1.	.66
Manufacturing 6.	.42
Services 1.	.70
Investment	
Agriculture 1.	.19
Manufacturing 3.	.58
Services 11	.05
Employment	
Agriculture 2.	.14
Manufacturing 5.	.00
Services 1.	.69
Employment by Category	
Unskilled 2.	.68
Skilled 3.	.17
Semi-professional 2.	.29
Professional 2.	.14
Self-employed 2.	.00
Agoregate prices	
Nominal wage 0.	.67
Real wage -1	.56
Consumer price index 2.	.27
Producer price index 2.	.57
Consumer prices	
Agriculture 5	08
Manufacturing 0	74
Services 1	79
Producer prices	
Agriculture 5	.21
Manufacturing 2	.14
Services 1	.61
Balance of trade (% of base year GDP)	.17

Table 10.1:Short Run Effects of the External Shocks in the mid-1980s on the
Kenyan Economy (Percentage Changes from Initial Solution).

Demand for agricultural and service imports increased by 1.7 per cent. In overall terms, the increase in import demand was fully outweighed by agricultural export performance and hence an improvement in trade balance equivalent to 1.2 per cent of base year GDP.

The contribution of favourable external shocks to investment was significant. The savings made by the economy through the lower import bill and extra export earnings from higher prices in agriculture meant that there were more funds available for investment. However, due to the higher proportion² of total savings allocated to the services sector, it is not surprising that it benefited most. Investment in the sector grew 11.1 per cent notwithstanding that the agricultural and manufacturing sectors contributed to the improvement in total savings. Of these two, the manufacturing sector's investment grew by 3.6 per cent while investment in the agricultural sector increased 1.2 per cent. This disparity in the allocation of savings to the three sectors raises again the question of whether something could have been done to ensure that investment took place in the most productive sectors. Kenya is very much an agricultural economy hence a policy that actively encouraged allocation of savings to the agricultural sector and also to some extent to the manufacturing sector might have been preferred. Such a policy might encourage capital investments to produce real goods in the future.

However, in terms of employment, the two sectors enjoying favourable terms of trade experienced higher labour demand than the services sector where most of the investment took place. The manufacturing sector's employment demand grew by five per cent and, for the agricultural sector the demand was up by 2.1 per cent while in the services sector it grew by 1.7 per cent. Labour demands were not discouraged by the 0.7 per cent rise in nominal wages. This slight rise in the nominal wage is a result of the 30 per cent indexation to the general price level captured through the CPI which rose by 2.3 per cent. The change in the wage level is not determined by the level of employment as closure has endogenous labour demand with fixed nominal wages. However, indexation to the CPI allows the nominal wage to rise partially. As a consequence of this partial indexation, the results show 1.6 per cent decline in real wages in the face of rising CPI.

² The exogenous sectoral shares showing the proportion of total savings going to each of the three sectors in 1986 as computed from national accounts information were as follows: 7.81 per cent to agriculture, 23.16 per cent to manufacturing and 69.03 per cent to the services sector.

Employment demands in the three sectors suggest that the manufacturing sector in Kenya, given the right conditions, seems to have a significant potential to generate employment. The five per cent increase in labour demand resulting from the favourable terms of trade points to the capacity to absorb more workers by the manufacturing sector. This would lessen the burden placed on the agricultural sector of being the main employer in the economy.

The demand for labour at the sectoral level, when considered under different labour categories, gives a clearer picture of the manufacturing sector's potential for faster job creation. The demand for skilled worker services increased by 3.2 per cent and for unskilled workers by 2.7 per cent. These are the two categories of labour that benefit most from growth in manufacturing.

Unlike in the manufacturing sector, the boom in the agricultural sector contributed to a smaller increase (two per cent) in demand for self-employed labour. This slow growth in self-employed and family labour employment can be explained by the earlier observation that coffee accounted for a smaller proportion of Kenya's principal export commodities. Hence, the boom in coffee prices could not have as high a multiplier effect on jobs creation as in the 1970s. The increase in demand for services of semi-professional and professional workers by 2.3 per cent and 2.1 per cent respectively also suggests the potential of the services sector to generate employment. This is not surprising as it is what would be expected in a developing economy like Kenya.

The favourable terms of trade also had mixed results for income distribution (Table 10.2). The nominal labour incomes for unskilled, skilled, semi-professional and professional workers increased by between 2.8 per cent to 3.9 per cent. The best performance is recorded by skilled workers. The self-employed workers registered an increase of 2.7 per cent. The performance in the earnings of different labour categories was in line with the effects of the terms of trade on different sectors. Thus, good performance in the first four labour categories was a result of the growth in the manufacturing sector. The agricultural sector's labour earnings measured through income of the self-employed increased by a much smaller margin commensurate with the slight increase in agricultural output.

	СТОТ
Labour incomes	
Unskilled labour	3.37
Skilled labour	3.86
Office workers and semi-professionals	2.98
Professional workers	2.83
Self-employed and family labour	2.69
Household incomes	
Urban households (low income)	2.98
Urban households (middle income)	2.44
Urban households (high income)	1.22
Rural households (<0.5ha)	1.65
Rural households (<0.5ha + income)	1.45
Rural households (>0.5ha but <1ha)	1.46
Rural h'holds (>0.5ha but <1ha + income)	1.44
Rural households (>1ha but <8ha)	1.72
Rural households (>8ha)	0.96
Rural households (other)	1.36
Sectoral profits and government revenue	
Agriculture	7.02
Manufacturing	26.21
Services	2.94
Government revenue	3.99

 Table 10.2:
 Short Run Impacts of External Shocks in mid-1980s on Income

 Distribution in Kenya (Percentage Changes from Initial Solution).

When the labour of different labour categories are distributed to various household groups, it emerges that in nominal terms, all households are better off. Low and middle income urban households register the highest increases with three and 2.4 per cent respectively. These results are due to the better performance of the manufacturing sector which employs workers from these households. Rural households' nominal incomes also rose but by smaller amounts compared to the two urban household categories.

As for distribution of profits, lower manufactured import prices greatly reduced the manufacturing sector's costs. Hence, the sector's nominal profits rose by 26.2 per cent. The agricultural sector's profitability increased by seven per cent and that of the services sector by 2.9 per cent. Higher profits in the three sectors meant higher tax income for the government which experiences a four per cent increase in revenue.

10.3 An Analysis of the World Bank and IMF Policy Recommendations in the 1980s

In this section, some of the policies that the two Bretton Wood institutions recommended to the Kenyan government to help it deal with internal and external imbalances in the 1980s are analysed. As explained in Section 10.1, the Kenyan government did not immediately implement these recommendations even after drawing up a policy framework (Kenya, Republic of 1986). To date, the Kenyan government has implemented only part of these recommendations. The object of this section is to investigate the effects policies were likely to have on the Kenyan economy. The policy analyses look at the impacts of alternative fiscal austerity measures to bring the existing budget deficit under control. The analysis also investigates the question of trade liberalisation through lower tariffs which was also recommended by World Bank and IMF under structural adjustment programs. Lastly, the issue of foreign debt is addressed by examining the effects of reduced foreign capital inflows.

10.3.1 Adjustment through fiscal austerity measures

Fiscal adjustment was one of the main instruments recommended by IMF and World Bank under structural adjustment policies. A key fiscal austerity measure of the adjustment program was to freeze public wages. Moreover, the government was encouraged to reduce spending overall. The alternative means of fiscal adjustment available to the government was through taxation.

From the 1986 SAM information, the government had negative savings equivalent to Kshs 1496.2 million (Damus 1990). This indicates that the recommendation to the government to address the existing budget deficit was relevant. The simulations in this sub-section examine the effect that the three fiscal measures that addressed the government's negative savings would have had on the economy had the government implemented them. First, an expenditure cut through a reduction in government spending is simulated. A reduction of government spending by Kshs 1496.2 million which meant a 6.85 per cent reduction in total government expenditure. Second, the implication of a policy of fiscal austerity through higher indirect taxes is investigated. The higher indirect taxes are supposed to raise Kshs 1496.2 million as additional

government revenue. This means raising pre-simulation indirect taxes by 13.27 per cent in each of the three sectors. Third, a simulation is carried out to investigate the implication of a policy of fiscal austerity through higher direct (corporate profit) taxes. This is taken as an alternative to the two fiscal measures described above and, like the indirect taxes, is intended to raise Kshs 1496.2 million as extra government revenue. This was achieved by raising pre-simulation direct tax rates for firms by 20.21 per cent and a similar increase to direct taxes paid by middle and high income urban households together with rural households classified as 'other'. These simulations are as follows:

- FISC1 = Fiscal austerity through 6.85 per cent reduction in government spending.
- FISC2 = Fiscal austerity through 13.27 per cent increase in across the board in indirect taxes.
- FISC3 = Fiscal austerity through 20.21 per cent increase in direct taxes of the firms in the three sectors, middle and high income urban households and rural households categorised as 'other'.

The simulation results for the three fiscal austerity measures are reported in Tables 10.3 and 10.4. One clear outcome of the simulations is that a fiscal austerity measure of reducing government spending has a more significant impact on the economy than either of the two tax measures. There are significant costs in terms of GDP growth, investment and unemployment due to a reduction in government spending. Thus, reduced government spending contributed to a 1.5 per cent contraction in the real GDP. The measure is also deflationary with the consumer price index falling by three per cent. As expected, reduced government spending negatively affects domestic production hence the contraction in output for the three sectors. The services sector is worst affected with output falling by 2.7 per cent. The agricultural sector's output falls marginally by 0.02 per cent. Of the two tax measures, the increase in direct taxes (column FISC3) has a larger effect compared to the increase in indirect taxes (column FISC2). An increase in direct taxes led to a 0.4 per cent contraction in real GDP while the effect of the indirect taxes increase on the real GDP was a 0.2 per cent fall. Outcome on sectoral output showed that direct taxes had more or less the same effects as indirect taxes on the agricultural and manufacturing sectors.

The fiscal austerity measure of reducing government spending also had the greatest impact in terms of trade performance. There was an increase in agricultural and manufacturing exports as a result of reduced government spending. The increase in exports can be attributed to the reduced cost of production as illustrated by the fall in the CPI. This was accompanied by a reduction in imports as reduced government spending dampens the economy leading to an overall fall in demand for goods and services imports. Hence an improvement in the trade balance which is equivalent to 0.6 per cent of 1986 GDP is shown in the results. An increase in direct taxes also led to a fall in demand for imports hence an improvement in the trade balance. Direct taxes affect disposable income available to households for consumption purposes hence increasing them leads to a fall in final imports for consumption. However, an indirect taxes, especially in manufacturing sector, contributes to the worsening in trade balance.

	FISC1	FISC2	FISC3
Real GDP	-1.46	-0.20	-0.44
Output			
Agriculture	-0.02	-0.03	-0.02
Manufacturing	-1.07	-0.48	-0.54
Services	-2.70	-0.31	-0.68
Exports			
Agriculture	1.21	0.10	0.61
Manufacturing	1.15	-1.62	0.40
Services	-1.65	-0.43	-0.36
Imports			
Agriculture	-1.82	-0.21	-0.94
Manufacturing	-2.91	0.50	-1.33
Services	-4.38	-0.10	-1.20
Investment			
Agriculture	-0.47	0.23	-0.13
Manufacturing	-1.40	0.69	-0.38
Services	-4.12	2.07	-1.12
Employment			
Agriculture	-0.23	-0.27	-0.22
Manufacturing	-3.48	-1.59	-1.77
Services	-4.78	-0.55	-1.22
Employment by Category			
Unskilled	-4.14	-0.84	-1.32
Skilled	-4.18	-1.01	-1.46
Semi-professional	-4.53	-0.74	-1.32
Professional	-4.59	-0.69	-1.29
Self-employed	-3.65	-0.55	-1.02
Aggregate prices			
Nominal wage	-0.91	0.16	-0.34
Real wage	2.16	-0.37	0.79
Consumer price index	-3.01	0.53	-1.12
Producer price index	-2.85	0.60	-1.02
Consumer prices			
Agriculture	-2.11	-0.36	-1.07
Manufacturing	-2.87	1.49	-1.14
Services	-3.48	0.45	-1.13
Producer prices			
Agriculture	-0.93	-0.10	-0.48
Manufacturing	-3.07	1.55	-1.32
Services	-3.60	0.43	-1.10
Balance of trade (% of base year GDP)	0.55	-0.19	0.28

Table 10.3: Impacts of Fiscal Austerity Measures on the Kenyan Economy in the
mid-1980s (Percentage Changes from Initial Solution).

The reduction in indirect taxes have the best outcomes in terms of investment. All three sectors registered increases in investment. The most surprising result is the one on reduced government spending. A cut in public expenditure is meant to free up funds for investment. However, this did not happen as investment actually fell as a result of reduced government spending. This can possibly be explained by the slump the economy goes into as a result of less government expenditure. The fall in investment arising from increased direct taxes can be explained by the fall in household savings.

The three fiscal austerity measures depress the level of employment in the economy. However, the lower government spending caused the most reduction in employment followed by the effect of increased direct taxes. Cuts in government spending mostly reduce demand for semi-professional and professional labour as the government is a major employer of these categories. On the other hand, the indirect and direct taxes affect mainly the unskilled and skilled workers. These results are significant since the government policy can be formulated targeting creation of job opportunities for particular types of labour. Fiscal austerity measures through reduced government spending would affect employment of professional workers. Indirect and direct tax increases would impact more on skilled workers. However, in general terms, if the government wished to fix its budget deficit problem, the results in this simulation indicate that raising indirect taxes would have the least effect on employment demand.

As pointed out previously, the cut in government spending is highly deflationary. The results also show that an increase in direct taxes are also deflationary. This is attributable to depressed demand associated with reduced disposable income for households and reduced after-tax profits for firms. Indirect taxes are, as expected, inflationary. Basically, what these results point to is the need for a trade-off between policy instruments for government when formulating fiscal policy.

In terms of effect of the three fiscal policy measures on income distribution (Table 10.4), all of them led to lower nominal incomes for various households. The urban households were hit hard by the reduction in government spending. However, this was mainly for the lower and middle income urban households. The effects of indirect and direct taxes on income were not as significant as with the government spending. However, in both cases urban households were worse off compared with rural households in general.

Indirect tax measures seem to be the most appropriate policy in terms of household incomes. However, the cost of living fell for everybody through the price decrease due to the deflationary nature of the austerity measures resulting from reduced government spending and higher direct taxes.

	FISC1	FISC2	FISC3
Labour incomes			
Unskilled labour	-5.01	-0.68	-1.65
Skilled labour	-5.06	-0.85	-1.79
Office workers and semi-professionals	-5.40	-0.58	-1.65
Professional workers	-5.46	-0.53	-1.63
Self-employed and family labour	-4.53	-0.39	-1.36
Household incomes			
Urban households (low income)	-4.50	-0.61	-1.48
Urban households (middle income)	-3.99	-0.49	-1.27
Urban households (high income)	-2.18	-0.23	-0.66
Rural households (<0.5ha)	-2.74	-0.26	-0.83
Rural households (<0.5ha + income)	-2.34	-0.26	-0.73
Rural households (>0.5ha but <1ha)	-2.46	-0.22	-0.74
Rural h'holds (>0.5ha but <1ha + income)	-2.33	-0.26	-0.73
Rural households (>1ha but <8ha)	-2.82	-0.28	-0.87
Rural households (>8ha)	-1.58	-0.15	-0.48
Rural households (other)	-2.28	-0.26	-0.72
Sectoral profits and government revenue			
Agriculture	-0.55	-0.42	-0.36
Manufacturing	-15.57	-13.36	-8.06
Services	-7.74	-1.40	-1.97
Government revenue	-4.77	7.35	5.30

Table 10.4:Impacts of Fiscal Austerity Measures on Income Distribution
(Percentage Changes from Initial Solution).

10.3.2 Adjustment through trade liberalisation

Trade liberalisation was another important component of the government's macroeconomic reform program. In this experiment, the model is used to determine the effects of reducing import tariffs to 10 per cent for the agricultural and manufacturing sectors from their pre-simulation levels. Three simulations are undertaken. The first represents a rationalisation in the level of tariffs which are a protection measure *ceteris*

paribus. This involved reducing tariffs for agricultural imports from 16.37 per cent and for manufactured imports from 25.24 per cent to 10 per cent. Since trade liberalisation worsens the government fiscal position, the revenue lost from trade liberalisation is replaced by two options in the next two simulations. The first option, implemented through the second simulation, is to raise the indirect tax rate to keep the deficit of the government constant. This required accompanying the tariff reductions in the first simulation with a 15.65 per cent increase in indirect taxes for the three sectors. The second option recognises that trade reform in sub-Saharan Africa is often accompanied by increased foreign capital inflows, mainly through official grants and loans from bilateral and multilateral donors to support the policy changes. Therefore, trade liberalisation is accompanied by an increase in foreign capital inflows of 52.77 per cent in the third simulation. The three simulations can be summarised as follows:

- TRAD1 = Trade liberalisation through 38.92 per cent decrease in agricultural sector tariffs and 60.38 per cent reduction of manufactured imports tariffs. This leads to a uniform 10 per cent tariff level for the two sectors from 16.37 per cent and 25.24 per cent for agricultural and manufacturing sector respectively.
- TRAD2 = Trade liberalisation accompanied with a 15.65 per cent increase in indirect taxes. The increase in indirect taxes covers the government revenue short-fall from lower import duty collections.
- TRAD3 = Trade liberalisation accompanied with a 52.77 per cent increase in foreign capital inflow as aid to support the reform measure.

The results for these simulations are reported in Tables 10.5 and 10.6. The results for a policy of trade liberalisation alone (column TRAD1, Table 10.5) indicate that the Kenyan economy stood to gain from this adjustment measure. A 0.8 per cent growth in real GDP resulted when the tariffs in both the agricultural and manufacturing sectors were reduced to 10 per cent from their previous levels. However, output fell in the manufacturing and services sectors but rose marginally in the agricultural sector. This response is as would be expected since lower tariffs normally hurt import competing sectors such as manufacturing but have a positive impact on export producing sectors like agriculture.

There was a positive impact from trade liberalisation on exports as the three sectors showed increases in export supply, the highest being 3.4 per cent in the manufacturing sector followed by agriculture whose exports increased 1.2 per cent. The increase in manufactured exports in the face of a general fall in manufacturing sector's output suggests the possibility of a shift in the product mix. That is, import substitution production may have fallen while manufactured exports rose with trade liberalisation. The lowering of tariffs did not lead to an inflow of imports. In fact, agricultural import demand rose by only 2.8 per cent. Demand for manufacturing imports rose by 0.6 per cent. The net effect of trade liberalisation was an improvement in the trade balance equivalent to 2.2 per cent of the base year GDP.

When the trade liberalisation measure was accompanied by an increase in indirect taxes, real GDP increase is much smaller (half a percentage point, see column TRAD2 of Table 10.5). The effect on output of this policy would have been worse compared to the sole trade liberalisation (column TRAD1, Table 10.5). The increased costs through higher indirect taxes certainly meant larger reductions in production, especially in the manufacturing sector. Agricultural output was not affected in any significant way by raising both indirect taxes and undertaking some trade liberalisation. The improvement in the trade balance was slightly smaller as a result of raising indirect taxes.

	TRAD1	TRAD2	TRAD3
Real GDP	0.79	0.48	1.79
Output			
Agriculture	0.06	0.03	0.07
Manufacturing	-2.31	-2.97	-0.37
Services	-0.81	-1.20	0.17
Exports			
Agriculture	1.25	1.40	0.32
Manufacturing	3.41	1.43	2.58
Services	0.22	-0.30	0.57
Imports			
Agriculture	2.85	2.55	4.29
Manufacturing	0.60	1.00	5.06
Services	-2.46	-2.66	-0.48
Investment			
Agriculture	-2.06	-1.80	-0.39
Manufacturing	-5.97	-5.24	-1.14
Services	-16.77	-14.81	-3.35
Employment			
Agriculture	0.58	0.26	0.69
Manufacturing	-7.37	-9.38	-1.21
Services	-1.45	-2.15	0.31
Employment by Category			
Unskilled	-3.05	-4.12	-0.11
Skilled	-4.08	-5.37	-0.37
Semi-professional	-2.52	-3.46	0.03
Professional	-2.25	-3.14	0.10
Self-employed	-1.35	-2.04	0.30
Aggregate prices			
Nominal wage	-1.46	-1.31	-0.70
Real wage	3.49	3.12	1.66
Consumer price index	-4.78	-4.29	-2.33
Producer price index	-3.97	-3.39	-1.76
Consumer prices			
Agriculture	-2.74	-3.24	-0.73
Manufacturing	-8.23	-6.70	-5.25
Services	-3.93	-3.54	-1.55
Producer prices			
Agriculture	-0.90	-1.04	-0.19
Manufacturing	-7.67	-6.13	-3.93
Services	-3.44	-3.05	-1.34
Balance of trade (% of base year GDP)	2.23	2.04	1.47

 Table 10.5: Effects of the Trade Liberalisation Measures on the Kenyan Economy (Percentage Changes from Initial Solution).

The results for trade liberalisation supported by an increase in the inflow of foreign capital (column TRAD3, Table 10.5) would have been the best for the economy among the three alternative outcomes. If the trade liberalisation effects were supported with an increase in foreign capital inflow in the form of grants and aid, there would have been an expansion in real GDP of 1.8 per cent. Even the output for each of the sectors would have been better than in the two other cases. In terms of trade performance, this measure would have led to a much smaller improvement in the trade balance equivalent to only 1.5 per cent of GDP in spite of gains in outputs and overall GDP. This may be explained by the much higher level of import demand accompanying the expansion in the economy.

Investment and employment respond differently to the three policy measures. Undertaking trade liberalisation without paying attention to its fiscal consequences contributed to falls in investment in the three sectors. The services sector that normally benefits most from increased savings is affected most by lower government revenue resulting from trade liberalisation. Raising indirect taxes to replace government revenue lost by trade liberalisation does not improve the outcome on investment. However, declines in investment are marginally lower compared to the outcome had trade liberalisation been implemented without any such supporting measure (column TRAD2, Table 10.5). Increased foreign capital inflow does significantly affect the outcome the economy would have experienced had trade liberalisation been implemented without any support. The results for this simulation are not surprising as they capture the effect that foreign savings have on total savings. That is, to raise the level of investment funds. Hence investment falls resulting from trade liberalisation would have been much lower (column TRAD3, Table 10.5).

The effects on employment indicate that the second set of policies that liberalise trade and increase indirect taxes leads to poorer performance of employment demand. These policies led to a 9.4 per cent fall in demand for labour in the manufacturing sector alone. Trade liberalisation alone also led to falls in employment in the manufacturing and services sector though not by the same magnitudes as those in the case where indirect taxes are raised. The third simulation which is supported by increased flow in foreign capital gives the best outcome with regard to employment. Only the manufacturing sector experiences a decline (about 1.2 per cent) in employment demand while the other two sectors had some positive growth.

The distribution of the effects on employment among different labour categories present a clearer picture of the groups affected most by various policies. Trade liberalisation without any supporting policy to stop the revenue loss resulting from such a move led to higher falls in employment amongst unskilled and skilled workers. A similar outcome occurs when trade liberalisation is accompanied with increases in indirect taxes. The reason for reduced demand for services of unskilled and skilled workers is the negative effect that trade liberalisation and higher indirect taxes seem to have on manufacturing. Unlike the first two policies, the third policy where foreign capital supports trade liberalisation, the semi-professionals, professionals and self-employed benefit from higher employment. This is the result of higher output in the services and agricultural sectors.

The three simulations are deflationary though to different extents. Trade liberalisation alone led to a 4.8 per cent fall in CPI. This meant a 1.5 per cent fall in the nominal wage resulting in a 3.5 per cent rise in real wage. The second simulation, where indirect taxes are increased, is slightly less deflationary as the CPI fell by 4.3 per cent. This meant a smaller rise in real wages of 3.1 per cent. However, the third policy, in spite of giving the best outcome in terms of most of the other variables, is the least deflationary. The inflow of foreign savings is inflationary³ and this reduced the deflationary effect of trade liberalisation from 4.8 per cent to 2.3 per cent. This explains why the lowest increase in real wages of only 1.7 per cent occurred and the consequent employment outcome.

The price and wage changes are reflected in the income distribution as in Table 10.6. In nominal terms, as might be expected, the simulation with higher inflow of foreign savings had the lowest declines in nominal labour incomes from trade liberalisation. The second simulation, raising indirect taxes, results in the largest falls in nominal labour income. Thus, in nominal terms, the policy that uses foreign savings to support trade liberalisation registered the best outcome in labour income. When this effect on labour income is

³ As explained previously, being a real model, KEGEM does not include measures to control inflation. Hence, a measure such as reduced growth of money supply that would be used to sterilise the inflationary impacts of higher foreign savings is ignored.

distributed to various households, it is clear that the third simulation would have resulted in a better outcome for the households in nominal terms. However, in all three policy simulations trade liberalisation leads to falls in nominal incomes of all households. This may not be as 'bad' as it looks as the deflationary nature of the three simulations point to a lower cost of living for the households.

	TRAD1	TRAD2	TRAD3
Labour incomes			
Unskilled labour	-4.47	-5.37	-0.82
Skilled labour	-5.48	-6.61	-1.07
Office workers and semi-professionals	-3.94	-4.72	-0.67
Professional workers	-3.68	-4.40	-0.60
Self-employed and family labour	-2.79	-3.33	-0.41
Household incomes			
Urban households (low income)	-4.02	-4.83	-0.74
Urban households (middle income)	-3.28	-3.93	-0.59
Urban households (high income)	-1.56	-1.87	-0.26
Rural households (<0.5ha)	-1.81	-2.16	-0.28
Rural households (<0.5ha + income)	-1.77	-2.12	-0.30
Rural households (>0.5ha but <1ha)	-1.55	-1.85	-0.23
Rural h'holds (>0.5ha but <1ha + income)	-1.74	-2.09	-0.29
Rural households (>1ha but <8ha)	-1.96	-2.35	-0.31
Rural households (>8ha)	-1.06	-1.27	-0.17
Rural households (other)	-1.77	-2.13	-0.31
Sectoral profits and government revenue			
Agriculture	0.63	0.13	0.95
Manufacturing	-27.48	-43.02	-0.24
Services	-1.56	-3.25	1.05
Government revenue	-20.30	-12.70	-15.62

Table 10.6: Effects of the Alternative Trade Liberalisation Measures on IncomeDistribution (Percentage Changes from Initial Solution).

The sectoral profitability and fiscal consequences for the government are interesting for the three policy simulations. The manufacturing sector performs poorly in the case of sole trade liberalisation and is worst when indirect taxes are raised to support the reform measure. Only in the third simulation does the manufacturing sector register an acceptable one-quarter percentage decrease in its profits. In all three cases, the agricultural sector's profits are positive even though they do not increase significantly. Government revenue falls in each case. This is worse when nothing is done to ameliorate the short terms effects of trade liberalisation as revenue falls by 20.3 per cent in nominal terms. Raising indirect taxes rather than increased foreign capital inflow gave a better outcome for government revenue.

The income distribution results among the three institutions namely households, firms and government present an interesting outcome. It is clear from these results that the households would not have been worse off under trade liberalisation with foreign savings inflow. The government on the other hand would have been better off if trade liberalisation was accompanied with higher indirect taxes. Firms in different sectors would have been better off if trade liberalisation was carried out with supporting inflow of foreign capital. This interesting outcome means that the government would have to seriously consider the implication of any measures it takes when dealing with issues of trade liberalisation. The results imply that it is easier for the government when implementing a trade liberalisation policy if it identifies before hand the outcome it seeks with regard to income distribution. However, the effect of different policies on other macroeconomic variables cannot be ignored as is clear from the results.

10.3.3 Adjustment through reduced foreign borrowing

As balance of payment difficulties induced by unsustainable foreign debt were one of the major contributors to the need for a reform program, simulations reducing net foreign borrowing by government are carried out. Almost all of the Kenyan foreign debt is public. Therefore, the first simulation is carried out by reducing the net foreign capital inflows, which are usually in the form of aid, grants and loans, by 50 per cent from their 1986 level. The results are given in column FSAV1, Tables 10.7 and 10.8. However, this being a shock of foreign origin, there is need for some domestic stabilisation mechanisms. Two policy instruments available to the government are either fiscal austerity with cuts in government spending or exchange rate adjustment. Therefore, the second simulation reduces net foreign savings while at the same time cutting government spending by an equivalent amount. Results for this simulation are reported in column FSAV2, Tables 10.7 and 10.8. The third simulation adjusts for the reduction in net

- FSAV1 = 50 per cent reduction in foreign capital inflow.
- FSAV2 = 50 per cent reduction in foreign capital inflow accompanied by a 7.66 per cent cut in government spending.
- FSAV3 = 50 per cent reduction in foreign capital inflow accompanied by a 10 per cent exchange rate devaluation.

The three simulations show the importance of foreign capital on the economy. Any attempt to cut the inflow of capital has a negative effect as shown in column FSAV1, Table 10.7. A cut in foreign capital inflow led to a 1.1 per cent contraction in real GDP. This results from reduced investment in the economy. Foreign capital is a major source of investment funds for Kenya as the domestic savings level is below the investment needs. The three sectors experience declines in investment and, as usual, the services sector suffers the most as its level of investment falls by 13.9 per cent.

Attempting to reduce government spending to match the fall in foreign capital inflow worsened the situation as would be expected. The real GDP contracted by 2.7 per cent which is more than twice the contraction occurring if only foreign savings had been reduced. The reduction in government spending did not improve the investment outcome which declined further (column FSAV2, Table 10.7). This confirms an earlier observation that reduced government spending, rather than leading to higher investments, actually leads to declines in the short run. In line with the fall in the real GDP, output in all three sectors fell with a cut in foreign savings and the fall was much bigger when government spending was cut. The agricultural sector was not affected as much as the other two sectors. The fall in its output as a result of the two different policies was quite small.

	FSAV1	FSAV2	FSAV3
Real GDP	-1.09	-2.66	2.28
Output			
Agriculture	-0.01	-0.04	0.18
Manufacturing	-2.06	-3.22	3.16
Services	-1.03	-4.02	1.58
Exports			
Agriculture	0.98	2.29	3.27
Manufacturing	0.84	2.03	3.01
Services	-0.37	-2.24	2.59
Imports			
Agriculture	-1.46	-3.40	-4.26
Manufacturing	-4.47	-7.48	3.28
Services	-2.10	-6.86	-0.05
Investment			
Agriculture	-1.68	-2.23	2.11
Manufacturing	-4.91	-6.46	6.40
Services	-13.94	-18.04	20.30
Employment			
Agriculture	-0.12	-0.36	1.81
Manufacturing	-6.62	-10.13	11.04
Services	-1.84	-7.06	2.88
Employment by Category			
Unskilled	-3.13	-7.57	5.19
Skilled	-3.97	-8.41	6.52
Semi-professional	-2.71	-7.60	4.36
Professional	-2.49	-7.47	3.99
Self-employed	-1.74	-5.71	3.14
Aggregate prices			
Nominal wage	-0.80	-1.79	2.32
Real wage	1.90	4.30	-5.21
Consumer price index	-2.65	-5.84	7.94
Producer price index	-2.39	-5.39	8.01
Consumer prices			
Agriculture	-2.16	-4.41	8.86
Manufacturing	-3.26	-6.25	10.49
Services	-2.56	-6.26	6.22
Producer prices			
Agriculture	-0.75	-1.74	7.50
Manufacturing	-4.08	-7.23	11.31
Services	-2.25	-6.09	6.55
Balance of trade (% of base year GDP)	0.85	1.42	1.14

Table 10.7:Effects of Reducing Net Foreign Capital Inflows on the Kenyan
Economy (Percentage Changes from Initial Solution).

When the foreign capital cut was combined with a devaluation (column FSAV3, Table 10.7), the economy was not as adversely affected as in the other two cases. Real GDP grew by 2.3 per cent. Output in all three sectors increased but, once again, agricultural output increased by only 0.2 per cent. Unlike in the other two policy simulations, sectoral investments increase in this simulation mainly due to the real expansion of the economy as shown the increasing GDP.

The three policies improved the trade balance. The simulation with an exchange rate devaluation gave an improvement in the trade balance equivalent to 1.1 per cent of base year GDP. This was lower than the improvement of the trade balance equivalent to 1.4 per cent of GDP that resulted from reduced government spending. Even the reduced foreign capital inflow alone had some improvement in trade balance equivalent to 0.9 per cent of GDP. These results can be explained by what happens to export supply and import demand. The first two simulations led to lower import demand. In particular, the simulation which combined both the reduction in foreign capital inflow and a cut in government expenditure resulted in significant declines in import demand. The simulation with only reduced foreign capital inflow also had a substantial decline on import demand even though not by the level obtained when government spending was reduced at the same time. These falls in import demand must have contributed to the better trade balance results. The second simulation with reduced government spending did well since the cost of production was much lower leading to more exports. The improvement in the trade balance for the simulation with the exchange rate devaluation can be explained through the better performance in exports.

With respect to employment demand, the second simulation combining lower foreign capital inflow and government spending has the largest negative effect. The simulation cutting only foreign capital inflows also has a negative effect on employment demand. The large effect in the second experiment is what would be expected as reduced government spending has a tendency to lower employment demand. The manufacturing sector was most affected by reduced foreign capital and government spending. This is notwithstanding the result that most falls in investment occur in the services sector. The third simulation incorporating an exchange rate adjustment reversed the decline in employment resulting from a cut in foreign capital inflow.

The distribution of employment changes among different labour categories in the simulations FSAV1 and FSAV2 shows that the unskilled and skilled labour categories bear the cost of reduced economic activity of the two policies. Similarly, but more positively, the results with the exchange rate devaluation showed that it was still those two labour categories that benefited most from the consequent increases in employment demand.

One other result that comes out clearly from these three simulations is that self-employed labour demand did not have a very large response to foreign capital effects. In the first two simulations where the economy was adversely affected, falls in demand for self-employed labour were not as big as with the other four labour categories. Even in the simulation where the negative effects of the cut in foreign capital inflows were turned around by the exchange rate adjustment, the self-employed labour demand increased by an amount smaller than in the case of all other categories.

As for the effects of the three simulations on prices, the simulations that cut only foreign capital inflows and the one that combined it with a cut in government spending are both deflationary. The latter simulation registered a significant 5.8 per cent fall in the CPI. However, the third simulation with an exchange rate devaluation was highly inflationary and CPI rose by 7.9 per cent. These price changes had important effects on the wage level. In the case of the first two simulations, there was a fall in nominal wage in line with the 30 per cent indexation. This meant increases in real wages. The third simulation had a 5.2 per cent fall in the real wage as a result of the inflationary effect of the devaluation.

The changes in the wage level and the effect of the three policies on employment demand had a bearing on income distribution (Table 10.8). Interestingly, the nominal labour incomes fell in the simulations where foreign capital was reduced in isolation and also when it was combined with a cut in government spending. Nevertheless, self-employed labour income did not fall as much as in the other categories when only the foreign capital was reduced. When this was combined with a cut in government spending, nominal labour income for the self-employed category fell by 7.4 per cent which was still better than the performance of the other four categories. Hence, these results on labour income show that in aggregate the slump in economic activity that accompanies reduction in foreign capital inflow and in government spending meant falls in nominal terms. However, the deflationary effect of the first two simulations did contribute to ameriolating the situation through lower consumer costs.

	FSAV1	FSAV2	FSAV3
Nominal labour incomes			
Unskilled labour	-3.91	-9.22	7.63
Skilled labour	-4.74	-10.05	8.98
Office workers and semi-professionals	-3.49	-9.25	6.78
Professional workers	-3.28	-9.12	6.41
Self-employed and family labour	-2.53	-7.39	5.53
Nominal household incomes			
Urban households (low income)	-3.51	-8.27	6.79
Urban households (middle income)	-2.88	-7.12	5.57
Urban households (high income)	-1.39	-3.72	2.73
Rural households (<0.5ha)	-1.63	-4.57	3.46
Rural households (<0.5ha + income)	-1.57	-4.06	3.17
Rural households (>0.5ha but <1ha)	-1.40	-4.04	3.03
Rural h'holds (>0.5ha but <1ha + income)	-1.55	-4.03	3.14
Rural households (>1ha but <8ha)	-1.76	-4.77	3.66
Rural households (>8ha)	-0.95	-2.65	2.02
Rural households (other)	-1.57	-4.00	3.07
Nominal sectoral profits and government revenue			
Agriculture	-0.33	-0.90	7.87
Manufacturing	-29.73	-44.44	59.61
Services	-2.73	-11.00	10.95
Government revenue	-5.69	-10.59	14.79

Table 10.8: Impacts of Reduced Foreign Capital Inflows on Income Distribution inKenya (Percentage Changes from Initial Solution).

The results from the simulation with the exchange rate devaluation were different in the sense that at least some improvement in various labour incomes in nominal terms occurred. The skilled labour shows the best improvement in nominal incomes through a gain of nine per cent. However, there was ensuing inflation from the devaluation which may have reduced the positive effects of these gains.

The distribution of labour incomes from different labour categories to the various households presents a more positive picture. In nominal terms both rural and urban households were worse off from the reduction in foreign capital inflow (column FSAV1, Table 10.8) and when it was combined with a cut in government spending (column FSAV2, Table 10.8). However, the deflationary nature of the two measures must have reduced the negative effects of lower nominal incomes for all the households. The simulation without a cut in government spending gave the best outcome. Note however that low and middle income urban households suffered in both simulations. This is attributable to large reductions in unskilled and skilled labour incomes in nominal terms in comparison to other groups.

The simulation with the exchange rate devaluation gave the best outcome for nominal incomes for all household groups. The down side of the policy in terms of macro aggregates was its inflationary nature. However, it needs to be borne in mind that lack of monetary policy instruments in the model restricts the ability to implement any policy measures that the government might have used to accompany such a devaluation, for instance controls over the money supply. However, the results do indicate the price the government may have to pay in terms of lost welfare gains for households if a shock created by a fall in foreign capital inflow were to be stabilised by higher export earnings generated through an exchange rate devaluation.

As for the sectoral profitabilities, the three simulations have different effects on profits. However, it is clear that nominal profits in the manufacturing sector registered the most significant change. This can be linked to changes in producer prices in the three sectors. As can be seen from Table 10.7, the producer price in the manufacturing sector changed by higher magnitudes for each of the three simulations compared to the other two sectors. Consequently, profitability in the manufacturing sector responded in nominal terms with substantial changes. As for the agricultural sector, its profitability did not change significantly. Only in the case of reduced foreign capital with a devaluation did the sector's profitability show a significant change. Commensurate with aggregate profitability in the three sectors, government revenue fell in the first two simulations in line with the downturn in the economy. The revenue correspondingly increased in the third simulation when the economy responded positively to the exchange rate devaluation as a stabilisation response to a fall in foreign capital inflow.

10.4 Concluding Remarks

This chapter has used an updated database to apply KEGEM to address some of the issues that were relevant to the Kenyan economy in the 1980s. The first issue addressed regarding the vulnerability of the economy to external shocks shows that it is still sensitive to terms of trade shocks. However, unlike in the 1970s, the shocks experienced in the mid-1980s did not produce as large changes in the economy as in the 1970s. This was mainly due to the level of these shocks which were higher in the 1970s. There is some evidence that changes in the structure of the economy may have influenced the magnitudes of responses to the shocks.

In the analyses of the policy recommendations to government by the World Bank and IMIF, a number of points have emerged. On the issue of fiscal austerity measures, the three simulations implemented show that a fiscal austerity measure through higher indirect taxes rather than through lower government spending or higher direct taxes is a better option for the government. This is both in terms of the effects of these policies on macro variables and income distribution effects.

With regard to trade liberalisation, the results confirm that such a move would in the short run have a positive effect on overall GDP but have negative effects on some macro variables. Of the two options available to government to offset the duty revenue losses, the increase in foreign capital was better than increasing indirect taxes. Overall, the trade liberalisation measures show that the households would have lost in the short run. These losses would even have been larger if indirect taxes had to be increased to raise government revenue. However, the income losses when trade liberalisation is supported by foreign capital were very minimal.

As for the issue of foreign borrowing, the economy appears to be very sensitive to any moves to reduce net inflow of foreign capital. Such a policy would even be much worse if there was an attempt to reduce government spending to implement it. However, the results show that it is possible for the economy to withstand declines in foreign capital inflows if the exchange rate is devalued. Export earnings from the devaluation more than proportionately offset effects of reduced foreign capital inflow.