

6. The SADC Trade Liberalisation in a Demand- driven System: the “Bastard Keynesian” Model

The label “*Bastard Keynesian model*” combines two features that derives from two different theories: the marginal productivity as labour remuneration and the relation between aggregate demand and labour market. As Keynes (1936) himself explained in its *General Theory*: “*For we shall maintain the first postulate [the wage is equal to the marginal product of labour] as heretofore [...]*”. Moreover, he introduced a new relationship between the output market and the labour market to explain unemployment. For the Neoclassicals unemployment is due to rigidities in the labour market itself while for Keynes the labour demand is free to change its position according to changes in the aggregate demand. In this way he links unemployment to a shortfall in the output demand. Supposing the aggregate demand depends only on the investment level, in the simplest case without government and foreign trade, we may say changes in investments affects the aggregate demand with the same sign. Supposing the starting point is equal to a level of investment INV_1 , this means an aggregate demand Y_1 could be produced with the employment of L_1 paid w_1 . Supposing investment demand increases, also Y_1 increases up to Y_2 . Then, the demanded labour gets higher to allow output to raise. So, as the economy faces a demand shock, the labour market absorbs workers. But, this process is not infinite, there should be an “*upper bound*”. New workers may be employed only up to the existence of unemployment. When a condition of full employment is reached, any change in the aggregate demand could not affect the employment level. An increasing demand will lead to increasing prices, that in a dynamic perspective will lower the demand and create new unemployment to be exploited in the future.

The term “Bastard Keynesian”, firstly adopted by Joan Robbins, is currently used by Lance Taylor and Rudiger von Arnim as a term of comparison respect to mainstream Neoclassical models, and especially the World Bank LINKAGE model. In the following section we will describe their critique to present the potential advantages of this model.

I. The critique of mainstream CGEs

Trade liberalization for Neoclassical modellers means solely gains, but Taylor and von Arnim assert that final results of those models are affected mainly by two problems. The former is the “*Armington effect*” that comprehends an effect on real consumption and a fiscal effect, the latter, instead, is the closure rule. Here, we present their positions and briefly describe their reasoning.

What they define as the “*Armington effect*” is the interaction between external trade and the other macro-aggregates, mainly private consumption and government revenue through changes in prices. When we study a trade liberalization process, supposing the simplest model with only tariffs and a lump-sum tax on income, a reduction in tariffs means a higher income tax that stimulates a reduction in consumption. However, consumption itself is part of the “*Armington composite good*”, so it is affected by the tariff removal too. Thus, there is an income and a substitution effect, each of them has a different magnitude and they could not offset each other¹.

Moreover Taylor and von Arnim (2006) stated “*the negative direct impact of a higher tax on aggregate real consumption is greater than the positive indirect effect of a tariff reduction via a lower price.*”

This is not the only weakness of the Armington assumption. They recognize at least other two theoretical problems to detect.

Firstly, the model speaks in terms of composite goods. This means there is a composite good resulting from the imperfect substitutability between imports and domestically produced commodities and this choice reflects the national perspective. This analysis is not at the individual agent level. Another failure is the idea of spatial differentiation. Quoting von Arnim and Taylor (2007a), “*National product differentiation ignores the fact that characteristics of products are mostly determined by firms, not countries*” and to enforce this concept they present an example “*A Toyota manufactured in Japan is identical to the same model made in the US, and the Toyota Group itself decides how much international trade to undertake*”.

The other problem, the closure rule, is particular evident if we briefly illustrate the World Bank closure. Its assumptions are a saving-driven investment function, balanced trade, fixed employment (not necessarily full employment), and a balanced government budget. The last assumption is particularly strong if we follow the previous example of the simplest model. When tariffs lower the income tax should be adjusted, or better, increased. Using von Arnim and Taylor’s words “*LINKAGE limits macroeconomic risks of trade liberalization by holding employment, current account and the public fiscal deficit constant*”.

¹ The mathematical demonstration is provided in chapter 5.

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They highlight two different closures inside their “Bastard Keynesian” model, imposing either fixed government savings (or deficit) or fixed government expenditures.

Government revenue comes from taxation, both direct and indirect, while the expenditures are for consumption and investment. The latter is set exogenous as the government saving (or deficit), while its consumption expenditures are endogenous. Due to a trade liberalization process tariff revenue diminishes, it should be balanced by a change of the same sign of government expenditures. The government has no possibility of financing expenditures through increasing borrowing. Foreign capital inflows depend mainly on trade flows and not on government saving although this inflow is used to finance public deficit.

This kind of closure is very close to the World Bank view of the public sector. In fact, we may read “*Government collects income taxes, indirect taxes on intermediate and final consumption, production taxes, tariffs, and export taxes/ subsidies. Aggregate government expenditures are linked to changes in real GDP. The real government deficit is exogenous. Closure therefore implies that some fiscal instrument is endogenous in order to achieve a given government fiscal deficit*” (van der Mensbrugge, 2005).

It is possible to derive the same closure rule in the “Bastard Keynesian” model too. When a link between private sector savings and foreign capital inflows is set, savings are decided after the tax payment so that income tax rate becomes indirectly the equilibrating variable.

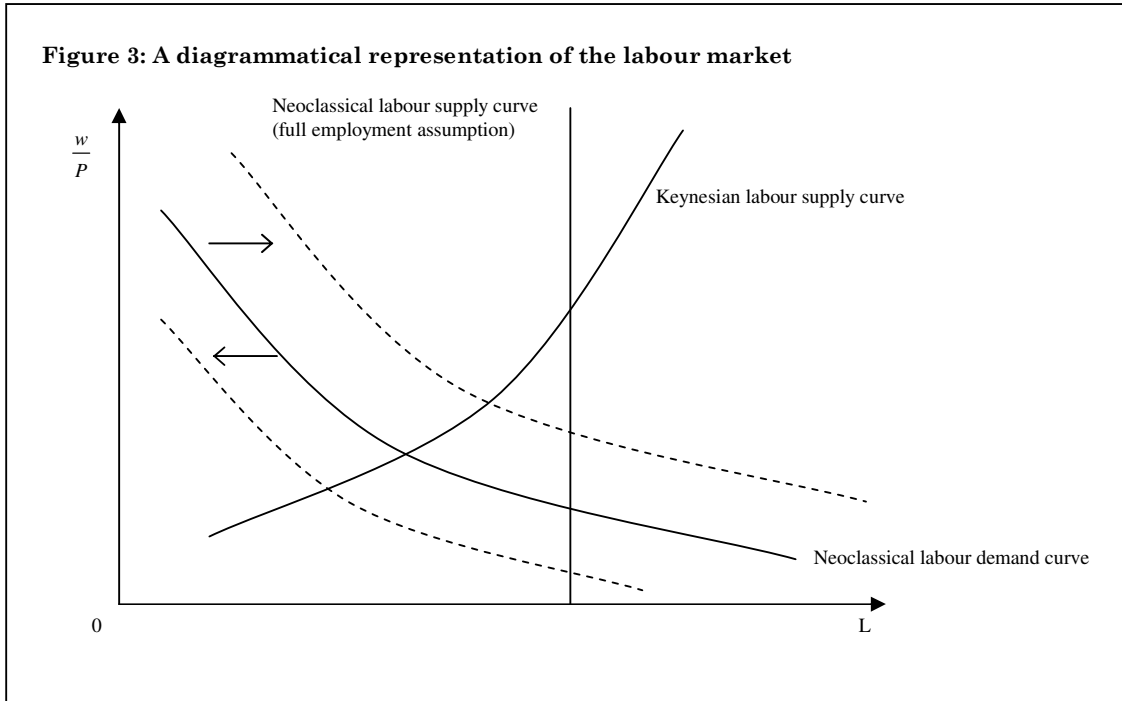
On the other side, there is the endogenous government saving with exogenous expenditures, a truly Keynesian perspective, which they define as “*absorption closure*”.

In this case government deficit is able to change and absorb each kind of shock, as a reduction in the tariff revenue. This means that government saving derives from government expenditure level. A fixed exchange rate, that in the short run is a plausible assumption, leaves the current account deficit to move and to be an adjusting variable. In this way as von Arnim and Taylor (2007a) have defined “*it permits macroeconomic absorption of shifting import and export quantities, instead of an elastic adjustment of trade flows to international prices*”.

II. A graphical interpretation of the “Bastard Keynesian” elements in the model

We have already argued about the structure of the “Bastard Keynesian” model in chapter 2 when we have described its fundamental relations and we will consider it in the next section. Here we want to describe using a diagrammatical representation the main concepts which underlie the BK model. As already cited in the introduction of this chapter, the term “Bastard Keynesian” derives from the contemporaneous existence of a Keynesian term (the well known Keynesian multiplier) and a Neoclassical demand labour function.

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The graph above shows the labour market in both a Neoclassical and a “Bastard Keynesian” model. Both of them have the same labour demand curve with diminishing returns to scale. It is a traditional Neoclassical interpretation of how labour is demanded by firms: the higher the real wage is, the lower is the employment level. The curve has two features that characterize it: its slope and its position in the $(\frac{w}{P}, L)$ plane.

In both cases, the slope is determined by the Shephard’s lemma but the curve position and its movements (the arrows in the figure above) are explained by different elements: the Keynesian multiplier, in the BK case, and the price of final output in the Neoclassical case. The former assumes that firms hire workers according to the final output demand. If one of the demand component (government consumption, for instance) declines, they produce less to satisfy the market demand level. As a consequence they have to employ less workers. In this case the curve moves leftwards. If the demand expands for the same real wage level a higher employment level is reached (a rightward movement).

The latter, instead, states that labour is demand up to when its marginal productivity equals the real wage rate. It may be straightforward to demonstrate assuming a Cobb-Douglas production function.

The production function takes this form: $Y = L^\alpha \cdot K^{1-\alpha}$

In this case the labour marginal productivity becomes:

$$mpl = \alpha \cdot L^{\alpha-1} \cdot K^{1-\alpha}$$

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and rearranging: $mpl = \alpha \cdot \frac{Y}{L}$

As already said labour demand is determined by the equality between marginal productivity and real wage:

$$w = P \cdot \alpha \cdot \frac{Y}{L}$$

$$\text{or } w = P \cdot \alpha \cdot \frac{Y}{L}$$

Since the second element in the right hand- side is diminishing, the wage rate depends on the general output price level. From the relation above we can demonstrate what we have said about the BK interpretation of the closure. The Keynesian multiplier makes the output (or production) level endogenous because now Y is endogenous.

To complete the description of the labour market we add the supply curve which differs according to the theory under investigation. In the Neoclassical theory it is vertical, because of the assumption of full employment. Although an increase in the real wage, labour is wholly employed and there is no room for a change in its level. The story goes differently in the BK case. Here, the supply curve has a negative slope to show that the supply may be modified and it answers to changes in real wages: the higher is its level, the more the workers claim to be employed.

III. The Mozambican “Bastard Keynesian” CGE.

Fundamentally, the “Bastard Keynesian” model does not differ from the Neoclassical model in its essential elements. The only remarkable difference is the treatment of labour market. In chapter 5, speaking about the IFPRI model, we have supposed that labour supply is equal to labour demand. Here to switch the model into a “Keynesian” model we have not to maintain this equality. This is the idea of Lofgren, Lee, and Robinson (2002), who assert that “*It is also feasible [...] to specify a Keynesian. closure in which aggregate employment is linked to macro variables through a Keynesian multiplier process. In the labour market (in one of the labour markets if labour is disaggregated), it is assumed that the real wage is flexible in a setting with unemployment. Adjustment in the real wage induces firms to change their labour demand and employment sufficiently to generate incomes and savings that are needed to finance the fixed quantity of real investment*”. Our model, however, is a bit different. We do not suppose under-employment only in one of the labour markets but we consider a general unemployment. This assumption is coherent with Mozambican labour statistics. Here a widespread underemployment is demonstrated respect to both localization and educational level. Presupposing that the educational level is a proxy of skilled, semiskilled, and unskilled labour,

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we may say that the unemployment rate is higher than 15 percent in each class, but the higher is the educational level the higher the rate becomes. Workers with secondary (or more) education have an unemployment rate more than double respect to workers with no education (2004/ 05 IAF).

To model this fact, we suppose that unemployment is a phenomenon at the “aggregate labour” level. So we suppose there are only two productive factors, capital and labour, while the former is fully employed the latter is supplied in the market according to an households’ decision. The idea is that workforce is not fully supplied in the market so that its level may change according to the productive needs. Activities, in fact, may face a demand increase which may be satisfied only by more inputs to produce more. In this way households supply extra labour. Its remuneration is a decreasing function so that to employ more workers firms diminish their wage rate.

This mechanism has two effects on income and indirectly on personal taxation. The former is evident: higher employed work means higher income for labour owners. The latter instead is the effects of income changes on taxation. Direct taxes from labour depend on how much labour households decide to supply.

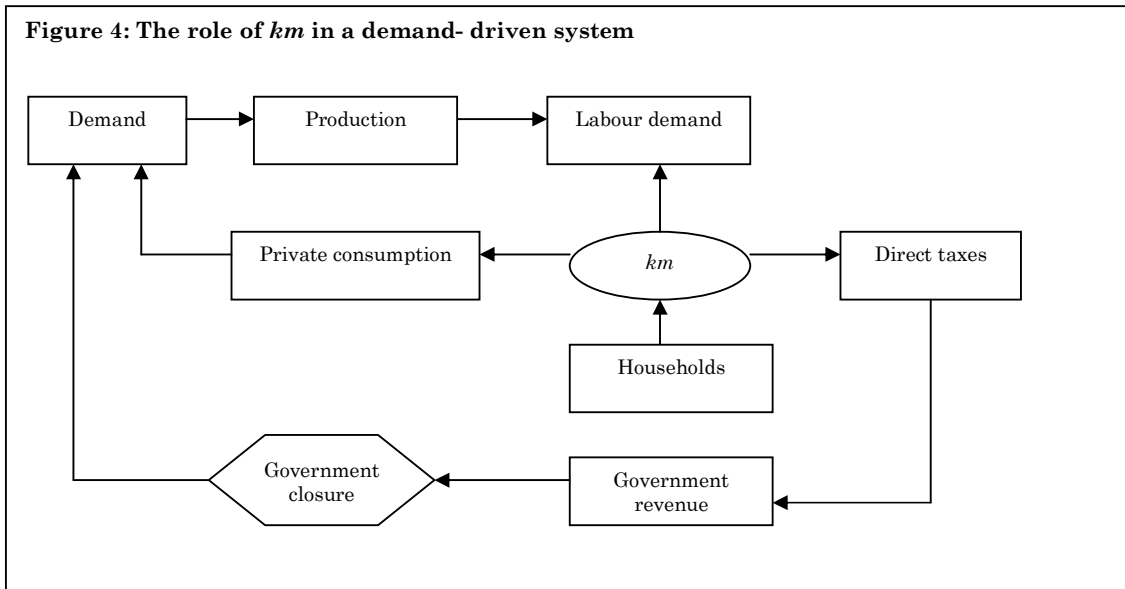
Although this mechanism is quite easily to explain, its implementation in MPSGE requires the introduction of a new element we call km (or Keynesian multiplier). It is the parameter which represents how much labour to supply. It may move from zero, when total labour is unemployed, to an upper bound representing when labour is fully employed. Formally it is known as “scaling parameter” and it is associated in the MCP format to a complementarity condition. To derive which is the constraint in this case, we refer to the simplest case of a closed economy without government already presented in chapter 2 box 12. As already said km represents an household’s decision on labour and consequently on income. The constraint should reflect these peculiarities but also guarantee the stability of the system itself. As a consequence it must satisfy the market clearing condition, which states that total supply in the market has to be cleared by the summation of the different demand components. Because the scaling parameter acts at the household level, the demand component it may affect is private consumption. An aspect should be underlined. The related constraint is binding for the economy as a whole so it affects aggregate private consumption. This means that if there are many private consumers we have to consider the summation of their consumption, simply evaluated as the residual after tax payment and saving decisions. Therefore, km scales aggregate consumption so that demand is consistent with total supply.

It is straightforward to derive how much the closure rule choice is crucial for this class of models. We have said that km affects consumption, via changes in disposable income, but it causes government tax revenue changes via variations in direct taxes. In this case government

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closure is crucial. If a reduction in government revenue is counterbalanced by a fixed government expenditure level, only private consumption and investments in our small example may change. If we assume fixed public deficit, instead, a direct tax change reflects a change in recurrent expenditures.

In figure below we reconstruct the fundamental relations between km , private and public consumption, and total demand.



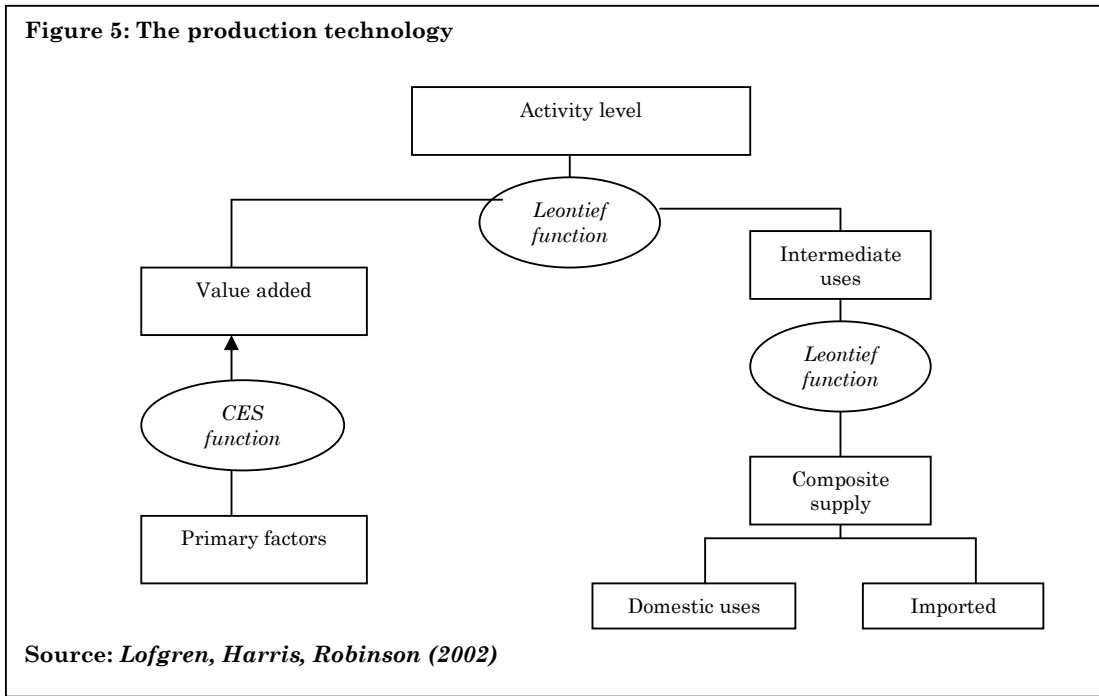
The rest of the model is business as usual. As in the Neoclassical model presented in chapter 5, each producer is a maximizing agent, who has the objective of maximizing profits given the production technology. In our case there is a multi- stage production technology (depicted in figure 5). Firstly, there is the aggregation of domestic produced and imported goods into a composite, a part of which is used as intermediate inputs. On the other side, primary factors are aggregated into the value added component. Finally, in the last step value added and intermediates are used to obtain the final production. At each stage, the aggregating function is a CES function: there is a certain elasticity of substitution between inputs. In our case we suppose at the top level a Leontief function (a particular CES with elasticity equal zero), then a CES function with elasticity equal 0.5 in value added composition².

In profit maximization, producers decide to use primary factors up to when their wages equal their marginal productivity. As previously described, the “Bastard Keynesian” model does not differ in the productive side respect to the Neoclassical model. As Lofgren, Harris and

² The parameter choice is exhaustively treated in chapter 5.

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Robinson (2002) state: “it is possible to assume that a factor is unemployed [...]the supply variable is flexed (or endogenized)”.



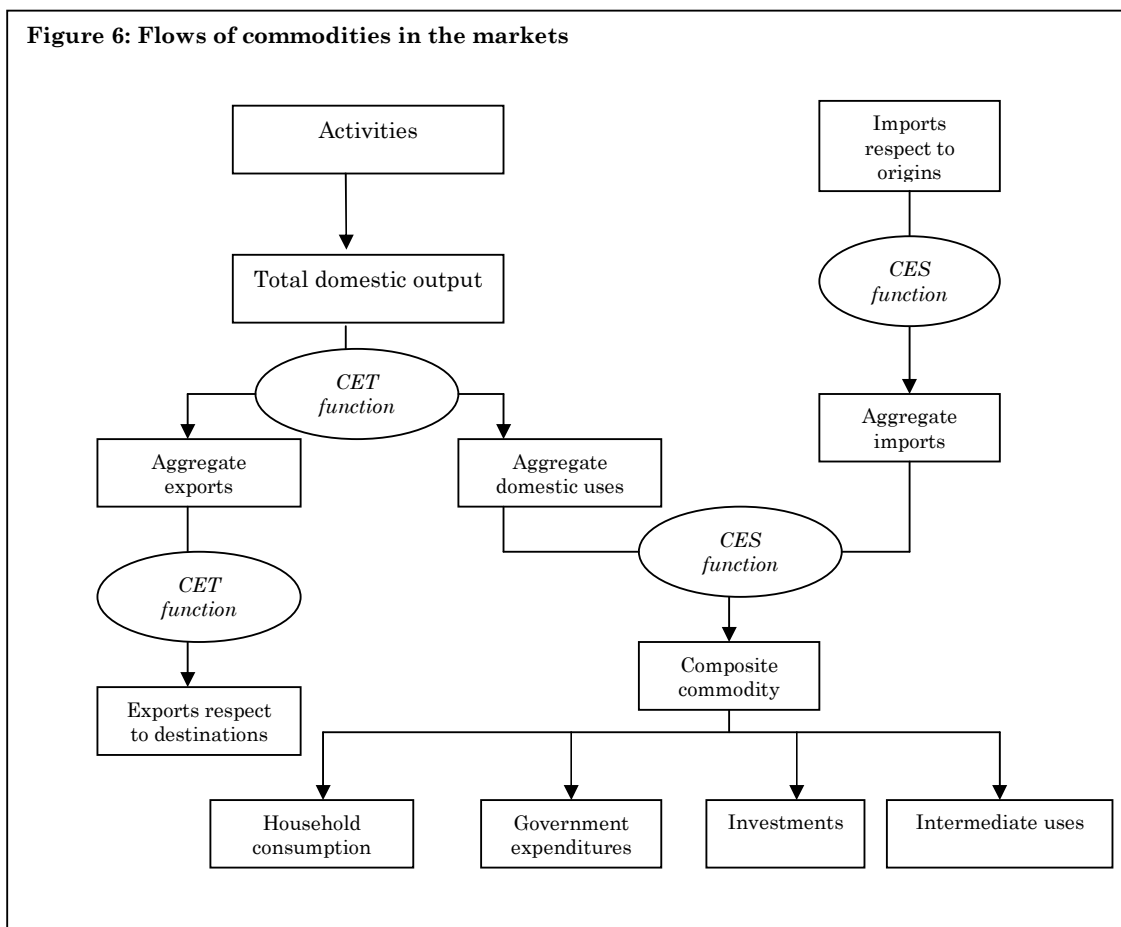
In the previous paragraph we have referred to a composite supply, here we clarify this concept. In the figure above there is the last step where domestic uses and imported goods boil down to create the composite supply. Figure 6 shows the physical flow of commodities in the market. Domestic output may be sold in the formal market or self-consumed³. Supposing it is marketed, producers have to allocate it between exports and domestic uses. The underlying assumption is that suppliers want to maximize sales revenue subject to the imperfect transformability between the two uses. Mathematically this is captured by a CET function. Unitary export prices are expressed in domestic currency and gross of unitary transaction costs (at the border, eventually, but this is not our case, the price is adjusted for export taxes). If the commodity, instead, is domestically sold, its unitary price is equal to the domestic purchaser price less transactions costs. On the basis of these two prices producers decide where to sell their production.

Final demand may be satisfied solely by domestic production, but, in an open economy, it is more likely to assume that the country imports some goods. So, when final consumers take decisions on their spending they think in terms of a composite bowl made up by domestic and

³ In the implementation of the model we assume two distinct productive activities for home-consumption and marketed commodities according to the assumptions and observations described and analysed in chapter 5.

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imported goods. However, the composition of the bowl is based on the concept of imperfect substitutability between domestic and imported goods. It is captured by a CES function and the decision is taken respect to relative prices. The import prices paid by domestic demanders includes both import taxes (and indirect taxes whose tax base is total imports) and the costs of transaction services per import unit (to move commodities from borders to the final demanders). Domestic suppliers, instead, receive a price net of transaction costs which are, however, paid by domestic consumers (they pay to move commodities from suppliers to them).



In this CGE model, institutions are represented by households, enterprises, the government, and the rest of the World.

Households (disaggregated into rural and urban households as in the SAM) receive income from factors of production. Income from labour is subject to the choice of km and it is directly given, capital income, instead, is indirectly received via the enterprises⁴. Then, their income is composed also of transfers from other institutions, i.e. from government, and the rest of the World. Income is used to pay direct taxes, save, and consume. In this model direct tax rate is

⁴ We have to remember that a part of what enter the capital account is land. It is directly given to rural households while capital, in a strict sense, is received by households via the enterprises.

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assumed to be fixed for each household⁵ and we suppose a fixed share of private savings respect to total private savings. Consumption is a residual after taxes and savings. It covers marketed, purchased at market prices (i.e. gross of commodity taxes, and transaction costs) and home commodities evaluated at producer price. Household consumption is allocated across different commodities (both marketed and home commodities).

Private enterprises receive, as already described, capital income besides transfers from other institutions (i.e. the government). Their income is allocated to direct taxes (with a fixed tax rate), savings (in fixed proportion respect total private savings), and transfers to other institutions (i.e. the government, and the rest of the World). They do not consume.

The government collects taxes, and receives transfers from other institutions. Its income is used to purchase commodities for its consumption and for transfers to other institutions. The behaviour of government consumption and savings depends upon the choice of closure rule.

The final institution is the rest of the World. As noted, transfers from this institution to the others are fixed in foreign currency. Foreign savings is the difference between foreign currency spending and receipts. However, also in this case the closure rule choice affects its behaviour.

IV. The MCP format of the “Bastard Keynesian”

The MCP format of this model does not greatly differ from the one presented for the Neoclassical model. Here, we will only focus on the different relationships.

As pointed out, differences arises in the specification of the labour market, so only the labour market clearing condition, the income balance condition for households, and government revenue from direct taxes changes.

For the first relation there is no change in the demand for labour (once again it is derived from the Sheperd’s lemma) but this time the labour supply depends upon km . $Ls0$ is not fixed but, as already described, it may change as a response in aggregate demand.

Formally equation (14) in the previous chapter becomes:

$$km \cdot Ls0 = \sum \left(s, va(s) \cdot \left(\frac{pf("k")}{pf("l")} \right)^{(1-va(s))} \cdot Y(s) \right) + \sum \left(is, va(is) \cdot \left(\frac{pf("k")}{pf("l")} \right)^{(1-va(is))} \cdot Y(is) \right) \quad (14BK)$$

The income balance condition for household (h) takes into account the fact that labour supply is now endogenized and that its amount may vary. Formally, we highlight the amount

⁵ With this assumption, we suppose the government has not the power to change instantaneously tax rates as a policy instrument to compensate declines in indirect taxation.

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of direct taxes paid for each income receipt. In this way we make evident the relationships between labour supply and tax payments:

$$RA(h) = (1 - th(h)) \cdot ((pf("l") \cdot hl(h) \cdot km) + pe \cdot he(h) + ptran \cdot SOCTRANSF(h) + pfx \cdot hx(h) - alphaz(h) \cdot pinv \cdot INV) \quad (21BK)$$

Government balance becomes:

$$\begin{aligned} GOV = & sum(h, (th(h) \cdot (pf("l") \cdot hl(h) \cdot km) + pe \cdot he(h) + ptran \cdot SOCTRANSF(h) + pfx \cdot hx(h)) \\ & + DETAX - (sum(h, ptran \cdot SOCTRANSF(h))) - ptran \cdot SOCTRS + \\ & (sum(s, tm(s) \cdot pfx \cdot m0(s) \cdot M(s)) + (sum(s, itx(s) \cdot pa(s) \cdot a0(s) \cdot A(s))) \quad (23BK) \\ & + (sum(s, vtx(s) \cdot pa(s) \cdot a0(s) \cdot A(s))) - (sum(s, atx(s) \cdot (pd(s) \cdot dm(s) + px(s) \cdot x0(s))) \\ & - (sum(s, rebt(s) \cdot pa(s) \cdot sum(g, ca(g, s)))) - pinv \cdot gsv0 \end{aligned}$$

where the first element in the right hand- side is households direct tax out of labour income.

Finally, as already said, to switch from the Neoclassical to the “Bastard Keynesian” model we need the introduction of a scaling parameter, km , and its associated condition. We have already detected why this constraint binds aggregate private consumption and its role in the stability of the system. Here we solely write it down in a formal way:

$$sum(h, RA(h)) = sum(h, (1 - sr(h)) \cdot (1 - th(h)) \cdot (pf("l") \cdot hl(h) \cdot km + pe \cdot he(h) + ptran \cdot SOCTRANSF(h) + pfx \cdot hx(h)) \quad (BK CONSTRAINT)$$

It is worthy noting that if we fix km at unity our model returns to be a Neoclassical model exactly as the one presented in chapter 5. According to this statement, a question arises: may the Neoclassical model be interpreted as a special case of the “Bastard Keynesian” model? In our opinion yes. Supposing that the scaling parameter value is fixed equal to one is a special case because in the BK model it may have each value. We may represent the relationship between them assuming that the Neoclassical class of model is a subset of the broader and more generally set of “Bastard Keynesian” models, which in turns are a subset of the larger Keynesian family.

V. The closure rules

Similarly to what has been done in chapter 5, here we summarize the closure options we implement in our model. When we have described how km works, we have briefly explained the role of government spending and how it is a likely demand injection which could stimulate

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activities to hire extra workers. So, its role is different respect to the Neoclassical model and we suppose that the government closure affects both the saving- investment balance (as in the Neoclassical model) and the employment level. Similarly, foreign savings may be a source of new demand. Therefore its treatment is fundamental. In the table below we sum up the different closures. All of them present endogenous labour supply (because of km) and fixed investment level. Moreover, tax and savings rates are fixed as capital supply.

Literature reference for this class of model is Taylor, von Arnim (2006) and subsequents. What we call here “Bastard Keynesian” benchmark is exactly the BK closure in their papers.

They call it “*absorption closure*” and the reason is evident analysing causality assumptions. Taxes on household are held fixed, so that a tariff cut causes a revenue reduction and government deficit adjusts to finance expenditures. As they state: “*Government borrowing moves up and down in any functioning economy, even when it is hypothetically constrained by IMF conditionalities or Maastricht accords. Letting it play its proper role in a model simulation is simple common sense*”. Leaving the current account (foreign savings) to move “*permits macroeconomic absorption of shifting import and export quantities, instead of an “elastic” adjustment of trade flows to international prices*”.

Table 48: The closure rules				
	“Bastard Keynesian” benchmark	BK Closure 1	BK Closure 2	BK Closure 3
Potential macro closure variables				
Exchange rate				
Investment	Fixed	Fixed	Fixed	Fixed
Foreign savings			Fixed	Fixed
Labour supply				
Capital supply	Fixed	Fixed	Fixed	Fixed
Government demand	Fixed		Fixed	
Saving rate	Fixed	Fixed	Fixed	Fixed
Tax rate	Fixed	Fixed	Fixed	Fixed
Wage rate				

The other closures want to analyze the effects of changing one specific assumption each time. We want to detect if the outcomes in a demand driven system are of the same sign independently of the closure rule or if a specific hypothesis on government or foreign savings may reverse the effects of the policy shock. Therefore, we will maintain endogenous foreign savings but we suppose a fixed government savings (*BK closure 1*), or suppose exogenous foreign exchange rate related to either with fixed public expenditures or fixed government deficit (*BK closure 2* and *BK closure 3*, respectively).

After having summed up the different closures and having clarified our aims, we should describe how these closures may be implemented. Similarly to what has been done with the

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Keynesian multiplier, adopted to endogenize labour supply, there are other two scaling parameters to consider: $fsav$, and $gsav$. Both of them should be applied when foreign savings and government savings, respectively, want to be endogenized. Let us start investigate the parameter on foreign savings, $fsav$ ⁶. It represents an activity level for this variable. In the benchmark its value is one. Then it changes according to the associated variable. It shows the percentage increase (or decrease) in foreign savings. The associated complementarity condition is built as the difference between current account and capital account according to the accounting definition of the scaled variable⁷. Formally:

$$fsav \cdot fsv0 \cdot pfx = pfx \cdot (sum(s, m0(s) \cdot M(s)) - (sum(s, xo(s) \cdot X(s))) + (ex - sum(h, hx(h)))) \quad (\text{FSAV})$$

Because of the construction of the model (see section III) the capital account is fixed in foreign currency so that changes in total available foreign savings reflect only changes in the trade balance. In fact, as Taylor and von Arnim point out foreign savings are mainly a consequence of commodity trade.

A similar reasoning may be applied for the scaling parameter $gsav$. Also in this case it is a level and directly shows the percentage change in government savings. This time the related complementarity condition has at least two different functional forms. The first is as the one for $fsav$ and expresses public deficit as the residual between total tax revenue and commodity consumption, according to the accounting rule. We can otherwise write the constraint in terms of government consumption. Deciding a closure rule for government means deciding which of the two variables, saving and consumption, is exogenous. Obviously supposing endogenous savings means assuming fixed government expenditures and the other way round. So we may say that endogenous government savings adjusts such that the institution’s real consumption is at its benchmark level. Formally:

⁶ Here we limit our analysis in the simplest case when the rest of the world is identified into a unique region. In our finale model, however, we present three distinct regions. In that case the issue becomes a bit more complex. We have not only one auxiliary variable $fsav$ but as many as the foreign areas (in our case three). The reason is intuitive: each trading partners presents a different quantity of imports and exports and therefore a different current account. On this basis they free different quantities of savings and a trade liberalization process like the one here studied, with differentiated treatments, has different effect on each region.

⁷ However it is likely another formal presentation of the condition. Similarly to what happens for $gsav$, we may express the constraint in terms of real consumption and real demand. Foreigners’ real demand equals real exports at final prices: $FOREIGN / pfx = sum(s, (x0(s) \cdot X(s)))$

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$$govt / pg = sum(s, gd0(s)) \quad (GSAV)$$

Fixing one of the scaling parameters (or all of them) at unity means assuming either one variable or both of them as exogenous.

VI. Our simulations' results

Our analysis focuses on the short- run effects of this tariff phase- out process, so we concentrate on immediate effects we perform an analysis through the different steps in the tariff cut. We may say how macro- aggregates act immediately step by step.

a) The benchmark BK closure

In this closure we suppose endogenous government and foreign savings. In the first step, when only agricultural products from RSA are liberalized, there is no change in the employment level (table 50). Since labour demand is strictly connected to production, also total production does not change. The reduction in tariffs displaced imports against the ones from the rest of the World while there is no evident advantage in tariff cut which stimulate imports from RSA that are fixed at the benchmark level, as shown in table 51.

The reduction in tax revenue, due to a tariff cut, affects only the government account. Because of the closure rule, government saving adjusts to close the gap between tax revenue and the fixed expenditures. Gains are mainly for households whose consumer price index declines because now agricultural products are cheaper. This stimulate private consumption which increases both for urban and rural households.

Because of the contemporaneous decline in private savings (because of higher consumption levels) and the broader government deficit nominal and real investments decline.

In step 2 we may observe the first effects on labour employment, which declines by 0.02 percentage points. This means that the tariff cut has a contractionary effects on total employment and production. At least if we consider formal production. Generally, informal production increases in each sector by the same percentage (+ 0.22 percent) because of the positive effects of the increase in labour remuneration. Formal production, instead, has not a unique trend across activities. The primary sector increases its production level, while the other sectors worsen their production. Similarly, labour employment in informal sectors increases but it is more than offset by the decline in formal employment.

In the external sector both imports and exports decline. The former diminish more than the latter. The only except is the trade with the other SADC member states whose imports decline more than exports. Because of the reduction in domestic production and imported goods, total internal Armington supply declines (-0.06 percent). By sector, in this stage only the

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agricultural sector gains from the tariff liberalization. The reason is quite intuitive considering the tariff phase-out. Up to this point, Mozambique has reduced drastically only tariffs on agricultural products.

The lower supply level combined with the increase in labour remuneration (+ 0.04 percent), because now labour is the scarce productive factors, leads to higher real private consumption and lower real investments (-1.06 percent). An interesting aspect to detect is that the decline in employment level is completely offset by the increase in wages which ultimately allows households to earn a higher total income.

The effects on the macro aggregates are negative. Government savings worsen and increase by 22.37 percent. We can immediately declare that it is a negative phenomenon because at the benchmark level government has negative savings, this means it worsens its financial position. This time also foreign savings move. They change between 0.21 and 0.23 percent respect to the region. It is worthy to note that foreign savings from RoSADC, already negative in the benchmark, worsen. All these data are shown in table 52.

When the tariff cut is completed, the effects are the same already explained the only difference is in numbers. Final employment is declined by 0.04 percent and formal production declines from 0.08 percent, in the trade sector, to 0.30 percent, in the mining sector. Tariff reduction has positive spillovers only on the agricultural sector and the informal activities (but here the reason is the stimulus to consumption because of the reduction in consumer prices). Government savings diminishes by more than a half (- 55.64 percent) and increases in foreign savings have the same magnitudes.

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Table 49: Short- run benchmark BK CGE model results on real production

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production
<i>Agriculture</i>	10.0430	11.6010	-	-	+0.07	+0.22	+0.17	+0.54
<i>Mining</i>	0.7680	-	-	-	-0.12	-	-0.30	-
<i>Manufacturing</i>	37.6390	9.7380	-	-	-0.11	+0.22	-0.28	+0.54
<i>Trade</i>	21.0340	-	-	-	-0.03	-	-0.08	-
<i>Services</i>	78.8700	4.8850	-	-	-0.08	+0.22	-0.19	+0.54

Table 50: Short- run benchmark BK CGE model results on employment

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment
<i>Agriculture</i>	6.4690	7.4270	-	-	+0.11	+0.20	+0.14	+0.50
<i>Mining</i>	0.0730	-	-	-	-0.14	-	-0.41	-
<i>Manufacturing</i>	7.5290	1.8860	-	-	-0.15	+0.18	-0.36	+0.46
<i>Trade</i>	6.1750	-	-	-	-0.07	-	-0.16	-
<i>Services</i>	27.3780	4.8850	-	-	-0.10	+0.22	-0.25	+0.54

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

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Table 51: Short-run benchmark BK CGE model results on real foreign trade

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
<i>Rest of world- ROW</i>	19.5420	41.2920	-1e ³	-5e ⁴	-0.16	-0.08	-0.40	-0.19
<i>Republic of South Africa- RSA</i>	8.1200	10.2310	-	-	-0.10	-0.08	-0.25	-0.20
<i>Rest of the SADC area- ROSADC</i>	2.8640	1.1090	-	-	-0.03	-0.08	-0.08	-0.20

Table 52: Short- run effects of the BK benchmark CGE model on macro- aggregates

	Base run	Percentage change respect the base run		
		1st step	2nd step	3rd step
<i>km</i>	1	-	-0.02	-0.04
<i>gsav</i>	1	+0.12	+22.37	+55.64
<i>fsav- ROW</i>	1	-	+0.21	+0.53
<i>fsav- RSA</i>	1	-	+0.23	+0.55
<i>fsav- ROSADC</i>	1	-	+0.23	+0.59

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

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b) *The BK closure 1*

Respect to the previous closure, here we suppose fixed government savings. In this way we want to detect whether there is the same behaviour in key elements such as production, employment and foreign trade in the short- run. Moreover, we are interested in looking at the relationship between saving sources (especially we want to see if government and foreign savings are interchangeable) and investment demand. In other words, we investigate if this closure allows to maintain at least the same investment demand level of the *BK benchmark* so that we may say that a change in one institution’s savings may be completely offset by a change in another institutions’ saving source.

As in *BK benchmark*, the first stage in tariff liberalization has no remarkable effects on production and employment levels. This is evident if we think of the phase- out: there is a 20 percent reduction in agricultural products from RSA and RoSADC. It represents near 1 percent of total imports. The only immediate effect is a reduction in the aggregate supply price for this class of products, that stimulates private consumption. Although we are considering minimal changes in quantities, there is a decline in imports from ROW which causes a decline in Armington supply. Because the consumption component increases, both government expenditures and investments slightly declines.

In this phase our macro- aggregates are fixed at the benchmark level.

When tariffs are partially cut on agricultural and manufacturing commodities, effects on the Mozambican economy becomes more robust. Formal total production declines led by the marked decline in services (-0.22 percent). In fact, the other sectors show positive performances (more evident in the agricultural and trade sectors with increases of 0.17 and 0.16 percent, respectively). Labour employment follows the same trend so that the decline in employment in the service sector counterbalances the higher employment level of the other sectors. This makes aggregate *km* to fall by 0.02 percentage points.

Because now labour is the relative scarce factor its wage increases (+ 0.01 percent) while profit rate declines (-0.05 percent). The declines in capital remuneration pushes downward the distributed profit rents which however do not decline by the same percentage (only -0.02 percent).

Respect to foreign trade, there is an increase in capital inflows from abroad, mainly from RSA since the tariff cut affects mostly imports from this country which is the major trading partner within SADC. Imports and exports from the rest of the World in this step are unaffected by the policy, while evidently it affects intra- SADC trade. There is a more pronounced effect on imports (directly affected by the policy) than on exports which however increase. Higher imports cause total domestic supply to increase lowering the related price.

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This stimulates private consumption. Rural and urban households present different patterns: the former consume only 0.2 percent more and the latter 0.35. This difference may be explained by the composition of the consumption basket. Rural households buy both composite and informal goods, while urban households buy only in the formal market. Composite formal prices decline more than the informal sector producer prices. This leads to different consumption prices which fall by 0.21 and 0.35 percent for rural and urban households, respectively. Since urban consumption basket is composed only by market- commodities the price fall is not counterbalanced by the informal component.

As in the first step government consumption declines, because of the public sector’s closure rule, by 2.2 percent. On the contrary, investments slightly increase (+ 0.22 percent).

When intra- SADC trade is completely liberalized, the trend already analysed in the second stage is reinforced. Labour employment lowers again (-0.04 percent) and, because of the closure rule with fixed government savings, foreign capital inflows grow too, especially respect to South Africa (table 56). Demand components are divided between increased and decreased ones; namely both rural and urban private consumption get higher (+ 0.50 and + 0.86 percent respectively), government expenditures drastically decline (-5.4 percent) while real investments increase by 0.56 percent.

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Table 53: Short- run “BK closure 1” CGE model results on real production

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production
<i>Agriculture</i>	10.0430	11.6010	9e ⁵	2e ³	0.17	0.20	0.42	0.50
<i>Mining</i>	0.7680	-	-	-	0.09	-	0.23	-
<i>Manufacturing</i>	37.6390	9.7380	3e ⁴	1e ³	0.09	0.20	0.23	0.50
<i>Trade</i>	21.0340	-	9e ⁴	-	0.16	-	0.41	-
<i>Services</i>	78.8700	4.8850	-1e ³	2e ³	-0.22	0.20	-0.55	0.50

Table 54: Short- run “BK closure 1” CGE model results on employment

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment
<i>Agriculture</i>	6.4690	7.4270	1e ³	1e ³	0.16	0.19	0.41	0.48
<i>Mining</i>	0.0730	-	-	-	0.13	-	0.13	-
<i>Manufacturing</i>	7.5290	1.8860	-	-	0.08	0.18	0.20	0.47
<i>Trade</i>	6.1750	-	-	-	0.15	-	0.38	-
<i>Services</i>	27.3780	4.8850	-1e ³	2e ³	-0.23	0.20	-0.58	0.50

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

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Table 55: Short-run “BK closure 1” CGE model results on real foreign trade

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
<i>Rest of world- ROW</i>	19.5420	41.2920	-	-2e ⁴	9e ³	4e ³	0.02	0.01
<i>Republic of South Africa- RSA</i>	8.1200	10.2310	1e ³	-	0.14	0.11	0.35	0.28
<i>Rest of the SADC area- ROSADC</i>	2.8640	1.1090	-	-	0.02	0.13	0.12	0.31

Table 56: Short- run effects of the “BK closure 1” model on macro- aggregates

	Base run	Percentage change respect the base run		
		1st step	2nd step	3rd step
<i>km</i>	1	-	-0.02	-0.04
<i>gsav</i>	1	-	-	-
<i>fsav- ROW</i>	1	-	0.23	0.59
<i>fsav- RSA</i>	1	-	0.30	0.70
<i>fsav- ROSADC</i>	1	-	0.28	0.76

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

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c) The BK closure 2

In this closure we suppose that foreign savings are fixed while public deficit is allowed to move and balances the saving- investment account. In the short- run, trade liberalization has a negative impact on labour employment which reduces by 0.02 percent in the second phase and 0.04 percent in the third one. Government savings deteriorate too. At the end of the process it has increased by 56.14 percent.

Analysing data in table 57, we note that domestic production gradually increases only in the agricultural sector, while it severely falls in the service and manufacturing ones. The same trend is evident in the employment data. Only in the primary sector labour is more employed while all the other sectors face declines. Informal production, instead, increases independently of the sector because it is stimulated by the higher rural incomes and consequently the higher demand.

Respect to foreign trade, we have supposed fixed capital inflows. This means that changes in imports and exports counterbalance each other in order to maintain stable the current account. According to this closure, the SADC free trade area diverts trade for the Mozambican economy. This means that because of the lower tariff rates respect to South Africa and the rest of SADC, imports from these regions have a comparative advantages because of their lower prices. However, according to simulation results, imports from these regions decline as well. In details, while imports from the rest of the World fall for each sector, within SADC members there is an increase in agricultural goods trade. The worst performance is in the manufacturing commodities trade which loses positions respect all trading partners. Relatively, the fall down inside the SADC region is partially mitigated by the good performance in the agricultural sector.

The same situation may be observed in the total Armington supply which increases only in the primary sector. The marketed prices declines and this fact particularly stimulates private consumption for urban households who consume a higher fraction of these goods respect to rural families. Urban living costs fall by 0.84 percent while in the rural area only by 0.5 percent.

Because of fixed government expenditures and the increasing consumption components, investments dramatically fall. They reduce by 3.15 percent.

As already said, labour becomes the scarcer factor, so that its remuneration increases more than proportionally, so that at the end of the liberalization process it is 0.10 percent higher. Although profit rate gets higher, the price of distributed profits decline and this partly offsets the increase in labour income for households. This mainly affects urban households (who only hold distributed profits). However they have a higher percentage increase in their consumption respect to rural households.

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Table 57: Short- run “BK closure 2” CGE model results on real production

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production
<i>Agriculture</i>	10.0430	11.6010	-	2e ³	0.12	0.21	0.31	0.51
<i>Mining</i>	0.7680	-	-	-	-0.08	-	-0.18	-
<i>Manufacturing</i>	37.6390	9.7380	-8e ⁴	1e ³	-0.06	0.21	-0.16	0.51
<i>Trade</i>	21.0340	-	-	-	-0.05	-	-0.13	-
<i>Services</i>	78.8700	4.8850	-4e ⁴	2e ³	-0.09	0.21	-0.23	0.51

Table 58: Short- run “BK closure 2” CGE model results on employment

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment
<i>Agriculture</i>	6.4690	7.4270	-	1e ³	0.11	0.19	0.27	0.48
<i>Mining</i>	0.0730	-	-	-	-0.14	-	-0.27	-
<i>Manufacturing</i>	7.5290	1.8860	-1e ³	-	-0.1	0.17	-0.24	0.43
<i>Trade</i>	6.1750	-	-	-	-0.08	-	-0.21	-
<i>Services</i>	27.3780	4.8850	-4e ⁴	2e ³	-0.12	0.21	-0.29	0.51

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Table 59: Short-run “BK closure 2” CGE model results on real foreign trade

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
<i>Rest of world- ROW</i>	19.5420	41.2920	-1e ³	-2e ⁴	0.05	-0.11	0.14	-0.28
<i>Republic of South Africa- RSA</i>	8.1200	10.2310	-	-	-1e ³	-0.11	-1e ³	-0.29
<i>Rest of the SADC area- ROSADC</i>	2.8640	1.1090	-	-	-0.18	-0.11	-0.45	-0.30

Table 60: Short- run effects of “BK closure 2” on macro- aggregates

	Base run	Percentage change respect the base run		
		1st step	2nd step	3rd step
<i>km</i>	1	-	-0.02	-0.04
<i>gsav</i>	1	0.12	22.58	56.14
<i>fsav- ROW</i>	1	-	-	-
<i>fsav- RSA</i>	1	-	-	-
<i>fsav- ROSADC</i>	1	-	-	-

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

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d) The BK closure 3

Under this closure both government deficit and foreign savings are fixed at their benchmark level. By construction households and enterprises devote a fixed share of savings respect total investments. It is likely to suppose that in this case real investment level should be stable at the benchmark level. In fact, looking at data, investments are not effected by the policy shock.

However, a labour multiplier acts and reduces labour supply by 0.03 percent. The model works as a textbook BK model when a supply side shock occurs, as the ones described in chapter 2. Throughout the whole liberalization process, benefits, in terms of domestic production, are widespread across sectors with the only exception of the service sector which drastically reduces its formal production (table 61). The general employment level, as already observed, declines due to the service sector performance. Its decline counterbalances the positive effects on employment in all the other sectors.

Foreign trade is affected by the shock. As predictable, imports from SADC countries are preferred so that they increase both from South Africa and the rest of the SADC members. Meanwhile Mozambique reduces its imports from the rest of the World. This behaviour is coherent with the traditional interpretation of a tariff cut: now RSA and RoSADC have competitive advantages, therefore Mozambique imports more from those origins. Exports, instead, do not follow the same trend. They increases respect to South Africa but surprisingly also respect to the rest of the World. Exports to other SADC member states declines⁸. For the first time this closure causes a different behaviour in foreign exchange rate. Under the other closures they diminish respect to each trading partner. Here, foreign exchange rate respect the rest of the World and South Africa increases while only for the rest of the SADC members it declines.

As usual, households have advantages from the tariff cut because of the lower market prices. For this reason, rural households, spending a smaller fraction in marketed commodities have a lower increase in consumption demand respect to urban households.

⁸ We have to clarify a concept both in this closure and in the previous one. Here we assume fixed foreign savings. By default, this is the option in MPSGE but it does not consider foreign savings from different countries. So in these simulations it is assumed that foreign savings is fixed in aggregate terms.

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Table 61: Short- run “BK closure 3” CGE model results on production

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production	Formal production	Informal production
<i>Agriculture</i>	10.0430	11.6010	9e ⁴	2e ³	0.23	0.19	0.58	0.46
<i>Mining</i>	0.7680	-	-	-	0.14	-	0.36	-
<i>Manufacturing</i>	37.6390	9.7380	2e ⁴	1e ³	0.15	0.19	0.38	0.46
<i>Trade</i>	21.0340	-	9e ⁴	-	0.14	-	0.36	-
<i>Services</i>	78.8700	4.8850	-1e ³	2e ³	-0.24	0.19	-0.60	0.46

Table 62: Short- run “BK closure 3” CGE model results on employment

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment	Formal labour employment	Informal labour employment
<i>Agriculture</i>	6.4690	7.4270	1e ³	1e ³	0.23	0.18	0.56	0.45
<i>Mining</i>	0.0730	-	-	-	0.14	-	0.27	-
<i>Manufacturing</i>	7.5290	1.8860	-	-	0.14	0.17	0.35	0.43
<i>Trade</i>	6.1750	-	-	-	0.13	-	0.33	-
<i>Services</i>	27.3780	4.8850	-1e ³	2e ³	-0.25	0.19	-0.62	0.46

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

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Table 63: Short-run “BK closure 3” CGE model results on foreign trade

	Base run		Percentage change respect the base run					
			1st step		2nd step		3rd step	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
<i>Rest of world- ROW</i>	19.5420	41.2920	-5e ⁴	-	0.25	-0.03	0.62	-0.08
<i>Republic of South Africa- RSA</i>	8.1200	10.2310	1e ³	9e ⁴	0.29	0.07	0.73	0.19
<i>Rest of the SADC area- ROSADC</i>	2.8640	1.1090	-	-	-0.12	0.09	-0.32	0.20

Table 64: Short- run effects of “BK closure 3” on macro- aggregates

	Base run	Percentage change respect the base run		
		1st step	2nd step	3rd step
<i>km</i>	1	-	-0.01	-0.04
<i>gsav</i>	1	-	-	-
<i>fsav- ROW</i>	1	-	-	-
<i>fsav- RSA</i>	1	-	-	-
<i>fsav- ROSADC</i>	1	-	-	-

Source: *Static CGE model results*

Note: features in the base run are 10³ Billion MT

VII. Concluding remarks

This chapter has presented a different framework to analyse the impact of a trade liberalization process. Conversely to chapter 5, this is a demand- driven model where labour supply is endogenized. This elements allows to study the employment effects of the policy shock. In the Neoclassical case, as already explained, the CGE illustrates only the “usual” consequences of a price reduction (led by lower tariffs) in the supply side. Predictably, the process has positive effects since we consider that a reduction in final prices stimulates an increase in consumption without affecting both capital and labour employment, because of the full employment assumption. In this BK model, instead, we may answer other questions that usually arise during a liberalization process such as: supposing the country loses its comparative advantages in the production of one good, is there not only a change between sectoral employment levels but also a change in the general employment level?

According to the IFPRI model the answer is no. A change in labour employment levels may occurs only at the sectoral level. Considering the whole economy, total labour employment is fixed at its benchmark level. Obviously, this supposition enforces the concept of “a liberalization process without loses but only gains” where people always have a work and they may benefit from the price reduction.

Here instead this is not true. We have definitely demonstrated that, although changes in the model closures, the SADC trade liberalization will reduce employment levels (-0.04 percent). However this analysis regards only short- run effects. In the medium- to long- run according to a steady state model, employment will increase (between 0.03 and 0.04 percent), coherently with mainstream macroeconomics.

The “Bastard Keynesian” model allows to capture many salient features in the liberalization process, i.e. direct effects of the price reduction, immediate effects on the public budget, and the innovative element of the effects on labour employment.