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The Macroeconomic Impact of Restructuring Public Expenditure by Function in South Africa

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EXTREME LEVELS OF INEQUALITY produced by the apartheid system seem to have overwhelmed policymakers committed to the public sector as the mechanism by which the welfare of the majority of the people could be improved. In the face of staggering obstacles, the government has adopted the argument of "fiscal discipline" as the organising principle of public policy. Yet there appears to be some scope for restructuring the budget along functional lines to improve the distribution of income and increase employment. This paper examines the macroeconomic impact of restructuring public spending using a multi-sectoral, dynamic .computable general equilibrium (CGE) model calibrated to a South African Social Accounting Matrix (SAM). The principal conclusion is that functional shifts in government spending can make a significant difference in growth, employment, inflation and income distribution. Above all, it is necessary that public policies to stimulate demand be co-ordinated with more supply oriented policies in order to stabilise major macroeconomic

variables. A strategy which emphasises economic services and infrastructure investment performs best according the results of the CGE simulations.

The paper is organised as follows: section 2 locates the model in the context of the South African debate on macroeconomic frameworks which has been structured in terms of "demand driven" versus "savings constrained" models. The section presents a stylised version of a macro-model which marries the concerns of both schools. The hybrid model is then subjected to a fixed public sector borrowing requirement (PSBR) to gross domestic product (GDP) constraint and it is shown that this will bind optimal fiscal intervention. Section 3 offers a brief empirical explanation of why South African fiscal policy is constrained by current rates of taxation. Since raising taxes is not politically feasible, the second best policy involves restructuring spending to broaden the coverage of pubic sector benefits. CGE results are presented in the fourth section which show that a strategy which concentrates on economic services and infrastructural investment will work best in an economy in which private sector investment is crowded in to some degree.

1. Theoretical Perspectives

Since Keynes, it has been widely accepted that in a fix-price model with under-utilised capacity and unemployed labour, a rise in government spending would increase output. If wages and prices are flexible over time, however, this outcome is less certain and depends upon how agents form expectations about the likely effects of government expenditure. Savings driven, or supply-side models question the proposition that the expenditure multiplier is even positive, noting that if taxes are not raised to pay for increased public sector spending, gross domestic savings will fall. As less is saved, less must be invested and thus the growth rate of the economy will decline If tax rates increase*(2) to

pay for the expenditure, growth will still slow down since higher taxes usually cause private savings to fall.

A demand driven model will show, on the other hand, that an increase in output accompanies a rise in public sector spending, whether tax rates increase or the deficit is financed through the capital market or monetary expansion. The essence of the difference in the two perspectives lies in the determinants of investment. A more structural view holds that investment will increase when entrepreneurs foresee opportunities to produce and sell their output profitably. The source and cost of funds is not irrelevant, but the most important determinant of investment is expected sales and profits. Orthodox models, by contrast, see investors as both motivated and limited by the amount of available savings, chained to the past as it were, and unconcerned with the size of the market for their goods . In demand-driven models, saving follow in the path of investment , adjusting to the vision of the future while in the supply-side model savings determine how the future will unfold *(3).

Past savings do indeed determine the available capacity to produce, but this constraint only becomes binding when capacity is fully utilised. Whether the capacity is in fact utilised may have little to do with past savings and, if anything, higher savings may well correlate with lower utilisation ratios. It follows that models which focus exclusively on demand or supply are inadequate as a foundation for understanding the dynamics of the market system. Policy based on a one-sided view will either be impulsive or without motivation and cynical in its self-assessment. Confusing and conflating the two approaches, policymakers often arrive at incoherent conclusions and resort to prescribed ratios or other rules of thumb. An example is setting the ratio of the PSBR to GIMP as an economic objective of government policy. A political initiative is thus disguised as an economic one.

A successful growth strategy must therefore take care to balance policies which stimulate demand with those which increase

supply. If demand is over-emphasised, the result is

inflation which may lead to a contraction in productive capacity. If so, the inflationary tendency is reinforced. On the other hand, policies centred exclusively on supply run the risk of increasing capacity to an extent that the growth in capacity itself becomes a drain on further investment.

(a) The Dynamics of a Co-ordinated Model

In this section, we develop a simple dynamic model which integrates elements of both the demand and supply sides. Current output depends upon consumption C, investment I, plus other autonomous expenditure A (government and exports). Consumption is a function of disposable income Y^d and investment depends upon capacity utilisation, u. The latter is defined as the ratio of current income Y to full capacity output Q. In symbols we have:

Equations 1-3 constitute the usual demand-side model referred to above. For any given period *t*, the Q_{t-1}, is known. Investment is determined in equation 2 and output is given by equation 1. The supply side of the model says that capacity output depends upon capital stock *K* available at the beginning of the period, which in turn depends on previous investment

In the CGE-modelled economy, substitution is limited so that labour *L* is never a constraint on the level of capacity output. With factor prices given, the firm calculates , *Q* and the associated labour demand from the production function of equation 4. But if the current level of demand Y_t falls short of capacity, demand for labour will fall, but not in proportion, since firms find it

profitable to retain overhead labour. If demand exceeds full capacity output, as determined in equation 3, prices and profitability rise and current period investment increases capacity, but *only* for the next period. Thus, the current period supply curve is vertical at full capacity. With *I* fixed, the demand-side model can be used to calculate multipliers in the usual way.

The traditional long-run supply-side model allows the factor prices of labour and capital to adjust until the demand fully absorbs supply. The consumption function in equation 1 then determines investment as a residual. Growth in the capital stock thus depends upon savings and, together with the growth in the labour force, determines the growth of income. In the traditional model, there is evidently no role for the independent investment function in equation 2 and capacity in equation 3 is always fully utilised.

If we drop the assumption of flexible prices and wages leading to full capacity utilisation, the full model then consists of equations 1-4 (including equation 2). A far more interesting set of dynamics unfolds when one assumes that both the demand (in equations 1-3) and supply side forces (in equation 4) are at work simultaneously. A rise in autonomous expenditure, for example, will increase capacity utilisation. Put the higher level of capacity utilisation stimulates investment as suppliers increase capacity to meet the rise in spending. An autonomous increase in capacity from, say technical change, might well dampen investment if demand does not increase in step. Sustained growth is possible in the model only if the demand and supply sides are co-ordinated.

The dynamics of the model then depends upon the composition of the changes: a given percentage increase in output must be accompanied by the same percentage increase in capacity, or capacity utilisation will change. If output is growing in industries already experiencing significant excess capacity, there is little need for additional investment and capacity utilisation will rise; but if demand is slanted toward industries

already operating close to full capacity, the only option is to invest, thereby increasing capacity output.

Once underway, the dynamics can be characterised in one of three ways. The system may converge to some long run equilibrium or it may diverge with some variables increasing without bound. If a long run equilibrium exists, it may be at full capacity utilisation, or something less. Clearly, a model which diverges is necessarily "medium term", since eventually the environment to which the model is calibrated must change. But note that with a change in regime, the question of whether a long run equilibrium exis ted for the initial set of parameters is clearly irrelevant. A sequential, medium term framework is probably the most realistic approach to modelling economies as they actually work. A third option is that cycles develop in capacity utilisation. The cycles themselves may be convergent or divergent or on the boundary between (a limit cycle).

Cyclical behaviour develops if the effect of investment on capacity growth is strong and there is significant depreciation. Imagine then an autonomous increase in investment which drives up income through the multiplier but increases capacity by a greater percentage. Capacity utilisation falls and this puts downward pressure on investment in the next period. Assume that this occurs and that investment is constant thereafter. If depreciation is rapid, the relatively low level of income will correspond to low capacity

utilisation only initially. Soon, capacity utilisation will rise, even though income remains constant. The cycle then turns up again as investment increases in response. to higher levels of capacity utilisation. Clearly, the type of investment, by origin as well as destination, would be an important determinant of the path of the utilisation ratio. *(4)
A model which allows for such a wide range of possibilities is clearly much richer than one for which the initial set of assumptions entirely predetermines the dynamic path. The issue, for example, of whether higher savings rates would or would not accelerate growth is entirely open in the model discussed here.

Similarly, the timing of exogenous shocks, relative to the position in the cycle, is crucial. A rise in government expenditure could promote growth or slow the economy down depending upon the degree to which private sector investment was crowded in or out by the intervention. In other words, policies which work at a low level of capacity utilisation might be ineffective at high utilisation rates and *vice-versa*. Since the impact of crowding in and crowding out is linked to the level of capacity utilisation, it is not possible to characterise one or the other as always dominant like in more one-sided models.

(b) The Public Sector in the Model

Public expenditure is broadly classified into current spending on goods and services G, capital expenditure I^g, the wage bill at wage rate w and employment L^g, interest payments at interest rate i on debt D and transfers T. With Y as GDP and t as the tax rate, the PSBR to GDP ratio p can be expressed:

From this formulation, it is clear that all major institutions in the economy play a role in the determination of the PSBR ratio. Government policy sets current and capital expenditure, employment, transfers and the statutory tax rate. But the trade unions influence the total government wage bill while the South African Reserve Bank (SARB) interest rate policy affects total interest payments. Transfers depend in part on demographic variables outside the control of government while the tax rate of equation 5 is clearly an effective rate which is less than or equal to the statutory tax rate. Rate payers across the economy evidently exercise some control over the PSBR ratio.
Government policy which seeks to control p must accurately predict income as well as the response of the remaining agents to government policy. Practice is more slipshod and policy often devolves into a search for a quiet residual in equation 5. Studies

of fiscal adjustment typically find that capital expenditures are cut more than current expenditure with infrastructural investment suffering the most (World Bank, 1994, p. 19). South Africa appears to be no exception to this general rule. Public investment then adjusts endogenously to conform to a given PSBR ratio.
To model this adjustment process, we set the level of the PSBR to GDP as an exogenous or policy determined parameter. Note that the savings-investment balance normalised by Q can be written as

where: S^p is the ratio of savings to output for the private, and S^x for the foreign sectors, respectively. Capacity utilisation is defined as in equation 3, the capital-capacity output ratio is k and g is the rate of growth of the private sector capital stock, assuming for simplicity that there is no depreciation. The private sector investment function is taken in the model to be:

where a is the accelerator coefficient, *b* is the crowding-in term, i^g government investment divided by income and *c* is the crowding-out coefficient which measures the intensity of the (negative) impact of an increase in the interest rate *r* on private sector accumulation. Substituting the last equation into equation (6), the solution for capacity utilisation is:

The short run mechanics of the model are immediately evident from equation (8). The first term in the numerator is crowding-in. A rise in public sector investment will increase capacity utilisation in the short run and an increase in the interest rate will cause capacity utilisation to fall. Consistent with the Keynesian short-run behaviour of the model, a rise in private (or foreign) savings will cause the utilisation rate to fall. An increase

in the accelerator coefficient *a* or the capital output ratio *k* will push up capacity utilisation.
An increase in any other component of government expenditure will have a dampening affect on capacity utilisation since it will crowd out public investment and therefore private investment. Thus, a non-zero crowding-in coefficient *b* ensures that a rise in current government expenditure will cause capacity utilisation to fall. On the other hand, a rise in the tax rate *t* will cause current

levels of capacity utilisation to rise, since for the same PSBR ratio, more government investment will be forthcoming and thus with a positive b, more private investment *(5).
The dynamics of the model is significantly affected by the PSBR constraint. An autonomous increase in private investment, for example, will cause the current level of output to increase and hence the induced effects of higher income on the PSBR ratio will cause government investment to rise. The multiplier is strengthened because of this effect, but there is also a rise in capacity due to the higher level of investment, public and private. Any increase in output will have the same effect of raising government investment, thereby toning down the possible mismatch between changes in capacity and changes in the current level of income. Holding the PSBR ratio constant provides an automatic stabiliser which reduces the oscillatory character of the model. On the other hand, the inherent stabilising effect of proportional taxation is diminished by the PSBR rule since any positive (negative) exogenous shock to income, normally reduced by the increase (decrease) in the tax burden, is offset by a rise (fall) in government expenditure!
Finally, inflation affects the public sector balance in subtle ways. Current government expenditure and employment are set by policy in real terms, and transfers are set as a share of GDP. The interest rate is set by a reaction function of the SARB which in turn depends upon the level of inflation, economic activity and the change in foreign reserves. Nominal wages are determined by equations which depend on capacity utilisation and previous

gains in real wages relative to (endogenous) productivity increases (See Gibson and van Seventer, 1996, for further details). Thus, the interest on debt and the wage bill depend on how closely the interest rate and the wage rate track the rate of inflation. Depending upon the position of the economy in the cycle, the interest and wage rate may lag behind changes in the price level. When the economy is closer to full capacity, adjustments are more rapid.
Nominal variables, prices, wages, the interest and exchange rate, cause the public sector to have an additional destabilising effect on the dynamics of the economy. Close to full capacity utilisation, interest and wage costs rise, thereby reducing government investment. The resulting slowdown in capacity growth increases the upward pressure on inflation. On the other hand, an unanticipated increase in inflation would produce higher levels of government investment, causing capacity to grow, thereby reducing the inflationary tendency in the economy.
Holding the PSBR as a fraction of GDP constant has a number of significant disadvantages when considered from the perspective of optimal policy. On the one hand, it robs the public sector of a major policy lever in that it causes the current government spending multiplier to become negative when crowding in is a factor and zero if not. It also contributes to higher inflation due to slower rates of capital formation. On balance, then, one can conclude that this policy rule is destabilising and unlikely to produce the best macroeconomic performance for the South African economy. In the next section, we address the question of why this approach to macro-policy making was adopted when it is evidently defective.
(c) Exports in the Model
Exports contribute, of course, to the total amount of aggregate demand and a crucial aspect of the performance of any theoretical structure is the accuracy with which exports are

modelled. Here the strategy is again to concentrate on both the demand and the supply sides. The bulk of South African exports are from the traditional sectors mining and agriculture. Both sectors are assumed to operate at full capacity and export what is left over after domestic demand is satisfied. Higher levels of capacity utilisation in the domestic economy thus reduce traditional exports. Exports of the non-traditional sectors (all but mining and agriculture) on the other hand, are positively related to capacity utilisation with the proportion of output exported depending upon the real exchange rate.

2. The Policy Environment

The second-best macro-economic policy of a fixed PSBR ratio can be seen as the legacy of apartheid period and the negotiated end to white rule. Lacking the political wherewithal to adopt obviously superior fiscal policies, the government has settled for a second-best rule of thumb. In this section, we provide a formal explanation of why optimal intervention has been effectively ruled out as a strategy. Interracial disparities in public sector expenditures are so large relative to the available tax base, that the only workable option was to set arbitrary limits the size of the public sector and adopt the rhetoric of "fiscal discipline".

(a) The Spending Dilemma

One measure of the injustice of the apartheid period is the degree to which social benefits were skewed towards the white minority. While whites were responsible for the bulk of public sector revenues, 77 per cent in 1975 and 72 per cent in 1987, they captured some 56 per cent of social benefits in 1975 and 35 per cent in 1987 (IMF, 1992, p. 28). In 1975 whites were 16 per cent of the population and by 1987 they constituted 14 percent. Thus, spending on a per capita basis was becoming more egalitarian but with a

considerable distance to go.

With the official end of the apartheid period, the justification for large disparities in the distribution of social benefits was no longer present. But it was far from clear how to redress the inequality inherited from the past. To appreciate the magnitude of the problem, let s be the ratio of government spending per capita on blacks (including Asians and coloureds) to that on whites. If the tax rate on the white population were raised to pay for the equalisation of benefits at the level of the whites, the change in the tax rate would be:

where n is the share of the whites in the total population and g_W is government spending on whites as a share of white income *(6)
The IMF estimates $g_W = 0.1$ (IMF, 1992, p. 28). Data for s are less certain. An often quoted statistic is that the government spent four times more to educate a white than a black child, but other categories of expenditure, such as health, could be more equally distributed. Fig. 1 plots the increase in the white tax rate, Δt, required to equalise per capita spending given the initial disparity ratio, s. For example, the increase in the white tax rate which would allow the equalisation of benefits when $s = 0.53$ (an estimate of the actual s for health*(7)) is approximately 0.33. Educational benefits were initially even more skewed ($s = 0.25$) and the figure shows the tax rate would have to increase by 0.5 to equalise per capita spending. Thus, if all benefits were skewed in the same ratio as health, the tax rate would have to rise from the present 31 per cent to 64 per cent of white income*(8).
Since tax rates in this range are practically unenforceable, the government has opted to revise its goals of extending white benefits to other races. Instead, they will alter the composition of government spending. According to the minister of finance, the government is committed "to effect deep transformation and to live within its means" (Business Day, 13 March 1997). The government will attempt to reallocate spending within functional categories to achieve a more egalitarian distribution of benefits

and between functional categories to raise employment within an "envelope" or declining PSBR to GIMP constraint (Department of Finance, 1997).

Figure 1: Equalising Government expenditure

In practice, fiscal discipline implies that most departments are unlikely to be able to meet the policy targets they have set for the medium term. In particular, the goal of free and compulsory education for 10 years with acceptable learner-teacher ratios, accelerated construction of new classrooms and equalisation of per pupil government expenditure is all but unreachable. Neither will there be sufficient government funding for an acceptable number of average annual per capita visits to health care facilities. With primary (i.e., non-interest) spending slated to fall in the 1997-98 budget by 4.7 per cent in real terms, the current approach to budget prioritisation replaces the goal of equalised spending with fiscal discipline. The priorities in spending have not yet been fully determined inasmuch as the Growth, Employment and Redistribution (GEAR) appears to call for the substitution of capital for current expenditure, yet recent budget proposals emphasise social over infrastructural spending (Department of Finance, 1996). On the other hand, the RDP has been phased out while welfare maintenance grants appear to have retained their

place, if tenuously, in recent spending plans. These contradictory elements suggest that there is still considerable scope for debate in the determination of national priorities (Nattrass, 1996).

Figure 2: Government Expenditure

(b) Three Views in the Debate

The discussion on budget reprioritisation has been confused by conflicting assumptions about the proper role of government in the economy. Neo-classical theory offers little guidance, since as is well known, it fails to provide a complete theory of social choice (Hahnel and Albert, 1990, p.28) The Coase theorem holds that allocative efficiency can be treated separately from the distribution of income (Coase, 1960). An important conclusion is that the state should not meddle in the affairs of the private market but should limit its activities to lump sum income transfers. Since income transfers do not affect marginal calculations, the two tasks of promoting efficiency and a just distribution of income are, in principle, separable.

The theory of the modern welfare state holds that while an equitable distribution of income is not required for efficiency, it is nevertheless desirable for reasons of societal coherency. If the market does not provide a minimum level of welfare for the citizen of the state, it becomes the responsibility of the state to supply a safety net. In its most extreme interpretation, the state becomes the

employer of last resort.
By contrast, neo-liberal theory maintains that income distribution is itself endogenous and that the role of the state should be circumscribed. Incomes, in this view, are the product of intertemporal rational choice and the state has no logical or moral role in the allocation of resources in markets and neither should it play a role in determining the distribution of income. Like the price of any other resource, good or service, the distribution of income is the outcome of a market driven process. The neo-liberal state does exist, however, but it is only for the purpose of repairing market failures. Were there no externalities in production or consumption, or no public goods, the role of the state would optimally be confined to providing protection for private property and enforcing contracts. Health, education, security, justice and environmental protection all involve some sort of market failure or externality.
Openness, both on the current and capital account, is another hallmark of neo-liberal thinking. If domestic savings rates are insufficient, foreign capital can substitute, so long as the domestic interest rate is sufficiently attractive. Since saving *is* investment, capital inflow immediately augments productive capacity. Local market conditions are irrelevant; foreign capital need not be crowded in by a buoyant economy.
A third view of the relationship between states and markets is that the former should engineer the success of the latter. It is not adequate for the state simply to repair market imperfections but it rather has a fundamental role in developing markets and promoting domestic firms. In exchange for the guidance of the state, firms may agree to take over much of the provision of

social welfare that in other regimes would be the responsibility of the state. The efficiency of static resource allocation is less of a concern than growth with full employment. So long as the state ensures that the markets will operate at maximum capacity, the question of income distribution can be left to private intertemporal choice.
These three models have been adopted with various degrees of success in Europe, the Americas, Africa and Asia. It comes as no surprise that the implications for welfare, growth and the size of the public sector depend in large measure on the model in place. Broadly speaking, the Western European democracies have opted for the welfare state approach, with the result that both real wages and benefits (public and private) have been higher than in the U.S. But unemployment has hovered at about 10-11 per cent in Europe while it has fallen to half that in the U.S. due to lower real wages there. Unit labour costs have risen most dramatically in Europe, while they have been flatter in the U.S., Canada and Japan. Real wages have risen in Europe but only in Japan and Canada have real wage increases been associated with declining unit labour costs. In the developing world, productivity growth has been negative since 1980 in Latin America and the Caribbean, the Middle East and the entire continent of Africa (World Bank, 1995, p .13).
In the next sections we examine the budgetary priorities using the CGE discussed above. No pure strategy can be followed inasmuch as a good deal of the budget is established by previous commitments. Historical policy also links future spending to more or less well identified cost drivers, population growth, labour force, inflation rates, etc. and is therefore outside the scope of any but fundamental reform. Given that major change in the policy direction is unlikely to materialise, we consider some relatively minor shifts in the direction of public expenditure. Each simulation involves a range of parameter changes summarised in spirit under headings that correspond to the three conceptions of the appropriate role of government:

the welfare state, the neo-liberal model and a strategy emphasising a public-private sector partnership, characterised here as "Japan Inc." It should be understood that these labels are identifiers of specific simulated policy packages rather than indicating a more fundamental shift towards the models used in the countries discussed above. It is also to be stressed that these simulations are entirely macroeconomic in nature and we do not consider any of the underlying microeconomic issues of implementation and feasibility. Neither are the simulations intended to assess the overall welfare effects of the three directions in policymaking. The objective is more modest, *viz*. to assess the impact on growth, employment, exports, inflation and income distribution of different assumptions about the structure of the budget.

3. CGE Simulations

The parameter levels for the three simulations are summarised in Table 1 and are assumed to hold for the 1995-99 forecast period. The changes are classified in five groups: current government consumption, other spending related to current consumption, consumer subsidies, capital transfers for land reform, and assumptions about the macroeconomic environment. The latter include the ratio of the PSBR to GDP, the assumed inflow of direct foreign investment and public sector induced productivity change. *(9) Note that exports and imports are entirely endogenous in the model and thus require no special assumptions for any of the simulations.

(a) The Welfare State Simulation

The first column for the welfare state (WS) simulation emphasises health and education as well as social services and housing. The

real current expenditure of goods and services for these government functions is assumed to increase for the next five years by 10 per cent per annum relative to the base (1994) levels.

There is no real increase for economic services and expenditure on security declines by 5 per cent per year. Government employment, shown in row 2a of Table 1 is assumed to grow at the same rate as total government consumption; thus, its growth relative to the average of total current government expenditure is shown as zero. For all simulations, transfers are assumed to grow in proportion to spending on goods and services in the functional category of social welfare and housing. But in the WS simulation, transfers grow 2 per cent per annum faster, to reflect a wider social safety net. Moreover, there is a housing subsidy introduced as a fraction of GDP*(10) A direct electricity subsidy is granted equal to 10 per cent of the base year real consumption of low-income households for the forecast period. Row 4 shows that additional funds ofr land reform (10 per cent in nominal terms) are made available in the first simulation*(11). We further assume that land reform stimulates small scale farming activities. This translates in the model economy into lower labour productivity in the farm sector.

(b) The Neo-Liberal Simulation

Rectifying market failures and scaling down the government is the main objective of the neo-liberal (NL) approach. This is simulated by way of above average real spending increases on security (at 10 per cent per year over the base year level), an average increase in spending on health and education (3-4 per cent per year over the base year level) and no real increase in spending on economic services and social welfare /housing. In addition, the housing and electricity subsidies, as well as the land reform programme are scrapped. Government employment and transfers to households grow at 5 per cent and 2.5 per cent less per year than the current expenditures to which they are linked. The effort to equalise per capita public sector spending by race is entirely abandoned.

The scaling down of government is reflected in the declining PSBR to GDP ratio. The PSBR is assumed to fall from 6 per cent in the first simulated year (1995) to 3.4 per cent of GDP in 1999, approximately consistent with policy objectives. As a result of the fiscal prudence, capital as well as labour productivity increases by *1* and *0.5* percent, respectively, as shown*(12).

Table 1: Assumptions of the Simulations*(13)

	Welfare State	Neo-Liberal	Japan Inc.
1 Growth in Real Current Government Consumption			
a Health	10*(14)avg*(15)	avg*(16)	
b Education	10	Avg*(17)	avg*(18)
c Security	-5	10	0
d Econ Services	0	0	15
e Social Welfare and Housing	10	0	0
2 Growth Relative to Government Consumption			
a Employment	0	-5	-2
b Transfers	2	-5	-2
3 Subsidies			
a Housing	yes*(19)	no	no
b Electricity	yes*(20)	no	no
4 Land Reform*(21)	10	no	no
5 Major Macroeconomic Variables			
a PSBR/GDP	6	3.4*(22)	6
b Capital Productivity *(23)	0	1	0.5
c Labour Productivity*(24)	0	0.5	-0.25
d Direct Foreign Investment*(25)	0	3.5	0

Finally, we assume that foreign investors react favourably to the adoption of the "Washington Consensus", expecting the exchange rate to be less vulnerable to rapid depreciation. This is reflected in the model by shifting the private sector investment function up by an additional 1 per cent compared to the previous simulation.

(c) The Japan Incorporated Simulation

The spending programme in the Japan Inc (JI) simulation is based on a pact between the private sector and the government. It emphasises the economic services function of current expenditures and public sector investment. The strategy is to generate sufficient employment and income to allow a larger fraction of the population to meet their own medical and educational needs through normal market channels. Spending in the health and educational categories does not exceed the average (3-4 per cent per year over the base year level). Neither is there any real increase in current expenditure on social welfare /housing. The assumption is that firms receiving the support of the state will adequately provide for their workers. Employment and transfers decline by about 2 per cent. Similar to the neo-liberal strategy, there will be no spending on subsidies or land reform. The state considers spending in these categories to be less effective, ultimately, than on direct economic services. Neither is security a priority, as seen in the Table. The relatively slow growth in current expenditure will translate in the model into higher levels of government investment, given that the PSBR to GDP ratio is fixed. The government makes resources available not only by means of the economic services budget in order to accelerate capital productivity enhancing activities directly but also through the provision of infrastructure. The rationalisation of state services is assumed to promote higher capital productivity in the private

sector, although not to the same extent as was assumed for the NL simulation (0.5 per cent). We make the assumption here that state-led growth is on balance more capital intensive than the purely market oriented (NL) strategy. On the other hand, an important part of the JI approach is to target small and medium sized enterprises (SMEs), characterised by higher labour absorption. This is modelled here by a small decrease in labour productivity (-0.5 per cent). Finally, no additional foreign investment is expected to be forthcoming in this simulation.

(d) Results of the Simulations

Table 2 provides a picture of the macroeconomic performance in the simulations. The first column of the Table shows capacity utilisation and should be interpreted as measuring the "balance" of the model, as discussed in section two above. If capacity utilisation is rising, then supply is continually falling short of demand and thus supply-side stimulus would be called for whereas demand-side policies are warranted in the opposite situation. When considering the results in the Table, bear in mind that each simulation is the result of a complex combination of assumptions which may work together or in opposite directions to produce the reported effects. For reasons of space, it is obviously impossible to sort out the various comparative statics results of the assumptions of Table 1. This section can only provide some general indication of how the underlying adjustment mechanisms play themselves out.

Table 2 confirms that the WS policies are more oriented towards demand expansion than the NL policies since government expenditure is rising and the PSBR to GDP constraint is unbinding. If the PSBR constraint were to bind, then the rise in expenditure would only cause government investment to fall, bringing private investment down with it due to the crowding in term in the investment function in equation (7). With the demand

injection, capacity utilisation in the WS simulation rises over the forecast period, while it falls in the NL scenario.

The contraction in aggregate demand imposed on the NL simulation in Table 1 would produce slower growth than in the WS simulation, were it not for the injection of foreign investment. In the NL simulation, the assumed productivity increase coupled with fiscal discipline is simply insufficient to propel the economy forward. As stressed in the theoretical discussion above, increasing productive capacity without at the same time validating that capacity through demand stimulation simply causes investment to contract in the following period. The result is that the supply and demand-side models generate approximately the same average rate of growth over the forecast period, 3.4 per cent and 3.2 per cent, respectively.

The JI simulation produces the most rapid growth, however, averaging 4.5 per cent. Note that capacity utilisation rises to its highest level, a period average of 88.5 per cent, despite the apparently supply-side focus of this set of policies. We shall return to this point below. In none of the three cases, however, is the policy package so unbalanced that it produces capacity utilisation rates above 90 per cent and as a result, inflation remains under control. The reasons for the superior performance of the JI simulation are now clear: there is a relatively large injection from the fiscus unconstrained by considerations of fiscal discipline. The injection is balanced, however, by some growth in capital productivity to prevent a rise in capacity utilisation from igniting inflation. The limitations of demand-led growth can be seen clearly in the first simulation: the rise in the inflation rate from 1996 to 1997 causes an increase in the rate of interest (shown in the 4th

column) which chokes off the expansion. Output falls momentarily in 1998, but then regains some of its momentum when the interest rate is stabilised. In the NL scenario, growth also dips in 1998, but it is now a reaction to the sharp drop in capacity utilisation due to insufficient effective demand. When the interest rate falls, demand recovers somewhat

and the sharp decline in growth is arrested in 1999. The same interest rate effect can also be seen in the JI simulation. There growth flattens but then experiences another demand-led burst in 1998-9, as is evident from the increase in the rate of capacity utilisation in that year.

(e) Real Wages and Employment

The relatively rapid inflation in the WS simulation retards growth in the real wage, certainly relative to the NL simulation. After five years, the lowest real wage appears in the JI simulation, some 1.1 per cent lower than in the base year. Clearly there is something of a growth/real-wage trade-off, but in the NL simulation, growth is slightly higher on average than under the WS assumptions and the real wage is also 2.3 per cent higher on average. The main effect of changes in the real wage is on employment, as shown in the next column. The JI simulation shows the largest employment gains, followed by the WS package. While the real wage is the highest in the NL simulation, it clearly forces a higher level of unemployment than in the other two options. The data show that in the decade of the nineties, employment grows only by a cumulative 6.5 per cent in that scenario, versus 10.0 and 17.9 per cent in the WS and JI simulation (see below for a disaggregation of public versus private sector employment gains). Neo-liberalism has never been known for its rate of job creation.

Do the wage gains compensate for the loss of employment? Not according to the last measure in Table 2 which shows the movement in the Gini coefficient for the three simulations. Owing to a relatively rapid rate of population growth, the Gini accelerates under all assumptions*(26). But note that although the lowest coefficient is recorded for the WS experiment, the neo-liberal Gini is lower than in the JI simulation. This suggests a trade-off between growth and equity when the former accelerates due to the increase in the demand for skilled (i.e., high income)

labour while inflation races ahead of the nominal wages of unskilled labour.*(27)

Table 2: Basic Macro Data for the Simulations

	Capacity Utilisation	Growth in GDP	Inflation Rate	Interest Rate	Real Wage*(28)	Employment*(29)	Gini Coefficient
I. WELFARE STATE							
1994	83.8	2.3	10.4	12.8	104.0	94.6	0.4722
1995	86.3	2.6	11.6	14.2	103.8	96.7	0.4756
1996	86.8	3.2	12.1	14.7	103.9	99.7	0.4762
1997	87.9	3.7	13.0	15.7	103.6	103.4	0.4764
1998	87.9	3.2	12.6	15.4	104.1	106.6	0.4763
1999	88.0	3.3	12.6	15.3	104.6	110.0	0.4760
Period Average							
1990-4	82.6	0.0	12.5	15.1	102.3	95.7	0.4660
1995-9	87.4	3.2	12.4	15.0	104.0	103.3	0.4761
II. NEOLIBERAL							
1995	87.4	3.6	12.1	14.7	103.4	97.4	0.4760
1996	87.2	3.3	11.2	13.8	104.7	99.6	0.4793
1997	87.2	3.8	10.9	13.4	105.7	102.3	0.4821
1998	86.3	3.3	9.6	11.9	107.7	104.5	0.4845
1999	85.3	3.2	8.5	10.8	109.7	106.5	0.4866

Period Average							
1995-9	86.7	3.4	10.5	12.9	106.3	102.1	0.4817
III. JAPAN INC							
1995	86.8	3.1	12.2	14.9	103.3	97.5	0.4759
1996	87.8	4.1	13.1	15.8	103.0	101.4	0.4791
1997	89.0	5.0	14.1	17.0	102.4	106.6	0.4822
1998	89.3	5.0	14.0	16.9	102.6	111.8	0.4851
1999	89.6	5.4	13.9	16.8	102.9	117.9	0.4880
Period Average							
1995-9	88.5	4.5	13.5	16.3	102.8	107.0	0.4820

Source: Model computations.

Table 3 provides some additional detail on the labour market in the three simulations. Note that the WS and NL simulations are approximately equal in their employment performance in the private sector, both in regard to the total as well as the distribution between unskilled and skilled labour. The additional employment in the WS simulation is the product of the higher PSBR ratio which increases government and thus total employment. The cost is lower wages, both for skilled and unskilled labour; real wage growth for unskilled labour is 2.3 percentage points lower under the WS compared to the NL simulation.

Table 3. Structure of Employment and Real Wage.

EMPLOYMENT						REAL WAGE	
	Unskilled	Skilled	Private	Public	Total	Unskilled	Skilled
1990-94	92.9	95.7	94.7	99.2	95.7	99.6	103.8
WS	96.6	105.1	102.1	107.6	103.3	96.1	108.0
NL	97.1	105.2	102.3	101.0	102.1	98.4	110.2
JI	100.9	109.2	106.2	109.8	107.0	94.6	107.0

Source: Model computations. Note 1990 = 100, period averages 1995-9.

The]I scenario is clearly the best for labour since it combines relatively high employment with high wages. The WS simulation follows with the NL simulation lagging substantially behind. *The* NL simulation provides the highest wage for skilled labour, however, as the principal cause of the high level of inequality mentioned above. Note that the real wage of unskilled labour never reaches its 1990 level in any of the simulations and thus it is a lost decade for real wage growth no matter what the elected strategy.

(f) The Composition of Demand

An analysis of the demand composition of demand provides an alternative perspective on the balance of supply and demand

side factors in each of the experiments. Fig. 2-5 show the trajectories for government current expenditure, investment, consumption and net exports all as a fraction of GDP. Fig. 2 shows that current government expenditure (including the wage bill) rises on average as a percentage of GDP in the WS experiment whereas it drops slightly (by less than half of a percent of GDP) in the other two experiments. Consequently, in Fig. 3 government investment moves in the opposite direction. Whereas the NL option stays around 2.5 per cent of GDP, the WS experiment shows a relative decline in government investment. The JI experiment flat trajectory for the private sector investment share, as seen on the right-hand side scale.

Figure 3: Investment

Closer observation reveals that in the *JI* experiment private sector investment reacts on average most favourably due to the

positive stimulus of market growth and crowding-in. Crowding-out is also at work, however, since the interest rate rises most rapidly in this simulation[12]. A smaller increase in private sector investment accompanies the WS policy package. Crowding-out is not as strong as in the JI simulation, but

neither is crowding in. Nor is crowding-in dominant in the NL strategy. Recall that private investment in this latter scenario also includes additional foreign investment, attracted by fiscal prudence as reflected in the declining PSBR ratio; from Table 1, the effect is to cause total investment (foreign and domestic) to rise by 3.5 per cent. The lower inflation under the neo-liberal assumptions reduces capital costs, which offsets slower growth and slower public sector capital accumulation. Still, the lower level of capacity utilisation in the NL scenario eventually undermines the growth in investment, as is clear in Fig. 3.

Figure 4: Consumption

Note that only the *WS* simulation produces a significant increase in consumption as a share of *GDP* (see Fig. *4*). Consumption rises *1.2* per cent of *GDP* compared to a drop of 0.9 and 1 .0 per cent in the NL and JI options respectively. The rise in consumption in the WS experiment is due to the crowding out of government investment by transfers. Fig. 5 shows net export performance (as a share of GDP). Observe that the NL simulation performs best, almost a percentage point higher (on average over the trajectory) than in the JI simulation, and slightly higher than in the WS package.

Exports are growing in all simulations, while imports follow the rate and bias of growth. In the WS and NL simulations, GDP growth is similar, yet the NL produces a higher level of net exports. This is the result of slower growth in imports due to lower consumption demand (both public and private), and eventually the tailing off of investment (which is import intensive). The JI package posts the worst performance since the rapid rate of growth in this scenario creates significant growth imports, due mostly to the importation of capital equipment. Observe that the NL simulation is entirely consistent with the export orientation touted by that school while it is in fact the JI simulation that requires the most external assistance to maintain its rapid growth (see Gibson and van Seventer, 1996b).

Figure 5: Net Exports

(g) Savings and Finance

The declining PSBR ratio in the NL case sets it apart conceptually from the other two simulations. Since the PSBR is lower, if follows that public sector debt accumulates less rapidly and thus the financing of the debt is less onerous. In

this subsection, we investigate the mechanisms by which the debt is financed to see if the lower PSBR to GDP ratio is as beneficial to the macro economy as is sometimes claimed.

Table 4 Savings, Finance and Debt (Percent of GDP)

GOVERNMENT				DEBT FINANCING				
	Savings	Debt	Int Paym	Public	Private	Capital Flight	Private Savings	Foreign Savings
1990-4	-3.6	43.3	3.9	59.5	40.5	20.3	21.9	-0.5
WS	-4.7	51.4	5.9	67.8	32.2	23.3	21.4	2.0
NL	-2.1	49.6	5.0	66.6	33.4	22.8	20.6	1.7
JI	-2.9	49.3	5.9	67.8	32.2	22.4	21.5	2.3

Source: Model computations. Note: Period averages 1995-9.

The first two columns of Table 4 show that a higher PSBR does in fact have an impact on the growth of debt, but the effect is not dramatic when measured as a fraction of GDP. Similarly, interest payments (in the third column) fall less than 2 per cent of GDP, although this is a significant level of expenditure. Public sector debt is financed by the public and private sectors. The Public Investment Commissioners (PICS) as well as the SARB hold government paper and there has been increasing reliance on the former to purchase government bonds in recent years. Part of the explanation lies in the financial liberalisation that the country is undergoing. As additional foreign and domestic investment opportunities arise, the private sector will be less willing to hold government securities. This is shown clearly in the next column 'in the form of capital flight. The stock of foreign assets rises with

liberalisation and is the counterpart to increased monetisation of the debt. Note that in the JI simulation, capital flight is the least. This is due to the increasing attractiveness of equity in the model as growth accelerates.
The last two columns show that the composition of finance for investment differs significantly in the WS versus NL

strategies. In the former, government savings are negative which requires that private and foreign sources increase as a counterweight. The higher rate of growth in the]I scenario is due in part to the higher rate of government investment as a share of GDP, even for the same PSBR to GDP ratio. Foreign savings are "crowded in" and even given the higher PSBR, the economy is growing rapidly.
Certainly, government dissavings, at least in this model, is not the chief cause of slow growth. The current deficit is greater in the JI than the NL simulation but less than in the WS scenario. Even with the higher PSBR to GDP ratio, the debt to GDP ratio is lover in the JI simulation than in the other two. In a supply-side model, one would expect the current public sector deficit to be negatively correlated with growth since it would absorb available savings. But in the more balanced framework presented here, it is evident that no such simple conclusion is warranted.

4. Conclusions

This paper began by extolling the virtues of co-ordinated policies which are associated with stable time paths for capacity utilisation. It is clear from the simulation results that an expansion of demand which is too rapid will lead to its own undoing. Capacity will begin to shrink, real wages fall and the trade deficit will swell. The cycle will turn down again and, feeding on itself, will undo the gains achieved in the demand-led expansion. If unchecked, income can decline indefinitely. Policies which stimulate the supply side only are not much better. If the rise in capacity is not validated by a simultaneous increase in demand, capacity utilisation will fall and this will slow the growth of output and employment. The challenge, as is seen in the JI simu lation, is to stimulate both sides at the same time and this requires a careful functional balance in state expenditure. The JI simulation seems to produce the best

results, but it is not advanced here as an *optimal* policy package. The income distribution does not improve even compared to the WS simulation, which might be taken as a proxy for a more directed attempt to equalise *per capita* public expenditure, as discussed above. Ultimately the WS package misses the mark as well, however, since it fails to provide the rapid job growth that is clearly needed in South Africa. But even the JI package is not adequate, since the rise in the Gini coefficient reveals the simulation as parsimonious in its exchange of employment for the loss in real wages.
Finally, note that the simulations show that higher growth is associated with lower real wages. Does this mean that a prerequisite for growth is to limit wage increases to below the inflation rate? Clearly not, since the message of a co-ordinated growth strategy is that both capacity and its utilisation must grow together. A successful growth strategy may indeed entail lower real wages, but simply forcing real wages down as a matter of policy can backfire. It could easily reverse the growth process, causing output and employment to spiral down without limit.

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Appendix

Suppose government expenditure is targeted at 2 population groups.

where $n=N_1/N$ is the share of population of the first group in total population and z_i is per capita government spending on population group i. Similarly, government revenue can be written as

where t_i is the tax rate and y_i is per capita income of population group i. Equalisation of per capita expenditure is brought about by setting $z_{1=}\ z_2$ in the second period with al be the spending ratio in the first period. The required change in government expenditure is:

If additional tax revenues are sourced from the first population group only then

If additional expenditures, *DG*, are balanced by additional revenues, *DT*, we can solve equations A.3 and A.4 for the tax rate of the first population group as follows

in which is the ratio of *per capita* spending on group 2 to group 1 and $g_1 = G_1 / Y_1$ government spending in group 1 relative to their income. In equation (9) above $g_1=g_w$.

is the ratio of per capita spending on group 2 to group 1 and $g_1 = G_1 / Y_1$ government spending in group 1 relative to their income. In equation (9) above $g_1=g_w$.

Endnotes

1

Department of Economics, University of Vermont and Policy Unit, Development Bank of Southern Africa, respectively. All views expressed in this paper are those of the authors and not the Development Bank of Southern Africa. Paper presented at the African Economic Research Consortium (AERC) conference on Transitional and Long Term Development Issues, Novemb er - 30 Decembe 1,1995, Johannesburg, SA. We are grateful to S Gelb and L.Taylor who collaborated on an earlier version of the model and to B. de Jager and P J. Montiel for comments on an earlier draft. Finally, we thank the editor and anonymous referees of the SAJE for their many helpful suggestions. Financial support of the AERC is also gratefully acknowledged.

2

Of course the tax will increase whether tax rates increase or not.

3

The Lucas model (1976) attempts to join these two perspectives as two ends of a spectrum of time: the Keynesian model applies in the short period, while the supply side framework is taken as a description of the long run. But if rational agents correctly (or even incorrectly) anticipate the long run in their current behaviour, the Keynesian short run may never be observed. For Keynesians the long run may never come, but for the rational expectations school, the short run is even more suspect. Even if there were no binding resource constraints for either labour or capital, rational agents would behave as if there were.

4

Consider a simple example in which investment goods are primarily (but not exclusively) imported. A rise in investment demand could conceivably correlate with a fall in GDP if imports replaced some domestic production. Capacity would then rise with the imported capital goods while utilisation would fall due to the decline in income. The incentive to invest would clearly be less in the next period. As the imported capital equipment rusts, capacity falls and utilisation increases, thereby stimulating investment once again. Similarly, investment demand for capital intensive goods might decrease the share of labour in total income. If aggregate demand falls as a result, utilisation will then decline rapidly, again weakening the inducement to invest further.

5

In the applied GDE model considered below, private savings are not independent of the tax rate as it assumed in equation 8.

6

Per capita expenditure on the black population (including coloureds and Asians) is 53.51 percent of the *per capita* expenditure on whites (IMF,1992, p.24).

7

In the applied GDE model considered below, private savings are not independent of the tax rate as it assumed in equation 8.

8

Measured as a percentage increase in nominal expenditure; land reform implies an additional *decrease* in labour productivity of 0.5 per cent.

9

This estimate assumes no change in the level or distribution of income. The tax rate on black income is also held constant for the exercise.

10

There are many other assumptions in the base run of the model which are described in detail elsewhere. See Gibson and van Seventer (1996, 1996a) for fuller discussion of the properties, assumptions and performance of the CGE model. This model has been extended here with a disaggregation of government current expenditure by function.

11

The *ex post* amounts allocated from the budget are shown below together with the *ex ante* assumptions.

The Housing Subsidy

	Percentage of DP✉	Rb 1990 const prices✉
1995	0.10	0.275
1996	0.15	0.426
1997	0.25	0.736
1998	0.30	0.911

1999	0.40	1.255

Source: Model calculations.

12

It should be noted that the concept of the PSBR in this model excludes capital transfers and land acquisition; i.e., the PSBR is just the difference between government investment and government savings. This flow version of the PSBR is consistent with the flow accounting of the national accounts, but the stock version, which includes capital transfers and land acquisition, is relevant for calculating total public sector debt (and thus interest payments).

13

Percent changes unless indicated otherwise.

14

Percent changes unless indicated otherwise.

15

Moves with the average of current government expenditure.

16

Moves with the average of current government expenditure.

17

Moves with the average of current government expenditure.

18

Moves with the average of current government expenditure.

19

Housing subsidy included at full amount (see footnote 6).

20

Subsidy equal to 10 per cent of real electricity consumption for low income households.

21

Measured as a percentage increase in nominal expenditure; land reform implies an additional decrease in labour productivity of 0.5 per cent.

22

PSBR declines linearly from 6 to 3.4 per cent between 1995 and 1999.

23

Measured as output per unit of capital.

24

Measured as output per unit of labour. The figures shown do not include the effect of the land reform variable.

25

Increased such that total investment (excluding households and government) rises by the indicated percentage ex post.

26

The assumption of a 1 per cent rise in capital productivity translates in the model into a 1 per cent increase in exogenous capacity growth rates compared to the previous simulation for food; electrical machinery, other manufacturing and trade. The capacity growth rates of the other sectors are considered to be determined by exogenous and technology factors outside the scope of the policy makers.

27

Note that there are only two income classes here, and thus the Gini coefficient can be expressed simply as the share of population minus the share of income of the low-income class.

28

= 100

29

= 100