INTERNATIONAL MONETARY FUND

SOUTH AFRICA

Selected Issues

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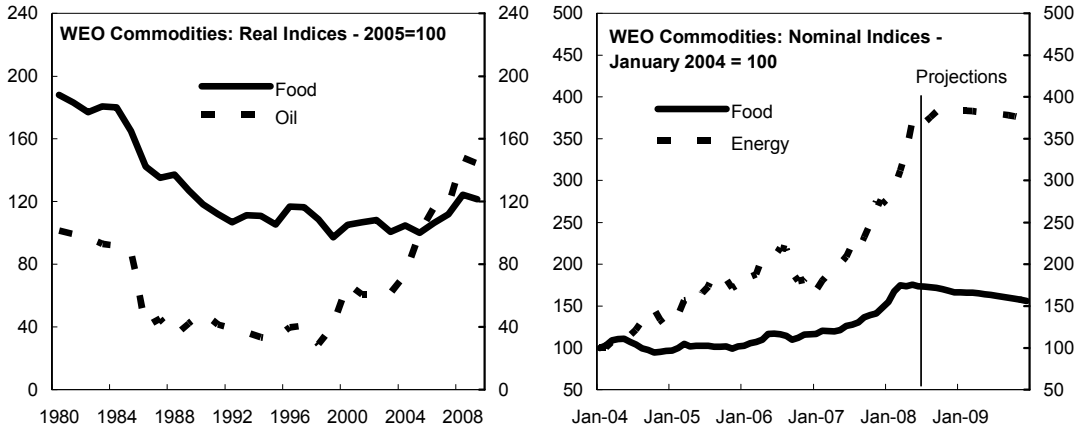
I. MONETARY POLICY AND LARGE SHOCKS TO RELATIVE PRICES: INTERNATIONAL EXPERIENCE AND IMPLICATIONS FOR SOUTH AFRICA[1]

1. **This note discusses the policy response by a sample of central banks to the ongoing oil and food price shocks (Figure I.1), drawing some lessons which can help put in context developments in South Africa.** These shocks amount to an increase in the relative price of those goods; but in certain contexts they may threaten to raise inflation. The shocks and their impact on realized inflation is undermining the stability of inflation expectations and the credibility of central banks in many countries.

Figure I.1. Food and Price Shocks in Perspective



Source: *WEO*, April and June 2008.

2. **Mishkin (2007) argues that an energy price shock may not merit a tightening of the monetary policy stance "as long as the permanent change in relative energy price does not lead to a change in the underlying trend rate in inflation—a crucial assumption."** A key question is thus whether and when that assumption holds true, and in particular, whether it does in South Africa today. We try to answer this question by examining the reaction to oil and food price shocks of underlying inflation and monetary policy in South Africa and a number of other countries.

3. **The paper is organized as follows.** It starts with a discussion of the first and second round effects of "supply shocks" and attempts to gauge second round effects in South Africa. It follows with a historical look at monetary policy responses to supply shocks in a number of countries after the 1980s. We then examine in some detail a number of recent monetary policy decisions in several inflation-targeting countries to get a sense of what determines central banks responses to these shocks. The final section offers concluding remarks.

[1] Prepared by Alfredo Cuevas.

A. First and Second Round Effects of Relative Price Shocks

4. **First and second round effects may be hard to distinguish in practice.** The first round effect of increases in certain food and fuel prices is often taken to be their direct impact on the general price index, although conceptually the indirect cost-push effects on low-margin goods that use food and fuel as inputs should be considered as first round too, given the almost inevitable pass-through. In South Africa, food represents 26 percent of the CPIX basket; gasoline accounts for 5.1 percent of the basket. Using the 2002 input-output matrix, we estimate that the total (direct plus first round indirect) effect of a 1 percent rise in a broad set of food items is a 0.35 percent rise in the cost of consumption.[2] In this note we use a narrow definition of first round effects for practical reasons, but even then it is clear that South Africa has a significant exposure to these shocks. Increases in the prices of food and fuel are often seen as "supply shocks"; however, the ongoing shocks are demand driven on a global scale, even if from a single country perspective they look like supply shocks. Thus, in this note we will call them "relative price shocks," and we will refer to the rise in the prices of other goods as "underlying inflation."[3]

5. **The second round effects of relative price shocks include their eventual impact on inflation expectations, wage settlements, and price setting in the economy at large.** These effects propagate through direct and indirect channels—i.e., inflation expectations might react both to oil price shocks and to headline inflation, which incorporates first round shocks. Second round effects unfold over long periods of time, and may evolve in complex ways. For example, a rise in the price of food will boost CPI directly and raise costs where food is used as an input; but it will also reduce consumers' purchasing power, depressing demand for other goods (and/or at a later stage).

6. **Some evidence of second round effects in South Africa can be obtained by looking at certain correlations.** The left-hand chart in Figure I.2. shows correlations between monthly food and nonfood inflation at various time horizons for the period January 2000-March 2008, using seasonally adjusted data. An initial rise in food prices (a shock to relative prices) tends to be followed by upward movements in nonfood inflation, peaking at lags of about six months. The positive correlations are suggestive of pass-through from food to nonfood prices; but they are not too high. The right side chart tries to identify threshold effects by restricting the calculation of correlations to cases in which the change in

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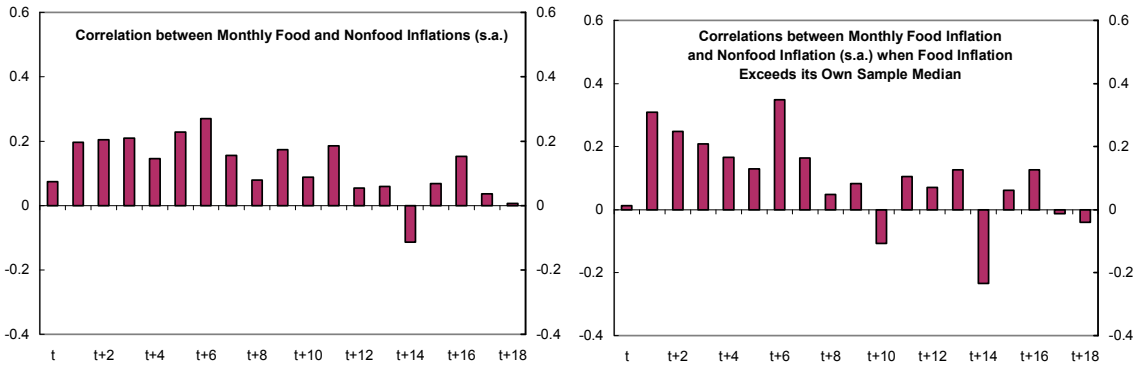
[2] The goods are agricultural products, meats, fish, fruit and vegetables, oils and fats, and several other products. These goods account for 26 percent of household consumption in the 2002 input-output table. See Statistics South Africa (2006). CPIX is CPI excluding the interest on mortgage loans.

[3] In some countries this would be similar to the concept of "core inflation." However, the exact definition of core inflation varies across countries.

food prices was above its own sample median. We observe that in this case the correlations are higher earlier, supporting the presence of threshold effects whereby second round effects are more intense when the original shock is larger; we again observe a peak in the sixth month, suggesting semiannual price revisions in South Africa. This simple analysis is not conclusive, though, since food and nonfood inflation might just be responding with different speeds to some third factor, such as exchange rate changes.

Figure I.2. Second Round Effects of Shocks to Food Prices



Sources: Statistics South Africa and IMF staff's calculations.

7. **Further evidence of pass-through from relative price shocks to general inflation was obtained from Granger causality tests.** Granger causality tests using one and two lags indicate that food and fuel inflation helps forecast inflation in the rest of the price index in South Africa, but not the other way around. Using more lags in the tests reduces the significance of the results, but in all cases the higher F statistics are those obtained when trying to reject the null that food and fuel inflation does not cause underlying inflation in South Africa.

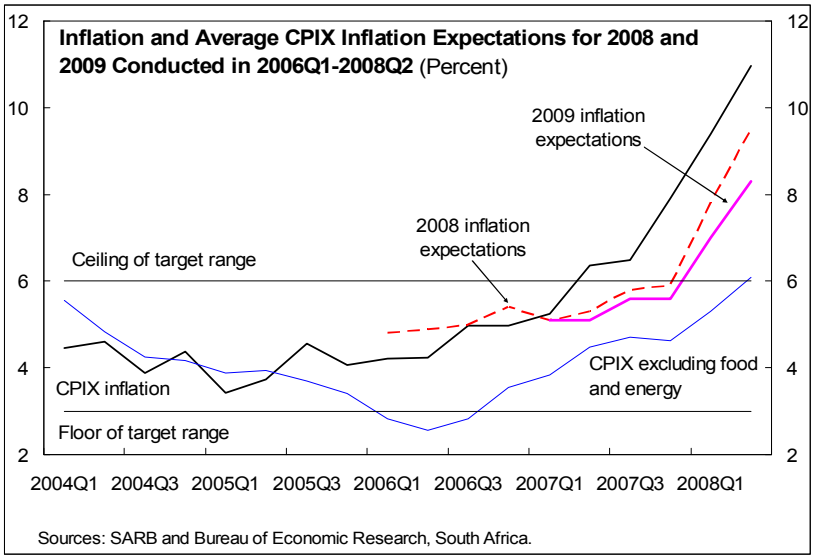
Table I.1. Granger Causality Tests

	Lags: 1		Lags: 2	
Null Hypothesis:	F-Statistic	Probability	F-Statistic	Probability
FOOD&FUEL does not Granger Cause REST	5.238	0.024	2.309	0.104
REST does not Granger Cause FOOD&FUEL	0.266	0.607	0.034	0.967

Sample: 1998M01- 2008M03

8. **Second round effects from the relative price shocks of the last few years appear to be under way in South Africa.** Inflation expectations stand above the upper limit of the inflation target and growth in the CPIX without food and fuel has been accelerating (Figure I.3). Thus, in terms of Mishkin's "crucial assumption" cited above, it seems that in South Africa underlying trend rates of inflation are being affected by relative price shocks.

Figure I.3. Second Round Effects May Already Be in Train in South Africa



B. Historical Perspective on Monetary Policy Responses to Relative Price Shocks

9. **In this section, we use regression analysis to characterize the behavior of several central banks since the late 1980s, by which time the lessons from the 1970's and 1980's oil shocks had been absorbed**. In September 2005, in the wake of Hurricane Katrina, which caused major temporary disruptions to the US oil industry, the Reserve Bank of New Zealand (RBNZ) kept its policy rate unchanged with the following statement: "Monetary policy will not attempt to offset the unavoidable first round price effects of the oil spike. However, it will be used to resist any flow-through to ongoing price and wage inflation." This statement is representative of the view that monetary policy should be concerned only with containing the second round effects of relative price shocks.[4] We find that the behavior of the central banks we examine has, on average during the period under study, broadly conformed to that policy view.

10. **We estimated policy response functions for Australia, Iceland, New Zealand, Norway, and the UK, and Brazil, Colombia, Chile, Korea, Turkey, and South Africa.** These countries now target inflation, although they may not have been inflation targeters during the entire sample period. The basis of all models is a policy rule that allows for

[4] This approach can be interpreted as implicitly targeting underlying inflation, whatever the formal target may be. In fact, there is a small literature on the inflation index one should target in the presence of relative price shocks. These papers often favor targeting indexes that abstract from such shocks, such as "core" or domestic inflation indexes. See for example Aoki (2001) and Kamps and Pierdzioch (2002).

differentiated responses to relative price inflation and underlying inflation. A simple model of this type is the following:[5]

$$i_t = \alpha + \beta_{und}\ \pi_t^{Und} + \beta_{rel}\ r_t + \lambda\ z_t + \gamma\ y_t + \varepsilon_t \qquad (1)$$

In expression (1), i_t is the nominal policy interest rate; π_t^{und} is underlying inflation in the last 12 months, z_t is the nominal *depreciation* of a country's currency during the same period, y_t is the output gap, and r_t is an indicator of relative price movements for key products (food and fuel). Underlying inflation, as noted previously, denotes the rate of inflation excluding food and fuel items. The relative price variable is constructed as the residual from an auxiliary regression of headline inflation against underlying inflation—and thus reflects the component of the change in oil and food prices that is uncorrelated to changes in the prices of all other goods. In richer countries where food has a small weight in the headline price index, underlying inflation should be a more satisfactory predictor of headline inflation, reducing the usefulness of r_t (see the appendix for a fuller explanation).[6]

11. **One might expect to see $\beta_{rel} = 0$ and $\beta_{und} > 0$ in equation (1) in cases where inflation expectations are well anchored and underlying inflation is less vulnerable to relative price shocks**—that is, where Mishkin's crucial assumption holds. But his is not something one should expect across the board, because even if a bank is focused on second round effects only, known sensitivity of underlying inflation to relative price shocks could motivate $\beta_{rel} > 0$.

[5] Taylor's (1993) pioneering work on policy rules had an even simpler rule, including on the right hand side only general inflation and the output gap.

[6] The use of this variable permits us to include in the analysis countries for which indices of food and fuel prices were not available. Were such information available, one could substitute the growth in that index for r_t in expression (1). The estimated regression coefficients and their interpretation would be different, but the information contained in the analysis would be the same.

Table I.2. Estimation of Equation 1 for Several Inflation Targeting Countries

Policy Interest Rate as in Equation 1 with OLS on lagged right-hand-side variables

	United Kingdom	Australia	New Zealand	Norway	Iceland	Korea	Colombia	Chile	Turkey	Brazil	South Africa
Underlying inflation(t-1)	**0.423**	**1.443**	**1.373**	**1.825**	**0.815**	**1.624**	**1.738**	**1.070**	**1.580**	**0.591**	**1.532**
	14.54	*6.22*	*6.57*	*5.96*	*4.65*	*13.68*	*6.43*	*110.66*	*7.37*	*3.85*	*11.1*
"Relative price" shocks(t-1)*	**1.673**	-0.174	0.081	-0.099	0.669	0.233	**1.406**	-0.453	-0.620	-1.194	0.217
	16.040	*-0.8*	*0.34*	*-0.81*	*1.27*	*0.66*	*2.18*	*-2.58*	*-2.09*	*-3.12*	*1.21*
Output gap(t-1)	**0.006**	**0.004**	**0.018**	-0.002	0.001	0.003	**0.000**	0.002	0.000	0.001	-0.002
	4.270	*2.52*	*2.12*	*-1.43*	*0.38*	*0.84*	*2.52*	*1.14*	*-0.19*	*0.51*	*-1.13*
Depreciation(t-1)	**0.063**	-0.026	**0.048**	-0.012	0.018	**0.071**	-0.034	0.004	-0.008	0.030	**0.052**
	3.640	*-1.3*	*2.2*	*-0.41*	*0.7*	*2.74*	*-1.48*	*0.16*	*-0.27*	*1.18*	*2.8*
R-squared	0.835	0.603	0.433	0.569	0.435	0.654	0.641	0.808	0.559	0.305	0.663
Observations	120	72	71	25	59	121	47	31	52	46	61
Frequency	Bimonthly	Quarterly	Quarterly	Bimonthly	Bimonthly	Bimonthly	Bimonthly	Bimonthly	Monthly	Bimonthly	Bimonthly
Sample dates	Jan'88 - Jan'08	Q1'90 - Q4'07	Q2'89 - Q4'07	Dec'02 - Feb'08	Mar'97 - Feb'08	Jan' 88 - Mar'08	Dec'98 - Oct'07	Jan'03 - Feb'08	Jan'04-Apr'08	July'00-May'08	Jan'98 - Feb'08

Source: IMF staff estimates based on central bank and statistical institute data.
Coefficients in boldface are significant at the right-hand-side 5 percent level or better. Regressions constants not shown.
* Residuals from a regression of headline inflation on underlying inflation and a constant.

Policy Interest Rate as in Equation with instrumental variables

	United Kingdom	Australia	New Zealand	Norway	Iceland	Korea	Colombia	Chile	Turkey	Brazil	South Africa
Underlying inflation(t)	**0.408**	**7.636**	**1.271**	**2.881**	**0.994**	**1.747**	**1.972**	**1.015**	**3.827**	**0.559**	**1.494**
	10.55	*7.3*	*3.76*	*2.85*	*4.74*	*14.69*	*4.94*	*6.09*	*3.38*	*3.91*	*14.04*
"Relative price" shocks(t)*	**1.730**	-0.325	-0.144	0.165	0.721	0.038	**2.858**	-1.146	-1.903	-1.631	**0.629**
	15.57	*-1.27*	*-0.37*	*0.26*	*0.99*	*1.28*	*2.35*	*-4.06*	*-2.5*	*-4.22*	*3.73*
Output gap(t)	-0.003	**0.004**	0.015	0.002	0.001	0.957	0.000	0.003	-0.002	0.002	-0.007
	-0.51	*2.54*	*1.39*	*0.96*	*0.71*	*1.66*	*0.61*	*1.29*	*-1.15*	*0.54*	*-2.67*
Depreciation(t)	**0.061**	-0.053	0.028	-0.009	-0.014	0.002	-0.071	-0.029	-0.201	0.046	**0.037**
	2.79	*-1.98*	*0.99*	*-0.1*	*-0.4*	*0.62*	*-1.62*	*-0.99*	*-1.61*	*1.68*	*2.15*
R-squared	0.819	0.585	0.245	0.416	0.420	0.680	0.486	0.624	.	0.308	0.736
Observations	117	72	69	22	56	121	45	31	46	44	57
Frequency	Bimonthly	Quarterly	Quarterly	Bimonthly	Bimonthly	Bimonthly	Bimonthly	Bimonthly	Monthly	Bimonthly	Bimonthly
Sample dates	Jan'88 - Jul'07	Q1'90 - Q4'07	Q2'89 - Q2'07	Dec'02 - Aug'07	Mar'97 - Aug'07	Jan' 88 - Mar'08	Dec'98 - Jun'07	Jan'03 - Feb'08	Jan'04 - Oct'07	July'00-Jan'08	Jan'98 - Jun07

Source: IMF staff estimates based on central bank and statistical institute data.
Coefficients in boldface are significant at the right-hand-side 5 percent level or better.
* Residuals from a regression of headline inflation on underlying inflation and a constant.
** Lag *a* equals 2 if bimonthly data, and 1 if quarterly data.

12. **We estimated several variants of these models, including by replacing π_t^{und} with its one-year lead to capture inflation expectations, and replacing r_t with a the change in world oil prices measured in local currency.**[7] The sample periods in some cases start before the adoption of IT in the sample countries (see the appendix for a description of the data and its sources).

13. **Equation (1) and its variants may be subject to bias because the right-hand side variables could react to interest rate changes—this is especially clear for the exchange rate.** Thus, we ran the ordinary least squares (OLS) regressions replacing the right-hand side variables with their one-period lags. This could also be justified on grounds that some of these variables are observed by policy makers with a lag. We also estimated the regressions with instrumental variables (IV), using as instruments 6-months of lags of our inflation variables and of the exchange rate. Table I.2 shows both OLS and IV results for equation 1; the results are qualitatively similar, but the magnitude of the OLS coefficients appears somewhat more plausible.

Table I.3. Distribution of the OLS Coefficient on Underlying Inflation

	Model variant	*Coefficient is positive and significant at 10%*	*Statistically insignificant at 10%*
1	Equation 1	Aus, Bra, Chl, Col, Ice, Kor, NZ, Nor, **SA**, Tky, UK	
2	Replaces π_t^{und} with its one-year lead	Aus, Bra, Chl, Ice, Kor, Nor, **SA,** UK	Col, NZ, Tky
3	Oil price replaces r_t	Aus, Bra, Chl, Col, Ice, Kor, NZ, Nor, **SA**, UK	Tky
4	Combines variants (2) and (3)	Aus, Bra, Chl, Col, Ice, Kor, NZ, **SA**, UK	Nor, Tky

Source: IMF staff's estimates based on data from central banks.

Table I.4. Distribution of the OLS Coefficient on Relative Price Shocks

	Model variant	*Coefficient is positive and significant at 10%*	*Statistically insignificant at 10%*
1	Equation 1	Col, UK	Aus, Bra, Chl, Ice, Kor, NZ, Nor, **SA,** Tky
2	Replaces π_t^{und} with its one-year lead	Chl, Ice, UK	Aus, Bra, Col, Kor, NZ, Nor, **SA,** Tky
3	Oil price replaces r_t	Col, UK	Aus, Bra, Chl, Ice, Kor, NZ, Nor, **SA**, Tky
4	Combines variants (2) and (3)	Ice	Aus, Bra, Chl, Col, Kor, NZ, Nor, **SA**, Tky, UK

Source: IMF staff's estimates based on data from central banks.

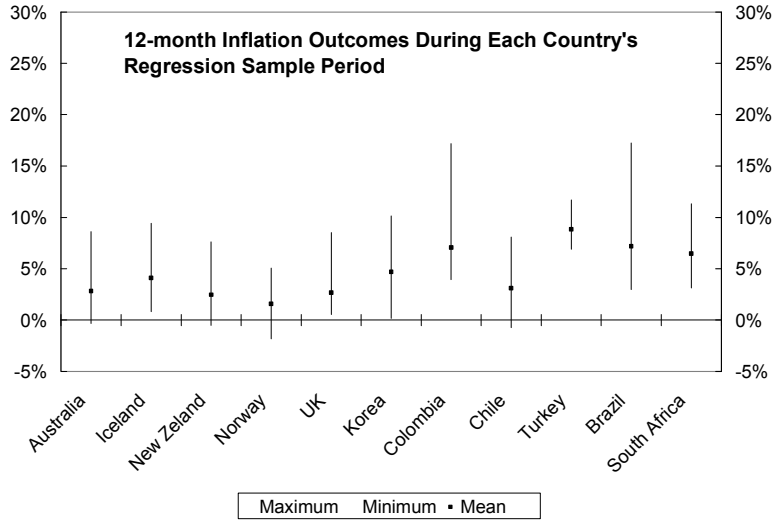
[7] All models were also run with a lag of i_t on the right hand side to allow for gradual policy reactions as in Clarida, Gali and Gertler (1998). Including the lagged variable reduced the explanatory power of other variables in most regressions. These results are omitted in the interest of brevity.

14. **For the most part, the story seems to hold that central banks in these countries have largely sought to address only second round effects.** Tables I.3 and I.4 report the results of OLS regressions for all variants of the basic model, presenting summary information on the two coefficients of highest interest: those on the underlying and relative price inflation variables. A majority of countries and models feature significant responses to underlying inflation, but not to relative price shocks. Regressions for Australia and New Zealand provide the clearest example of this configuration.

15. **There are some countries (Colombia, Chile, Iceland, South Africa and the UK) where the policy interest rate responds to relative price inflation in some specifications.** In our IV estimate of equation 1, South Africa also displays a positive and significant coefficient on relative price inflation. Two possible explanations could be put forward for these results, which should be seen as suggestive rather than conclusive.

16. **Compared to New Zealand or Australia, countries such as South Africa have a higher exposure to food shocks and have in recent memory experienced relatively higher inflation (Figure I.4).**[8] The central banks in these countries might therefore be more concerned about the effects of relative price shocks on inflation expectations. Thus, results displayed in Tables I.2 and I.4, where these countries' regressions sometimes show a significant role for relative price shocks, is not surprising.

Figure I.4. Indicators of Inflation in Sample Countries

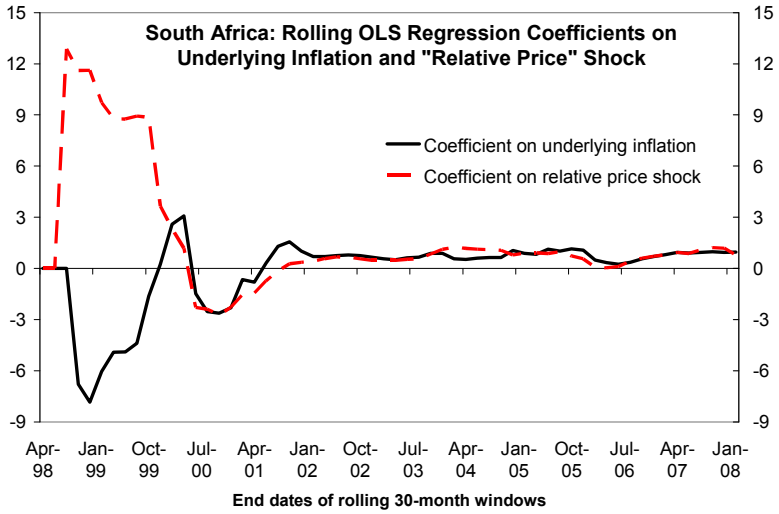


Sources: Staff estimates based on central banks and statistical institutes data.

[8] Note, however, that different societies may not have the same tolerance of inflation, as suggested by the pattern shown in Figure I.4.

17. **Also, it may be that the sample period encompasses more than one distinct monetary policy "regime," whose average policy response function has the features shown above.** This might help explain the estimate for the UK. This country has the longest sample in our group, with about half its observations representing the era before the Bank of England was made autonomous and inflation targeting was adopted. In the case of South Africa, monetary policy became more systematic with the adoption of inflation targeting in 2001. Figure I.5 depicts rolling regression estimates of equation 1 for South Africa using 30-month windows. As shown by the chart, the coefficient measuring the policy reaction to relative price shocks diminished and stabilized at a positive level similar to that of the coefficient on underlying inflation after the adoption of inflation targeting. Prior to that, both coefficients are unstable, very large in absolute value, and bear opposite signs.[9]

Figure I.5. Rolling Estimates of Equation 1 for South Africa



Sources: Statistics South Africa and IMF staff's estimates.

C. Recent Monetary Policy Decisions Around the World

18. **The statements and minutes released to the press by the monetary authorities in our sample countries since mid-2007 indicate that the responses to relative price shocks are not mechanical, but vary according to the relevant context.**[10] The releases reveal concern over oil and food prices throughout the world. However, these shocks, global in

[9] Charts for rolling regression coefficients estimated with IV, and also using directly food and fuel inflation instead of r_t (not shown) have similar characteristics. The behavior of these coefficients in the early part of our sample is likely due to the strong movements in the interest rate in response to large exchange rate swings observed at that time.

[10] We added Canada to the countries discussed in this section to increase the variety of experiences analyzed.

nature and thus a source of inflation risk in virtually all countries, play out differently in each case depending on recent inflation readings, the likely future trajectory of inflation, the state of expectations, the strength of demand, and other factors.[11] The three responses we examine are tightening, easing, and lengthening of the policy horizon (another choice is to leave rates unchanged, but we do not examine it since we discuss easing, a more extreme choice).

19. **A common action in the last year among the central banks examined for this note was raising the policy rate.** Table I.5 presents some detail on a few of these recent tightening decisions. In virtually all cases, the recent rise in food and fuel shocks is mentioned as a source of concern. However, policy tightening occurred in those cases in which the general inflation context raised the vulnerability to those shocks. In particular, tightening occurred where underlying inflation, headline inflation and/or inflation expectations were already a cause for concern, as well as where other inflation pressures were at work, usually as a result of strong aggregate demand or currency depreciation.

Table I.5. Selected Recent Tightening Decisions

Country / date	Decision	Food and fuel shocks	Inflation: recent and outlook	Demand factors	Other considerations
Australia March 2008	Hike, 25 bp	Press release discusses commodity prices as TOT shock to demand	High headline inflation 2007; high underlying inflation	Demand growth outpacing capacity	Tight labor market
New Zealand July 2007	Hike, 25 bp	Mentions rising food and fuel prices as inflation risk	High, rising domestic (nontraded) inflation	High levels of capacity utilization	Tight labor market; but strong currency
Colombia Feb. 2008	Hike, 25 bp	Food caused inflation to breach band	Nonfood inflation and expectations have been rising	Demand has slowed down, but still strong	No sign of impact from global slowdown
Chile June 2008	Hike, 50 bp (larger than previous increases)	Supply shocks raised inflation (headline and core) and expectations	Well above target's "tolerance range"	Strong demand growth	Labor market and wages still stable
Turkey May 2008	Hike 50 bp (start of a tightening cycle)	Aim to contain second round effects of food and fuel	Inflation gets farther away from band, projected to stay high	Slowing demand supports disinflation	Pass-through from currency depreciation

Sources: Various central banks' press releases and published minutes.

[11] Also, the pass-through from international to domestic prices is affected by tax and subsidy policies.

20. **There have also been some recent decisions to ease monetary policy despite the global shocks to food and fuel prices (Table I.6).** In most such decisions two factors were key: (i) the risk of recession either mitigated or outweighed the inflation risk from relative price shocks, and (ii) trends in headline and underlying inflation seemed reasonably subdued at the time of the easing decisions. An exception was Turkey, where the inflation rate was well above its target; yet, even in that case, an argument was made that previous tightening and softening demand conditions implied that inflation would move down toward the target.

Table I.6. Selected Recent Easing Decisions

Country / date	Decision	Food and fuel shocks	Inflation: recent and outlook	Demand factors	Other considerations
Brazil July and Sep. 2007	Cut rates 50 bp + 25 bp—end of easing cycle	Risk from global inflation mentioned in minutes released to the press	Inflation projected within target; stable expectations	Early signs of demand strength	Import growth a relief valve
Canada Jan. and March 2008	Cut rates, 25 bp + 50 bp	Not mentioned in these press releases	Headline 2.2 percent and core 1.4 percent in 2007	Strong demand in 2007; but concern over US slowdown	Strong Canadian dollar
United Kingdom Dec. 2007 and Feb. 2008	Cut rates, 25 bp + 25 bp	Food and oil to raise inflation "quite sharply;" pressures to fade away later; lesser upward risk	Essentially on target (2.1 percent); but measures of expectations "currently elevated"	Concerns over deceleration abroad and at home; larger downward risk	Financial sector shocks, tighter monetary conditions
Turkey Dec. 2007 and Jan. 2008	Cut rates, 50 bp + 25 bp (part of an easing cycle started in Sept. 2007)	Supply shocks raised inflation temporarily; but also weakened demand. Will look out for 2nd round effects	Outside target; but projected to fall despite risks from food and fuel	Slowing demand supports disinflation	Monetary tightening from 2007 still working through system

Sources: Various central banks' press releases and published minutes.

21. **In addition to changing their policy rates, some central banks appear to have decided to implicitly or explicitly extend their time horizon for bringing inflation back to target once it is forecast to exceed it.** In the recent experience, the marked acceleration of inflation, combined with adherence to a gradual approach to tightening (the usual interest rate increases are still 25 or 50 basis points, with no indication that policy lags are getting shorter), tend to imply a longer time until inflation returns to target. In Chile, for example, the June 2008 decision states the central bank's commitment to "reduce the current elevated

inflation *toward* 3 percent in the policy horizon" (emphasis added). This choice is consistent with the overall inflation targeting framework.

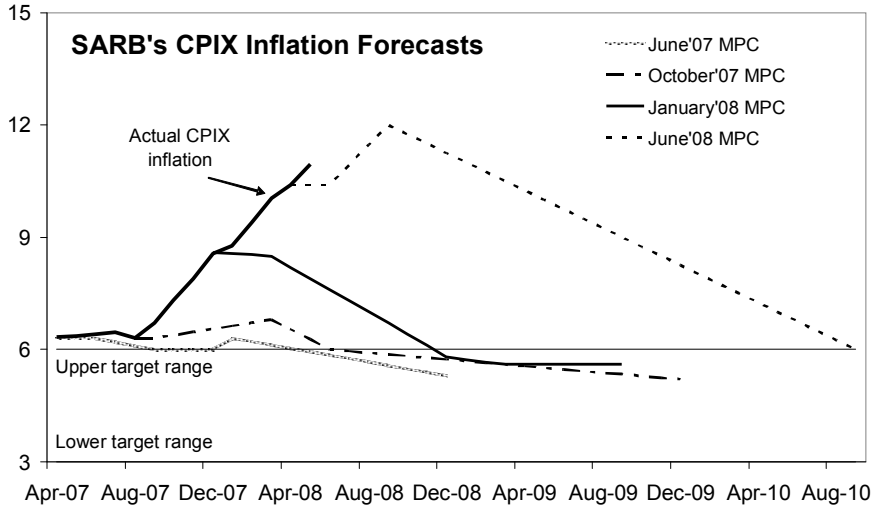
22. **The only case in our sample where an explicit change was made to the inflation targeting framework was Turkey.** In June 2008, Turkey's central bank, in conjunction with the government, announced it would increase its inflation targets for 2009, 2010 and 2011 to 7.5, 6.5, and 5.5 percent, respectively, from 4 percent. Having failed to meet their inflation targets of 5 percent in 2006 and 4 percent in 2007, and with headline inflation pushing into double digit range, the monetary authorities argued that food and energy shocks that were expected to persist in the coming months would make it impossible to meet the inflation target in the near term. They also explained that expectations were becoming increasingly backward-looking, and that the official target was losing effectiveness as an anchor for expectations. Finally, they indicated that their decision to revise the inflation targets for the next several years did "not necessarily mean that monetary policy will be looser in the forthcoming period." Although this decision may have brought about more realistic targets, and thus may improve monetary policy transparency, it entails a risk that inflation expectations could become unhinged.

23. **Where does South Africa's Reserve Bank stand against this context? The Monetary Policy Committee (MPC) statements emphasize second round effects; but with a high degree of concern over the original shocks themselves.** For example, the MPC statement described oil prices as a "threat" after Brent crude reached $70 dollars a barrel in April 2006. Still, like other central banks, the SARB reacted to these shocks only when context, especially ongoing headline and underlying measures of inflation, heightened their impact. Thus, it was not until June 2006 that the SARB started a tightening cycle, motivated by a deterioration in the general outlook for inflation.

24. **After its interruption in early 2008, tightening resumed in April 2008, with supply shocks taking on a more prominent place in SARB's MPC statements.** In that release, the SARB noted that the deteriorated inflation outlook reflected the impact of "a series of supply side shocks." A point highlighted in the press release was the large increase in inflation expectations, which have now breached the inflation target band, as shown earlier in Figure I.3. Essentially, the argument appeared to be that second round effects were under way and needed to be countered. Thus, hikes in oil and food prices were seen as requiring a strong response, as expectations, core inflation, and credibility were at risk.

25. **The SARB seems also to have chosen, implicitly, to accept a possibly longer time to return inflation to the target band (Figure I.6).** This is especially clear in the June 2008 decision, when following a steep increase in headline inflation, and against expectations of a larger-than-usual interest rate hike, the SARB decided to increase the repo rate by the usual 50 basis points. In its policy statement, the SARB acknowledged that inflation would now take longer to come back within the 3–6 percent target band.

Figure I.6. Implicit Lengthening of the Policy Horizon in South Africa



Sources: SARB, Statistics SA.

D. Concluding Remarks

26. **Persistent and large shocks may have significant second round effects in some contexts which could destabilize expectations and hurt central bank credibility.** Speaking about oil shocks, Ed Gramlich (2004) said that although some additional unemployment and inflation may have to be accepted, the best response is likely to involve policy rate increases because "[...] the worst possible outcome is for monetary policy makers to let inflation come loose from its moorings." This viewpoint, rooted in the lessons from the oil shocks of the 1970s and 1980s, finds echo in the policies examined in this note.

27. **Inflation targeting central banks generally aim to distinguish between first and second round effects, largely seeking to contain the latter even as the former are accepted; but their concrete actions are context-specific.** Such a policy approach involves a relatively more aggressive stance when already high inflation readings and rising inflation expectations complicate the outlook, which is especially likely if the goods whose prices are spiking represent a large proportion of the consumption basket, and if there is a history of high and variable inflation. Similarly, a more aggressive stance is observed when strong demand and other factors generate additional inflation pressures. Although its policy actions are unable to offset first round effects, a central bank can help anchor expectations by signaling its commitment to the inflation target. Precisely because expectations are put at risk by relative price shocks, the expectations channel of monetary policy takes on special importance in those circumstances.

28. **The SARB has applied the approach described above to address the ongoing shocks to food and fuel prices by tightening its policy stance; however, it is facing a**

particularly difficult challenge going forward. Responding to domestic inflation risks, the SARB started tightening its policy stance earlier than other banks, and the recent intensification of food and fuel price shocks has merited additional tightening actions. But these shocks come at a stage in which the SARB might have expected to be ending its tightening cycle. The rise in headline inflation despite previous tightening puts a premium on effective communication of the nature of the ongoing shocks, the reasons for the breaching of the target band, and the role of monetary policy actions. Also, the increasing debt service burden on borrowers who have seen their interest rate increase by 500 basis points since mid-2006 necessitates careful monitoring of rising risks to the quality of loans. In this context, SARB's recent decisions to tighten policies while allowing a longer time to bring inflation back to target are appropriate and in line with good practice around the world. Looking forward, a further challenge to the SARB's communication strategy may arise from the change in the CPI weights in 2009, which will modify the way food and fuel prices affect measured inflation in South Africa.

Appendix

Derivation of the regressor r_t

The overall or "headline" price *index* can be written as $h=w\,u + (1-w)\,n$, where u is the underlying inflation index, w is its weight in the consumption basket, and n is the index for the rest of the goods (those responsible for non-underlying inflation). Then the relationship between the various inflations is

$$\pi_t^h = \frac{wu_t}{h_t}\,\pi_t^u + \frac{(1-w)n_t}{h_t}\,\pi_t^n$$

Now, we can write non-underlying inflation π^n as consisting of an element which is correlated to underlying inflation, and an element v_t which is orthogonal to underlying inflation: $\pi^n = a_0 + a_1\,\pi^u + v$, where we have omitted time indices for convenience. If underlying and non-underlying inflation move closely, v_t will explain a small part of the variation in non-underlying inflation. Then we can rewrite headline inflation as follows:

$$\pi_t^h = \left(a_0\,\frac{(1-w)n_t}{h_t}\right) + \left(\frac{wu_t}{h_t} + a_1\,\frac{(1-w)n_t}{h_t}\right)\pi_t^u + \frac{(1-w)n_t}{h_t}\,v_t$$

This expression looks very much like a regression of headline on underlying inflation (the difference between this decomposition and a regression of π^h on π^u is that the expressions in the first two brackets will be constant by construction). In the text, we have been interested in the residual from such a regression, which is the variable called r_t. As we can see, roughly speaking, the importance of the residual from a regression of headline inflation on underlying inflation depends on the weight of non-underlying prices in the consumption basket, $1-w$. If w is very close to 1, the regression will have excellent fit and the residual will account for a small part of the variation in headline inflation. Fit also depends on how closely correlated underlying and non-underlying inflations are: if v_t explains a small portion of the variance of π^n, fit of the headline inflation regression will also be good. Moreover, if a_1 is large, some effects of non-underlying inflation on total inflation (and ultimately on policy) will be confounded with the effects of underlying inflation on total inflation (and policy). Hence our interest in the orthogonal component v_t, which combined with the weight of goods in the non-underlying index, $1-w$, is obtained as a residual r_t from the regression of headline on underlying inflation.

Data sources

Oil prices and exchange rates are from the *World Economic Outlook* and *International Financial Statistics*, respectively. Other data sources are shown in the table below. Output gaps were estimated applying the Hodrick-Prescott filter to the output indicators.

	Inflation			Output		Policy Rate	
Country	Headline	Underlying	Source	Indicator	Source	Indicator	Source
United Kingdom	Retail Price Index excl. interest rates on mortgage bonds (RPIX)	RPIX excl. food, petrol and oil prices	Office of National Statistics	Manufacturing Production Index	Office of National Statistics	Official Bank Rate	International Financial Statistics
Australia	Consumer Price Index (CPI)	CPI excl. volatile items	Australian Bureau of Statistics	Gross Domestic Product	International Financial Statistics	Cash Rate	Reserve Bank of Australia
New Zealand	Consumer Price Index (CPI)	CPI excl. government charges, food and fuel prices	Statistics New Zealand	Gross Domestic Product	International Financial Statistics	Official Cash Rate	International Financial Statistics
Norway	Consumer Price Index (CPI)	CPI adjusted for tax changes and excl. energy products	Statistics Norway	Manufacturing Production Index	Statistics Norway	Sight Deposit Rate	Sveriges Riskbank
Iceland	Consumer Price Index (CPI)	CPI excl. agricultural products, vegetables, fruits and petrol	Statistics Iceland	Gross Domestic Product	International Financial Statistics	Monetary Policy Interest Rate	Central Bank of Iceland
Korea	Consumer Price Index (CPI)	CPI excl. agricultural products and oils	Korea National Statistical Office	Manufacturing Production Capacity Index	Korea National Statistical Office	Base Rate	International Financial Statistics
Colombia	Consumer Price Index (CPI)	CPI excl. staple food, public utilities and fuel prices	National Department of Statistics	Gross Domestic Product	International Financial Statistics	Base Rate for Repo Auctions	Banco de la Republica
Chile	Consumer Price Index (CPI)	CPI excl. fresh fruit, vegetable and fuel prices	National Bureau of Statistics	Index of Economic Activity	Banco Central de Chile	Monetary Policy Interest Rate	Banco Central de Chile
Turkey	Consumer Price Index (CPI)	CPI excl. unprocessed food products and energy prices	Turkish Statistical Institute	Composite Leading Economic Indicator for Economic Activity	Central Bank of Turkey	Overnight Interest Rate	Bloomberg
Brazil	Consumer Price Index (CPI)	CPI excl. food and energy prices	Brazilian Institute of Geography and Statistics	Gross Domestic Product	Haver Analytics	SELIC Interest Rate	Central Bank of Brazil
South Africa	Consumer Price Index excl. interest rates on mortgage bonds (CPIX)	CPIX excl. food and petrol prices	Statistics South Africa	Coincident Business Cycle Indicator	South African Reserve Bank	Repo Rate	South African Reserve Bank

References

Aoki, Kosuke (2001), "Optimal Monetary Policy Responses to Relative Price Changes," *Journal of Monetary Economics*, v.48 (2001), 55-80

Clarida, Richard, Jordi Gali and Mark Gertler (1998), "Monetary Policy Rules in practice: Some International Evidence," *European economic Review, v. 42, 1033-1067*

Gramlich, Edward (2004), "Oil Shocks and Monetary Policy," remarks at the Annual Economic Luncheon, Federal Reserve Bank of Kansas City, September 16, 2004, http://www.federalreserve.gov/boarddocs/speeches/2004/20040916/default.htm

Kamps, Cristophe and Christian Pierdzioch (2002), "Monetary Policy Rules and Oil Price Shocks," Kiel Institute of World Economics Working Paper 1090, 38 p.

Mishkin, Frederic (2007), "Headline versus Core Inflation in the Conduct of Monetary Policy," Speech at the Conference on Business Cycles, International transmission, and Macroeconomic Policies, HEC, Montreal, October 2007

Statistics South Africa (2006), *Final Supply and Use Tables, 2002: An Input-Output Framework,* Statistics South Africa, Pretoria, 69 pages. (The data can be downloaded from http://www.statssa.gov.za)

John B. Taylor (1993), "Discretion versus policy rules in practice," *Carnegie-Rochester Conference Series on Public Policy* 39 (1993) 195-214

The press releases, official monetary policy statements and minutes of monetary policy meetings used were obtained from the following central bank websites:

Australia: www.rba.gov.au

Brazil: www.bcb.gov.br

Canada: www.**bank**-banque-**canada**.ca

Chile: www.bcentral.cl

Colombia: www.banrep.gov.co

Iceland: www.sedlabanki.is

Korea: www.bok.or.kr

New Zealand: www.rbnz.govt.nz

Norway: www.norges-bank.no

South Africa: www.reservebank.co.za

Turkey: www.tcmb.gov.tr

UK: www.bancofengland.co.uk

II. Constraints on Growth in South Africa: Lessons from a Cross-Country Comparison[1]

A. Introduction

1. **Over the last decade, South Africa's macroeconomic performance has on average been strong, but its growth outcomes have been disappointing in comparison with peers.** Although the country's growth rate has picked up in recent years relative to past performance, its annual average per capita GDP growth rate (1.7 percent) was only half that of low and middle income countries (3.6 percent) between 1996 and 2006.[2] Given South Africa's relatively stable macroeconomic environment, abundant natural and labor resources, and developed financial markets, its growth rates should arguably have been much higher.

2. **The purpose of this paper is to examine the factors that have constrained South Africa's growth since the end of apartheid, by comparing its GDP components and its saving and investment performance with those of a panel of faster-growing countries.**[3] The panel comprises the ten fastest-growing economies in terms of GDP per capita, which meet a minimum criterion on population size (to maintain comparability with South Africa) and for which the necessary data are available.

3. **The overall messages that emerge are the need to increase South Africa's investment and savings rates, its labor productivity, and its openness to trade.** The study finds that sluggish investment has significantly hampered growth since the end of apartheid and that underinvestment is, in turn, partly explained by limited saving capacity. Interactions between investment, saving, and production may have perpetuated a slow growth trap during the last decade.

B. What Have Been the Main Constraints on Growth in South Africa over the Last Decade?

4. **In this section, to better understand differences in growth performance, we decompose GDP growth data for South Africa and the panel in three different ways.**[4]

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[1] Prepared by Luc Eyraud.

[2] According to World Development Indicators classification and data.

[3] The study covers the post-apartheid decade from 1996 to 2006. 2007 data are included when available.

[4] All decompositions are applied to GDP growth (rather than GDP growth per capita) to achieve results comparable to previous studies.

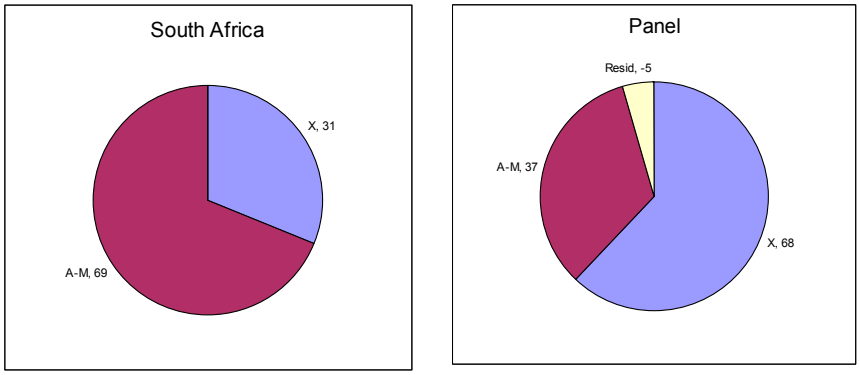
The first decomposition computes the contribution to growth of expenditure components of GDP and highlights differences in the structure of aggregate demand. The second breaks down GDP growth into contributions of labor productivity and employment, which allows for a more detailed view of the labor-force-related differences. Lastly, a production-function decomposition separates the contributions of labor, capital, and total factor productivity (TFP).

First Decomposition: Demand Components of GDP

5. **The first decomposition breaks down GDP growth into the contributions of absorption and trade balance** (see methodology in Appendix, Box 1)**.** The panel's real per capita GDP growth averaged 4.7 percent a year between 1996 and 2006 (versus 1.7 for South Africa).[5] Two main conclusions arise from the comparison of South Africa to the panel.

6. **First, South Africa's growth is less export driven than the panel.** In South Africa, two-thirds of the real growth of domestic production comes from growth in domestic demand and one-third from growth in foreign demand. For the panel it is the opposite (see Figure II.1). This is confirmed by traditional openness indicators: trade flows as a share of GDP are higher in the panel (on average, over the period the ratio of exports and imports to GDP equals 63 percent for the panel and 53 percent for South Africa). The gap in openness is particularly high for goods.

Figure II.1. Contributions to GDP Growth



Sources: World Development Indicators and IMF staff calculations.
Note: X = foreign demand; A-M = absorption minus imports = domestic demand.

7. **Second, the contribution of investment to growth is relatively low in South Africa and the contribution of consumption relatively high.** Investment contributes only a quarter of GDP growth in South Africa compared with almost a third in the panel (see

[5] The panel consists of China, Vietnam, India, Russia, Poland, Ukraine, Korea, Bangladesh, Iran, and Romania (see selection method in paragraph 2 of the text).

Table II.1). This stylized fact will be analyzed further below (see section C). Contributions of household and government consumption are higher in South Africa, suggesting a lower savings rate than for countries in the panel (indeed, on average over the decade gross domestic saving amounted to 15 percent of GDP in South Africa versus 29 percent of GDP in the panel).[6] South Africa's trade balance thus makes a much more negative contribution to GDP growth, notwithstanding the substantial natural resource base.

Table II.1. Normalized Contributions of Demand Components to GDP Growth
(In percent)

	GDP growth	Trade balance	Absorption		
			Private Consumption	Investment	Public consumption
South Africa	100	-17	73	25	19
Panel	100	-4	69	32	9

Sources: World Development Indicators and IMF staff calculations.

Productivity and Labor Input Characteristics

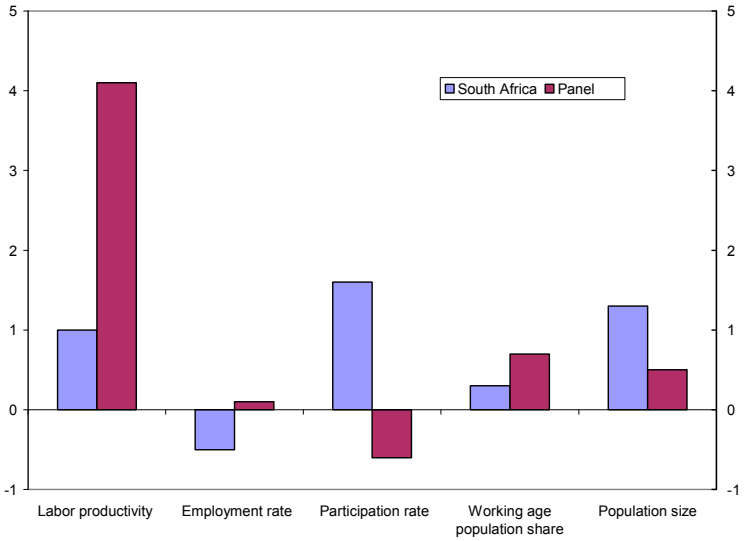
8. **In the second decomposition, GDP growth rate is written as the sum of the growth of five components: labor productivity, employment rate, participation rate, working age population share, and population size** (see methodology in Appendix, Box 2). With a shift in country composition (necessitated by data availability), for 1996–2006 average real GDP growth rate per capita in the panel amounts to 4.4 percent.[7]

9. **The most striking result is the much lower contribution of labor productivity growth in South Africa compared with the panel** (Figure II.2)**.** Had labor productivity in South Africa grown at the same rate as in the countries in the panel, other things being equal its average annual GDP growth rate would have been 3 percentage points higher—a substantial difference in living standards if sustained over a decade. Because labor productivity is a function of the capital labor ratio and Total Factor Productivity (TFP), paragraphs 11–13 examine a decomposition that distinguishes between capital deepening and TFP.

[6] The higher contribution of public consumption in South Africa mainly reflects the higher share of public consumption in GDP (18 percent in South Africa versus 13 percent in the panel).

[7] The composition of the panel changes between decompositions owing to data limitations. For this decomposition, the panel consists of China, Vietnam, Russia, Poland, Ukraine, Korea, Iran, Romania, Morocco, and Turkey.

Figure II.2 Contributions to GDP Growth (1996–2006)
(In percent)



Sources: World Economic Outlook and IMF staff calculations.

10. **Higher growth in the labor force has more than offset favorable employment dynamics in South Africa.** Between 1996 and 2006, in South Africa there is a negative contribution of the employment rate and a positive contribution of the participation rate; it is the opposite in the panel (see Figure II.2). This result can be explained by the larger increase in labor force in South Africa. Even though employment growth has been 3.5 times higher in South Africa than in the panel, it has not been sufficient to accommodate the huge increase in labor force, which grew at five times the rate of the panel (see Table II.2). [8] As a consequence, the employment rate has decreased over the period while the participation rate has increased. On average, however, both employment and participation rates are lower in South Africa than in the panel.

Table II.2. Employment and Labor Force in South Africa and the Panel (average 1996–2006)
(In percent)

	Employment growth per year	Labor force growth per year	Employment rate	Participation rate
South Africa	2.8	3.2	74.5	52.6
Panel	0.8	0.6	91.0	66.2

Sources: World Economic Outlook and IMF staff calculations.

[8] The panel includes East European countries that showed weak employment growth during the last decade.

Capital, Labor, and Total Factor Productivity

11. **The third decomposition breaks down real GDP growth (1996–2006 average) into three components: capital, labor, and TFP contributions.** To understand the TFP component better, two computations are carried out, one where TFP implicitly includes improvements to labor quality and the other where labor quality improvements are in principle recorded as increases in effective labor and thus removed from the TFP component (see methodology in Appendix, Box 3). The change in the panel composition due to data limitations now shifts the panel's average real GDP growth per capita to 3.8 percent for the period.[9]

12. **The main result highlighted by the third decomposition is the weaker contribution of capital in South Africa**.

- **The contribution of capital in South Africa is one-third of that in the panel.** The difference in the capital contribution is the main explanation of the GDP growth gap. This confirms the results of the first decomposition (which showed South Africa to have a comparatively lower contribution of investment to growth) and will be analyzed further in section C.

- **The contribution of TFP in South Africa is about two-thirds of that in the panel**. The lower performance may be linked to underinvestment in Research and Development (R&D): between 1996 and 2006, R&D expenditures amounted to 0.76 percentage points of GDP in South Africa vs. 0.92 percent in the panel. On average, there were 307 R&D researchers per million people in South Africa vs. 1,207 in the panel.[10] Notably, when the TFP component is adjusted for labor quality, the difference in TFP contribution is reduced, suggesting that part of the productivity gap stems from lower labor force skills in South Africa.

- **The contributions of labor in the panel and in South Africa are very close,** especially when labor quality improvements are incorporated in the labor component. This result seems surprising, because the second decomposition indicated that South Africa's employment growth was larger than that of the panel. The explanation is that the panel now includes countries with fast employment growth (Malaysia, Morocco, Spain, Mexico, and Egypt), replacing East European countries that had to be dropped because investment data was not available.

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[9] The panel now includes China, India, Korea, Bangladesh, Iran, Morocco, Spain, Egypt, Malaysia, and Mexico.

[10] The gap can also be measured with other indicators (for example, the number of publications in scientific and technical journals) but the lack and the questionable quality of data make it difficult to draw reliable conclusions.

Table II.3. Results of the Third Decomposition
(In percent)

		GDP growth	Capital contribution	Labor contribution	TFP contribution
Without Labor quality adjustment	South Africa	3.5	0.6	1.8	1.1
	Panel	5.1	1.8	1.6	1.7
With Labor quality adjustment	South Africa	3.5	0.6	1.9	1.0
	Panel	5.1	1.8	1.9	1.3

Sources: World Economic Outlook, World Development Indicators and IMF staff calculations.

13. **Our results for South Africa differ from those of earlier studies in that the contribution of labor to growth is higher than estimated previously** (see Table II.4)**.** The difference is due to the fact that the sample period in previous studies generally covers the 1990s, when employment growth in South Africa was sluggish (especially formal nonfarm employment); our study covers more recent years when employment growth has been greater.[11]

Table II.4. Production-Function Decomposition in South Africa
(In percent)

	Time period	GDP	Capital	Labor	TFP
Fedderke (2002)	1990's	0.9	0.4	-0.6	1.1
Du Plessis and Smit (2007)	1995-2004	3.1	0.6	0.6 0.9 (quality adj)	1.9 1.6 (quality adj)
IMF (2005)	1995-2003	2.9	0.7	0.9	1.3
IMF (2008)	1996-2006	3.5	0.6	1.8 1.9% (quality adj)	1.1 1.0 (quality adj)

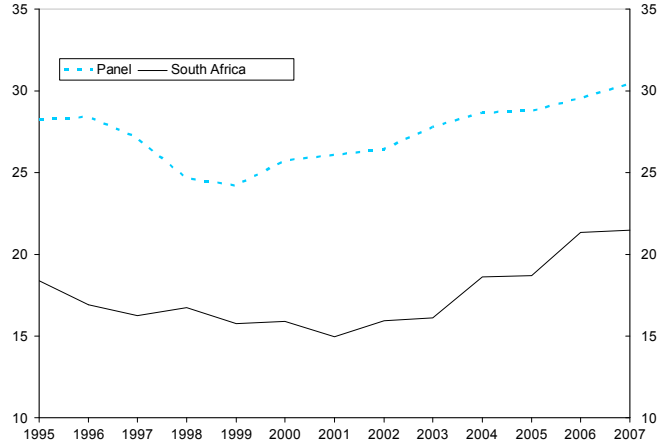
C. Has Low Saving Contributed to the Relative Weakness of Investment in South Africa?

14. **The weakness of investment in South Africa is a common feature of the three decompositions performed above.** The first and third show that in South Africa the contributions of investment and of capital are smaller, and South Africa's lower labor productivity growth in the second decomposition is consistent with a lower capital-labor ratio than the panel. The difference in TFP (including lower skill levels) also seems to explain part of the growth gap, but it is less striking than the gap in investment.

[11] Other minor divergence points can be found in the capital stock computation (most studies use the series computed by the South Africa Central Bank rather than applying the perpetual inventory method as we did); the correction of outliers (notably the 2000 employment growth rate, see Appendix, Box 2); the adjustment for labor quality; and the choice of employment series (total or nonfarm formal employment).

15. **Between 1996 and 2001 investment growth in South Africa was sluggish and the recovery since 2002 has not been sufficient to close the investment rate gap with the panel.** On average for the period, the investment to GDP ratio in South Africa has been 10 percentage points lower than in the panel (see Figure II.3), and annual real investment growth has been 1.5 percentage points lower. Although since 2002, real investment has accelerated and the investment ratio has increased significantly, in 2007 it was still 9 percentage points below the panel's ratio.

Figure II.3. Gross Capital Formation
(In percent of GDP)



Sources: World Economic Outlook and IMF staff calculations.

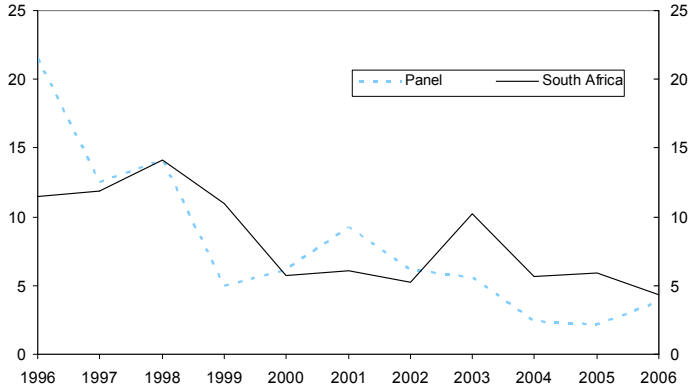
16. **Lower saving could explain the relative lack of dynamism of investment in South Africa compared with the panel**:

- **Lower saving in South Africa is likely to have constrained investment given the high correlation generally seen between domestic saving and investment rates.**[12] Over the period, the saving to GDP ratio has been on average 14 percentage points lower in South Africa than in the panel, and the gap increased over the period studied from an average of 12 percentage points for 1996–2001 to 16 percentage points for 2002–06.
- **Reflecting the shortage of savings, the cost of capital has been slightly higher in South Africa**. Although the real interest rate has been only 0.2 percentage point higher a year on average, the gap has widened substantially over time (from an average of -1.4 percentage point for 1996–2001 to +2.2 percentage points for 2002–06) because real interest rates have decreased more in the panel than in South Africa (see Figure II.4).

[12] See, for instance, Feldstein and Horioka (1980) or Obstfeld and Rogoff (2000).

Econometric estimates confirm the sensitivity of investment to real interest rates. A simple econometric equation with two variables—the capacity utilization in the manufacturing sector and the real interest rate—accounts for 60 percent of the volatility of real investment growth in South Africa since 1970.[13] The effect of interest rate is substantial: other factors being equal, a 1 percentage point increase in the real interest rate decreases real investment growth by 7 percentage points after a year.

Figure II.4. Real Interest Rate
(In percent)



Sources: International Financial Statistics, World Development Indicators and IMF staff calculations.

- In principle, poor investment growth could also result from liquidity constraints on private sector financing (banks may be reluctant to lend regardless of the level of interest rates). But the argument doesn't seem to hold for South Africa: financing appears to be more abundant than in the panel, even if access is concentrated.[14] The more developed financial markets in South Africa seem to allow the difference in real interest rates with respect to the panel to be reduced despite the large savings shortfall.[15]

[13] Variables enter the equation as one-period changes and with one lag (which mitigates the endogeneity problem). The real interest rate is computed as the difference between the nominal lending rate (source: *International Financial Statistics*) and GDP deflator inflation. The equation is very stable over time. Results are available from the author upon request.

[14] On average over the decade, the annual stock of domestic credit to the private sector amounted to 123 percentage points of GDP in South Africa vs. 51 percent in the panel.

[15] Apart from the shortage of saving and its effect on real interest rates, there are other possible explanations of the investment weakness in South Africa. For instance, indirect evidence (on FDI inflows and stock market returns) seems to suggest that returns on investment have not been as attractive in South Africa than in the panel: between 1996 and 2006, FDI inflows, on average, amounted to 1.6 percent of GDP in South Africa versus

(continued…)

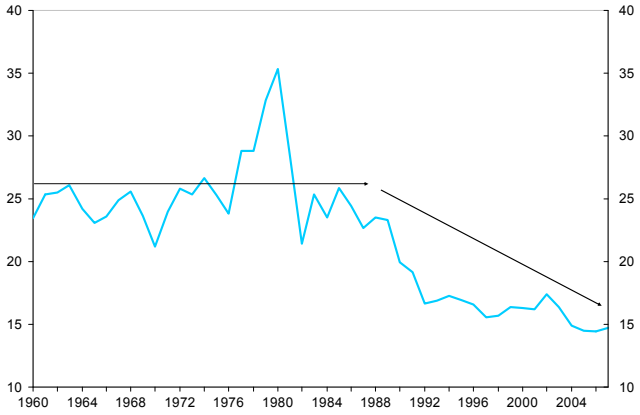
D. How to Release the Saving Constraint Weighing on Investment and Growth?

17. **Having identified saving as a main constraint on investment, we now analyze South Africa's saving performance from a cross-country perspective.** After setting out stylized facts on national saving and its components, we investigate the accounting and economic determinants of private saving.

Some Features of National Saving in South Africa

18. **Since 1980 national saving in South Africa has trended downward** (Figure II. 5): the national saving rate has decreased from an average of 26 percentage points of Gross National Disposable Income (GNDI) during 1960–1985 to 15 percent of GNDI in 2007 (the large spike in saving around 1980 appears to have been associated with a bubble in gold prices).

Figure II.5. National Saving in South Africa
(In percent of GNDI)

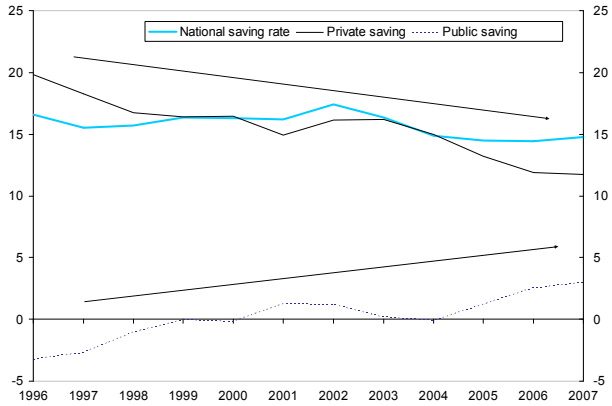


Sources: South Africa Reserve Bank and IMF staff calculations.

19. **Since 1996, the decline in national saving has been the net outcome of a deterioration in private saving and an improvement of public saving.** The decline in national saving (1.8 percentage points of GNDI between 1996 and 2007) reflected an 8.1 percentage point fall in private saving that was partially offset by a 6.2 percentage point rise in public saving (see Figure II.6). Over the last decade tax revenue gains from robust economic growth and improved revenue administration have more than offset the increase in public current expenditures. The interdependence of public and private saving is analyzed more closely below.

2.3 percent of GDP in the panel; between 1998 and 2006, stock prices grew by 18 percent in South Africa versus 26 percent in the panel.

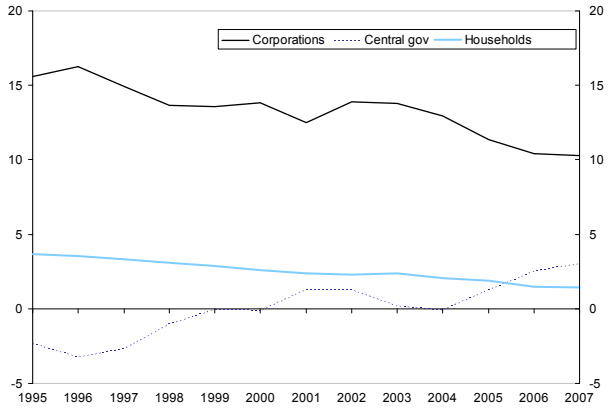
Figure II.6. Saving Rates of the Public and Private Sectors
(In percent of GNDI)



Sources: South Africa Reserve Bank and IMF staff calculations.

20. **Within the private sector, the decline in saving has been higher for corporations than for households** (Figure II.7). While the corporate saving rate fell by 6 percentage points of GNDI between 1996 and 2007, the household saving rate decreased by 2.1 points (though from a lower starting level).[16] The decrease in both household and corporation saving rates does not seem to validate the hypothesis that households "pierce" the corporate veil.[17]

Figure II.7. Saving Rates by Institutional Sector
(In percent of GNDI)



Sources: South Africa Reserve Bank and IMF staff calculations.

[16] As a share of their respective starting levels, the decrease has been higher for household saving (which has dropped by half of its 1996 level) than for corporate saving (which has dropped by one third since 1996).

[17] According to the "piercing the veil" theory (Poterba 1991), corporation and household saving should be substitutes, because households realize that corporations save on their behalf. For instance, when corporations retain earnings in response to changed inflation or tax rates (thus increasing their saving), households rationally reduce their saving rate (by continuing to consume despite lower dividend income), because they expect retained earnings to raise the value of their equity portfolio.

21. **From a cross-country perspective, private saving is significantly lower in South Africa than in a panel of faster-growing countries.**[18] First, between 1996 and 2007, the national saving rate averaged more than 10 percentage points lower in South Africa than in the panel. Second, the national saving rate has decreased in South Africa since 1996 but has increased in the panel. Third, most of the gap in level and evolution between South Africa and the panel is explained by differences in private saving (see Table II.5).

Table II.5. Comparison of the Saving to GNDI Ratios in South Africa and the Panel

	Evolution between 1996 and 2007 (In percentage points)			Average level 1996-2007 (In percent of GNDI)		
	South Africa	Panel	Gap	South Africa	Panel	Gap
National Saving	-1.8	+2.9	4.7	15.7	27.7	12.0
Public Saving	+6.2	+6.1	-0.1	0.2	2.0	1.8
Private Saving	-8.1	-3.2	4.9	15.6	25.6	10.0

Sources: South Africa Reserve Bank, World Economic Outlook and IMF staff calculations.

22. **Both corporate and household savings seem to be low in South Africa by international standards.** Due to lack of data, the comparison at the household and corporation levels can only be carried out in relation to OECD countries (rather than to the previous panel). In 2006, the household saving rate averaged 4.8 percentage points in OECD countries vs. -0.5 in South Africa; the gap was less significant for corporations (11.5 percentage points in OECD countries vs. 10.1 in South Africa).[19]

An Accounting Decomposition of the Corporate Saving Rate

23. **To understand the decrease in private saving in South Africa between 1996 and 2007, it is helpful to look at the accounting components of corporate saving.** Apart from the advantages of a more detailed analysis, there are two reasons for focusing on corporate saving: (i) corporate saving accounts for over 90 percent of total private saving over the period, and (ii) corporate saving is the main reason for the decrease in private saving between 1996 and 2007 (see paragraph 20).

24. **The corporate saving rate is broken down into four accounting components** that have intuitive interpretations: gross operating profit rate, ratio of total corporate income to production income, retained earning ratio, and ratio of profit after social contributions (see methodology and results in Appendix, Box 4). Three results emerge from the decomposition:

[18] This panel consists of China, Vietnam, India, Poland, Korea, Russia, Romania, Bangladesh, Iran, and Turkey.

[19] The household saving rate is computed as the ratio of household net saving to household net disposable income; the corporation saving rate is the ratio of gross corporate saving to nominal GDP.

- **The significant increase in the amount of tax paid by corporations is the main reason for the decrease in corporate saving.**[20] The component of the corporate saving rate that has shown the highest variation over the period is the ratio of profit after social contributions, which declined by 27 percentage points. This ratio depends, in turn, on the evolution of two subcomponents, net transfers and taxes on income and wealth; further analysis shows that, for corporations, the ratio of taxes to gross primary income increased by 25 percentage points between 1996 and 2007, whereas the net transfer ratio was very stable. **This result is surprising because the corporate income tax rate has decreased over the last decade.** In fact, the broadening of the tax base (notably the introduction of a capital gains tax in 2001), the rise in companies' gross operating surplus, and better tax collection have more than offset the decrease in the tax rate.
- **The increase in tax payments had the effect of transferring saving from the corporate to the public sector, with negligible net effect on total saving.** From an accounting point of view, corporate taxation decreases corporate saving and increases public saving by the same amount; all else being equal, the effect on total saving is therefore neutral.
- **The increase in corporate dividend payments also exerted, to a lesser extent, downward pressure on corporate saving.** The retained earnings ratio decreased by 21 percentage points between 1996 and 2007. The drop is especially noticeable before 2001; since then, better investment opportunities seem to have increased the incentives to retain earnings.

Economic Determinants of Private Saving

25. **As a complement to the accounting approach, econometric analysis can help identify behavioral determinants of private saving.** The econometric literature on private saving is abundant and deals with both specific countries and panels. Standard determinants include domestic income (level and growth rate); financial variables (interest rates, financial depth indicators, measures of saving constraints); demographic variables (dependency ratio, pension regime); crowding out terms (fiscal balance, external financing); measures of

[20] A simple simulation confirms this result. Under the assumption that the ratio of tax to corporation gross primary income (GPI) is maintained at its 1996 level, the corporate saving rate would have worked out to 15 percent in 2007, and the public saving rate would have been equal to -2 percent (other factors being unchanged). The fact that the simulation falls almost on the 1996 data (respectively 16 and -3) is unexpected; the other components of the gap between corporate saving and national income (apart from the tax component) have offset one another over the period. Intuitively, it means that the other deductions from the value added (i.e., wages, dividends, and interests) have been stable over time on the whole.

uncertainty (inflation, unemployment, urbanization); and persistence terms (lagged saving rates). Many determinants have ambiguous theoretical effects.

26. **To explain the decrease in private saving in South Africa and its average relative to the panel, we use the parameter estimates from a 2000 World Bank study by Loayza, Schmidt-Hebbel, and Serven**. Their study has the advantage of covering a large number of countries (150, including South Africa) and a long period (1965 to 1994). It is the most comprehensive study to date in terms of methods and scope, and many of the results are typical of those found elsewhere in the literature. We apply their estimated private saving equation to South Africa and to the panel between 1996 and 2006 (see methodology in Appendix, Box 5). Two main results arise from the econometric analysis.

27. **First, four factors account for private saving being lower in South Africa than in our panel of fast-growing countries: (i) a younger population; (ii) a higher rate of urbanization; (iii) lower growth in GDP per capita ; and (iv) lower inflation** (Table II.6). The higher young dependency ratio in South Africa seems to be the main variable explaining the gap, but its impact is mitigated by the lower old dependency ratio; thus, demography seems to have a neutral effect on saving differences between South Africa and the panel. Urbanization also plays a crucial role, but its theoretical interpretation is ambiguous.[21] Lower GDP growth in South Africa would also explain part of the gap, if the econometric method (GMM) really sorts out the endogeneity problem.[22] Lastly, lower macroeconomic uncertainty in South Africa (measured by lower inflation) has induced people to save less for precautionary reasons.

[21] According to the authors, the negative effect of the urbanization ratio reflects the precautionary saving motive (lacking the means to diversify away the uncertainty of their agriculture income, rural residents tend to save more). But the variable is also highly correlated with factors (level of development, release of credit constraints) that are supposedly captured by other variables in the equation.

[22] Our analysis shows that, in South Africa, investment has been impeded by insufficient domestic saving and that private saving is partly determined by past GDP growth. A vicious circle may therefore have materialized over the last decade, with low GDP growth constraining private saving, which, in turn, has hampered investment and growth. This circular causality is nevertheless difficult to sort out and to quantify.

Table II.6. Average Long-Term Contributions of the Explanatory Variables to the Private Saving Rate Level: Results for South Africa, the Panel and the Gap between South Africa and the Panel

	South Africa	Panel	Gap
Actual private saving rate (av. 96-06)	19.7	30.1	-10.4
Real growth rate income	0.9	3.1	-2.2
Real per capita income	94.4	96.0	-1.6
Real interest rate	-4.9	-3.6	-1.3
Terms of trade	1.3	0.5	0.8
Urbanization ratio	-53.1	-47.3	-5.7
Old dependency ratio	-9.6	-18.3	8.7
Young dependency ratio	-38.7	-30.0	-8.6
Gov saving	0.0	-1.7	1.7
Private credit	-8.2	-6.4	-1.8
Inflation	2.4	5.0	-2.6
Implied constant + residual	35.0	31.2	3.8

Source: IMF staff calculations.

28. **Second, the decrease in South Africa's private saving rate over the last decade is due to: (i) relaxation of credit constraints; (ii) increased urbanization; (iii) the increase in public saving and; and (iv) the ageing of the population** (Table II.7). The main explanatory variable is the private credit term, which measures the release of borrowing constraints after apartheid. Intensified urbanization was also a factor. The importance of the crowding-out effects of public saving is consistent with the results of the accounting decomposition (the transfer from corporate to public saving). Finally, though the increase in the old-age dependency ratio contributed to the decline in private saving, the effect is more than offset by a decrease in the young-age dependency ratio, which had the opposite effect.

Table II.7. Average Long-Term Contributions of the Explanatory Variables to the Private Saving Rate Decrease in South Africa

Actual decrease (between 95-97 and 04-06)	-5.7
Estimated long-term decrease	-4.6
Real growth rate income	1.8
Real per capita income	0.7
Real interest rate	2.9
Terms of trade	0.4
Urbanization ratio	-4.0
Old dependency ratio	-2.1
Young dependency ratio	4.0
Gov saving	-3.4
Private credit	-3.9
Inflation	-1.0

Source: IMF staff calculations.

E. Conclusion and Policy Implications

29. **Over the last decade the main constraints on growth in South Africa have been the low investment rate, insufficient labor productivity gains, reduced openness to trade and slower technical progress.** Underinvestment, a common factor to the three growth

decompositions, has significantly impeded growth since the end of apartheid. Despite a pickup in recent years, the investment rate remains low compared to faster-growing countries. Continuing to boost investment is therefore critical for accelerating growth.

30. **Low saving capacity has constrained the expansion of investment but the scope to increase private saving seems limited by structural features of the economy.** The low level of private saving in South Africa mainly result from structural factors, like shifts in demographics, urbanization, and financial sector deepening, that are not easily affected by public policies. The two main factors that explain the difference in the private saving rate between South Africa and the panel (apart from the persistence term) are both demographic: the young dependency ratio and the urbanization rate.

31. **Macroeconomic instruments meant to increase private saving seem to be either self-defeating with regard to national saving or costly in terms of other consequences.** Despite the importance of structural factors, some macroeconomic variables impact private saving, but their effect can be detrimental to national saving (for example, decreasing public saving) or may induce macroeconomic costs (for example, increasing inflation).

32. **The safest way to increase national saving in South Africa is to continue raising public saving, preferably by containing the growth of public consumption**. An increase in public saving would have a positive effect on national saving even if it were partially offset by the private sector. An increase in the tax take (whether through an increase in the tax rate or a broadening of the base) is likely to be less effective in boosting national saving than a slowdown in public consumption, because the offset by the private sector is likely to be higher, as illustrated for example by our accounting analysis of corporate saving.[23]

[23] Tax payments directly transfer saving from the private to the public sector, as they reduce private income and increase public income by the same amount (other factors being equal). By contrast, a decrease in public consumption has only an indirect effect on private saving through its economic impact on private consumption; the offset is likely to be less and to take more time (the Ricardian hypothesis as originally stated by Barro (1974) applied to taxes rather than to government spending).

Appendix

Box 1. Computation of the First Growth Decomposition

- GDP growth is broken down into two components: the contribution of absorption (A) and the contribution of the trade balance (TB). Absorption is itself the sum of household consumption (C), government consumption (G), and investment (I); trade balance is the difference between exports (X) and imports (M). Thus:

$$\Delta Y/Y = \Delta A/Y + \Delta TB/Y = \underbrace{\Delta A/Y - \Delta M/Y}_{(1)} + \underbrace{\Delta X/Y}_{(2)}$$

where (1) = contribution of domestic demand for domestic products and (2) = contribution of foreign demand for domestic products.

- Results are presented in a normalized form (with each side of the equation being divided by GDP growth):

$$100\% = \Delta A/\Delta Y - \Delta M/\Delta Y + \Delta X/\Delta Y$$

- Contributions are computed annually and then averaged out for the period 1996-2006.

Box 2. Computation of the Second Growth Decomposition

- Real GDP is written as the product of ratios: labor productivity, employment rate, participation rate, working age population share, and total population:

$$Y = \frac{Y}{L_{empl}} * \frac{L_{empl}}{L_{force}} * \frac{L_{force}}{L_{15-64}} * \frac{L_{15-64}}{L_{tot}} * L_{tot}$$

where L_{empl} is employment, L_{force} is labor force, L_{15-64} is working age population, L_{tot} is total population.

- In growth terms: $\hat{Y} \approx \underbrace{\frac{\hat{Y}}{L_{empl}}}_{(1)} + \underbrace{\frac{\hat{L}_{empl}}{L_{force}}}_{(2)} + \underbrace{\frac{\hat{L}_{force}}{L_{15-64}}}_{(3)} + \underbrace{\frac{\hat{L}_{15-64}}{L_{tot}}}_{(4)} + \underbrace{\hat{L}_{tot}}_{(5)}$. This highlights the contributions to growth of (1) productivity, (2) the employment rate, (3) the participation rate, (4) the "demographic dividend" term (working age population share) and (5) population size.

- Unlike the first decomposition, contributions are not normalized.
- Contributions are computed annually and then averaged out for 1996-2006.
- The decomposition is applied to South Africa after correcting the official data on employment and labor force.[24]

Box 3. Computation of the Third Growth Decomposition

Contributions are computed annually and then averaged out for the period 1996-2006.

First decomposition

Real GDP growth is broken down into three components: capital (K), labor (L) and TFP (A) contributions. With a Cobb-Douglas function $Y = AK^{\alpha}L^{1-\alpha}$:

$$\Delta Y/Y = \alpha \Delta K/K + (1-\alpha)\Delta L/L + \Delta A/A \qquad (1)$$

To apply the decomposition, the following assumptions are made:

- $\alpha = 1/3$ in all countries.
- L = Employment *or* Labor force (depending on whether or not employment data are available). The 2000 employment growth rate is adjusted for South Africa (see Box 2).
- Capital stocks are computed using a perpetual inventory method. Parameters (geometric depreciation at 5%, asset life 21 years) are chosen to be consistent with a degree of declining balance to depreciation equal to 1.05 (and to meet the constraint that investment series are short for some countries). This methodology is also applied to South Africa (the capital stock computed by the SARB with a straight-line depreciation method is not used).

[24] The change in survey in 2000 (from the October Household Survey to the Labor Force Survey) creates disruptive evolutions of employment and labor force. The correction uses interpolated data available in the first Labor Force Survey (February 2000) and applies simple corrections to take into account the new benchmark methodology of the 2001 Census.

Alternative decomposition

In decomposition (1), TFP is computed as a residual and thus includes changes in the quality of labor that should, in fact, be attributed to L. Transferring labor quality from TFP to L can be performed in different ways. We use the Barro (1999) and Bosworth-Collins (2003) framework and formalize production with a function that explicitly includes labor quality. If $H = (1.07)^s$ with H human capital and s average number of years of schooling, then $Y = AK^{\alpha}(LH)^{1-\alpha}$ and

$$\hat{Y} = \hat{A} + \alpha * \hat{K} + (1-\alpha) * (\hat{LH}) \qquad (2)$$

Transferring labor quality from TFP to L has two consequences: (1) it increases the labor contribution (and decreases the TFP contribution) in both South Africa and the panel. (2) In so far as improvement in labor quality (education) seems to have been stronger in the panel than in South Africa over the period, transferring labor quality should increase relatively more the L contribution in the panel and decrease relatively more the TFP contribution in the panel, closing the gap between South Africa and the panel for both.

Box 4. Accounting Decomposition of the Corporate Saving Rate

The corporate saving rate[25] S/VA is broken down into four multiplicative components. Each reflects the deduction made by a specific agent from the corporate value added. The sum of all deductions make up the gap between value added and saving:

$$\frac{S}{VA} = \frac{GOS}{VA} * \frac{GPI + d}{GOS} * \frac{GPI}{GPI + d} * \frac{S}{GPI}$$

(1) The gross operating profit rate GOS/VA (ratio of the Gross Operating Surplus, *GOS,* to the Value Added of the corporate sector, *VA*) can be seen as the residual after the deduction made by workers from the corporate value added.

(2) The ratio of the Gross Primary Income before dividends paid (*GPI+d)* to *GOS,* which varies with the amount of net interest paid, represents what is left after the lenders'

[25] The corporate saving rate can not be defined in the same way as the households' (namely, saving divided by disposable income), because saving is, by construction, equal to disposable income for corporations.

deduction.

(3) The retained earning ratio $GPI/GPI + d$ (ratio of the Gross Primary Income *GPI* to *GPI*+*d*), which fluctuates with dividends paid, represents what is left after the shareholders' deduction.

(4) The ratio of profit after social contributions S/GPI (ratio of saving, *S,* to *GPI*), which measures taxes and transfers, can be seen as what is left after the government's net deduction for taxes, other levies, and transfers.

Results: Level and Variations of the Accounting Components of the Corporate Saving Rate

	S/VA	(1)	(2)	(3)	(4)
1996	29.0	45.5	103.7	75.9	80.9
2001	21.1	48.3	107.2	61.0	66.7
2007	17.4	53.0	111.5	55.1	53.5
Variation 1996-2007	-11.5	+7.5	+7.9	-20.8	-27.4

Sources: Quarterly Bulletin of the SARB (S-125 and S-126) and IMF staff calculations.

Box 5. Econometric Analysis of the Private Saving Rate

Loayza, Schmidt-Hebbel, and Serven (2000) estimate several private saving equations for a panel of 150 countries, including South Africa, between 1965 and 1994. We use the results of their GMM system estimator specification. As their study ends with 1994, using their estimates for the years 1996 to 2006 constitutes an out-of-sample forecast.

The following variables are included in the selected private saving rate equation[26]:

- The lagged private saving rate (ratio of gross private saving to gross private disposable income, GPDI). *Positive sign.*
- Real per capita GPDI (measured as the difference between gross national domestic

[26] The ratio M2 to National Income is not statistically significant in the specification that we adopt.

income and gross public disposable income, itself equal to the sum of public saving and public consumption). *Positive sign.*

- The real growth rate of per capita GPDI. *Positive sign.*
- The real lending interest rate. *Negative sign.*[27]
- The terms of trade. *Positive sign.*
- The urbanization ratio (percentage of the population living in cities). *Negative sign.*
- The old dependency ratio (ratio of population above 64 to total population) and the young dependency ratio (ratio of population under 15 to total population). *Negative sign.*
- The ratio of government saving to GPDI.[28] *Negative sign.*
- The ratio of the private credit flow to GPDI. *Negative sign.*
- The inflation rate of the GDP deflator. *Positive sign.*

The estimated econometric equation of the World Bank study is separately applied to South Africa and to the panel. Results are then used for two purposes:

- To compute the contribution of the explanatory variables to the average *level* of private saving in South Africa and in the panel and to the gap between them.
- To compute the contribution of the explanatory variables to the *decline* in South African private saving over the last decade. To reduce the sensitivity of our results to the choice of start and end dates, we compute the contributions between the intervals 1995–1997 and 2004–2006.

Because the equation incorporates a lagged dependent variable, long-term contributions are computed for each explanatory variable in two stages: (1) The long-term multipliers are

[27] The estimated negative effect of the interest rate on private saving suggests that the income effect outweighs the sum of the substitution and the wealth effects in a microeconomic framework.

[28] The econometric estimation shows that the private sector reduces its saving rate by 0.3 percentage point in the short term and by 0.7 percent in the long term for each percentage point increase in the public saving ratio (these numbers give the range of estimates of most empirical studies on ricardian equivalence).

derived from the estimated short-term coefficients by dividing each coefficient by one minus the coefficient of the lagged dependent variable. (2) Long-term contributions are calculated as the product of the multiplier and the average value of the explanatory variable over the period.

By definition the gap between the actual saving rate and the sum of the explanatory variable contributions is equal to the sum of the estimated residual and the estimated constant. As World Bank estimates are not available at the country level, the constant peculiar to South Africa (as well as the one peculiar to the panel) is unknown, and it is not possible to tell the estimated residual form the estimated constant.

References

Aaron, Janine, and John Muellbauer, 2000, "Personal and Corporate Saving in South Africa," CEPR Discussion Paper No 2656 (London: Center for Economic Policy Research).

Arora, Vivek, and Ashok Bhundia Ashok, 2003, "Potential Output and Total Factor Productivity Growth in post-Apartheid South Africa," IMF Working Paper 03/178 (Washington: International Monetary Fund).

Barro, Robert, 1974, "Are Government Bonds Net Wealth?" *Journal of Political Economy,* Vol 82, pp. 1095–1117.

Du Plessis, Stan, and Ben Smit, 2007, "South Africa's Growth Revival After 1994," Stellenbosch Economic Working Paper 01/06 (Stellenbosch, SA: Stellenbosch University).

Edwards, Sebastian, 1995, "Why Are Saving Rates so Different Across Countries? An International Comparative Analysis," NBER Working Paper No 5097 (Cambridge, MA: National Bureau of Economic Research).

Fedderke, Johannes, 2002, "The Structure of Growth in the South African Economy: Factor Accumulation and Total Factor Productivity Growth 1970–97," *South African Journal of Economics,* Vol. 70, pp. 4-ff.

_____, 2004, "From Chimera to Prospect: Toward an Understanding of the South African Growth Absence" (Cape Town, SA: University of Cape Town).

_____, 2005, "Sources and Constraints of Long-term Growth 1970–2000," Working Paper (Cape Town, SA: University of Cape Town).

Harjes, Thomas, and Luca Antonio Ricco, 2005, "What Drives Saving in South Africa?" in *Post-Apartheid South Africa: The First Ten Years*, ed. by Michael Nowak and Luca Antonio Ricci (Washington: International Monetary Fund).

Loayza, Norman, Klaus Schmidt-Hebbel, and Luis Serven, 2000, "What Drives Private Saving Across the World," *Review of Economics and Statistics*, Vol 82, No, 2.

Masson, Paul, Tamim Bayoumi, and Hossein Samiei, 1998, "International Evidence on the Determinants of Private Saving," *World Bank Economic Review*, Vol. 12, No, 3**.**

Nowak, Michael, and Luca Antonio Ricci, eds., 2005, *Post-Apartheid South Africa: The First Ten Years* (Washington: International Monetary Fund).

Prinsloo, J.W., 2000, "The Saving Behaviour of the South African Economy," Occasional Paper No. 14 (Pretoria: South African Reserve Bank).

III. CAN FISCAL POLICY BOOST GROWTH AND EMPLOYMENT IN SOUTH AFRICA?[1]

1. **South Africa has made strong progress in the past few years, but unemployment and poverty persist.** Good macroeconomic management and favorable external conditions have raised growth, lowered inflation for a while, strengthened public finances, and improved the external reserve position. The life of ordinary citizens has improved significantly, measured by indicators such as access to electricity and clean water, as well as reduction in child hunger. Still, unemployment and poverty remain high, especially in rural areas and townships.

2. **The authorities aim to raise economic growth further to reduce high unemployment and deep-rooted poverty.** The medium-term objectives of South Africa are ambitious: (i) achieve a 6 percent average growth in 2010–14; (ii) bring unemployment down to 14 percent by 2014 from 28 percent in 2004 and 23 percent in 2007. The strategy involves adopting policies conducive to higher growth and employment creation while sustaining macroeconomic and financial stability.

3. **This paper analyzes the contribution fiscal policy can make toward achieving these objectives without compromising macroeconomic stability.** The emphasis is on a deficit-neutral rebalancing of the revenue-expenditure mix in the medium term to improve incentives to invest and work and to create fiscal space for the most productive type of expenditure. The paper also explores the distributional implications of the proposed policies for high-income and low-income households.

4. **The analytical tool chosen for this exercise is the IMF's Global Integrated Monetary and Fiscal Model (GIMF).** In this model, described in detail in Kumhof and Laxton (2007),[2] fiscal policy can have strong and persistent effects on economic activity through realistic features such as: (i) two types of households—intertemporally-optimizing (overlapping-generations) and liquidity-constrained ones, generally corresponding to higher- and lower-income households.[3] This feature strengthens the effects of fiscal policy changes through their large and immediate impact on liquidity-constrained households; (ii) finite planning horizon for the intertemporally-optimizing households, which leads to stronger discounting of future flows and thus gives more weight to current and near-term policies; and

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[1] Prepared by Nikolay Gueorguiev.

[2] Kumhof, M., and D. Laxton, 2007, "A Party without a Hangover? On the Effects of U.S. Government Deficits", IMF Working Paper 07/202 (Washington: International Monetary Fund).

[3] Throughout the paper, we will use interchangeably the term pairs overlapping-generations —higher-income households, and liquidity-constrained—lower-income households.

(iii) distortionary taxes on consumption, capital, and labor that affect saving, investment, and labor supply decisions. Built from extensive microfoundations, the model is particularly suitable for policy analysis owing to its rich structure, flexible and realistic menu of tax and expenditure instruments, and endogenous interaction between fiscal and monetary policies.

5. **We have adapted the model to the South African environment.** First, as workers at the bottom half of the income distribution (who are more likely to be liquidity-constrained) typically do not pay personal income tax in South Africa, liquidity-constrained households have been exempt from the scope of the labor tax in the model; moreover, they receive only a small share of the dividends paid by corporations as opposed to the higher-income households.[4] Second, we introduce a wage subsidy received by the liquidity-constrained households, which is indeed being considered by the government in the context of a social security reform. Third, to account for the existence of a large pool of underutilized labor, willing to work at the prevailing wage rate should labor demand pick up, the labor supply elasticity of liquidity-constrained households with respect to wages has been raised significantly above that of the nonconstrained ones.[5] Finally, the risk premium on international borrowing has been linked to both the current account deficit and the terms of trade, according to observed empirical regularities in South Africa. The model is calibrated to match South Africa's historical national accounts and fiscal data.

6. **The rule-based fiscal and monetary policies aim to smooth the economic cycle and maintain stability.** Fiscal policy aims to stabilize the budget balance around a chosen structural target; cyclically higher/lower revenue lead to higher/lower target headline balance. Government consumption adjusts to achieve the target given the effect of economic activity on revenue. Monetary policy operates in an inflation-targeting framework, guided by the usual inflation-forecast-based rule where the policy interest rate responds gradually to deviation of projected inflation from the target and to the output gap.

7. **In the model, fiscal policy affects medium-term growth through its effects on incentives to invest and work, and through improving productivity of private capital**. Specifically, a cut in the tax on capital raises private return to capital and thus investment and labor demand. A cut in the tax on labor raises the marginal return to working and thus labor supply (a wage subsidy works the same way). On the expenditure side, rising public investment lifts the productivity of private capital and makes private investment more

[4] Even if they do not typically purchase equities directly, lower-income households could still own them indirectly, for example through employer-supported pension plans.

[5] This parameterization allows large response of employment of liquidity-constrained workers to small changes in wages, approximating empirically observed absorption of excess labor at close to prevailing wages.

attractive, while a cut in government consumption works in the opposite direction, but with a much smaller force.

8. **The paper explores two policy scenarios in support of growth and employment creation.** The first scenario packages together policies aimed at raising the output growth rate, while the second adds policies specifically targeting a rise in employment as well.

- Scenario I: Raising output growth.
    - Cut the corporate income tax rate by two percentage points (cost: 0.5 percentage points of GDP);
    - Raise public investment by one percentage point of GDP;
    - To maintain the targeted structural fiscal balance, close the resulting gap by:
        - Raising one percentage point of GDP through the planned introduction of mining royalties, thus capturing some of the economic rents provided by South Africa's mineral endowment;[6]
        - Slowing the growth of government consumption (which remains positive in real terms) so that its ratio to GDP falls by about 0.5 percentage points.
- Scenario II: Raising output growth and employment. The scenario employs the same policies as in Scenario I, plus:
    - Cut the average effective personal income tax rate by one percentage point to boost the supply of labor by income tax-paying workers (cost: 0.3 percentage points of GDP). To maximize the labor supply effect, the cut can be targeting the middle of the income tax scale, lowering the marginal tax rate of sought-after skilled workers and small businesses;
    - Introduce a 10 percent wage subsidy for low-skill, lower-income workers (cost: 1.2 percentage points of GDP, broadly matching the authorities' estimate);

[6] The introduction of royalties is modeled as an increase in the government's share of dividends from the mining sector and a reduction in private resident and nonresident share. To the extent that mineral output prices are well above production costs, the negative effect of royalties on investment and output in the mining sector would be minimal. Should revenue from this source prove insufficient, the gap could be filled by environmentally-motivated indirect taxes and charges (an electricity levy, emissions charges, etc.), which are also being implemented or contemplated by the authorities.

- In addition to the introduction of mining royalties, these policies would be financed by an even slower growth in government consumption, so that its ratio to GDP drops by about 2 percentage points. This could be achieved by holding general government consumption constant in real terms for two years.

9. **The main results are:**

- Scenario I: output moves to a higher equilibrium, and in the process growth increases by 0.5 percentage points a year on average in the first five years; during this period, employment increases by 0.4 percent, or about 52,000 positions, using the 2007 number of employees as a base (Figure III.1). The corporate income tax cut raises the profitability of private capital and boosts private investment and labor demand. The rising public investment reinforces this effect by allowing more output to be produced with the available capital and labor, i.e., raising total factor productivity. These positive effects outweigh, in terms of growth and employment, the reduction in private dividend income caused by the introduction of royalties in mining, and the cost of slower-growing government consumption. The effect of the royalties is responsible for the larger medium-term employment response of higher-income households (as well as their lower consumption growth), as the loss of dividend income motivates them to raise their supply of labor.[7]

- Scenario II: results are predictably stronger, with growth increasing by 0.6 percentage points a year in the first five years and employment rising by nearly 1 percentage point, or 128,000 positions, as incentives to work are strengthened for both household groups (Figure III.2). In addition, consumption of liquidity-constrained households rises significantly, as the wage subsidy raises their disposable income akin to social safety net transfers. This partly explains why their labor response is not even stronger—the subsidy raises both their marginal and average income, so its income and labor/leisure substitution effects work in opposite directions.

- What is the effect of the two employment-boosting policies—cutting the personal income tax and introducing the wage subsidy—in Scenario II? The income tax cut yields a gain of about 24,000 positions for the higher-income households (at fiscal cost of 0.3 percentage points of GDP in foregone revenue) and the wage subsidy delivers about 59,000 more positions for the lower-income households (at a net cost of 1 percentage point of GDP after netting out the revenue increase from the higher consumption generated by the subsidy). [8] [9] While the personal income tax cut appears

[7] In technical terms, the loss of dividend income forces these households to choose less of both consumption and leisure, the two arguments in their utility function.

[8] These results are obtained by re-running Scenario II while excluding each of the two policies separately.

more efficient, it is worth stressing that the two policies are not substitutes, as each of them affects (and targets) only one of the two household groups. Still, the wage subsidy appears expensive for the size of its effect on employment.

- Macroeconomic stability is preserved, as inflation and the current account deficit deviate little from equilibrium. Under both scenarios, monetary policy tightens early in response to the perceived opening positive output gap, but reverses course upon realization that output is rising permanently. Inflation hovers around equilibrium, checked by monetary policy's strong reaction (Figures III.1 and III.2, middle-right panel). As domestic demand initially rises faster than output, spurred by the strong investment response, the current account balance declines slightly (Figures III.1 and III.2, middle-left panel). In the long run, it improves slightly but permanently relative to the initial equilibrium, as dividend payments to nonresidents are reduced by the royalties in the mining sector.

10. **In conclusion, the analysis has found that notable growth and employment gains could be achieved by rebalancing the composition of fiscal revenue and expenditure without detriment to macroeconomic stability.** In particular, cuts in the corporate income tax would stimulate private investment, while increases in public infrastructure investment would boost the productivity of the private capital stock, with beneficial effect on growth. Regarding employment, an appropriately targeted cut in the personal income tax would strengthen the incentive to work among higher-income workers, while the introduction of a wage subsidy would lower the take-home reservation wage required by low-income workers and thus raise their employment; however, the effect appears modest relative to the subsidy's fiscal cost. An alternative use of these resources—to support continuing skill-enhancement programs to enable workers to take available higher-skill jobs—may result in bigger employment and wage gains for low-income households. Financing of the described policy package would be provided by slower growth in government consumption than so far, the forthcoming introduction of mining royalties, and possibly by the introduction of environment-friendly charges. Many of these policy measures are already in train—in particular the corporate income tax cut in 2008, the rise in public investment, and the introduction of an electricity levy—thus providing a solid foundation beneath South Africa's sustainable medium-term growth rate.

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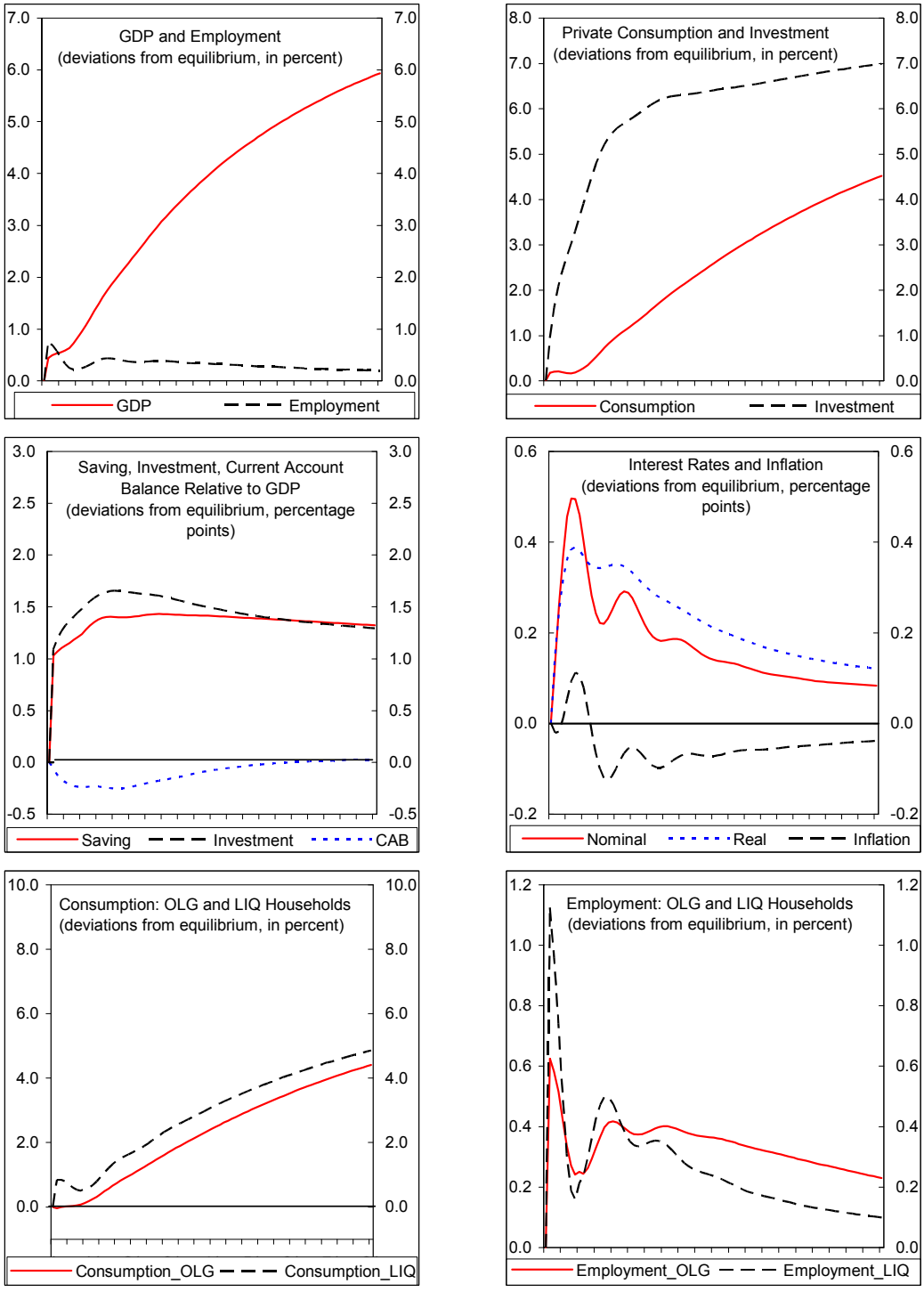
[9] The estimate of a gain of 59,000 positions appears conservative, as the model does not allow for different labor intensity in the economy's sectors. Using a more disaggregated computable general equilibrium model with 43 sectors and 9 different types of labor, a forthcoming World Bank study estimated that a 10 percent wage subsidy applied to 60 percent of the employees could raise overall employment by 2–4 percent.

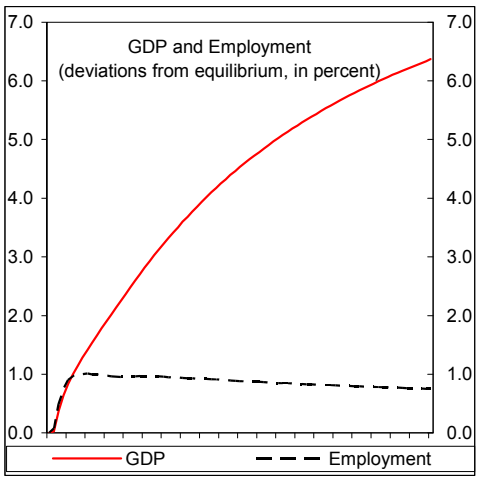
Figure III.1. Scenario I: Macroeconomic Effects of a Fiscal Policy Package Aimed at Raising Output Growth

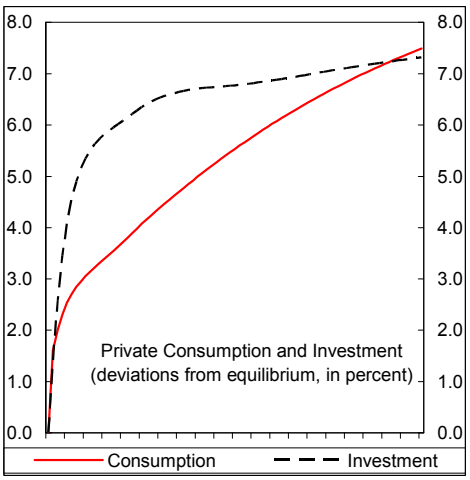


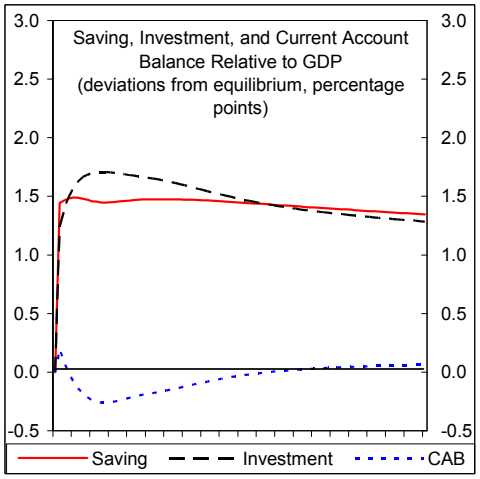
Source: IMF staff calculations.

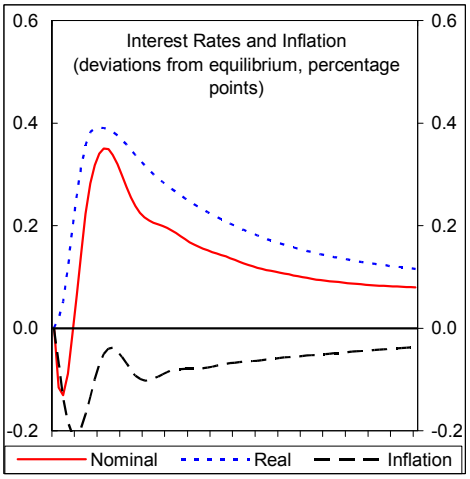
Note: Simulations run over 20 years; each tick mark corresponds to one year. The abbreviations OLG and LIQ denote the overlapping-generation (higher-income) consumers and the liquidity-constrained (lower-income) ones.

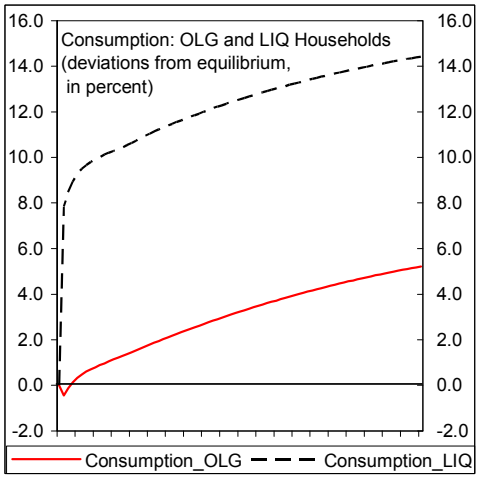
Figure III.2. Scenario II: Macroeconomic Effects of a Fiscal Policy Package Aimed at Raising Output Growth and Employment

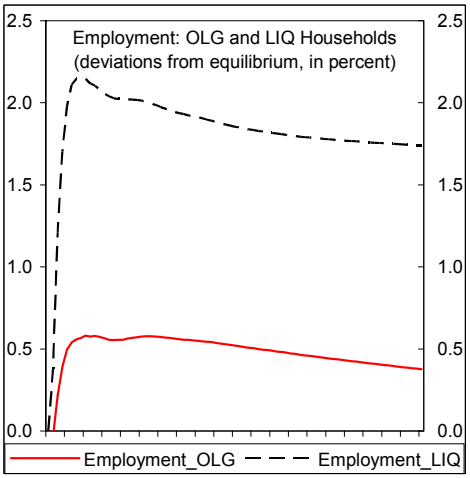












Source: IMF staff calculations.

Note: Simulations run over 20 years; each tick mark corresponds to one year. The abbreviations OLG and LIQ denote the overlapping-generation (higher-income) consumers and the liquidity-constrained (lower-income) ones.

SOUTH AFRICA: TAX SUMMARY AS OF JUNE 2008[1]

(All amounts in South African rand)

Tax	Nature of Tax	Exemptions and Deductions	Rates
1. Taxes on income, profits, and capital gains			
1.1. *Individual income tax* Income Tax Act No. 58 of 1962, as amended	A central government tax is charged on taxable income, assessed as gross income less exemptions and deductions, received by South African residents on their worldwide income, with relief for the avoidance of double taxation. Nonresidents working in South Africa for short periods are liable for tax in South Africa, in respect of their South African source income, with relief for the avoidance of double taxation. As of end-May 2008, comprehensive agreements for avoidance of double taxation on the same income were in force with (or applied to) 61 countries, with agreements under (re)negotiation or in the process of signing or ratification with 20 other countries. Cash allowances and noncash fringe benefits are subject to taxation according to formulas, including employer-owned vehicles, interest free or low interest loans, and residential accommodation.	*Exemptions* are the first R 19,000 of taxable interest and dividends for taxpayers under 65 years of age and R 27,500 of taxable interest for taxpayers age 65 and over. Dividends from resident companies received by residents and nonresidents are generally exempt from tax. Foreign interest and foreign dividends are generally taxable, but exempt up to R 3,200 out of the total taxable interest and dividend exemption. Interest is exempt where earned by nonresidents who are absent from South Africa for 183 days or more per annum and who are not carrying on business through a permanent establishment in South Africa. Other exemptions include: (i) benefits payable under the Unemployment Insurance Act, and (ii) leave gratuities on retirement/retrenchment up to R 30,000. *Deductions* are allowed for (i) Annual contributions to pension and retirement funds (the greater of R 1,750 or 7½ percent of remuneration from retirement funding employment); (ii) Arrear pension fund contributions (up	For the year of assessment ending February 29, 2009, the following applies: Tax thresholds: Below age 65: R 46,000 Age 65 and over: R 74,000 Rebates (deductible from normal tax determined on taxable income): Primary rebate: R 8,280 Secondary rebate: R 5,040 (persons 65 years and older). Tax is calculated on the taxable income of any person under 65 years of age in accordance with the table below: Taxable Annual Income (In Rand) / Marginal Tax Rates (In percent) 0 to 122,000 — 18 122,001 to 195,000 — 25 195,001 to 270,000 — 30 270,001 to 380,000 — 35 380,001 to 490,000 — 38 490,001 + — 40

[1] Updated by N. Gueorguiev, African Department, with the assistance of South African officials. For further information, see http://www.sars.gov.za or http://www.treasury.gov.za.

Tax	Nature of Tax	Exemptions and Deductions	Rates
	Wage and salary earners are subject to withholding at the source (pay-as-you-earn, PAYE). Income tax returns must be submitted at the end of the tax year for salaried persons whose net remuneration is in excess of R 60,000. Directors of private companies are subject to PAYE, according to a formula for withholding. Standard Income Tax on Employees (SITE) falls under the PAYE system; SITE is applicable to net remuneration up to R 60,000 for taxpayers who do not receive travel allowances or any other income. SITE taxpayers are not required to submit income tax returns. In the case of other individuals, provisional payments are required in two half yearly instalments. Provisional taxpayers with a taxable income exceeding R 50,000 may make a third voluntary payment. Individuals below the age of 65 who do not conduct business and earn taxable interest, dividends, and rental income of less than R 10,000 a year are not required to register for provisional tax purposes. Individuals age 65 and older are not required to register for provisional tax purposes, if their annual taxable income consists exclusively of remuneration, interest, dividends or rent from the lease of fixed property and is R 80,000 or less. Pensions from South African sources are subject to income tax, with the exception	to a maximum of R 1,800 per annum; any excess over R 1,800 may be carried forward to the following year of assessment); (iii) Retirement annuity fund contributions (up to the greater of 15 percent of nonretirement funding income or R 3,500 less current deductions to a pension fund, or R 1,750. Deductions for arrear retirement annuity contributions are permitted as in (ii); (iv) Medical expenses: monthly caps for tax-free medical scheme contributions; deduction of medical expenses allowed to the extent they exceed 7.5 percent of income. Deductions are unlimited for taxpayers over 65 years of age or handicapped. (v) Donations to approved nonprofit organizations (up to 10 percent of taxable income before deducting medical expenses). Allowances are made in respect of subsistence and traveling allowances and advances.	A separate rate of 40 percent applies to trusts, other than special trusts. A special trust is a trust created solely for the benefit of a person who suffers from any mental illness or a serious physical disability. Special trusts are taxed at the tax rates applicable to individuals under 65 years of age.

Tax	Nature of Tax	Exemptions and Deductions	Rates
	of pensions of war veterans and certain disability payments. Pension fund administrators are required to withhold tax at the source (PAYE). Annuities, rental income, and royalties are taxable. The tax year runs from the first day of March to the last day of February.		
1.2. *Capital gains tax* Income Tax Act No. 58 of 1962, as amended	Capital gains on the disposal of assets are subject to income tax (Schedule 8 of the Income Tax Act). Events that trigger a disposal of assets include a sale, donation, exchange, loss, death, and emigration. Nonresidents are subject to capital gains tax on South African real estate and shares in companies holding South African real estate.	Exclusions include: a gain of up to R 1.5 million from the sale of a primary residence; most personal use assets, such as motor vehicles, furniture and collectibles; proceeds from an original endowment policy or original life insurance policy; compensation for personal injury or illness; and prize winnings from a South African competition (e.g., the national lottery).	For the taxation of capital gains of individuals and special trusts, 25 percent of the net capital gain is included when calculating the tax payable (after deducting the annual exclusion). For companies, close corporations and trusts, 50 percent of the net capital gain is included. The taxable gain is included in taxable income. With these provisions, the maximum *effective* rate of the tax is: Individuals 10 percent (i.e., 40 percent maximum income tax rate, applied to 25 percent of net capital gains) Companies 15 percent Trusts 20 percent
1.3. *Corporate income tax* Income Tax Act No. 58 of 1962, as amended	A central government tax levied on the worldwide taxable income derived by South African resident companies, with appropriate relief to avoid double taxation. Taxable income is defined as gross income, other than capital receipts and exempt income, less allowable deductions and set off of losses. The tax year of assessment is the	Deductions include normal operating costs, Government's cash grants, interest, and depreciation allowances but exclude dividends and capital expenditure. Small business corporations are taxed at a rate of zero percent on the first R 46,000 of taxable income. Depreciation allowances of non-mining	a. *Non-gold mining companies*: 28 percent of taxable income. Nonresident companies earning South African source income are taxed at a rate of 34 percent. These companies are not subject to the Secondary Tax on Companies (see 1.4) in respect of dividends. b. *Employment companies:* 34 percent c. *Qualifying small business corporations*

Tax	Nature of Tax	Exemptions and Deductions	Rates
	financial accounting year. Companies are required to make two provisional tax payments in respect of each year of assessment. The first payment is made within six months after the commencement of the year of assessment, the second at the end of such year, and companies with taxable income in excess of R 20,000 have the option of making a third payment within a period of six months from the end of the tax year (seven months for companies with a February year end). As of end-May 2008, comprehensive agreements for avoidance of double taxation on the same income were in force with 61 countries, with agreements under negotiation or in the process of signing or ratification with 20 other countries. Limited agreements for the avoidance of double taxation on profits derived from sea or air transport are also in force with two countries. Gold mining companies are subject to special tax provisions.	companies vary according to type of asset, life expectancy, and intensity of use of assets. Generally, the straight-line method is used. Plant and machinery used in a process of manufacture, including aircraft and ships used by a taxpayer in the carrying on of his trade, may be written off on a straight line basis over five years. Farming machinery may be written off at 50 percent, 30 percent, and 20 percent over three years. An accelerated allowance for new machinery and manufacturing assets acquired after March 1, 2002 is provided for, on a 50:30:20 basis. Accelerated depreciation allowances are available for oil and gas drilling. Deduction for current R&D expenditure is 150 percent. Qualifying small companies are eligible for immediate write-off of all manufacturing plant and machinery in the year in which it is brought into use. Small items up to R 5,000 qualify for an immediate 100 percent depreciation. Depreciation allowances are allowed for certain permanent structures: industrial buildings and hotels – 5 percent a year; airport service facilities — 5 percent a year; electricity transmission lines, telephone transmission lines and railway lines – 5 percent a year; pipelines for transporting	*(turnover below R 14 million)*: 0 percent of taxable income up to R 46,000; 10 percent of taxable income between 46,001 and R 320,000 and 28 percent of taxable income in excess of R320,000. *Very small businesses (turnover below R 1 million):* A presumptive turnover-based tax is introduced since March 1, 2008: Annual Turnover (In Rand) — Marginal Tax Rates (In percent) 0 to 100,000 — 0 100,001 to 300,000 — 2 300,001 to 500,000 — 4 500,001 to 750,000 — 5.5 750,001 to 1,000,000 — 7.5 d. *Gold mining companies*: Formula-based tax rate determined in accordance with one of the following: (a) Where the company is not exempt from the secondary tax on companies (STC): $y = 35 - (175 \div x)$ or (b) where the company is exempt from the STC: $y = 45 - (225 \div x)$ In the formula y is the tax rate and x is the profit-to-revenue ratio.

Tax	Nature of Tax	Exemptions and Deductions	Rates
		oil and gas – 10 percent a year. Taxpayers investing in designated depressed urban areas receive special accelerated depreciation allowances for construction (20 percent in the first year, 5 percent per year for the subsequent 16 years) or refurbishment of buildings (20 percent straight line over five years). Capital expenditure is allowable as a deduction from income of all types of mines in the year of assessment during which it is incurred (immediate expensing), limited, however, to the taxable income from mining before the allowance. Any unutilized capital expenditure may be carried forward to the next year as unredeemed capital expenditure. Cost of land, mineral rights, mining rights, and servitudes are not deductible. An assessed loss can be carried forward indefinitely but cannot be carried back. Learnership allowances as tax deductions to promote on-the-job-training: Allowances are granted on commencement and completion of the learnership. The amount of the allowance depends on whether the learnership agreement is with an existing employee, new employee, or a disabled person.	e. *Oil extraction companies*: taxed at normal rate. f. *Long-term insurance companies*: 29 percent tax is levied on taxable income derived by the funds representing the interests of shareholders, individual policyholders, and company policyholders. g. *Income derived by retirement funds*: From March 1, 2007 this income is fully exempt.

Tax	Nature of Tax	Exemptions and Deductions	Rates
1.4. *Secondary tax on companies (STC)* Income Tax Act No. 58 of 1962, as amended	A tax on companies declaring dividends. The tax is payable on net dividends, i.e. dividends declared less dividends received since the immediately preceding dividend declaration. Converted into a dividend tax from October 1, 2007; applicable to all distributions to shareholders excluding the return of capital in a capital reduction, deregistration, or liquidation.	*Exemptions* include: 1. Dividend payments of fixed property companies as defined in section 47 of the Collective Investment Schemes Control Act. These dividends are taxed in the hands of the recipient. 2. Dividends in specie in relation to approved unbundling transactions. 3. Dividends declared by companies to shareholders, which form part of the same group of companies (a shareholding test of at least 70 percent is applied).	10 percent from October 1, 2007.
2. Social security contributions			
2.1. *Unemployment insurance contributions* Unemployment Insurance Contribution Act No. 4 of 2002.	A contribution collected for the Unemployment Insurance Fund, administered by the South African Revenue Service.	The maximum earnings amount subject to the tax is R 139,944 per year.	Employee and employer contributions of 1 percent each of the employee's monthly remuneration, payable monthly by employers.
2.2. *Work injury insurance contributions*	A compulsory insurance scheme.	The maximum earnings amount subject to the tax is R 179,088 per year.	Insurance premiums vary with risk, according to 23 different classes of employers (i.e., sectors).[2]

[2] The average rate for 2002/03 was R 1.40 per R 100 of earnings.

Tax	Nature of Tax	Exemptions and Deductions	Rates
2.3 *Skills Development Levy* Skills Development Levy Act No. 9 of 1999, as amended	A compulsory charge on total remuneration paid by employers, earmarked to fund skills development. The levy is payable for PAYE-registered employers with an annual payroll in excess of R 500,000.	Exclusions include: amounts paid to independent contractors; reimbursed amounts; amounts paid for services rendered by directors of private companies. Partial rebates are available for training provided by employers from Sector Training and Education Authorities, which administer the skills development funds. The levy is a deductible expense for income tax purposes.	1 percent of payroll.
3. Taxes on property			
3.1. *Property tax* Municipal Property Rates Act No. 6 of 2004.	A municipal tax payable on the capital value of land and improvements to finance the cost of municipal services. The tax may be levied on residential, industrial, commercial, farm, state, and public service property and land owned by public benefit organizations. New property rate system based on market values are being phased in over 3 years. Old system currently still in place.	The rate is levied on the basis of market valuation in rand. Property valuation may be valid for a maximum of five financial years. The valuation of public infrastructure is discounted by 30 percent. Municipalities may exempt or provide reduced valuation to other specific categories of owners by use, location, or ownership, but not to specific property owners. Specific exemptions include: a. Mining rights. b. Property belonging to a land reform beneficiary (for 10 years after registry of deed). c. The first R 15,000 of the market value of a residential property. d. Property registered and used as a place of public worship. e. National parks.	Rates are set by municipal councils and differ across local governments. Annual increases in property rates may be capped by the national Minister of Provincial and Local Government, in consultation with the national Minister of Finance.

Tax	Nature of Tax	Exemptions and Deductions	Rates
3.2. *Estate duty* Estate Duty Act No. 45 of 1955, as amended	A central government tax payable on the estate of an individual. Property includes life insurance proceeds and lump-sum benefits received from pension or provident fund benefits. The estate of a deceased nonresident consists of only his or her South African assets. Agreements to avoid double estate taxes are in place with the U.K., the U.S., Botswana, Lesotho, Swaziland, and Zimbabwe.	Deductions include funeral and estate administration expenses; debts of deceased as at the date of death; donations to public benefit organizations; and property accruing to the surviving spouse. In addition, a deduction of R 3.5 million is applicable.	20 percent.
3.3. *Donations tax* Income Tax Act No. 58 of 1962, as amended	A central government tax payable by the resident donor on the cumulative value of property donated.	Donations to spouses and to public benefit organizations are exempt. Annual exemption limit of R 100,000 apply for natural persons.	20 percent of the value of the property donated.
3.4. *Transfer duty* Transfer Duty Act No. 40 of 1949, as amended	A tax payable on the purchase consideration or fair value (whichever is the greater) of transfers of real estate.	Exemption on the first R 500,000.	For natural persons, 5 percent on the value in excess of R 500,000 but under R 1 million plus 8 percent on the amount in excess of R 1 million. For legal entities, 8 percent of total value of property.

Tax	Nature of Tax	Exemptions and Deductions	Rates
4. Domestic taxes on goods and services			
4.1. *Value-added tax (VAT)* Value-Added Tax Act No. 89 of 1991, as amended	A central government tax levied on the supply of goods and services. VAT is collected at a single, positive rate, is *consumption-type* and allows full and immediate tax credit on capital and intermediate goods. VAT is based on a *destination principle* with exports zero-rated and imports taxed). An *invoice-based credit method is used,* with VAT calculated on sales and tax paid on the difference between VAT on sales and VAT on purchases, adequately supported by invoices. The compulsory registration threshold for the VAT is R 1,000,000 per year of turnover. Voluntary registration is available for vendors with turnover of more than R 20,000, but less than R 1,000,000 per year.	Main *zero-ratings* include (i) exports; (ii) several food items including brown bread, cooking oil, maize meal, milk, eggs, fruit, and vegetables; (iii) illuminating paraffin; (iv) petrol and diesel; (v) several agricultural inputs including seeds, feed, and fertilizers sold to VAT registered farmers; (vi) international transport services; (vii) municipal property rates; and (viii) grants by national and provincial governments to municipalities. Main *exemptions* include: (i) financial services (mainly interest); (ii) residential rents; (iii) passenger transport by road or rail; (iv) educational services; (v) medical schemes and pension and life insurance benefits; (vi) medical services and medicines supplied by the state; and (vii) child care services. Threshold for small farmers and small four-monthly filers: R 1.5 million.	0 percent, 14 percent.
4.2. *Gambling taxes*	A provincial government tax levied on gambling, casinos and betting.		The schedule of fees and levies differ across provinces. - Casino license fees range from a flat rate of R 50,000 to R 114,000 for the basic license renewal. Additional amounts of about R 1,000 are charged per table, machine or employee. Levies on casino gambling revenue range from 5-12 percent and are levied on gross revenue. - Gambling machine operators tend to have lower flat-rate licenses but higher charges

Tax	Nature of Tax	Exemptions and Deductions	Rates
			per machine and higher levies on income, ranging from 10-20 percent. - Bingo halls are charged per seat, and in some cases per employee. The revenue levies range from 2.5-15 percent of income, net of amounts paid out to punters.
4.3. *Excise duties* Customs and Excise Act No. 91 of 1964, as amended	Central government taxes payable by the manufacturer or importer of certain commodities. Most are specific, though some ad valorem rates exist.	A rebate is granted on excisable goods that are exported or used by diplomatic representatives and on taxable goods used by producers in farming, forestry and the manufacture of taxable goods for industrial or commercial purposes.	*Alcoholic beverages:* Beer (excluding sorghum beer): 4,238 cents per liter absolute alcohol. Sorghum beer: 7.82 cents per liter. Sorghum powder: 34.7 cents per kilogram. Unfortified wine: 184 cents per liter. Fortified wine: 340 cents per liter. Sparkling wine: 563 cents per liter. Spirits: 6,772 cents per liter absolute alcohol. Other fermented drinks: 212 to 432 cents per liter depending on the type. *Tobacco products:* Cigarettes: 682 cents per 20 cigarettes. Cigarette tobacco: 867 cents per 50 g. Pipe tobacco: 230 cents per 25g. Cigars: 3,972 cents per 23 g. *Fuels:* Petrol: 3.909 cents per liter. Diesel: 3.817 cents per liter. *5 percent ad valorem excise duty:* -- Beauty or make-up preparations and preparations for skin care; -- Motorcycles (200-800 cc engines). *7 percent ad valorem excise duty:* -- Perfumes and toilet waters;

Tax	Nature of Tax	Exemptions and Deductions	Rates
			-- Fireworks; -- Articles of fur skin; -- Air conditioning machines; -- Line, telephone sets, and cellular phones; -- Loudspeakers and amplifiers; -- Sound and video recording or reproducing apparatus; -- Digital cameras and video cameras; -- Radio broadcast receivers; -- Monitors, projectors, and television reception apparatus; -- Water scooters; -- Firearms; -- Golf balls.
4.4. *Fuel levy* Customs and Excise Act No. 91 of 1964, as amended	A central government levy on the sale of petrol, diesel, and kerosene mixtures.	A concession is made for diesel fuel sales to primary producers (agriculture, forestry and mining) of 40 percent of the general fuel levy on 80 percent of diesel consumed. Fishing, coastal shipping, and offshore mining qualify for a 100 percent concession of the general fuel levy and Road Accident Fund (RAF) levy. Off-road freight transport (nonpassenger) qualifies for a full refund of RAF levy. Primary producers (agriculture, forestry and mining) also qualify for a full rebate of the RAF levy on 80 percent of diesel consumed.. Diesel power plants with a capacity of more than 200 MW benefit from a full rebate of	Petrol: R 1.27 per liter[3] Diesel: R 1.11 per liter Distillate fuels and mixture of kerosene: R 1.05 per liter Biodiesel: 63c per liter *Road Accident Fund levy:* An additional fuel levy of 46.5 cents per liter is collected on petrol and diesel for the Road Accident Fund. *Electricity levy:* 2c/kWh on the sale of electricity from nonrenewable sources effective September 1, 2008..

[3] Fuel excise rates are from April 4, 2008.

Tax	Nature of Tax	Exemptions and Deductions	Rates
		the general fuel levy and the RAF levy.	
4.5. *Motor vehicle taxes* Customs and Excise Act No. 91 of 1964, as amended	A tax levied on the value of imported components used in the manufacture of duty payable motor cars, station wagons and similar dual purpose motor vehicles, excluding heavy duty motor vehicles and motorcycles.	Provision is made that the value of the imported components can be reduced by a duty free allowance as well as the value of imported rebate credit certificates. Customs duty is only payable on the remaining customs value.	30 percent as of January 1, 2007, with an annual reduction of 2 percent until it reaches 20 percent
	A customs driven program in terms of which the customs value of components imported for the manufacture of motor vehicles are liable to customs duty.		
	Ad valorem customs and excise duty which is applicable to imported as well as locally produced motor vehicles.		0.00003 times the value for ad valorem duty purposes, less 0.75 percent, with a maximum of 20 percent
	Items (1) and (2) are applicable to motor cars, motor vehicles for the transport of ten or more persons of a vehicle mass not exceeding 1,600 kg, motor vehicles for the transport of goods of a vehicle mass not exceed 2,000 kg, or a GVM not exceeding 3,500 kg or a mass not exceeding 1,600 kg or a GVM not exceeding 3,500 kg per chassis fitted with a cab and chassis fitted with engine of Heading No. 87.06 of a mass not exceeding 3,500 kg.		
	Heavy duty vehicles: certain components are liable to customs duty and the balance allowed under full rebate of customs duty.		Chassis fitted with engines: for vehicles not exceeding 3 500 kg, or a GVM not exceeding 1 600 kg. – 30 percent; any other - 20 percent Driving axles: 20 percent

Tax	Nature of Tax	Exemptions and Deductions	Rates
			Gear boxes: 20 percent Cabs/bodies for motorcars: 30 percent Cabs/bodies for other vehicles: 20 percent Pneumatic tires: 20 percent
4.6. *Air passenger tax* Customs and Excise Act No. 91 of 1964, as amended	Central government levy on international air travel	Exemptions include: children under 2 years of age; passengers carried 'not for reward'.	R 120 on international travel to all destinations, except Botswana, Lesotho, Namibia and Swaziland where the charge is R 60.
5. Taxes on international trade transactions			
5.1. *Customs duties* Customs and Excise Act No. 91 of 1964, as amended	A one-column tariff schedule based on the Brussels nomenclature with general, most favored nation, and preferential rates of duty. There is a customs union (SACU) with Botswana, Lesotho, Namibia and Swaziland. There is a trade agreement with the European Union, which provides for progressive reduction and elimination of duties over 5-12 years from 1999, depending on the type of good. There is a trade agreement with other members of the South African Development Community (2000), which provides for a phased reduction and eventual elimination of duties over eight years.	Rebates are allowed for certain goods used in manufacture by approved industries (e.g., textiles, motor vehicle production) or by particular institutions and bodies. Duty free import is allowed once per person during 30 days for new and used goods up to R 3,000 per person with separate provisions for alcoholic beverages, tobacco and perfumes.	Import duties vary widely. There are approximately 12 tariff bands excluding specific rates of duty. Specific duties apply to approximately 220 categories and in particular to agricultural products (e.g., meat, fish, vegetables, fruit, and tea) and textile products. Of the 6 700 tariff categories, 3 705 are free of duty. Within the 12 tariff bands, 2 775 categories attract the following rates: 1 to 5 percent – 222 6 to 10 percent – 549 11 to 15 percent – 663 16 to 20 percent – 519 21 to 25 percent – 384 26 to 30 percent – 172 31 to 35 percent – 15 36 to 40 percent – 221 41 to 45 percent – 9 46 to 50 percent – 0 51 to 55 percent – 1

Tax	Nature of Tax	Exemptions and Deductions	Rates
6. Other taxes			
6.1. *Stamp duties* Stamp Duties Act No. 77 of 1968, as amended	Ad valorem taxes payable on legal documents such as lease agreements and the transfer and cancellation of marketable securities.	Lease agreements for a duration of five years or less are exempt from stamp duties. Most securities issued by certain public corporations and public authorities are exempt from stamp duty on transfers. Where Uncertificated Securities Tax is chargeable, the transaction does not attract stamp duty. Interest-bearing securities are exempt.	Rates of stamp duty vary for different instruments. Stamp duty is 0.5 percent on rent payable and 0.25 percent on the registration of the transfer of certificates.
6.2 *Uncertificated Securities Tax* Uncertificated Securities Tax Act No 31 of 1998.	Ad valorem tax on the change in beneficial ownership in securities.	Government Departments and public benefit organizations that are exempt from income tax in terms of section 10 (1) (cN) of the Income Tax Act of 1962.	0.25 percent of the value of such securities.