



WP/09/25

IMF Working Paper

Why Isn't South Africa Growing Faster? A Comparative Approach

Luc Eyraud

IMF Working Paper

African Department

Why Isn't South Africa Growing Faster? A Comparative Approach

Prepared by Luc Eyraud¹

Authorized for distribution by Sharmini Coorey

February 2009

Abstract

This Working Paper should not be reported as representing the views of the IMF.

The views expressed in it are those of the author and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the authors and are published to elicit comments and to further debate.

The purpose of this paper is to examine 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 10 faster-growing countries. The study finds that sluggish investment has undermined growth since 1996 and that the underinvestment is in part explained by limited saving. Thus, over the last decade, interactions between investment, saving, and production may have perpetuated slow growth in South Africa.

JEL Classification Numbers: E21, E22, O11, O47, O55, O57

Keywords: investment, saving, growth, emerging countries

Author's E-Mail Address: leyraud@imf.org

¹ I am grateful for comments and suggestions I received from Robert Burgess, Sharmini Coorey, Alfredo Cuevas, Nikolay Gueorguiev, Sean Nolan, Mwanza Nkusu, and George Tsibouris. Anne Grant provided editorial help. Any errors remaining are my responsibility.

CONTENTS

I. Introduction	3
II. Major Constraints on Growth in the Last Decade.....	3
A. First Decomposition: Demand Components of GDP.....	4
B. Productivity and Labor Input Characteristics.....	5
C. Capital, Labor, and Total Factor Productivity.....	6
III. Investment Determinants in South Africa Compared with the Panel	8
IV. Releasing the Saving Constraint on Investment and Growth.....	11
A. National Saving in South Africa	11
B. An Accounting Decomposition of the Corporate Saving Rate	14
C. Economic Determinants of Private Saving	15
V. Conclusions and Policy Implications.....	17
Appendix.....	18
References.....	23
List of Figures	
Figure 1. Contributions to GDP Growth.....	4
Figure 2. Contributions to GDP Growth (1996–2006) (Percent)	6
Figure 3. Gross Capital Formation (Percent of GDP).....	9
Figure 4. Real Interest Rate (Percent).....	10
Figure 5. National Saving in South Africa (Percent of GNDI).....	12
Figure 6. Public and Private Saving Rates (Percent of GNDI).....	12
Figure 7. Saving Rates by Institutional Sector (Percent of GNDI).....	13
List of Tables	
Table 1. Normalized Contributions of Demand Components to GDP Growth (percent).....	5
Table 2. Employment and Labor Force in South Africa and Comparators (average 1996–2006) (Percent).....	6
Table 3. Results of the Third Decomposition (Percent)	7
Table 4. Production-Function Decomposition in South Africa (Percent).....	8
Table 5. Doing Business Indicators (2003–2006).....	11
Table 6. Comparison of Saving-GNDI Ratios in South Africa and the Panel.....	14
Table 7. Average Long-term Contributions of the Explanatory Variables to the Private Saving Rate: Results for South Africa and the Panel and the Resulting Gap.....	16
Table 8. Average Long-term Contributions of the Explanatory Variables to the Decrease in the Private Saving Rate in South Africa	16
Table 9. Results: Level and Variations of the Accounting Components of the Corporate Saving Rate	21

I. INTRODUCTION

Over the last decade South Africa's economic performance has on average been solid but its growth has lagged behind that of its peers. Although the growth rate has picked up in recent years, between 1996 and 2006 annual average per capita GDP growth (1.7 percent) was only half that of low- and middle-income countries generally² (3.6 percent). Considering that South Africa has a relatively stable economy, abundant natural and labor resources, and well developed financial markets, arguably it should have been growing much faster.

The purpose of this paper is to examine factors that account for South Africa's growth since the end of apartheid³ by comparing its GDP components and its saving and investment performance with those of a panel of faster-growing countries. The panel comprises the 10 fastest-growing economies in terms of GDP per capita that meet a minimum population criterion (for comparability with South Africa) and for which the necessary data are available.

The study finds that sluggish investment over the last decade has hindered the achievement of faster growth in South Africa, and that the underinvestment is partly explained by limited saving. Interactions between investment, saving, and production may have perpetuated slow growth in South Africa. The message that emerges is that in order to achieve a sustained acceleration in growth the country needs to raise its investment and savings rates and its labor productivity and become more open to trade.

II. MAJOR CONSTRAINTS ON GROWTH IN THE LAST DECADE

To better understand differences in growth, in this section we decompose GDP growth data for South Africa and the comparator countries in three different ways.⁴ The main finding from these decompositions is that the contribution of investment to growth is relatively low in South Africa.

The 10 countries were selected for the comparator panel using two criteria⁵: (1) they recorded their highest average annual growth rate of real GDP per capita between 1996 and

² World Development Indicators classification.

³ The study covers the post-apartheid decade of 1996 to 2006; 2007 data are included when available.

⁴ All decompositions are applied to GDP growth generally, rather than per capita, to achieve results that can be compared with those of previous studies.

⁵ Because of variations in the availability of data, the composition of the panel is not the same for all comparisons. It was not possible to find a consistent set of countries that had data for all decompositions and stylized facts without including countries whose growth rates fell far below the levels of the 10 that are growing fastest.

2006 (among the countries listed in the World Development Indicators); (2) they averaged a population of at least 20 million people over the period.

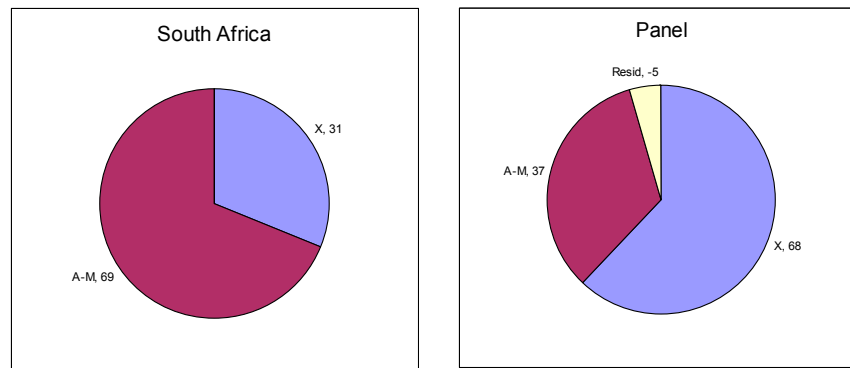
The first decomposition computes the contribution to growth of expenditure components of GDP and highlights differences in the structure of aggregate demand. The second looks at the contributions to GDP growth of employment and labor productivity, which allows for a more detailed view of labor-force-related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

A. First Decomposition: Demand Components of GDP

The first decomposition analyzes the contributions to GDP growth of domestic absorption and trade balance (see the Appendix for the methodology of all calculations). Between 1996 and 2006 real per capita GDP growth averaged 4.7 percent a year for the panel but only 1.7 for South Africa.⁶ From this it is possible to draw two conclusions:

1. South Africa is less export-driven than the countries in 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 1). This is confirmed by traditional openness indicators: trade flows as a share of GDP are higher for the panel (on average, over the period the ratio of exports and imports to GDP was 63 percent for the panel and 53 percent for South Africa). The gap is particularly high for goods.

Figure 1. Contributions to GDP Growth



Source: World Development Indicators and IMF staff calculations.

Note: X = foreign demand; A-M = absorption minus imports = domestic demand.

2. In South Africa the contribution of investment to growth is relatively low 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 Table 1).

⁶ The panel consists, in descending order of real growth per capita, of China, Vietnam, India, Russia, Poland, Ukraine, Korea, Bangladesh, Iran, and Romania (see selection method in the introduction of Section II).

This stylized fact will be analyzed further below (see Section III). Contributions of household and government consumption are higher in South Africa, suggesting that it has a lower savings rate than the 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 in the panel.⁷ The contribution of South Africa's trade balance to GDP growth is thus more negative, notwithstanding its substantial natural resource base.

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

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

Source: World Development Indicators and IMF staff calculations.

B. Productivity and Labor Input Characteristics

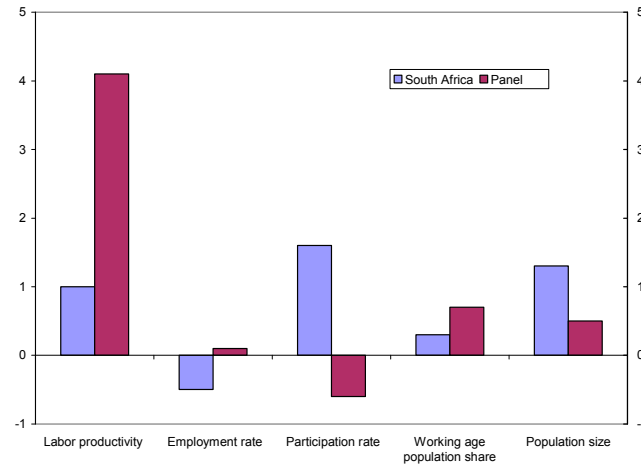
In the second decomposition (see method in Appendix), GDP growth is written as the sum of the growth of five components: labor productivity, employment rate, participation rate, working age population, and population size. With a shift in country composition necessitated by data availability, for 1996–2006 average real GDP growth per capita in the panel amounts to 4.4 percent.⁸ Two aspects of the comparison deserve mention:

1. The most striking result is that labor productivity growth contributes much less in South Africa than in the panel (see Figure 2). Had labor productivity in South Africa grown at the same rate as in panel countries, all else being equal its average annual GDP growth would have been 3 percentage points higher—sustained over a decade, that would make a substantial difference in living standards. Because labor productivity is a function of the capital labor ratio and total factor productivity (TFP), Subsection C examines a decomposition that distinguishes between capital deepening and TFP.

⁷ The higher contribution of public consumption in South Africa mainly reflects the higher share of public consumption in GDP (18% in South Africa; 13% in the panel).

⁸ The panel is not the same for all comparisons (see footnote 5). For this decomposition, the panel consists, in descending order of real growth per capita, of China, Vietnam, Russia, Poland, Ukraine, Korea, Iran, Romania, Morocco, and Turkey.

Figure 2. Contributions to GDP Growth (1996–2006)
(Percent)



Source: World Economic Outlook and IMF staff calculations.

2. Also striking is the symmetry of the contributions of employment and participation: in South Africa employment makes a negative contribution and participation a positive one; it is the opposite in the panel (see Figure 2). This result can be explained by the larger increase in labor force in South Africa. Even though employment grew 3.5 times more in South Africa than in the panel,⁹ it has not been sufficient to accommodate the huge increase in the labor force, which grew at five times the rate of the panel (see Table 2). As a consequence, the employment rate decreased over the period in South Africa and the participation rate increased. On average, however, both employment and participation rates are lower in South Africa than in the panel.

Table 2. Employment and Labor Force in South Africa and Comparators
(average 1996–2006) (Percent)

	Annual Employment Growth	Annual Labor Force Growth	Employment Rate	Participation Rate
South Africa	2.8	3.2	74.5	52.6
Panel	0.8	0.6	91.0	66.2

Source: World Economic Outlook and IMF staff calculations.

C. Capital, Labor, and Total Factor Productivity

The third decomposition (see method in Appendix) breaks down real GDP growth (avg. 1996–2006) into three components: capital, labor, and TFP. To better understand the TFP component, two computations are carried out, one where TFP implicitly includes

⁹ The panel includes East European countries that had minimal employment growth during the decade.

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. The change in panel composition due to data limitations now shifts the panel's average real GDP growth per capita to 3.8 percent for the period.¹⁰

The main result highlighted by the third decomposition is the lesser contribution of capital in South Africa, where it is one-third of that in the panel. This difference is the main explanation of the GDP growth gap. It 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 III.

The contribution of TFP in South Africa is about two-thirds of that in the panel. The difference 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 versus 0.92 percent in the panel. On average, there were 307 R&D researchers per million people in South Africa versus 1,207 in the panel.¹¹ Notably, when the TFP component is adjusted for labor quality, the difference in TFP contribution is reduced; thus, part of the productivity gap may stem from the fact that the labor force in South Africa is less skilled.

The contributions of labor in the panel and in South Africa are similar when labor quality improvements are incorporated. This result seems at odds with the results of the second decomposition, which found that employment grew more in South Africa than in 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 were not available.

Table 3. Results of the Third Decomposition
(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

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

¹⁰ The panel now includes, in descending order of real growth per capita, China, India, Korea, Bangladesh, Iran, Morocco, Spain, Egypt, Malaysia, and Mexico.

¹¹ The gap can also be measured using other indicators (for example, number of publications in scientific and technical journals), but the questionable quality of data, where they exist, make it difficult to draw reliable conclusions.

Our results for South Africa differ from those of earlier studies in that we find a higher contribution of labor to growth (see Table 4). The difference is that the sample period in previous studies generally covers the decade of the 1990s, when growth in employment, especially formal nonfarm employment, in South Africa was sluggish; our study covers more recent years when employment has grown more.¹²

Table 4. Production-Function Decomposition in South Africa
(Percent)

	Period	GDP	Capital	Labor	TFP
Fedderke (2002)	1990s	0.9	0.4	-0.6	1.1
Du Plessis and Smit (2007)	1995–2004	3.1	0.6	0.6	1.9
				0.9*	1.6*
IMF (Arora 2005)	1995–2003	2.9	0.7	0.9	1.3
IMF (2008)	1996–2006	3.5	0.6	1.8	1.1
				1.9*	1.0*

* Quality adjusted.

III. INVESTMENT DETERMINANTS IN SOUTH AFRICA COMPARED WITH THE PANEL

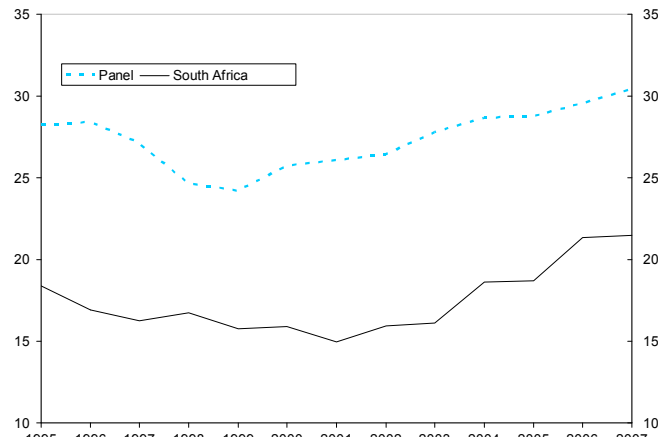
The lesser contribution of investment in South Africa is a common feature of all three decompositions.¹³ This section investigates possible explanations for that.

Between 1996 and 2001 investment grew only sluggishly in South Africa, and the pickup since 2002 has not been sufficient to close the investment rate gap with the panel. For the period, on average the investment-to-GDP ratio in South Africa has been 10 percentage points less than in the panel (see Figure 3), and annual real investment growth has been 1.5 percentage points less. 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 ratio.

¹² Other minor divergences can be found in the capital stock computation (most studies use the series computed by the South African central bank rather than applying the perpetual inventory method as we did); the correction of outliers (notably the 2000 employment growth rate; see Appendix); the adjustment for labor quality; and the choice of employment series (total or non farm formal employment).

¹³ The first and third decompositions 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's. The difference in TFP (including fewer skills) also seems to explain part of the growth gap, but it is less striking than the gap in investment.

Figure 3. Gross Capital Formation
(Percent of GDP)



Source: World Economic Outlook and IMF staff calculations.

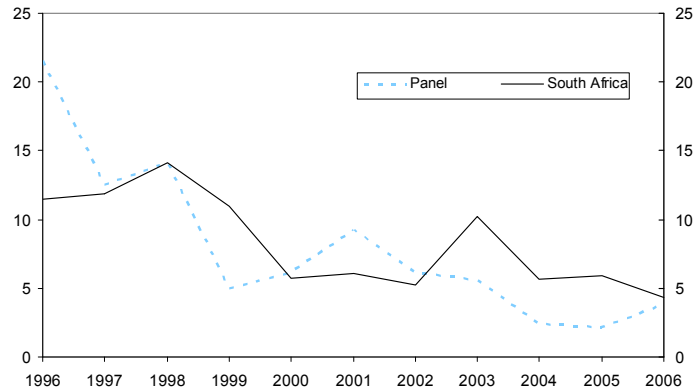
To better understand the underperformance of investment in South Africa for the last decade, we compare the level and evolution of the main investment determinants in South Africa and the panel. Four macroeconomic variables are examined:

1. Lower saving in South Africa is likely to have constrained investment, given the usually high correlation between domestic saving and investment rates. 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 for 2002–2006.
2. 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 points a year higher on average, the gap widened substantially over time (from an average of –1.4 percentage point for 1996–2001 to +2.2 percentage points for 2002–2006). Thus while the real interest rate declined significantly in South Africa, particularly during 1996–2001 (with improved fiscal and monetary policy possibly reducing the risk premium), real interest rates decreased even more in the panel (see Figure 4), negating this advantage. Econometric estimates confirm the sensitivity of investment to real interest rates. A very simple econometric equation with two variables—capacity utilization in the manufacturing sector and the real interest rate—accounts for 60 percent of the variability of real investment growth in South Africa since 1970.¹⁴ The effect of the interest rate is

¹⁴ Variables enter the equation in first difference 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.

substantial: other factors being equal, a 1 percentage point increase in the real interest rate decreases real investment growth after a year by 7 percentage points.

Figure 4. Real Interest Rate
(Percent)



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

3. In principle slow investment growth could also result from liquidity constraints on private financing (banks may be reluctant to lend regardless of interest rates), but the argument does not seem to hold for South Africa: even if access is concentrated, financing seems to be more abundant there than in the panel.¹⁵ The more developed financial markets in South Africa seem to allow for the difference in real interest rates with respect to the panel to be reduced despite the serious savings shortfall.
4. Indirect evidence seems to suggest that returns on investment have not been as attractive in South Africa as in the panel. A direct measure of returns can be computed for South Africa¹⁶ but not for the panel because cross-country data on profits are not available. For comparison purposes, we must settle for indirect indicators of returns, such as foreign direct investment (FDI) flows or stock market price changes. In this respect, lower FDI inflows into South Africa may be a sign that return on investment is lower.¹⁷ Stock market returns have also been less favorable to investment in South Africa: increases in panel stock market prices between 1996 and 2006 provided more incentive to invest there than in South Africa.¹⁸

¹⁵ On average, over the decade the annual stock of domestic credit to the private sector amounted to 123 percent of GDP in South Africa and 51 percent in the panel.

¹⁶ The ratio of the net operating surplus of the domestic economy to capital stock at current cost works out to an average return of 17 percent between 1996 and 2006 with a steady increase over the period.

¹⁷ Between 1996 and 2006 FDI inflows on average amounted to 1.6 percent of GDP in South Africa and 2.3 percent in the panel.

¹⁸ Between 1998 and 2006, stock prices grew by 18 percent in South Africa versus 26 percent in the panel.

Finally, for the most recent period the comparison of South Africa with the panel can be carried out at the microeconomic level by means of qualitative cross-country surveys. According to the *Doing Business Survey*, since 2003 South Africa has outperformed the panel at each stage of the procedures required to go into business (see Table 5). Difficulties in doing business do not seem to account for the lower level of investment in South Africa.

Table 5. Doing Business Indicators (2003–2006)

		South Africa	Panel
Starting a business	Number of procedures	9	10
	Days required	37	37
	Cost (% of per capita income)	9	31
Registering property	Number of procedures	6	6
	Days required	23	114
Dealing with licenses	Number of procedures to build a warehouse	17	19
	Days required to build a warehouse	174	260
Employing workers	Rigidity of employment index (0: less; 100: more)	44	43
Enforcing contracts	Number of procedures	26	39
	Days required	600	602
Protecting investors	Disclosure index (0 less; 10 more)	8	6
Closing a business	Years to resolve insolvency	2	4

Note: Data are only available since 2003.
Source: World Bank, *Doing Business Survey*.

IV. RELEASING THE SAVING CONSTRAINT ON INVESTMENT AND GROWTH

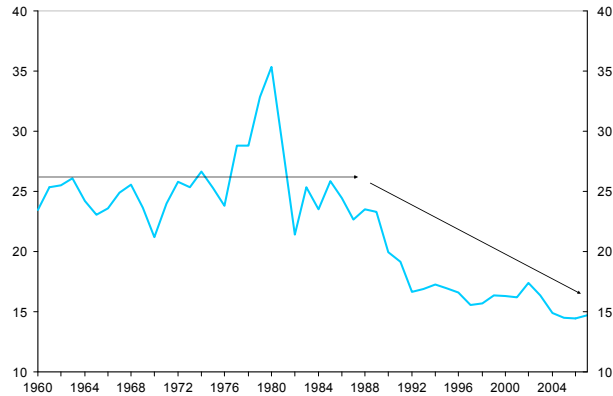
Having identified lack of saving as a major constraint on investment, we analyze South Africa's saving performance more closely taking a cross-country view. After setting out stylized facts on national saving and its components, we will investigate the accounting and economic determinants of private saving.

The analysis in this section finds that (i) private saving (especially its corporate component) is the main driver of the decrease in national saving in South Africa; (ii) the level and evolution of private saving mainly result from structural factors.

A. National Saving in South Africa

Before analyzing the determinants of saving, a few facts are highlighted. Since 1980 national saving in South Africa has trended downward (Figure 5): the rate decreased from an average of 26 percentage points of gross national disposable income (GNDI) during 1960–1985 to 15 percent in 2007 (the large spike in saving around 1980 seems to have been associated with a bubble in gold prices).

Figure 5. National Saving in South Africa
(Percent of GNDI)

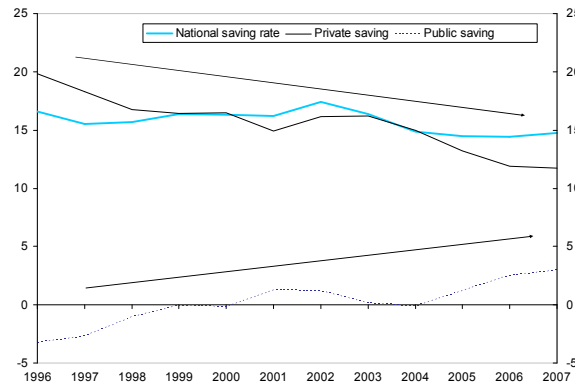


Source: South Africa Reserve Bank, and IMF staff calculations.

Disaggregated data help us to better understand the decrease in national saving:

1. Over the last decade, private saving pulled national saving downward. The decline in national saving by 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 6). Tax revenue gains from robust economic growth and improved revenue administration more than offset the increase in public expenditures. The interdependence of public and private saving is analyzed more closely below.

Figure 6. Public and Private Saving Rates
(Percent of GNDI)

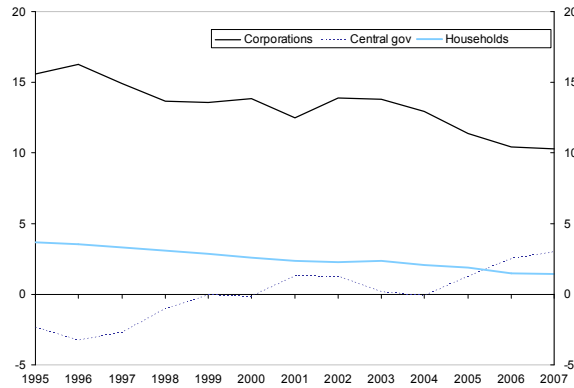


Source: South Africa Reserve Bank, and IMF staff calculations.

2. Within the private sector, the decline in saving between 1996 and 2007 was higher for corporations (6 percentage points of GNDI) than for households (2.1 points, though

starting from a lower level¹⁹). It is noteworthy that the decrease in both household and corporation saving rates does not seem to validate the hypothesis that households “pierce” the corporate veil.²⁰

Figure 7. Saving Rates by Institutional Sector
(Percent of GNDI)



Source: South Africa Reserve Bank, and IMF staff calculations.

Private saving is significantly lower in South Africa than in our panel of faster-growing countries²¹:

1. The comparison of South Africa with the panel highlights differences in both the level and the evolution of national saving. First, between 1996 and 2007, the national saving rate was on average more than 10 percentage points lower in South Africa than in the panel. Second, since 1996 the national saving rate has decreased in South Africa but has increased in the panel.
2. Most of the gap in level and in evolution is explained by differences in private saving (see Table 6). Due to lack of data, the comparison of household and corporate levels can be carried out only for OECD countries, not for 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

¹⁹ In relation to the starting level, the decrease has been higher for household saving (which fell by half the 1996 level) than for corporate saving (which fell by one-third).

²⁰ According to the “piercing the veil” theory (Poterba, 1991), corporate 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 (by continuing to consume despite lower dividend income) because they expect retained earnings to raise the value of their equity portfolio.

²¹ This panel consists, in descending order of real growth per capita, of China, Vietnam, India, Poland, Korea, Russia, Romania, Bangladesh, Iran, and Turkey.

OECD countries vs. 10.1 in South Africa).²² By international standards both corporate and household savings in South Africa seem to be low.

Table 6. Comparison of Saving-GNDI Ratios in South Africa and the Panel

	Evolution Between 1996 and 2007 (Percentage points)			Average 1996–2007 (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

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

B. An Accounting Decomposition of the Corporate Saving Rate

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. Beyond the advantages of a more detailed analysis, there are two reasons for focusing on corporate saving: (i) Corporate saving on average accounts for 84 percent of total private saving over the period (thus, 16 percent for household saving), and in recent years the share has reached almost 90 percent. (ii) Corporate saving is the main reason for the decrease in private saving between 1996 and 2007 (see above).

The corporate saving rate is broken down into four 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 method and interpretation in Appendix).

Three results emerge from the decomposition:

1. The significant increase in the amount of tax paid by corporations is the main reason for the decrease in corporate saving.²³ The component of the corporate saving rate that has shown the most 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, although the net transfer ratio was very stable, the ratio of taxes to

²² 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.

²³ A simple simulation confirms this result. On the assumption that the ratio of tax to corporate gross primary income (GPI) holds 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 turns out to be almost equal to 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, this means that the other deductions from value added (wages, dividends, and interests) have on the whole been stable over time.

gross primary income increased by 25 percentage points between 1996 and 2007. This result is surprising because the corporate income tax rate has decreased over the last decade. In fact, better tax collection and the broadening of the tax base (notably introduction of a capital gains tax in 2001) have more than offset the decrease in the rate.

2. 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.
3. 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 dividends.

C. Economic Determinants of Private Saving

As a complement to the accounting approach, econometric analysis can help identify behavioral determinants of private saving. The abundant econometric literature on private saving deals with both panels and individual countries. 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 system); crowding-out terms (fiscal balance, external financing); measures of uncertainty (inflation, unemployment, urbanization); and persistence terms (lagged saving rates).

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 replicate those found elsewhere in the literature. We apply their estimated private saving equation (see method in Appendix) to South Africa and to the panel between 1996 and 2006.

Two primary results arise from the econometric analysis; the first relates to the level of saving, the second to its variation:

1. Four exogenous factors explain why private saving is lower in South Africa than in our panel of fast-growing countries: (1) a younger population, (2) a higher rate of urbanization, (3) lower growth in GDP per capita, (4) and lower inflation (see Table 7). The higher young dependency ratio in South Africa seems to be the variable that best explains the gap, but its impact is mitigated by the lower old dependency ratio; thus, demography seems to be having a neutral effect on saving differences between South Africa and the panel. Urbanization also has a crucial role, but its theoretical interpretation

is ambiguous.²⁴ Lower GDP growth in South Africa would also explain part of the gap, if the econometric method (GMM) really sorts out the endogeneity problem.²⁵ Lastly, less macroeconomic uncertainty in South Africa (measured by lower inflation) means that people have less incentive to save for precautionary reasons.

Table 7. Average Long-term Contributions of the Explanatory Variables to the Private Saving Rate: Results for South Africa and the Panel and the Resulting Gap

	South Africa	Panel	Gap
<i>Actual private saving rate (av. 1996-2006)</i>	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

Note: shaded = main differences; Source: IMF staff calculations.

- The decrease in South Africa's private saving over the last decade is due to (1) relaxation of credit constraints, (2) increased urbanization, (3) increased public saving, and (4) the aging of the population (see Table 8). The main explanatory variable is the private credit term, which measures the relaxation of borrowing constraints after apartheid ended. 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 8. Average Long-term Contributions of the Explanatory Variables to the Decrease in the Private Saving Rate in South Africa

<i>Actual decrease (between 1995-97 and 2004-06)</i>	-5.7
<i>Estimated long-term decrease</i>	-4.6
Real growth rate income	1.8
Real per capita income	0.7
Real interest rate	2.9

²⁴ 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 measured by other variables in the equation.

²⁵ 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 has in turn impeded investment and growth. Such circular causality is nevertheless difficult to sort out and quantify.

Terms of trade	0.4
Urbanization ratio	-4.0
Old dependency ratio	-2.1
Young dependency ratio	4.0
Government saving	-3.4
Private credit	-3.9
Inflation	-1.0

Note: shaded = main differences; Source: IMF staff calculations.

V. CONCLUSIONS AND POLICY IMPLICATIONS

Over the last decade the main constraints on growth in South Africa have been the low investment rate, insufficient labor productivity gains, lower openness to trade, and slower technical progress relative to faster-growing countries. Underinvestment, a common factor in the three growth decompositions, has significantly slowed growth since 1996. Despite a pickup in recent years, the investment rate is low compared to faster-growing countries. Boosting investment is therefore critical for accelerating growth.

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

Despite the importance of structural factors, some macroeconomic variables do impact private saving, but their effect may be detrimental to national saving (for example, decreasing public saving²⁶) or may have macroeconomic costs (for example, increasing inflation).

The best way to increase national saving in South Africa therefore seems to be 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 higher tax rates or a broader 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,²⁷ as illustrated for example by the accounting analysis of corporate saving in Section III.B.

²⁶ Decreasing public saving increases private saving but by a smaller amount (the Ricardian effect). As a result, national saving decreases.

²⁷ Tax payments transfer saving directly from the private to the public sector because 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

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); TB is the difference between exports (X) and imports (M). Thus:

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

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:

$$100\% = \frac{\Delta A}{\Delta Y} - \frac{\Delta M}{\Delta Y} + \frac{\Delta X}{\Delta Y}$$

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

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 the labor force,

L_{15-64} is the working age population, and

L_{tot} is total population.

- In growth terms: $\hat{Y} \approx \underbrace{\frac{\hat{Y}}{L_{empl}}}_{(1)} + \underbrace{\frac{\hat{L}_{empl}}{L_{force}}}_{(2)} + \underbrace{\frac{\hat{L}_{force}}{L_{15-64}}}_{(3)} + \underbrace{\frac{\hat{L}_{15-64}}{L_{tot}}}_{(4)} + \underbrace{\frac{\hat{L}_{tot}}{L_{tot}}}_{(5)}$. 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), and (5) population size.
- Unlike the first decomposition, contributions are not normalized.
- Contributions are computed annually and then averaged for 1996–2006.
- The decomposition is applied to South Africa after correcting the official employment and labor force data.²⁸

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 $Y = AK^\alpha L^{1-\alpha}$:

$$\frac{\Delta Y}{Y} = \alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta L}{L} + \frac{\Delta A}{A} \quad (1)$$

- 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 3).

²⁸ The change in the survey in 2000 (from the October Household Survey to the Labor Force Survey) creates a break in the employment and labor force series. 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.

- 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, a standard requirement in the literature (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 using straight-line depreciation is not used).

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. Labor quality can be transferred from TFP to L in different ways. We use the Barro (1999) and Bosworth-Collins (2003) method 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

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

- 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) Insofar as improvement in labor quality (education) seems to have been better in the panel than in South Africa over the period, transferring labor quality should in the panel increase the L contribution relatively more and decrease TFP relatively more, closing the gap between South Africa and the panel for both.

4. Accounting Decomposition of the Corporate Saving Rate

The corporate saving rate²⁹ $\frac{S}{VA}$ 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:

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

²⁹ The corporate saving rate cannot be defined as the household rate is (by dividing saving by disposable income), because saving is, by construction, equal to disposable income for corporations.

(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 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' 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.

Table 9. 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

Source: Quarterly Bulletin of the South African Reserve Bank (S-125 and S-126) and IMF staff calculations.

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. Because 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 equation³⁰:

- The lagged private saving rate (ratio of gross private saving to gross private disposable income, GPDI): PS/Y
- Real per capita GPDI (measured as the difference between gross national domestic income and gross public disposable income, itself equal to the sum of public saving and public consumption): YR/L
- The real growth rate of per capita GPDI: $dlnYR/L$
- The real lending interest rate³¹: R

³⁰ The ratio M2 to national income is not statistically significant in the specification that we adopt.

- The terms of trade: *TOT*
- The urbanization ratio (percentage of the population living in cities): *URB*
- 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): *OLD* and *YOUNG*.
- The ratio of government saving to GPDI³²: *GS/Y*
- The ratio of the private credit flow to GPDI: *C/Y*
- The inflation rate of the GDP deflator: Π

$$PS/Y = 0.587 * PS/Y_{-1} + 0.049 * \ln(YR/L) + 0.45 * d \ln(YR/L) - 0.253 * \ln(1 + R) + 0.078 * \ln(TOT) - 0.382 * UR - 0.655 * OLD - 0.299 * YOUNG - 0.285 * GS/Y - 0.318 * C/Y + 0.143 * \ln(1 + \Pi)$$

The estimated econometric equation of the World Bank study is applied separately to South Africa and to the panel. The 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 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 from the estimated constant.

³¹ 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.

³² 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 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).

REFERENCES

- Aaron, Janine, and John Muellbauer, 2000, “Personal and Corporate Saving in South Africa,” CEPR Discussion Paper No 2656 (London: Centre for Economic Policy Research).
- Arora, Vivek, 2005, “Economic Growth in Post-Apartheid South Africa: A Growth-Accounting Analysis” in *Post-Apartheid South Africa: The First Ten Years*, ed. by Michael Nowak and Luca Antonio Ricci (Washington: International Monetary Fund).
- Arora, Vivek, and Ashok Bhundia, 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” (Capetown, SA: University of Cape Town).
- _____, 2005, “Sources and Constraints of Long-term Growth 1970–2000,” Working Paper (Capetown, 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 Servén, 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.
- Prinsloo, J.W., 2000, “The Saving Behaviour of the South African Economy,” Occasional Paper No. 14 (Pretoria: South African Reserve Bank).