

**From Chimera to Prospect:
South African Sources of and Constraints on
Long-Term Growth, 1970-2000**

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Policy Paper Number 1

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From chimera to prospect: South African sources of and constraints on long-term growth, 1970-2000

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January 23, 2006

Abstract

The paper takes stock of South Africa's past growth experience during the period 1970-2000. It discusses major factors of growth, including physical and human capital, and institutions, and draws conclusions about the constraints to long-run growth in the future. We highlight three main conclusions on physical capital and uncertainty, market distortions (especially in labor markets), and human capital accumulation.

First, empirically, one of the main reasons for South Africa's structurally declining growth rate is its declining investment rate in fixed capital. Investment in South Africa, as elsewhere, responds positively to the rate of return on capital and negatively to the real user cost of capital, thereby providing policy makers with some immediate policy levers. But a key determinant of investment appears to be uncertainty, especially uncertainty that arises from institutional constraints on economic performance. For example, uncertainty in South Africa proves to be crucial not only for investment in physical capital stock, but also for capital flows required in meeting the shortfall of private sector savings relative to private sector investment. Uncertainty affects investment both directly and indirectly, by lowering the effectiveness of the policy levers that the rate of return on capital and the user cost of capital provide.

Second, despite considerable liberalization since 1994, there remain significant market distortions in the South African economy in capital, labor, and output markets, including external trade. Much remains to be done to improve microeconomic policies and the efficiency of resource allocation. A continued, high level of market concentration and related market power in output markets, as well as incomplete trade liberalization remains a concern in an increasingly globalized and competitive world. But perhaps the most enduring concern remains the now well-documented distortions in the labor markets. These distortions pose real constraints to long term, labor-absorbing, equitable growth. To alleviate these constraints and engender more robust and widely shared growth, concerted microeconomic reforms are needed.

Third, the impact of human capital on growth reflects the twin combination of a declining contribution of human capital accumulation to growth and a declining quality of education. While much has been accomplished to widen and equalize access to education across racial groups, quality of education has suffered. Even the best parts of the schooling and university systems do not seem to produce the sort of educational output required for long term economic growth in sufficient quantity – yet they do so at a relatively high cost.

The main policy implications are threefold: (1) South Africa needs to further reduce remaining uncertainty and engender credible, overall policy environment and favorable climate for private sector investment and growth; (2) further microeconomic and regulatory reforms are needed to reduce market concentration and remaining distortions, especially in labor markets and international trade; and (3) while continued emphasis on broad-based education is very much needed to help eliminate the past inequities, strong reforms to monitor and improve the quality of education must also be put in place.

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1. Introduction

South Africa's democratic transition now lies more than a decade in the past, a period long enough to allow us to take stock of the past growth performance of the country and recognise implications for its future pro-growth policies. The successful political transition raised hopes for an economic transition characterised by broadly shared growth and greater access of the majority of the population to economic opportunities, and hence to jobs. Economic policies have, indeed, been geared towards ensuring macroeconomic stability (with considerable success) and raising access to basic social services, especially education and health. A number of special initiatives have also aimed to promote a wider spread of economic benefits across the population. However, the outcomes in terms of growth of per capita income and employment have been below expectations. Two important questions, therefore, arise, one positive: what were the main determinants of and institutional constraints on long-term growth in South Africa? and the other normative: what are the implications of this positive analysis for future economic policies?

In this paper we hope to shed light on both of these questions. Simply put, we are interested in identifying the main factors that have constrained output growth and, in particular, employment growth in South Africa, especially during the past ten years. Based on this analysis, we also offer some preliminary thoughts on what economic and social policies could do to engender more dynamic and broadly shared economic growth in the future.

We begin with a review and decomposition of the long-run performance in terms of real output and employment creation. Specifically, we decompose South Africa's growth into its primary sources, in order to identify any underlying structural changes. The evidence obtained in this way reveals that not only have growth and employment creation in South Africa been subject to a long-term, structural decline, but that the sources of economic growth have also shifted from capital accumulation to growth in total factor productivity. Put differently, South Africa's growth pattern has simply *not* been labour-absorbing to the degree that was necessary to generate a sustained decline in the high unemployment rate. The question is: why is this so?

To answer this and related questions, we first focus on perhaps the most fundamental driver of long-term growth to date: investment in physical capital stock. The evidence suggests that rates of return on capital and the user cost of capital are fundamental to the determination of investment in fixed capital stock, but exercise their influence subject to the powerful impact of *uncertainty*. Moreover, uncertainty appears to be a crucial determinant not only of investment in physical capital stock, but also of international capital flows. Here, we also consider the impact of macroeconomic policy and financial markets on investment in physical capital and economic growth.

Given the importance of institutions to capital accumulation, we also discuss some institutional features of labour and output markets, as well as those governing international external trade flows. The core finding is that labour-market distortions are present – and specifically that the strong negative wage elasticity associated with labour usage in South Africa has not been utilised as a vehicle of job creation. Equally, however, we report the existence of very significant price mark-ups over marginal cost of production in output markets, in part reflecting high industry concentration, as well as incomplete trade liberalisation. The net consequence of this combination of market distortions is a loss of competitiveness that limits the growth potential of South Africa’s industry.

Furthermore, given the rising importance of total factor productivity to growth in South Africa, the chapter examines the long-run determinants of technological progress in this country. Specifically, we consider evidence on the importance of the factors identified by modern (endogenous) growth theory in determining South Africa’s growth performance. While a number of different determinants are considered, emphasis is placed on the contribution of investment in human capital. The evidence suggests that what counts increasingly is the *quality*, not just the quantity, of human capital investment.

Finally, we consider the implications of these findings for economic and social policy geared towards more dynamic growth of output and employment, and a more rapid diffusion of economic benefits. We also suggest a few knowledge gaps and potential avenues of further policy research that, if addressed, could help to develop and implement more effective economic policies for broadly shared growth.

An important caveat is that the chapter focuses on and discusses mainly *macroeconomic*, *market-related*, and *institutional* determinants and constraints of growth, largely ignoring the complex distribution and poverty issues dealt with elsewhere. The hypothesis supported by much of the literature is that growth is a *necessary condition* for economic progress and improvement in standards of living. This chapter focuses on growth and says little about how the benefits of growth have been shared among the South African population, although these are well-known facts. The chapter refers, however, to the numerous applied microeconomic studies that shed more light on the distribution/poverty pattern of South Africa’s growth experience. A more comprehensive socio-economic accounting of the growth-cum-equity experience of South Africa would need to combine this analysis of factors of growth with the findings of these microeconomic studies.

2. Growth in South Africa, 1970-2000: Evidence and Interpretation

2.1. Growth decomposition¹

International evidence from *developed countries* has often pointed to the significant contribution of total factor productivity (TFP) growth to total growth, as compared with the contribution of factor inputs.² In effect, real output growth in developed countries is difficult to explain with reference to growth in factor inputs alone. Rather, most economic growth in this group of countries over the most recent decades of the twentieth century seems to be the result of technological progress.

Developing countries, including South Africa, are different.³ Evidence from developing countries often shows a changing pattern of growth, beginning with a heavy reliance on capital growth and, more broadly, factor accumulation, then shifting to total factor productivity-led growth with rising per capita real GDP. South Africa's aggregate growth experience largely mirrors that of many developing countries, although growth in South Africa has been markedly slower during the 1990s than in comparator countries (see Figure 1.1).

The empirical question, then, is whether factor accumulation or TFP gains led real output growth in South Africa during the period 1970–2000. With regard to the former, the policy imperative is to account for specific factors that determine investment in physical capital and employment. If, on the other hand, TFP growth is dominant, we must consider deeper determinants of technological progress in the South African context.

A standard decomposition of sources of growth indicates that during the period 1970–90, economic growth was driven largely by factor accumulation, and by gains in TFP in the 1990s (see Table 1.1; Figure 1.2 illustrates the same data). The 1970s and 1980s saw economic growth heavily led by capital and labour input accumulation, with very little contribution by technology. In the 1990s, however, the pattern of growth was reversed: growth in labour input contributed *negatively*, and growth in capital input contributed relatively weakly to the overall growth. By contrast, the single strongest contributor to output growth during the course of the 1990s was a rapid augmentation in technology.

Part of the reason for the change in South Africa's pattern of growth in the 1990s towards creation of a greater role for technology lies in a decline in formal sector employment.⁴ This change was associated with considerable restructuring

¹The discussion that follows draws substantially on Fedderke (2002a).

²See for instance Abramovitz (1956, 1986, 1993); also Fagerberg (1994), Maddison (1987) and Bosworth and Collins (2003).

³See for instance Lim (1994).

⁴See the more detailed discussion in Fedderke and Mariotti (2002), and Fedderke and Pirouz (2002).

and shedding of labour in major industries such as mining. As a result, with declining employment, growth in labour inputs alone could not have added to the growth in real output of the economy. At the same time, the declining contribution of capital to overall growth during this period is a result of the declining investment rate.⁵ The contribution of technological progress has, therefore, been rising since the 1970s, although in the context of a declining overall growth rate in output.

This aggregate evidence conceals considerable variation across sectors.⁶ The only consistent feature across the main sectors – agriculture, mining, manufacturing and services – of the economy is that the contribution of labour towards output growth has shown a downward trend from the 1970s to the 1990s. In terms of the contribution of growth in the capital stock, we find that in the agriculture, mining and services sectors, capital has been of declining importance as a contributor towards output growth, while for manufacturing industry it has assumed increasing importance. Finally, in terms of the contribution of technological progress, the strongest efficiency improvement is evident in agriculture, although this contribution by technology has declined during the 1990s. Mining, by contrast, while coming off a low rate of technological progress, has been on an upward trend, similar to that of services. These results confirm our initial finding: that technology as a contributor to economic growth in the South African economy has become increasingly important, though sectoral shifts have also affected the overall growth. The exception to this finding is the manufacturing sector, which has experienced a decline in the importance of technological innovation throughout the 1990s (see Table 1.2).

3. The foundation of long-run growth: Investment in physical capital stock

The investment rate in the physical capital stock has been documented in the literature as a core determinant of long-run economic growth. Whether we are referring to classical theories of economic growth (Solow 1956) or modern endogenous theories of economic growth (for example Romer 1986, 1990; Grossman and Helpman 1991) and more recent contributions (Bosworth and Collins 2003; Kraay 2001), investment in physical capital is consistently considered a key source of economic growth. Empirical research confirms this centrality of the investment rate in physical capital. In a seminal paper, Levine and Renelt (1992), for example, have established investment in physical capital as the single most robust variable in empirical cross-sectional growth studies, and De Long and Summers (1991, 1993) have confirmed its importance as the key engine of long-run gains in per capita

⁵See the more detailed discussion in Fedderke (2001a, 2004), and Fedderke, Henderson, Kayemba, Mariotti and Vaze (2001).

⁶See Fedderke (2002a) for the full empirical evidence on sectors.

real output.

In the South African context, we have seen that the contribution of capital has been the dominant source of economic growth in the 1970–80 period, and the second most important source in the 1990s, after TFP. Moreover, the decline in the overall growth rate of real output is clearly associated with the observed decline in the importance of capital as a factor of growth. Hence a more in-depth look at investments in physical capital is needed for a fuller understanding of the growth puzzle of South Africa.

3.1. *Determinants of investments in South Africa: Empirical evidence*⁷

The modern theory of investment expenditure has focused on the impact of *irreversibility* and *uncertainty*. While the importance of irreversibility and uncertainty for changes in the capital stock has long been recognised (for example Hartman 1972, Nickel 1978), recent debates (for example Dixit and Pindyck 1994) have provided a more comprehensive understanding of the issues.

Irreversibility of investment decisions is associated with the possibility of waiting for better returns in the future. This means that the decision not to invest at a present point in time can be thought of as a purchase of an option that has value, since waiting to invest in an uncertain environment delivers additional information. The modern literature has been cast in terms of a stochastic, dynamic environment. One of the core – and straightforward – insights of the modern literature is that uncertainty generates a reward for waiting, and, hence, that increases in uncertainty will potentially *lower* investment.

The most important of these insights, however, has been the recognition that the impact of uncertainty on investment is ambiguous. A rise in uncertainty raises the threshold at which investment will be triggered, and this suggests a negative link between investment and uncertainty. However, uncertainty may at least in part be due to an increased *volatility* of profit flows, such that the higher threshold level of profitability is reached more frequently in an uncertain than in a certain environment, generating more rather than less frequent bursts of investment expenditure. In this case, increased uncertainty may be associated with *higher* investment expenditure on average, even though the net rate of return on investment required to justify the investment expenditure has increased due to the uncertainty. The net effect of uncertainty on investment is, therefore, ambiguous, and a matter of empirical analysis.⁸

We focus our analysis of determinants of investment expenditure on manufacturing – a key industry in South Africa – for which solid data are readily available.

⁷This section draws substantially on the more extensive analysis and discussion presented in Fedderke (2001a, 2004).

⁸A comprehensive coverage of the modern debate can be found in Dixit and Pindyck (1994).

Our results are consistent with those of other studies based on the aggregate investment rates in South Africa.⁹ A key issue in empirical implementation of irreversible investment models is that one must control for the impact of uncertainty.¹⁰

The results confirm the standard theoretical expectations about the impact of the rate of return on capital and the user cost of capital on investments (see Figure 1.3).¹¹ A rising expectation of the rate of return on capital, and rising user cost of capital, tend to increase and decrease the investment rate in physical capital stock respectively. In this regard, investment in physical capital stock in South Africa is, therefore, susceptible to the standard policy levers (such as tax policy, depreciation rules, measures that improve the efficiency of factor input markets, etc.) associated with stimulating investment expenditure.

A striking finding is that uncertainty exercises a statistically significant and strong *negative* impact on investment expenditure in the South African manufacturing industry (see again Figure 1.3). Importantly, both *systemic*¹² and sectoral uncertainty¹³ appear to be important for investment, with systemic uncertainty showing a stronger impact. Systemic uncertainty is defined here as political stability, measured as a weighted average of eleven indicators of repressive state responses to pressures for political reform, while sectoral uncertainty refers to the measured volatility of sector-specific output demand. The political instability index covers the 1970–2000 period of twenty-four years of apartheid and six years of the period of political liberalisation.¹⁴ While the index tracks the rising political stability to 1994 and beyond, its close association with investments covers the whole period of analysis, and captures the periods of peak instability in the mid-1970s and the 1980s. This result is a consistent and robust finding regardless of which other variables are controlled for in the estimation.¹⁵ One explanation for the observed investment performance of the South African economy, therefore, is that uncertainty, including both systemic and sectoral uncertainty, continues to characterise the South African economic environment.¹⁶

On the surface, a major implication of these empirical findings is that the standard policy handles such as tax policy are important as a *potential* means

⁹See Fielding (1997, 2000). Results are consistent with those presented here.

¹⁰See for example Ferderer (1993), and Guiso and Parigi (1999).

¹¹The reported results are panel estimation results for 28 manufacturing sectors. Aggregate results confirm the central findings – see Mariotti (2002) and Kularatne (2002).

¹²See Fedderke (2001a, 2004) and Fedderke, de Kadt and Luiz (2001a) for detail on this index.

¹³Measured as a moving average of a variance of output demand measure by sector.

¹⁴The index is available as far back as 1935.

¹⁵In the regression, we also tested for the impact of credit rationing, openness of the manufacturing sectors to international trade, technological progress, the skills composition of the labour force, the real wage, and government crowd-in.

¹⁶There is also new evidence to consider on the sources of systemic uncertainty in South Africa. This includes institutional factors, as well as crime rates. See Fedderke, Luiz and Henderson (2005).

of stimulating investment expenditure. Both the proxy for the rate of return on capital stock as well as the marginal cost of investment come to determine the long-run investment rate in South Africa. The implication of this is twofold. In the first instance, the policy factors that change the user cost of investment (or rate of return on capital) may deter or foster investment. Since changes in the real user cost of capital influence the investment rate of the manufacturing sector, public policy can influence long-run changes in investment rates by changing elements of real unit cost of capital (for example tax rates on corporate incomes and dividends, depreciation rules, etc). The basic point is that policy-makers could potentially play a role in creating the appropriate (or unfavourable) conditions for rising investment rates via changes in the real user cost of capital.

This finding, however, has to be qualified significantly because of both *direct* and *indirect* policy implications of the empirical results concerning the impact of uncertainty on investment. There are direct policy implications that arise from the direct (and large) negative impact of uncertainty on investment in South Africa: stability of the investment environment at a systemic level (i.e. the investment climate) appears crucial if investment rates in South African manufacturing industry are to rise. This implies the need for a stable and predictable macroeconomic policy stance resulting in price stability, but also signals the importance of a stable political environment conducive to credible policy adjustments over time.¹⁷

But the importance of uncertainty for investment arises in more than this direct sense. Uncertainty also raises the threshold rate of return below which investment is unlikely to occur. Firstly, this implies that any policy intervention designed to stimulate investment expenditure may face serious constraints where an industry is operating below the threshold rate of return on investment. Policy intervention may not trigger a physical investment response because the intervention has not been substantial enough to breach this threshold. Secondly, as a corollary, the creation of a macroeconomic as well as a microeconomic environment that is stable, predictable and devoid of sudden and arbitrary policy interventions is a policy goal that emerges not only because uncertainty has a direct negative impact on investment rates in manufacturing, but also because it serves to lower the threshold below which investment does not occur. In effect, lowering uncertainty directly stimulates investment, and indirectly it renders other policy levers more effective in achieving their objective. Moreover, further evidence presented below shows that the relevance of uncertainty is even deeper than its immediate significance in the context of investment in the physical capital stock.

¹⁷New results suggest that lowering crime rates is also important – see Fedderke, Luiz and Henderson (2005).

3.2. *Further evidence on the determinants of investment*

Beyond uncertainty, there are also a number of other factors, such as capital flows and the financial sector, that influence investment rates in South Africa. For example, the shortfall of private sector savings relative to investment (see Figure 1.4) highlights the significance of the role of the financial sector in the South African economy in at least two distinct senses. Firstly, it emphasises the need for inflows of foreign capital, as expected in developing countries. Therefore, understanding the determinants of capital flows into and out of the South African economy becomes a key to an understanding of constraints on the investment rate in the economy. Secondly, it raises the question of the efficiency of the South African financial sector as an intermediary between savers and investors in the economy. The crucial question here is what role the financial sector has played in effectively intermediating between economic agents with surplus funds (savers), and those with opportunities to productively utilise those funds (investors). The nature and role of the financial sector in the South African growth process becomes relevant.

3.3. *The importance of capital flows: the return of uncertainty*

The shortfall of savings relative to investments has been recognised as a long-standing structural constraint of the South African economy. Except for very brief periods in the 1960s and the early 1980s, South Africa's private sector has not produced sufficient savings to meet its demand for physical capital formation. The implication is that South Africa has been, and remains, reliant on capital inflows in order to finance its physical capital formation.

On the presumption that capital flows respond positively to higher domestic returns on assets, and negatively to risk and higher returns on foreign assets,¹⁸ and employing a range of distinct measures of capital flow,¹⁹ we report on estimates of the determinants of capital flows in Figure 1.5.

The results are, firstly, consistent with expectations of the portfolio theory (Fedderke 2001b). Thus an improved rate of return on assets and reduced risk on assets will increase capital inflows into South Africa, although there are some differences between the various capital flow measures on the imputed magnitude of the impact of the various rates of return and risk dimensions.

Secondly, as expected, capital flows in South Africa prove to be associated positively with growth and negatively with political risk. More specifically, it

¹⁸For the detail, see Fedderke (2002b).

¹⁹Estimations are for the standard short- and long-term capital flow measures reported in the balance of payments (TNORM), and three measures of capital flight constructed according to the indirect method (KFIND – see World Bank 1985, World Bank Development Report, World Bank, Washington, D.C.) for its construction), the balance of payments method (KFBOP – see Cuddington 1987) and the derived method (KFDRV – see Dooley 1988).

turns out that both changes in the level of political rights and changes in the level of political instability affect capital flows. Higher instability and political liberalisation in South Africa were both initially associated with higher capital outflows. We note further that it is difficult to argue that the three capital ‘flight’ measures are more responsive to risk than the ‘normal’ capital flow measures of the balance of payments – with the one exception of the KFDRV measure. Capital inflows tend to respond to the already favourable growth performance; of course, any ‘additional’ capital inflow may further enhance the growth in output.

The direct risk dimensions that were earlier shown to be crucial for investment in physical capital stock are also one of the key indirect enabling conditions for investment in South Africa. South Africa’s reliance on capital inflows, therefore, strengthens the policy need to minimise any source of uncertainty that may detract from investment directly, or from capital inflows. A key policy implication is that the extent of transparency, predictability, and credibility of political processes will, therefore, determine how and to what extent the process of democratisation in South Africa brings about economic as well as political benefits for the majority of the South Africans.

3.4. The role of the financial system

The financial system not only allocates scarce resources to the most efficient uses; it is also important for growth. Nowadays, most economists agree that the financial system is, in fact, essential for development.²⁰ They argue that a more efficient financial system leads to higher growth and reduces the likelihood and severity of crises. Kularatne (2002), for example, has recently investigated the role of financial deepening in South African growth in the post-war era. This study allows for both direct effects of the financial system on growth, as well as indirect effects via a stimulus of the investment rate in the economy. In addition, Kularatne allows for the possibility that a rising level of per capita output (as an indicator of the level of development) may itself stimulate the development of the financial system, i.e. there may exist a feedback from output to financial deepening. Finally, the study controls for both the impact of credit extension by financial intermediaries in the South African economy, as well as the liquidity of the stock market.²¹ The central finding of this study is that *all* forms of financial deepening (both credit extension and stock market liquidity) stimulate economic growth.²²

²⁰For example see Levine (1997), Levine and Zervos (1998) and Levine, Loayza and Beck (2000).

²¹This serves as the proxy for the ease of raising capital on equity markets in a wide range of international studies.

²²In particular, a percentage increase in the ratio of total value of shares traded increases the investment rate and per capita output by 0.28 per cent and 0.30 per cent, respectively. A

The two dimensions of financial deepening – credit expansion and stock market liquidity – are found to be complementary rather than substitutes for each other. Moreover, although the impact of financial deepening is indirect, by stimulating investment in physical capital, credit extension in the South African financial markets appears to serve as a means of improving the liquidity of the stock market, rather than increasing investment in physical capital stock directly.

One possible explanation for the absence of a *direct* association between financial intermediation and the real sector may be attributed to the presence of credit rationing within the South African economy. Firms may find it difficult to source working capital from financial intermediaries for investment projects. Indeed, this is borne out by the evidence gathered by a recent World Bank Report on the constraints on growth in South Africa,²³ which supports the argument concerning the prevalence of credit rationing within the South African economy. This suggests that the full potential of the financial sector for growth stimulus in South Africa has not yet been realised.

3.5. *The role and limits of demand side policy*

Finally, macroeconomic stability is crucial in creating appropriate *levels* of the net return on physical capital to render investment attractive to the private sector, but, even more importantly, it is crucial in rendering the return *certain*. In effect, the conduct of monetary and fiscal policies represents another important channel by means of which uncertainty faced by investors can be minimised. Mariotti (2002) investigates the impact of two indicators of demand side policy in the post-war South African growth experience: government consumption expenditure as a percentage of GDP as a proxy for fiscal policy stance,²⁴ and the CPI inflation rate as a proxy for monetary policy orientation. The study allows for both direct effects of policy on growth, as well as indirect effects via a stimulus of the investment rate in the economy. This study takes into account the possibility that the impact of policy intervention on output may be non-linear.²⁵

Government consumption expenditure and inflation are both found to have an

percentage increase in credit extension and per capita GDP increases the ratio of value of shares traded by 0.26 per cent and 0.83 per cent, respectively. The effect of a percentage increase in credit extension on per capita GDP and the investment rate is relatively small, estimated to be an increase of 0.08 per cent and 0.07 per cent, respectively.

²³See World Bank (2000). The survey covers the 1998–99 period.

²⁴Government consumption expenditure consists of remunerations, depreciation of fixed capital and intermediate consumption less fees and charges. It does not include expenditure on education, given the potential importance of human capital formation for economic growth.

²⁵Linear estimation would imply one of two corner solutions as the optimal level of government consumption expenditure: 0 per cent or 100 per cent. Estimation proceeds in terms of both Johansen vector or error correction techniques, as well as threshold autoregressive regression techniques in the presence of non-linearity.

unambiguously negative impact on long-run per capita GDP. But the results also indicate that there is an indirect impact of policy on output via its impact on investment. These results also suggest that the relationship between policy and long-run output growth and investment may be non-linear, implying the presence of an optimal level of government consumption expenditure and inflation. The estimated optimal level of government consumption expenditure turns out to be quite low (below 12 per cent of GDP), as is optimal inflation (below 3 per cent).

The significance of the findings regarding macroeconomic policy (i.e. demand side policy interventions) in South Africa is that they do play a role in the growth process, but not as a means of providing positive demand-side stimulus to output growth. At best, the positive stimulus of an increase in government consumption expenditure tends to be short-lived, only to be succeeded by contractionary pressures. Instead, the role of government stabilisation policy is to provide a stable and predictable macroeconomic environment – lowering uncertainty in the economy, and improving predictability of the economic environment for investors, while providing public goods services. In short, there is no quick-and-easy demand side policy panacea for the supply side problem of economic growth. But the demand side has a role to play: to keep the economic environment as stable and predictable as possible, without distorting private sector incentives. In this area, arguably more than in any other, South Africa’s policy performance has been exemplary for long-run growth purposes. At the same time, it is now recognised that markets and institutions also matter for economic growth, an issue we explore next.

4. The role of institutions and markets in economic growth

A more complete discussion of determinants of long-run growth requires a sense of institutional factors that may exercise an influence on growth directly, as well as indirectly via capital formation and capital flows. In this section, we extend our understanding of institutions from specifically social and political institutions, to what is perhaps the single most important set of institutions of all for long-run economic development: market institutions. Capital market distortions in the past allocation of capital in the South African economy have been identified as one constraint on capital accumulation²⁶ – and similar considerations may also be relevant to other markets.

Evidence is beginning to accumulate that the functioning of the market mechanisms in South Africa leaves considerable room for improvement. In particular, we consider the impact of *trade liberalisation* and the performance of *labour and output markets* in South Africa, as well as the evidence on the efficiency of output markets.

²⁶See the discussion in Fedderke, Henderson, Kayemba, Mariotti and Vaze (2001).

4.1. *Institutional factors of output growth*

The possible existence of a link between social and political institutions and long-run economic development has long been the subject of an extensive literature in its own right. From modernisation theory,²⁷ with its postulated positive association between economic and political development, the emphasis on property rights (hence markets) as critical to long-run development in the work of North (1981, 1990) and North and Thomas (1970, 1973), and the emphasis on the importance of the credibility of political institutions,²⁸ to the recent introduction of social capital,²⁹ explorations of the possibility of a link between institutions and economic development are a recurrent theme in the literature. Theoretical contributions have been accompanied by a growing body of empirical evidence.³⁰ Important questions can be raised on the link between institutions and growth in South African context as well.

Which institutional dimensions are important to the growth process in South Africa, and are the channels of influence direct or indirect? Fedderke, de Kadt and Luiz (2001b) explore the roles of political instability, political rights and property rights for South Africa's investment and growth performance. Figure 1.6 summarises their findings, which are consistent with the evidence presented on the investment function above, with some nuances. Firstly, the impact of the institutional dimensions on economic growth in South Africa appears to have been affecting investment, while political instability and property rights also appear to be important determining factors of capital accumulation. Secondly, where the agent (e.g. the state) who is responsible for setting the rules of the game is not seen to be fully and credibly committed to those rules which confer ownership, confidence, and hence investment, are inevitably going to be compromised. Thirdly, there is little evidence of a direct impact of institutional variables on growth, only of an indirect link via the investment rate. Instead, economic development drives institutional development both in terms of the rights structure within the political realm, and in terms of the level of political instability. Hence, there is no evidence that political rights *per se* in the period of investigation supported either capital accumulation or per capita output. Instead, political institutions appear to be an outcome variable rather than a forcing variable in the estimations. All this has obvious implications for economic policy.

South Africa-specific and international analyses suggest that there is little doubt that sound macroeconomic stability is key to growth, but macroeconomic

²⁷See for instance the classic Lipset (1959); Diamond (1992) provides an overview of later developments.

²⁸See for instance Borner, Brunetti and Weder (1995).

²⁹See Coleman (1988, 1990), Putnam (1995) and Fukuyama (1995a, 1995b)

³⁰Barro (1991) is the classic reference.

stability alone is not enough.³¹ It is only part of the story, and, one might argue, the easy part. Far more demanding is the need to establish that the policy commitment to long-term growth is a credible one, and that the institutional framework within which it is achieved is one that will itself hold and allow economic agents to fully realise the results of their work and entrepreneurial efforts. A major policy implication is that unless institutional stability requirements are met, the considerable achievements that South Africa has realised in the post-apartheid period, through its strict macroeconomic policy discipline, may be jeopardised.

5. The impact of market distortions: trade liberalisation

The 1990s have seen a laudable first attempt to initiate trade liberalisation in South Africa, but much remains to be done. The extent of the liberalisation of the economy constitutes one of the clear successes of the South African administration in the post-1994 period, and the country has continued its trade liberalisation, which has been a source of gains in total factor productivity. Within the Doha, South Africa pushed for the removal of agricultural subsidies in industrial countries. While it is negotiating a number of bilateral agreements, it is also moving ahead with unilateral tariff reform. The average unweighted tariff rate was reduced from 22 per cent in 1998 to an estimated 11 per cent in 2003. Nevertheless, the tariff structure is unduly complex and there are a number of highly protected sectors (e.g. textiles, footwear). On the customs and trade facilitation front, South African Customs Union has streamlined customs procedures based on the ASYCUDA. Customs procedures are well-defined and implemented. Despite these achievements, however, there remains a concern about whether trade liberalisation went far enough during the 1990s. Empirical evidence suggests that it did not.

An analysis of effective rates of protection across sectors shows that important sectors of the economy continue to enjoy very high levels of protection. Fedderke and Vaze (2001), for example, calculate effective protection rates (EPR) for 38 economic sectors, and the general changes are shown in Table 1.3 below.³² When a rise in EPR of greater than 1 per cent has been recorded, the industry has been classified as more protected. Falls in EPR of greater than 1 per cent have been categorised as liberalised. The remaining sectors have been placed in the column indicating modest or no change. In each column, sectors have been ordered by the size of sectoral real GDP, averaged over the 1988–98 period.

Note that the three large sectors – finance and insurance; agriculture, forestry and fishing; and gold and uranium – have all come under increased protection.

³¹ See the preceding discussion and Mariotti (2002) on evidence of the impact of macroeconomic policy on South African long-run economic growth.

³² For a recent dissenting view see Rangasamy and Harmse (2003), and the reply in Fedderke and Vaze (2004).

These three sectors make up on average 26 per cent of the total GDP of the 38 sectors during the period 1988 to 1998. When the other sectors of the economy in this column are added, the proportion of GDP where protection has increased rises to approximately 34 per cent of the GDP of the 38 sectors, on average, for the period from 1988 to 1998.

While the number of sectors undergoing significant trade liberalisation appears impressive, large sectors (in terms of their contribution to GDP) experienced increased protection. The liberalised sectors constitute just over 15 per cent of total GDP from the 38 sectors on average for the period 1988–1998; while the sectors where there has been little or no change in the EPR constitute the remaining 51 per cent of total GDP. The overall impact of the change in the trade regime in South Africa is, therefore, likely to be complex, and at best incomplete. Evidence to suggest that lowering of protection has led to increased import penetration is ambiguous at best, while there is far stronger evidence suggesting that those sectors subject to significant liberalisation have also been those realising the strongest successes in improved export performance in the economy.³³ In sum, the distortionary impacts of trade barriers matter, and there remains much to be done to remove these impediments to improved efficiency and productivity in the South African economy.

6. Labour market inefficiencies

South Africa's labour market has contributed in declining measure to long-term South African growth in the period under investigation. The importance of inappropriate pricing (and its institutional underpinnings) and rigidities in South African labour markets is arguably one of the single most widely documented characteristics of the South African economy to have emerged during the course of the 1990s. The wage elasticity of employment has time and again been found to be negative, in empirical study after study. Supporting descriptive evidence points in the direction of continuing rigidities creating obstacles to employment creation (Lewis 2001, 2002), Arndt and Lewis (2000), Nattrass (2000), and Fields (2000). Here we note four additional pieces of evidence relevant to an understanding of the problem of labour mispricing and employment losses in the South African economy. Firstly, we examine evidence to emerge from the mining sector, in which employment losses were particularly severe during the 1990s. Secondly, we consider evidence on the linkage between labour productivity, real wage and employment creation, considering both descriptive and econometric evidence. Thirdly, we consider some preliminary evidence concerning the impact of labour skills on the wage elasticity of labour demand. Finally, we examine the impact of trade liberalisation on the demand for labour in South Africa.

³³See the full discussion in Fedderke and Vaze (2001).

6.1. *The impact of the mining sector on employment*

During the 1990s, there were at least two salient features of the labour market in mining, traditionally one of the principal employers in the South African economy (Fedderke and Pirouz 2002). Two main conclusions are of interest.

Firstly, there has been a substantial amount of labour-shedding during the 1990s, with the employment loss concentrated in unskilled occupational categories. This is illustrated in Figure 1.7, with reference to gold and uranium mining, but the pattern is found in other mining sectors (see Fedderke & Pirouz 2002 for additional detail). More generally, employment in three principal mining sectors fell from a high of 101 705 employees in coal mining in 1985 to 55 219 in 1997; for gold and uranium mining the decline was from 526 839 to 241 352 employees over the same period; while for diamond and other mining employment declined from 199 572 in 1990 to 136 543 in 1997. In short, employment losses in the mining sector over the past decade have been dramatic. Given the significant historical contribution of mining to employment in South Africa, such significant job losses raise immediate concerns about the reasons for this phenomenon.

Secondly, a significant contributor, though not the only one, to the employment losses in mining has been the real cost of labour in production. This is illustrated by Figures 1.8 through 1.10, which show a substantial negative correlation between the real cost of labour and employment trends in all three principal mining sectors of the South African economy, over precisely the period in which substantial job losses have been recorded in these sectors. The real wage elasticities for the coal, gold and uranium, and diamond and other mining sectors were -0.44 , -0.69 , and -1.45 respectively. The finding is further confirmed by a consideration of the relative rate of increase in labour productivity and the rate of increase in the real cost of labour in the mining sectors. Table 1.4 demonstrates that over the period in which significant job losses occurred, increases in real labour costs were consistently greater than improvements in labour productivity – with the inevitable consequence that the real unit cost of labour was increasing over the period.

6.2. *The impact of the other sectors of the economy on employment*

The finding that labour mispricing constitutes a significant constraint on employment creation in South African mining, and hence acts as a brake on the economy's growth performance, generalises to other economic sectors. The impact of the link between the rate of increase in labour productivity and the rate of increase in the real wage on employment creation, considered for all 48 sectors of the South African economy over the 1970–97 period, shows that only where there is a strong positive correlation between growth in real labour remuneration and growth in labour productivity do economic sectors in South Africa create jobs on a sustainable basis (Fedderke and Mariotti 2002). Econometric evidence on real

wage elasticities confirms the strong impact of the cost of labour on employment prospects in the economy. For the 28 manufacturing sectors of the South African economy, the aggregate real wage elasticity is in the region of -0.5 to -0.55 . But in a fuller specification which controls for demand effects, skills composition of the labour force, openness of economic sectors, capacity utilisation in sectors, as well as industry concentration, the wage elasticity can be found to rise to -1.97 for manufacturing (see the extensive discussion of the estimation issues in labour markets in open economy contexts in Fedderke, Shin and Vaze 2003). The results hold across various skills levels for formal employment. The finding is consistently negative wage elasticities for unskilled labour, with the wage elasticity for unskilled labour in the formal labour market ranging from -2.00 to -2.23 , an elasticity considerably above that for skilled and highly skilled workers.

Given the substantial increases in the real cost of labour in the South African economy, labour mispricing continues to be an important factor in South Africa's poor track record of job creation, and constitutes the negative contribution of labour input to long-run real output growth in South Africa. The resulting employment losses hit hardest at the poorest segments of the population that have the fewest alternative skills for reemployment. Moreover, labour mispricing, and its institutional underpinnings governing wage determination for those who are already employed, results in limited opportunities for the unemployed to participate in the labour market, earn incomes, and reduce poverty. A key policy implication is that realistic wage policies, guided more by improvements in labour productivity and not by maximisation of remuneration for those already employed, are needed to ensure more rapid absorption of unemployed labour into the formal economy and the wider spread of benefits of job opportunities across the population.

6.3. The impact of globalisation on the South African labour market

Has globalisation exercised a negative influence on the South African labour market? A study on the 28 three-digit manufacturing sectors in South Africa shows the opposite: that globalisation, or trade liberalisation, has resulted in positive earnings increases in sectors that are labour intensive, as predicted by the Stolper-Samuelson theorem (Fedderke, Shin and Vaze 2003). Trade liberalisation has been associated with increased demand for, and growth in, the earnings of labour. Technological change, however, has been substantially labour-saving. The net effect of these two countervailing forces maintains a net positive, mandated increase in real wages for labour for the 1970–2000 period. However, actual real wage increases have significantly outstripped the mandated rate of increase in wages (the actual growth rate has been twice the mandated growth rate). The implication, once again, is that factor mispricing may help explain the poor employment creation record of the South African economy. The study further confirms the impact of limited output growth, high industry concentration, and slowly changing skills

composition of the labour force as contributing factors to the slow employment growth in South Africa.

7. Mark-ups and inefficiencies in output markets

Inefficiencies are not restricted to labour markets in South Africa, as product markets also appear to be associated with considerable pricing power on the part of producers. In fact, Fedderke and Schaling (2005) suggest that the mark-up over unit labour cost in South Africa is several orders of magnitude greater than that found in similar studies for the United States of America (USA), for example. This poses a challenge for the successful conduct of macroeconomic stabilisation policy, since cycles of price increases become self-reinforcing, rendering anti-inflationary policy more difficult. It also creates scope for continued mispricing of labour through excessive wage settlement between big business and organised labour in the economy, with the attendant employment implications both for large firms and, especially, for small and medium-size firms to which such settlements tended to apply as well. But the presence of pricing power in South African output markets also suggests that the level of competitive pressure in output markets is not adequate, lowering the competitiveness of South African production internationally.

The average mark-up in South African manufacturing industry has been found to be in the region of 80 per cent,³⁴ which is twice the average mark-up in USA manufacturing industry, reported as 45 per cent in comparable international studies (Fedderke, Kularatne and Mariotti 2005). Furthermore, the openness of manufacturing sectors to international trade influences the magnitude of industry mark-up over marginal cost. Both increased import penetration and increased export penetration tend to decrease the mark-up of price over marginal cost, and this occurs regardless of whether the increase in openness of the sector occurs relative to the industry-specific mean, or whether it occurs relative to the aggregate manufacturing mean.³⁵ The implication is thus that trade openness is one means by which excessive domestic market power in South African manufacturing can be curbed. This emphasises the importance of removing remaining forms of trade protection in South African industry.

High industrial concentration ratios further influence the magnitude of industry mark-ups. An important policy implication is that lowering industry concentration relative to the manufacturing sector mean does appear to lower the pricing power of industry. In addition to trade liberalisation, therefore, competition policy offers a means by which inefficiencies in output markets arising from the pricing power

³⁴ Ignoring intermediate inputs into production.

³⁵ For a discussion of the economic as well as the statistical significance of these and other reported effects see Fedderke, Kularatne and Mariotti (2003).

of industry can be curtailed.

Industry cost competitiveness, as measured by real unit labour costs relative to real unit labour costs in a basket of other countries, is also statistically significantly related to the observed mark-up (see Edwards and Golub 2002). This is the case for variation from both industry-specific and aggregate manufacturing mean relative real unit labour cost. The findings are divergent, however. An improvement in the cost competitiveness of an industry relative to its industry-specific mean reduces the price-marginal cost mark-up. An improvement in an industry's cost competitiveness relative to the manufacturing industry mean increases the price-marginal cost mark-up. Improvements in industry competitiveness are thus absorbed by firms as improved profitability, rather than by reducing prices. One explanation of this divergent finding is that in the presence of cost reductions within an industry, competition between rival firms does drive prices down. Between industries, such competition is absent, allowing industries to appropriate divergent profit rates.

Mark-ups over marginal cost, where marginal cost *includes* intermediate inputs, lie in the region of 7 per cent in South African manufacturing, which is below the corresponding figure reported for USA manufacturing (13 per cent).³⁶ Significantly, when industry mark-up over marginal cost, which includes intermediate inputs, is estimated while controlling for industry concentration ratios, significant increases in the mark-up due to increasing concentration ratios are found, again raising the mark-up to twice that found in USA manufacturing (or more). One explanation of this finding is that in South African industry, concentration ratios are considerably higher than in the USA, and need to be controlled for in order to capture true mark-up of price over marginal cost.

The evidence, therefore, points to the presence of considerable pricing power in South African industry. A corollary is that the pricing power in South African industry may have generated inefficiencies in resource allocation over time – particularly since the incentive to invest in physical capital stock may be substantially affected. While rigidities in South Africa's labour markets have contributed to an underemployment of the labour input in production, inefficiencies in South African output markets may equally have contributed toward the poor investment performance over the past two decades. Whether or not this has been a relevant factor in the South African investment record is worthy of further research.

In combination, the evidence on the efficiency of market processes in South Africa, from both labour and output markets, suggests symptoms of what might be termed crony corporatism. Crony corporatism is here defined as the explicit or tacit cooperation agreements between big business, big labour, and to some extent, government, to serve relatively narrow sectional interests, and curtails the efficient functioning of markets to a significant degree. The observed consequences of such

³⁶We report the results from Oliveira Martins and Scarpetta (1999).

corporatist behavior are higher unemployment, greater industrial concentration, higher prices and lower competition, and therefore, likely lower long-term, labour-absorbing growth than would otherwise be the case.

8. Innovation, human capital and their relevance for South Africa

8.1. *Endogenous technological change*

Modern growth theory has come to place increased emphasis on innovation as a long-term driver of economic growth, with attention focusing on the source of technological innovation. As we have seen from the outset, in South Africa, total factor productivity growth has assumed increasing importance as a growth driver over time. Almost universally in new growth theory, innovation is seen as the outcome of investment of resources for technological advance, but debate continues on which resources precisely are required, and what the strength of their impact will be. For Romer-type models (1986), the source of innovation is spillovers attached to investment in the physical capital stock. For the Lucas-variant (1988), the spillovers can be argued to result from investment in human rather than physical capital stock. Finally, in variants of the Schumpeterian approach to long-run growth, innovation is the explicit outcome of the investment of resources in technical advances, rather than the production of final output.³⁷ The crucial questions for our purposes are, firstly, whether endogenous growth processes are present in South Africa, and secondly, what form such endogenous growth processes might take. The latter is especially important, given the divergent policy implications that the alternative conceptions carry.³⁸

8.2. *The impact of endogenous growth processes in South Africa*

The key empirical question here is identifying determinants of growth in total factor productivity in South Africa. Since the results are symmetrical, we focus the discussion on the results for the spillover specification in Table 1.5, though the

³⁷For a non-technical discussion of the generic approaches to endogenous growth theory, and their implications for economic as well as institutional development, see Fedderke (2002c).

³⁸The methodology applies dynamic heterogeneous panel analysis to the South African manufacturing sectors. Estimation is of: $TFP = \frac{\dot{A}}{A} + \beta \frac{\dot{X}}{X} + \sum_{i=1}^m \gamma_i Z_i$ where $\frac{\dot{A}}{A}$ denotes exogenous technological change, $\frac{\dot{A}}{A}$ denotes either growth in physical capital stock (for the Romer (1986) type of approach), growth in human capital (for the Lucas (1988) type of approach), or growth in intermediate inputs or quality ladders (under Romer (1990), Grossman and Helpman (1991) or Aghion and Howitt (1992) type approaches), and Z_i denotes a range of additional regressors suggested by the literature. Here we skip the relatively complex range of estimation issues that arise, and proceed to salient estimation results directly. Full discussion of the estimation issues can be found in Fedderke (2001c).

additional modifications emerge from the Schumpeterian considerations (Fedderke 2001c). While the results confirm the presence of spillover effects for South African manufacturing, it is important to note that the confirmation is not unconditional. To the extent that spillover effects are corroborated, they take the form suggested by Lucas (1988) rather than Romer (1986). The coefficient on the growth rate of the capital stock is consistently negative (even where we control for investment in human as well as physical capital) and statistically significant. Since the coefficient of the capital growth rate should control for the positive contribution of capital stock over and above that implied by its income share due to spillovers, this constitutes a rejection of Romer-type spillover effects in South African manufacturing industry (in favour of classical growth theory). On the other hand, Lucas-type spillover effects do find some support, in the sense that at least some of the human capital investment variables prove to have positive and significant coefficients. However, even here the support for Lucas spillovers is circumscribed. In particular, only very *specific* types of investments in human capital contribute positively to productivity growth. The proportion of matriculation students taking mathematics, and the proportion of degrees in the natural, engineering and mathematical sciences (NES) out of total degrees, are the only two human capital variables that provide a positive and significant contribution to productivity growth in South African manufacturing industry over the 1970–97 period.³⁹

What counts, for purposes of the innovative activity associated with long-run output growth in South African manufacturing, is not so much the production of human capital *per se* as the production of *quality* human capital, as proxied by the mathematics and NES degree proportions. There are at least two good reasons why this finding is plausible. The first is that high quality human capital is simply more likely to have the positive spillover effects identified by Lucas (1988), while poor quality human capital is not. A second interpretation of the evidence might point to an improved quality of screening by an educational system (both primary and secondary, and tertiary) with rising mathematics and NES degree proportions. This, in turn, would reduce the risk faced by producers wishing to hire human capital for purposes of innovative activity.

The test of the Schumpeterian hypothesis confirms the presence of a positive impact of R&D expenditure on growth in total factor productivity. Thus the findings confirm the presence of the positive impact on output growth of innovative R&D activity undertaken by the private sector. Results from the range of human capital indicators again point to the possibility of a positive impact of human capital spillovers on productivity growth. However, just as for the spillover results,

³⁹By contrast, the total school enrolment rate, and the total number of degrees issued by South African universities, while significant, contributed negatively to total factor productivity growth, while the white school enrolment rate, the total number of NES degrees, and the number of apprenticeship contracts per capita proved to be insignificant.

the particular dimension of human capital investment controlled for proves to be crucial. The positive impact on productivity growth emerges from the NES degree proportion variable (as it did for the spillover discussion), while a number of human capital variables prove to be negative and significant (WENROL, APPCAP) or insignificant. The interpretation of this evidence remains much the same as for the spillover results above. While the human capital dimension can legitimately be argued to have a positive impact on long-run productivity growth, it is above all the *quality* dimension of human capital that exercises this effect, rather than the quantity of human capital.

8.3. *South Africa's legacy of human capital creation*

The empirical evidence from South African manufacturing industry appears to point to a positive impact of both explicit R&D activity and the quality of human capital. The implication is that we can isolate the core determinants of growth in total factor productivity for South Africa. Specifically, these are *investment in quality human capital*, as proxied by the proportion of school leavers and university graduates engaged in mathematical, scientific and engineering disciplines, and *R&D development activity*. In Figures 1.11 and 1.12 we report the proportion of white and black matriculants sitting mathematics (on any of the three grades available) and the proportion of university graduates by race in the NES degree categories. Table 1.6 reports the per-academic staff research output by university over the 1989–94 period.

In all three indicators of the capacity of the economy to undertake long-term innovation, there is evidence of a substantial decline. Reflecting the legacy of the apartheid era, the proportion of matriculants in the historically ‘best’ parts of the schooling system has been in a steady decline, and in black schooling has been persistently low. As a result, the proportion of NES degrees has collapsed. R&D activity in the university system, in turn, has also shown a steady decline on a per capita basis. Even the best part of the university system in South Africa has at the very least manifested declining quality over time during the period under investigation. The white university research output has ceased to increase in absolute terms from the late 1980s, and in per-lecturer output terms the output declined through to the early 1990s, though it has since stabilised. In addition, most research in South Africa is done in a very small number of universities.

In sum, the South African education has achieved widening access in recent years,⁴⁰ but at the expense of quality; the key policy challenge in the future is how to safeguard and promote wide access while improving long-term quality. For example, gender equality in enrolment has been largely achieved. Public resources in

⁴⁰We lack the space to develop evidence of the widening access here. But see Fedderke, de Kadt and Luiz (2000, 2003) for full details.

education are increasingly channelled towards the previously disadvantaged groups and communities. However, the system's capacity at all levels of education to deliver on what matters most for long-run economic development purposes—sound education in mathematics and science, and a deepening research capacity within the system—has been in decline. In sum, data on enrolments, matriculations, and public expenditures suggest that much has been achieved to equalize access to education. Econometric evidence on South Africa also suggests a positive link between investment in human capital and growth. Also evident, however, is that the quality of human capital has been eroding. The challenge for public policy is, therefore, to continue efforts to equalize access while addressing forcefully the quality problem.

9. Concluding Remarks

The findings on the determinants of long-run growth in South Africa presented in this paper cover three core sets of insights.

The first is that one of the central reasons for South Africa's structurally declining growth rate is its declining investment rate in fixed capital. The determinants of South Africa's investment rate are broadly consistent with those found in the wider literature. The South African investment function has the same structure as can be found elsewhere in the world, responding to the rate of return on and the real user cost of capital, thereby providing policy-makers with some immediate policy levers. But what proves to be key for investment expenditures is *uncertainty*, especially uncertainty that arises from institutional factors. In particular, uncertainty in South Africa has proven to be crucial not only to investment in the physical capital stock, but also to the capital flows that are required to meet the short-fall of private sector savings relative to private sector investment expenditure. Uncertainty affects investment both directly and indirectly, by lowering the effectiveness of the policy levers that the rate of return on capital and the user cost of capital provide.

Secondly, there remain significant market distortions in the South African economy in capital, labour and output markets, including external trade. This means that much remains to be done in improving microeconomic policy directions designed to increase the efficiency of resource allocation in the South African economy. The continued high level of protectionism in the economy, the size of the price mark-up over marginal cost of production, gives considerable cause for concern if South African production is to become globally competitive. But perhaps the most enduring concern consists of the now well-documented distortions in the labour markets. South Africa seems caught in an unfortunate pincer between inefficient labour and output markets which, unless addressed, will continue to constrain long-run growth prospects in the future.

Thirdly, the impact of human capital on growth reflects twin trends of declining contribution of human capital accumulation to growth and declining *quality* of education. The quality dimension of human capital investment with potentially significant impact on growth has been lacking. Even the best parts of the school and university systems do not produce the sorts of educational output required for long-term economic growth, and what they do produce comes at a relatively high cost.

These positive findings carry with them some normative policy implications that may be important for South African policy-makers as they contemplate policy posture in the second decade of the post-apartheid era.

1. Improving the investment climate. With respect to stimulating investment expenditure, regardless of whether this is through the augmentation of physical capital or the attraction of capital inflows, two requirements are central – raising the net rate of return on capital, and providing a stable, predictable climate for private investment. In this regard South Africa has made some progress, but more needs to be done to create a favorable overall environment for private investment, entrepreneurship and growth.
2. Maintaining sound monetary and fiscal policies. The adoption of sound fiscal and monetary policy, through the Medium-Term Expenditure Framework and inflation targeting, has provided macroeconomic conditions that are considerably more stable than has historically been the case. Such stability has provided the long-term platform for improved sustainable growth. The only remaining source of concern in the context of macroeconomic stability has been the behavior of the currency. However, with further strengthening of the macroeconomic policy fundamentals in recent years (2003–04), the emphasis in the future is likely to be on the maintenance of the strong record to date.
3. Strengthening institutions and the functioning of labour and output markets. By contrast to the substantial achievements in the context of macroeconomic stabilisation policy, the institutional structure of the economy still leaves room for further improvement. This is true with respect to a number of distinct dimensions. The crucial objective here is to improve the functioning of markets – both labour and output markets.
 - (a) Improving labour regulations for faster labour absorption. Labour market reform, geared towards creating a policy environment for faster labour absorption, remains one of the single most pressing needs in the economy. Excessive rigidity, inappropriate bargaining institutions for South African levels of development, excessive industry concentration, and associated mispricing of labour have led to poor employment

growth in the economy. They have also disadvantaged the large pool of unemployed people who remain excluded from the benefits of the formal economy. It is time, therefore, to revisit labour market regulation and consider, for example, the possibility of introducing multi-tiered labour regulation that would allow more flexible and faster labour absorption for small and medium-size firms. The objective must be to allow the poor, who are often excluded from participation in the labour market through human capital endowments associated with past legacy and information asymmetries, access to employment under labour market regulation that is less onerous on the employer, and offers more chances of employment to job seekers. Wage and non-wage costs in the labour-entry market, for example, may need to be distinguished from those that govern the formal labour market – and they need to be considerably lower in order to create employment opportunities for the poor. International experience of multi-tiered labour market regulation exists – South Africa can fruitfully learn much from this experience.

- (b) Making output markets more competitive. Output market reform is equally pressing. High industry concentration has led to mark-ups over marginal cost of production, which lowers incentives to expand production into international markets. Foregone employment opportunities and investment costs follow. Efficiency and competitiveness of output markets in South Africa require urgent attention, through continuation of the incomplete process of trade liberalisation, and the more aggressive pursuit of competition policy.
- (c) Deepening external trade and capital account liberalisation. Both further trade liberalisation and capital account liberalisation afford additional opportunity for further opening up of the economy to healthy competition that will result in longer term gains in the productivity and competitiveness of South Africa's economy. Currently there remains scope for further trade reform, greater regional trade integration, and reduction of excessive protection of some sectors of the economy. Also, restrictions on the movement of South African capital offshore continue to hamper both the opportunity for greater foreign direct investment and related technology transfers, and attempts to lower concentration levels in the South African economy. Given South Africa's level of development, greenfield investment is less likely than direct investment through equity acquisition. Yet the continued presence of constraints on South African firms wanting to move capital off-shore, restricts the ability of foreign firms to acquire South African ventures into which

technology transfer could take place. Increasing international entry into production in South Africa will require a further, systematic lifting of exchange controls.⁴¹

- (d) **Fostering quality human capital accumulation.** A significant achievement of the post-1994 government has been the major expansion of access to education. This is a major policy achievement. But we have also seen that innovation is of increasing importance to South African growth, and that R&D and quality human capital formation are central to technological progress in South Africa. In neither dimension is policy yet sufficiently developed to reap potential gains in long-term growth. For example, incentives for R&D activity are poorly developed relative to international competitors. Human capital formation, particularly in mathematics and sciences in South Africa, remains poor – and lags behind competitor nations. Therefore, a more rigorous policy approach to innovation is required. R&D incentives can be brought into line with international competitors. More frequent standardised evaluation of school learners can be implemented with computerised evaluation formats in order to test literacy and numerical ability. Incentives for school districts and pay incentives for teachers can be tied to the performance of learners over time. International experience exists here, too (see for instance PROMESA in Mexico), and here, too, South Africa can learn from international experience about what does and does not work in such incentive schemes.

In conclusion, it is clear that South Africa has achieved much since 1994. But these achievements are best viewed as the platform for yet higher aspirations.

10. Appendix

The systemic uncertainty or political instability index

A measure of systemic uncertainty is provided by an index of political instability obtained from Fedderke, de Kadt and Luiz (2001a). It is illustrated in Figure 1A.1. Political instability was latent in South Africa throughout the twentieth century, and often became overt after 1948. The index is a weighted average of eleven indicators of repressive state responses to pressures for political reform. They are constructed from official and unofficial sources.

⁴¹South Africa has Article VIII status with the IMF reflecting currency convertibility for current account transactions. Since 1994, it has also progressively eased exchange controls on capital transactions. For the latest status of the remaining exchange restrictions see, for example, the IMF Staff Report for the 2004 Article IV Consultation discussions on the IMF external website: www.imf.org under ‘South Africa’ keyword.

The indicators are:

- the number of prosecutions under the Defence Acts, and Emergency regulations;
- the number of prosecutions for ‘faction fighting’;
- the number of people proscribed and/or banned under the Suppression of Communism Act of 1950;
- the number of people placed in detention;
- the number of political fatalities;
- the number of organisations officially banned;
- the number of actions against ‘riots’;
- declarations of official states of emergency;
- the number of publications subjected to censorship.

Weightings were determined by the Delphi technique on the basis of advice from leading political scientists in South Africa.⁴²

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⁴²See the detailed discussion in Fedderke, de Kadt and Luiz (2001a).

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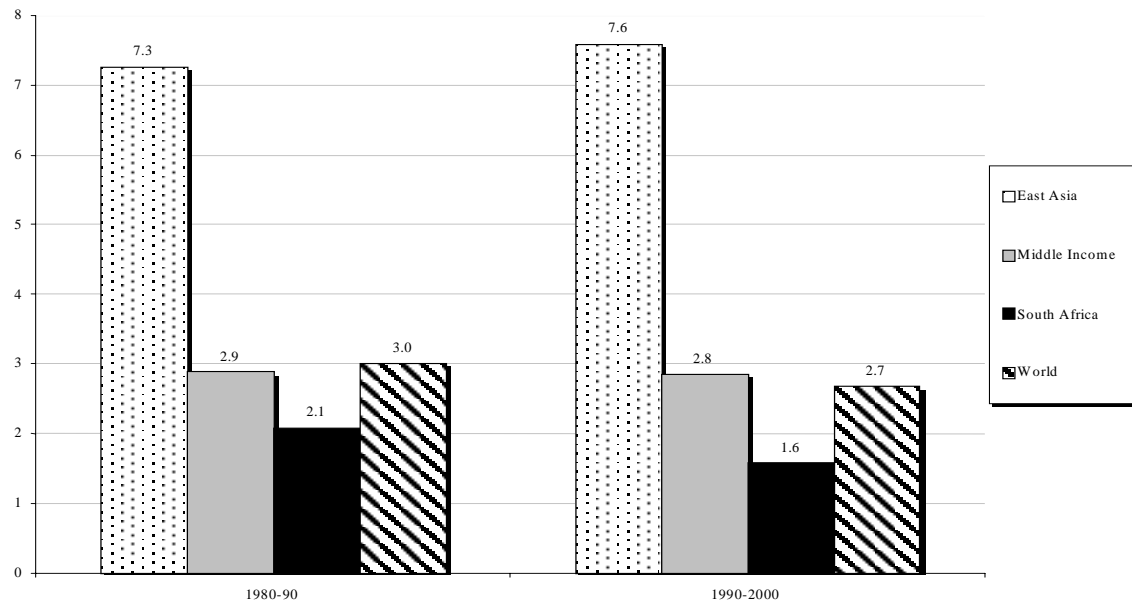
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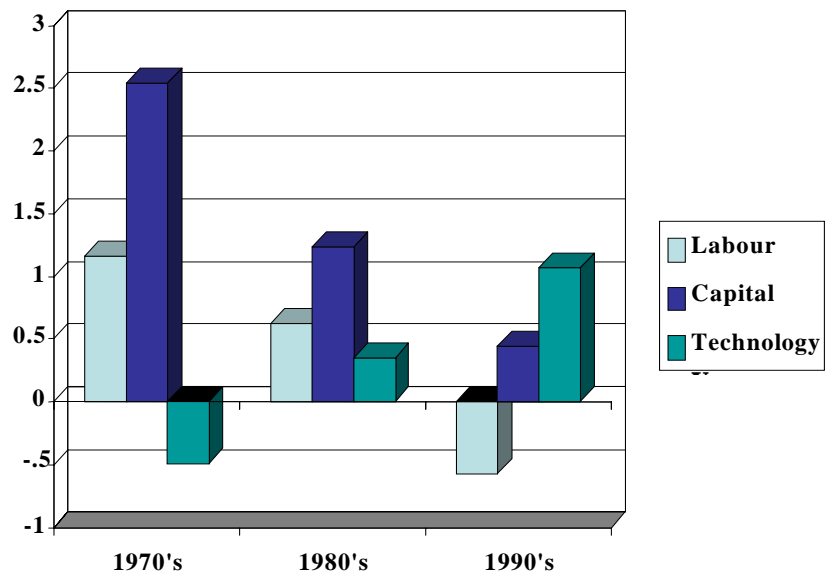
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Figure 1.1 Comparative growth performance of world, middle income and East Asian countries



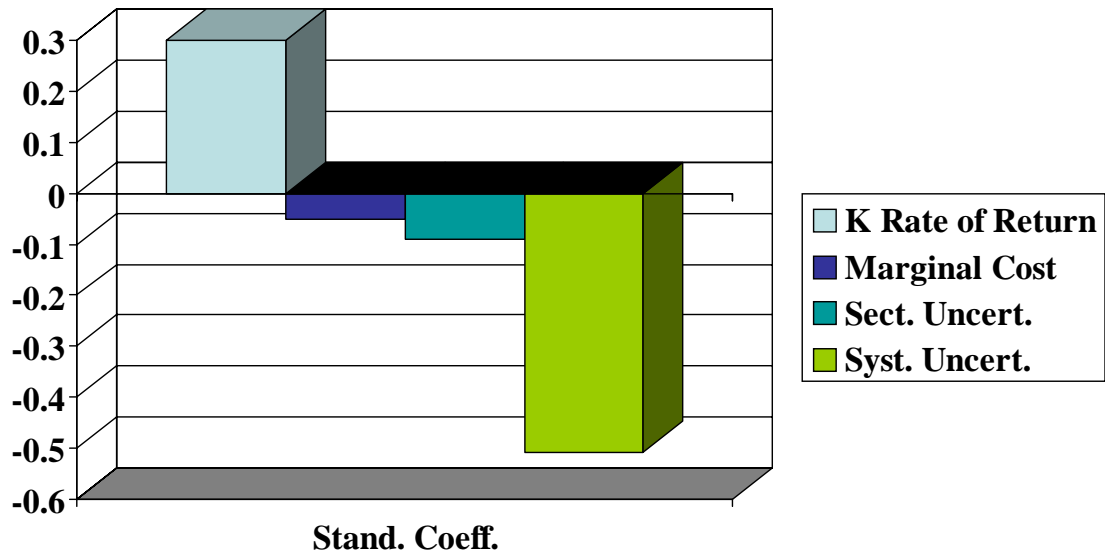
Source: World Bank Development Indicators Database

Figure 1.2 Decomposition of growth in real GDP



Source: Adapted from Fedderke (2002a).

Figure 1.3 Standardised coefficients in the investment relation



Source: Adapted from Fedderke (2001a).

Notes: K Rate of Return denotes the proxy for the expected rate of return on capital.

Marginal Cost denotes the user cost of capital.

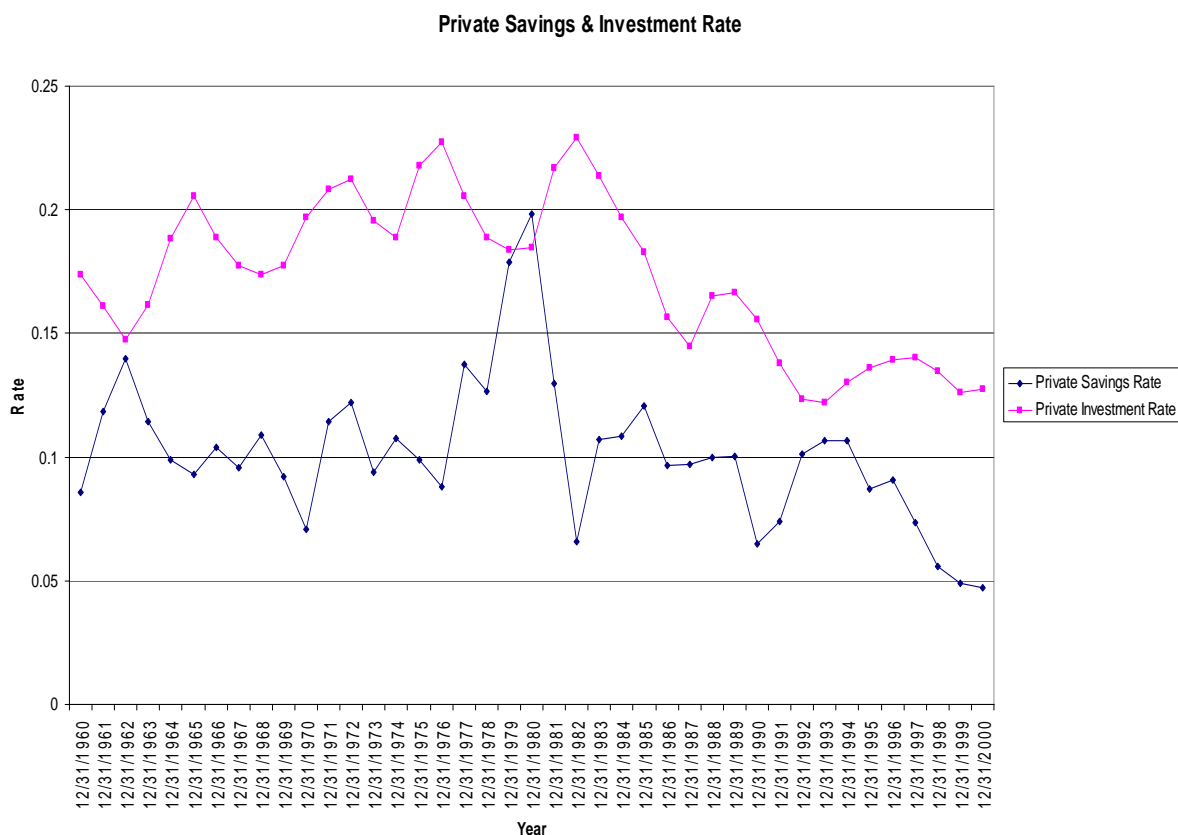
Sect. Uncert. denotes a measure of sectoral demand uncertainty.

Syst. Uncert. denotes a measure of systemic uncertainty.ⁱ

Figures are standard deviations, denoting the standard deviation response in the investment rate to a one standard deviation change in the independent variable. All coefficients are statistically significant.

ⁱ For the systemic uncertainty measure we employ the data set contained in Fedderke, de Kadt and Luiz (2001a). For the precise definition of the other variables deployed, the reader is referred to the discussion in Fedderke (2001a, 2004).

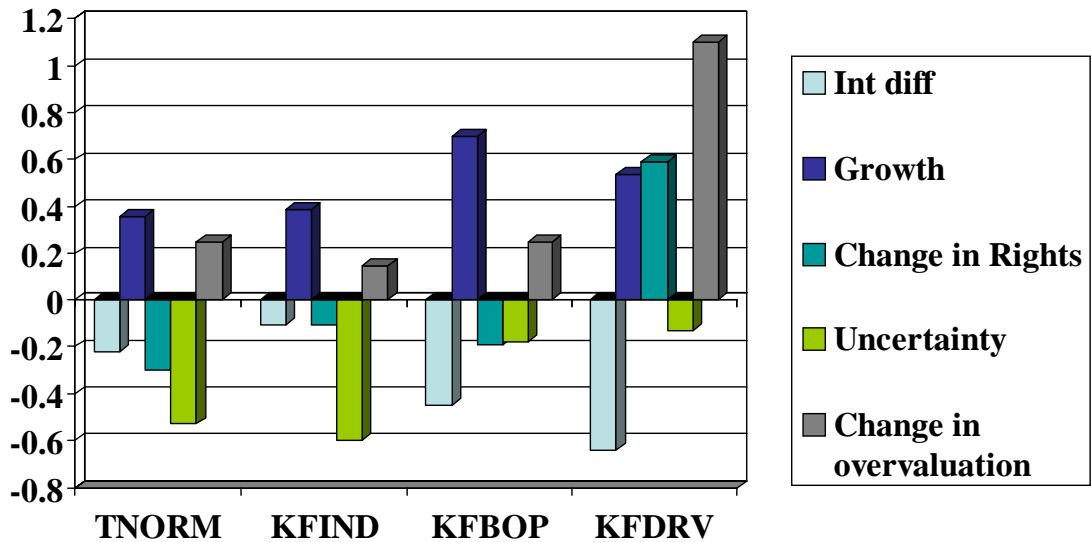
Figure 1.4 Private savingsⁱ and investment ratesⁱⁱ: South Africa, 1970–2000



ⁱ Defined as the sum of corporate saving (unit: R millions, current prices (Period)) [Source: SARB Quarterly Bulletin (S-129)] and saving by households (unit: R millions, current prices (Period)) [Source: SARB Quarterly Bulletin (S-131)], as a proportion of gross national product at factor cost (unit: R millions, current prices (Period)) [Source: SARB Quarterly Bulletin (S-127)].

ⁱⁱ Defined as the ratio of gross fixed capital formation at current prices by private business enterprises (unit: R millions, current prices (Period)) [Source: SARB Quarterly Bulletin (S-116)] to gross national product at factor cost (unit: R millions, current prices (Period)) [Source: SARB Quarterly Bulletin (S-127)].

Figure 1.5 Standardised long-run coefficients from ARDL estimation



Source: Adapted from Fedderke and Liu (2002).

Notes: Int diff denotes the change in the exchange rate-adjusted interest differential, defined as the difference between the foreign and the domestic interest rates.ⁱ

Growth denotes the percentage change in gross domestic product.

Change in rights is defined as the change in an index of political rights.ⁱⁱ

Uncertainty refers to the index of political instability employed in the investment estimations reported in Figure 1.3.

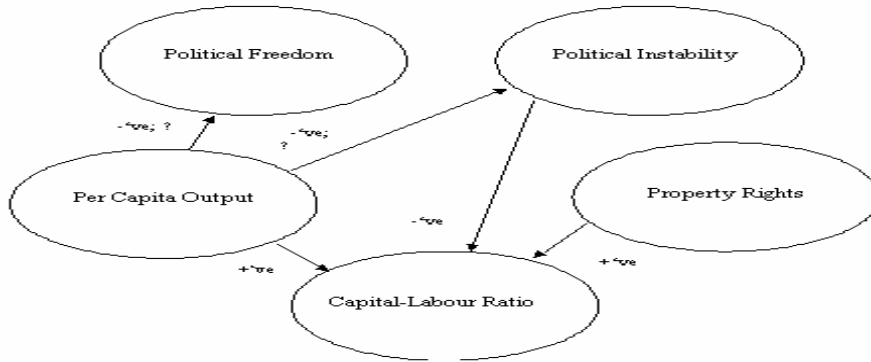
Change in overvaluation is defined as the change in the degree of over/undervaluation of the exchange rate in terms of PPP.

Figures are standard deviations, denoting the standard deviation response in the investment rate to a one standard deviation change in the independent variable. All coefficients are statistically significant.

ⁱ Thus a positive Int. diff. should trigger capital outflows.

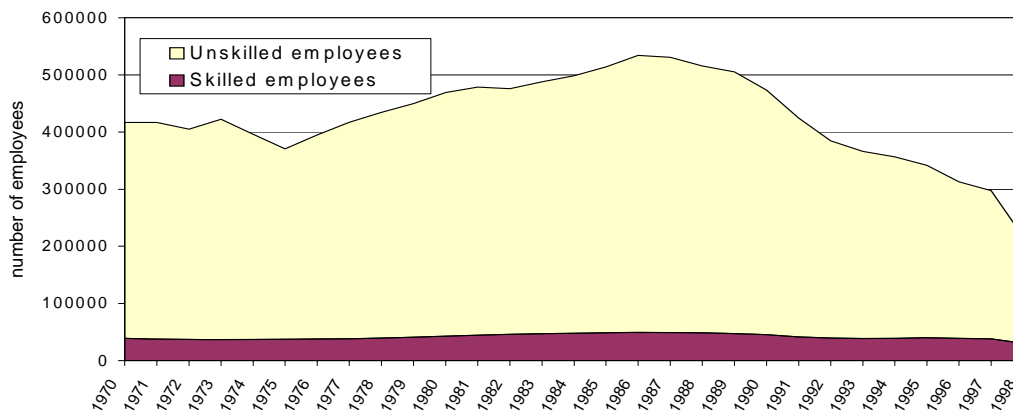
ⁱⁱ See Fedderke, de Kadt and Luiz (2001a) for a detailed description of the index underlying this variable.

Figure 1.6 Patterns of association



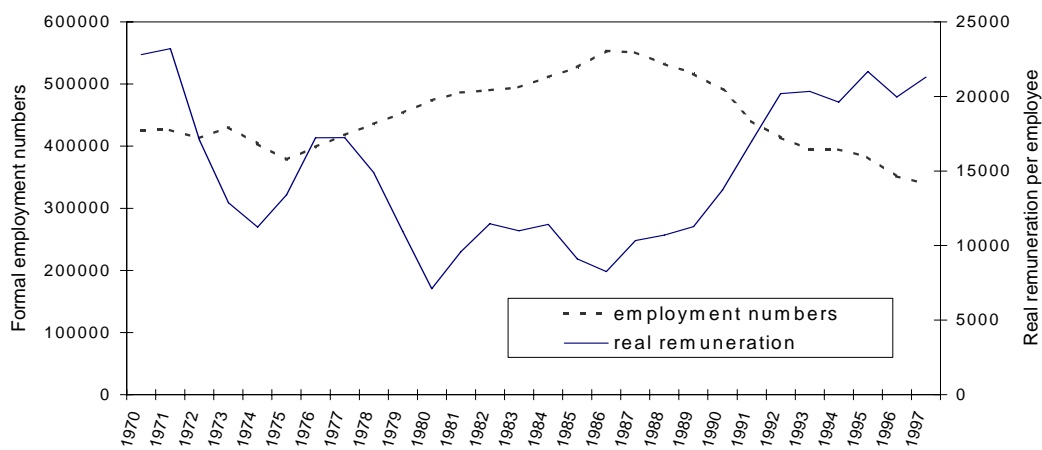
Source: Fedderke, de Kadt and Luiz (2001b)

Figure 1.7 Gold mining: skills composition of labour force



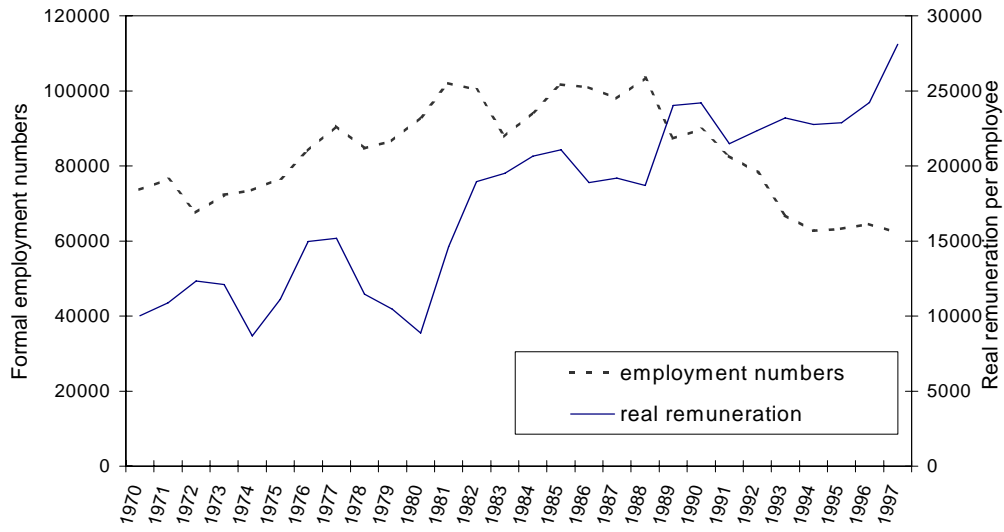
Source: Fedderke and Pirouz (2002)

Figure 1.8 Coal mining: employment and real cost of labour



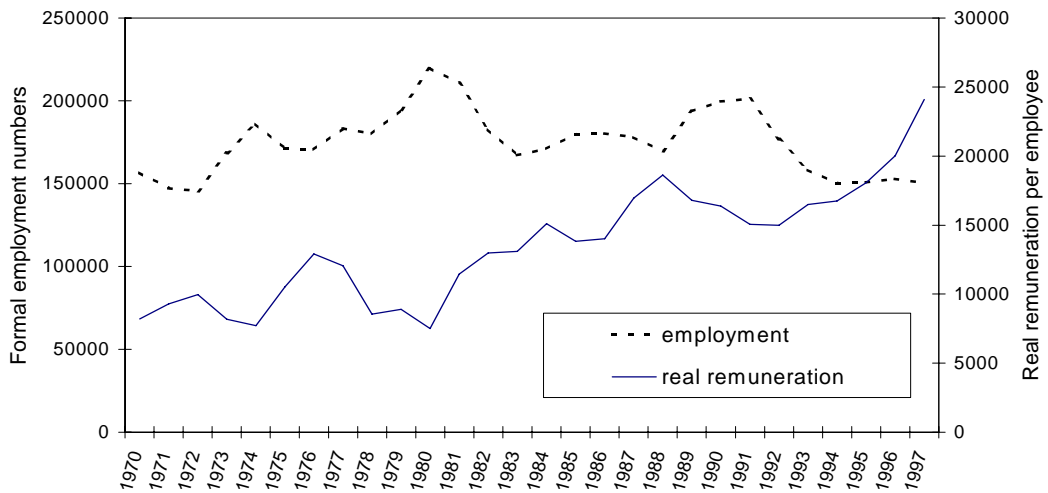
Source: Fedderke and Pirouz (2002)

Figure 1.9 Gold and uranium mining: employment and real cost of labour



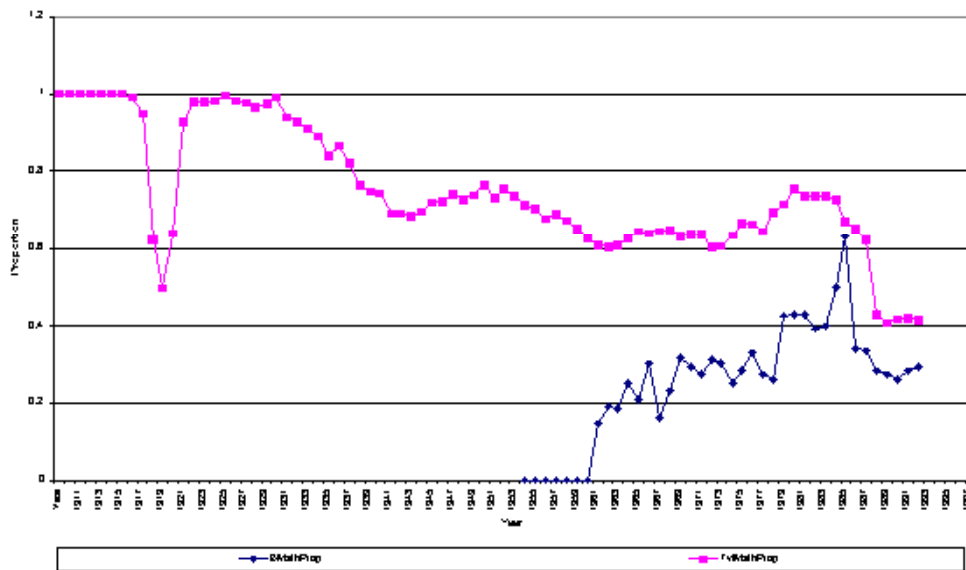
Source: Fedderke and Pirouz (2002)

Figure 1.10 Diamond and other mining: employment and real cost of labour



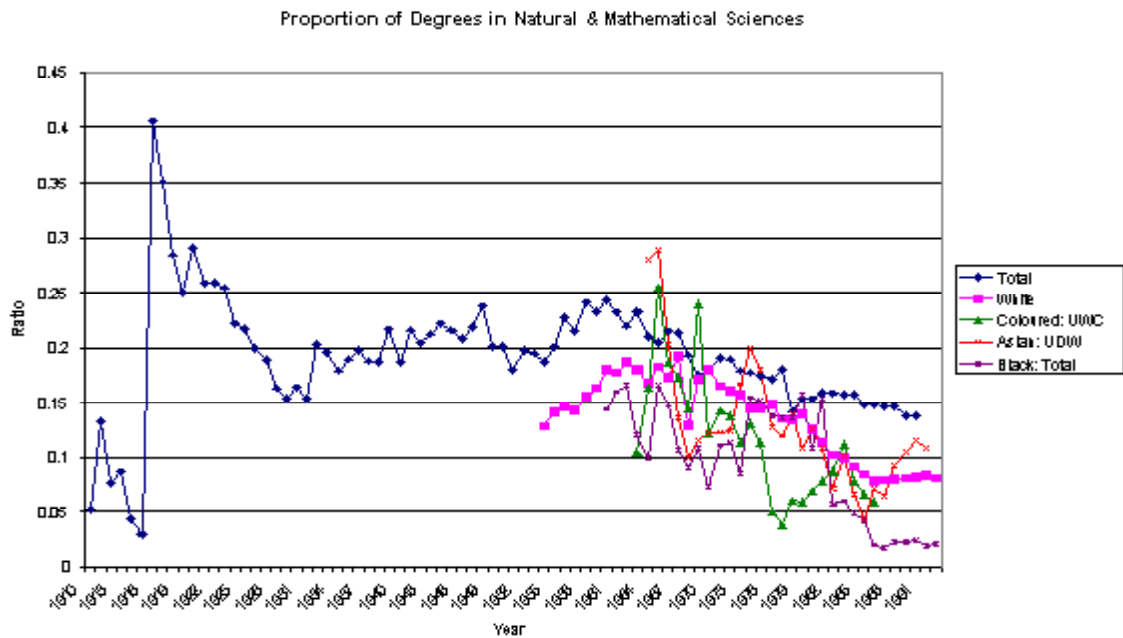
Source: Fedderke and Pirouz (2002)

Figure 1.11 Proportion of matric candidates with mathematics



Source: Fedderke, de Kadt and Luiz (2000)

Figure 1.12 Proportion of degrees in natural and mathematical sciences



Source: Fedderke, de Kadt and Luiz (2003)

Table 1.1 Contributions to growth by labour, capital and TFP

	Period	Real output		
		growth	Labour	Capital
1970s	3.21	1.17	2.54	-0.49
1980s	2.20	0.62	1.24	0.34
1990s	0.94	-0.58	0.44	1.07

Table 1.2 Decomposition of growth in real output into contributions by factors of production and technological progress; evidence by principal economic sectors, 1970-2000

	Percentage growth in real GDP	Of which:		
		Labour	Capital	Technology
<i>Agriculture, forestry and fishing</i>				
1970s	4.27	-0.10	2.00	2.37
1980s	4.30	-0.24	-0.56	5.10
1990s	2.40	-0.20	-0.92	3.52
<i>Mining</i>				
1970s	-1.08	0.51	3.81	-5.40
1980s	-0.55	0.18	3.90	-4.63
1990s	-0.60	-2.32	0.10	1.62
<i>Manufacturing</i>				
1970s	4.94	1.67	2.78	0.49
1980s	1.48	0.78	1.21	-0.52
1990s	0.43	-0.47	1.69	-0.79
<i>Service industry</i>				
1970s	3.41	1.49	2.80	-0.88
1980s	2.81	0.82	1.28	0.71
1990s	1.50	-0.59	0.44	1.65

Table 1.3 Classification of economic sectors according to changes in effective protection rates

More protected	Modest or no change	Liberalised
Finance & insurance	Electricity, gas & steam	Basic iron & steel
Agriculture, forestry & fishing	Machinery & equipment	Motor vehicles, parts & access
Gold & uranium ore mining	Wholesale & retail trade	Paper & paper products
Other mining	Metal products excluding machinery	Basic chemicals
Food	Other chemicals & man-made fibres	Basic non-ferrous metals
Textiles	Coal mining	Electrical machinery
Tobacco	Transport & storage	Wearing apparel
Leather & leather products	Beverages	Plastic products
	Non-metallic minerals	Other industries
	Coke & refined petroleum products	TV, radio & communication equipment
	Printing, publishing & recorded media	Furniture
	Medical, dental & other health & veterinary services	Glass & glass products
	Wood & wood products	Footwear
	Rubber products	Professional & scientific equipment
	Building construction	
	Other transport equipment	

Source: Fedderke and Vaze (2001)

Table 1.4 Average percentage changes in labour productivity and real labour cost in the three aggregate mining sectors of South Africa, 1970-1997

Sector	Avg % change in:	1970-75	1975-80	1980-85	1985-90	1990-95	1995-97
Coal	Labour productivity	3.19	7.95	11.27	-1.39	4.02	5.96
	Real cost of labour	3.98	-2.46	21.02	3.57	-0.94	10.91
Gold & uranium	Labour productivity	-4.47	-4.61	-4.31	-1.22	6.09	-1.28
	Real cost of labour	-8.55	-9.30	6.81	9.31	10.03	-0.59
Diamond & other	Labour productivity	2.40	0.58	5.64	1.19	5.11	8.58
	Real cost of labour	6.61	-4.88	14.70	3.98	2.17	15.58

Source: Fedderke and Pirouz (2002)

Table 1.5 Testing for spill-over effects in TFP

Dependent variable: Growth in Total Factor Productivity			
Regressors	Spill-over effects	Regressors	Schumpeterian effects
$\frac{\dot{K}}{K}$	-0.004* (0.000)	R&D	0.02* (0.01)
WENROL	-0.03 (0.34)	WENROL	-0.67* (0.30)
TOTENROL	-0.12* (0.04)	TOTENROL	-0.09 (0.05)
MATHPRP	0.11* (0.04)	MATHPRP	0.02 (0.04)
DEGREE	-0.1 X10 ⁻⁴ * (0.1X10 ⁻⁵)	DEGREE	-0.1 X10 ⁻⁵ (0.1X10 ⁻⁵)
NESDEG	0.00 (0.00)	NESDEG	-0.1 X10 ⁻⁵ (0.1X10 ⁻⁵)
NESDEGPRP	0.79* (0.32)	NESDEGPRP	1.00* (0.39)
APPCAP	13.82 (15.13)	APPCAP	-50.75* (19.52)
LnPATENT	0.01* (0.004)	LnPATENT	0.02* (0.00)

Source: Fedderke (2001c)

Notes: Figures in parentheses denote standard errors.

* denotes statistical significance at the 5% level.

WENROL denotes the primary and secondary school enrolment rate for 'whites', TOTENROL the primary and secondary school enrolment rate for all population groups, MATHPRP the proportion of matriculants sitting mathematics, DEGREE the total number of degrees issued by universities, NESDEG the number of degrees issued in the natural, engineering and mathematical sciences (NES), NESDEGPRP the proportion of NES degrees issued, APPCAP the per capita apprenticeship contracts issued, PATENT the number of patents registered, and R&D denotes an indicator of research and development expenditure

Table 1.6 Per capita publication unit output by university, 1989-94

	1989	1990	1991	1992	1993	1994	Rank1989	Rank1994
Wits	1.17	1.09	0.78	0.83	0.74	0.84	1	3
Cape Town	1.04	0.98	0.93	0.93	0.89	0.91	2	1
RAU	0.92	0.82	0.71	1.03	1.00	0.89	3	2
Natal	0.68	0.59	0.58	0.49	0.65	0.56	4	5
Rhodes	0.59	0.56	0.49	0.47	0.43	0.47	5	6
Stellenbosch	0.55	0.49	0.45	0.51	0.50	0.65	6	4
Pretoria	0.51	0.50	0.43	0.47	0.48	0.45	7	7
Free State	0.41	0.43	0.41	0.37	0.40	0.39	8	8
Potch	0.40	0.45	0.35	0.41	0.36	0.36	9	9
UPE	0.38	0.29	0.34	0.33	0.22	0.28	10	10
Medunsa	0.26	0.14	0.23	0.07	0.16	0.12	11	15
UNISA	0.24	0.25	0.24	0.25	0.23	0.25	12	11
UDW	0.20	0.19	0.21	0.22	0.18	0.24	13	12
Vista	0.15	0.10	0.11	0.11	0.09	0.09	14	17
UWC	0.14	0.09	0.11	0.13	0.20	0.22	15	13
Zululand	0.14	0.08	0.12	0.14	0.12	0.16	16	14
North	0.10	0.11	0.08	0.08	0.11	0.10	17	16