# South Africa's International Cost Competitiveness

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***TIPS Working Paper 14_2000***

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Report Prepared for the South African Finance Department

Under USAID / Nathan Associates SEGA Project

Revised January 2000

**Summary**

The purpose of this paper is to assess South Africa's international price and cost competitiveness, particularly with regard to labor costs, and to examine the quantitative relationships between South African cost competitiveness and trade performance.

South African export and investment performance improved markedly during the 1990s, particularly the post-1994 period, coinciding with the demise of Apartheid, the ending of sanctions, and the adoption of more liberal economic policies. However, some questions remain. Although much improved, South African overall export growth still lags behind that of the most dynamic emerging economies. Moreover, the improved performance could be due to a one-time post-sanctions boom rather than a manifestation of sustained long-term competitiveness.

Competitiveness is defined narrowly here as international cost and price competitiveness, with particular attention to labor costs in manufacturing. Unit labor costs in manufacturing (labor cost per unit of output or equivalently labor cost divided by productivity) captures a key underlying determinant of competitiveness in an important subset of traded goods. We evaluate South Africa's relative and absolute competitiveness, i.e., changes over time and levels of South Africa's prices and costs compared to other countries.

Relative competitiveness essentially involves calculating real effective exchange rates (REERs). The REERs presented here differ from those of the IMF and the South African Reserve Bank (SARB) by including a larger number of developing countries, especially from Africa and Asia, and by considering a larger set of alternative price indexes. The main findings are that the choice of weights matters surprisingly little; the choice of price series, however, does have important bearing on the time path of

the REER. All REER series have similar turning points, including an improvement in South African competitiveness in the 1990s, but the magnitudes differ.

The paper then presents estimates of the absolute levels of South African wages and productivity and compares them to a wide range of developed and developing countries. The main findings are that South African labor appears to be competitive vis-à-vis most industrial countries, but South African unit labor costs are high relative to most developing countries, particularly key competitors in Asia and Latin America.

The effect of cost competitiveness on trade flows is evaluated through multivariate regressions. The regressions confirm a close visual correlation between manufacturing exports and the real effective exchange rate. It is very clear that cost competitiveness has an important effect on trade performance.

In conclusion, South Africa should stay the course on the GEAR strategy of export-led growth. It takes time for reforms to have their full effects. But more outward-oriented policies have already paid dividends in the form of strong growth of manufactured exports and increased foreign direct investment. The improvement in international competitiveness in the 1990s has been an important factor in spurring the growth of manufactured exports. Nevertheless, South African unit labor costs remain high compared to most developing countries. There is certainly no room to increase real wages faster than productivity. On the contrary, wage moderation and/or continued real rand depreciation (uncompensated by inflation) are necessary to gain competitiveness vis-à-vis other emerging markets. It should be recognized, however, that macroeconomic competitiveness achieved by real depreciation of the rand by itself is insufficient to resolve the unemployment problem. Labor market rigidities, crime and educational inadequacies must also be tackled directly. These microeconomic reforms would complement improved

international competitiveness in leading South Africa towards fulfilling the objectives of the GEAR strategy.

## I. Issues

Under the GEAR (Growth, Employment and Redistribution) strategy, initiated in 1996, the South African government embarked on a bold attempt to overhaul its economic policies in ways that mirror and complement the dramatic political changes of post-Apartheid South Africa. In place of the inward-looking and interventionist policies of the Apartheid era, GEAR makes the private sector the engine of growth and seeks fuller integration into the world economy. The government has committed itself to liberalization and privatization, while reprioritizing public expenditure towards public goods and income distribution, all while maintaining prudent macroeconomic policies. In particular, the South African government has substantially liberalized international trade with the hope of expanding employment through export-led growth and higher foreign direct investment.

International competitiveness is thus an important pillar of the GEAR strategy. So far, however, the growth rates of exports and of foreign direct investment, while substantial, have been less than policymakers had hoped for. Exports of manufactures have increased but not by enough to generate an export-led growth boom similar to those of East Asia and a few other dynamic emerging economies. Moreover, South African manufactured exports are relatively capital intensive and imports of manufactured goods have increased markedly. Unemployment has worsened from already high levels, and some estimates of the unemployment rate are as high as 40%. Real wages have continued to rise in the face of this very high unemployment. These developments are all suggestive of labor market rigidities, which some studies have identified as important in South Africa (World Economic

Forum competitiveness rankings for example).[1] Economic theory suggests that trade liberalization can increase unemployment if real wages are rigid.[2] If this is so, one might expect to find that South African labor costs are high relative to other countries, impairing international competitiveness and adjustment to trade liberalization. Consequently, the purpose of this paper is to assess South Africa's international price and cost competitiveness, particularly with regard to labor costs, and to examine the quantitative relationships between South African cost competitiveness and trade flows.

Section II presents an overview of South Africa's recent trade performance. Section III reviews the theory of international competitiveness. Section IV presents estimates of South Africa's relative cost competitiveness, while section V tackles the more difficult subject of absolute competitiveness. Section VI relates the competitiveness indicators to trade flows. Section VII concludes with policy implications.

## II. Overview of South African Trade Performance

Figure 1 shows South African growth of exports of goods and services, in constant $US, in comparison with other "emerging market economies" and the world as a whole, for various periods.[3] Prior to 1995, South Africa's trade grew

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[1] For more detailed discussions of South Africa's labor markets and the controversy over labor market rigidities, see Nattrass (1998) and Fallon and Lucas (1998).

[2] For example, Harry Johnson's (1965) classic treatment of international trade in the presence of factor-market rigidities.

[3] Figure 1 shows exports in constant dollars. This is not the same as trade volumes, but it removes the effect of world inflation. Trade volume data is

much more slowly than the rest of the world. In the 1980s and early 1990s, South Africa's exports in constant dollars increased by 1-2 per cent annually, while world trade was increasing by about 5%. Some developing and newly-industrialized countries had export volume growth rates of 10% or more during part or all of this period. In 1995-97, however, South Africa's annual export growth rate jumped to nearly 9 per cent, slightly exceeding the world average. South Africa's export growth slowed sharply in 1998, but so did world trade, due to the Asian crisis (internationally comparable data are not yet fully available for 1998).

Figure 2 presents growth rates of manufactured exports, in current $U.S. South Africa had a dismal performance in the 1980s, with manufactured exports actually declining in nominal dollar terms, while some Asian countries had annual growth rates in excess of 20 per cent and many others had growth rates of more than 10 per cent. In the early 1990s, South African exports of manufactures boomed with a growth rate of above 20 per cent, which was in the vicinity of those of the most dynamic emerging economies. Thus the slow growth of overall South African exports in the early 1990s masked a structural shift from primary commodities towards manufactures. In 1995-97, the growth rate of manufactured exports fell in absolute terms but remained favorable compared to other emerging economies shown in Figure 2 (below Mexico, Malaysia and China, but greater than Mauritius, Brazil, Chile, Thailand, and India).

Inflows of foreign direct investment (FDI) into South Africa have increased in recent years. In 1997, net inflows reached 1.3 per cent of GDP, the highest level recorded over the 1975-1997 period. Figure 3 displays comparisons of foreign direct investment net inflows, as a share of GDP. Despite the recent increases, South

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less reliable and often not available for recent years for some countries. The source for all data in Figures 1-3 is World Bank World Development Indicators on CD-ROM.

African FDI inflows remain low compared to such countries as Chile, China, Malaysia and Mexico. Also, FDI inflows into South Africa declined sharply in 1998, as they apparently did for many emerging markets, because of the Asian financial crisis and its repercussions.

Figure 1
Exports of Goods and Services,
Average Annual Growth Rate
(Constant $US, %)

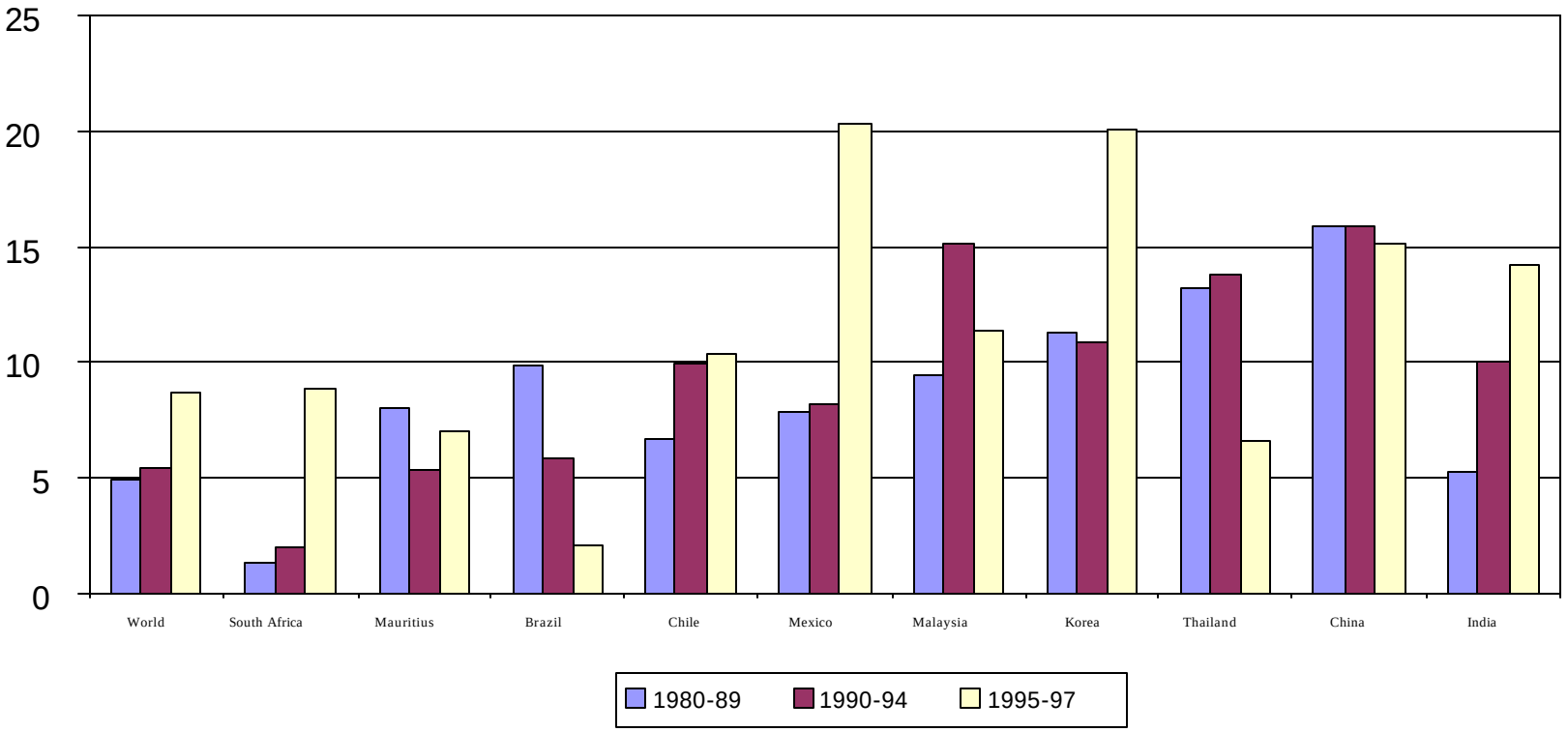


Figure 2
Exports of Manufactures,
Average Annual Growth Rate
(Current $US,%)

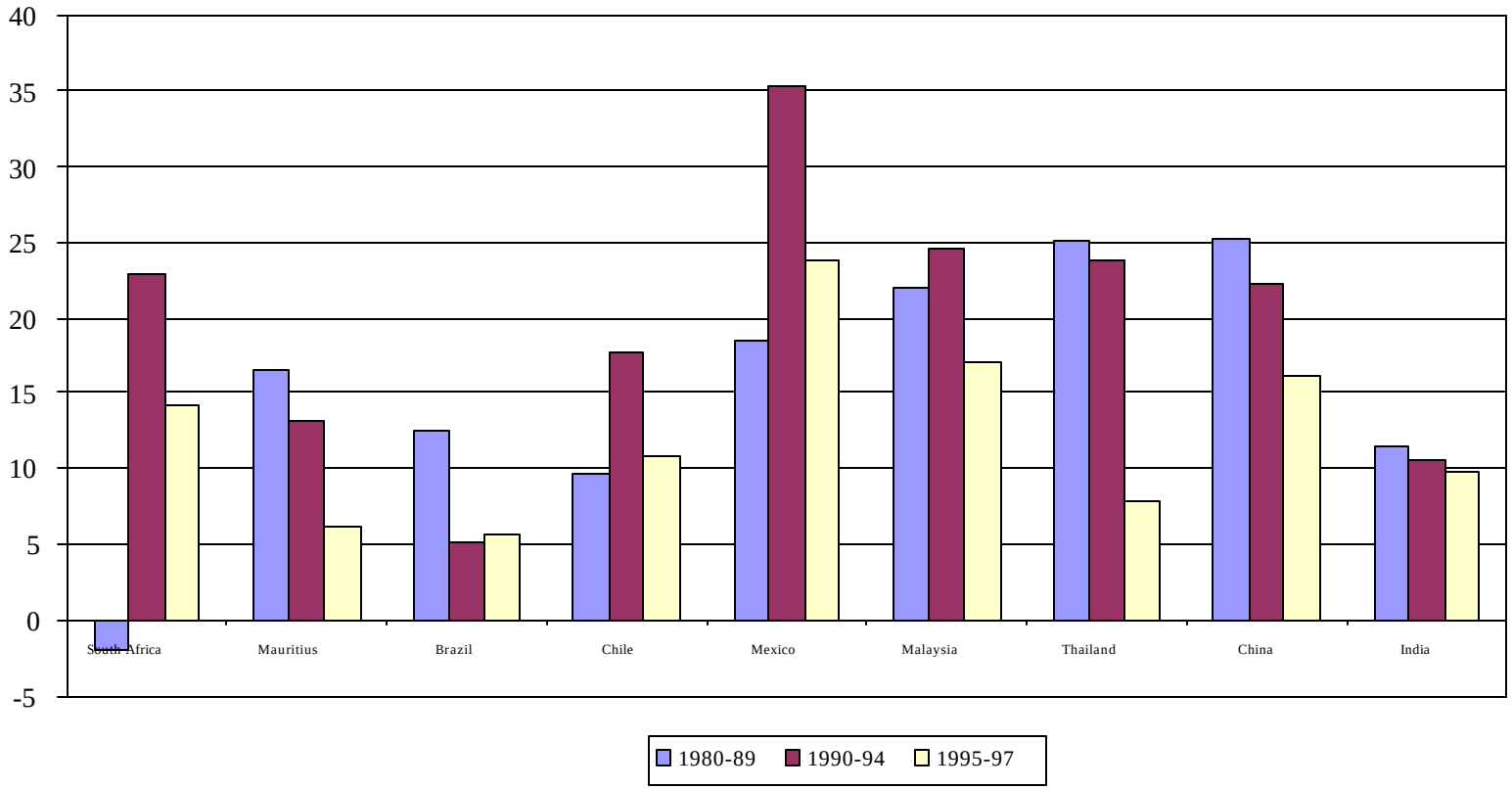
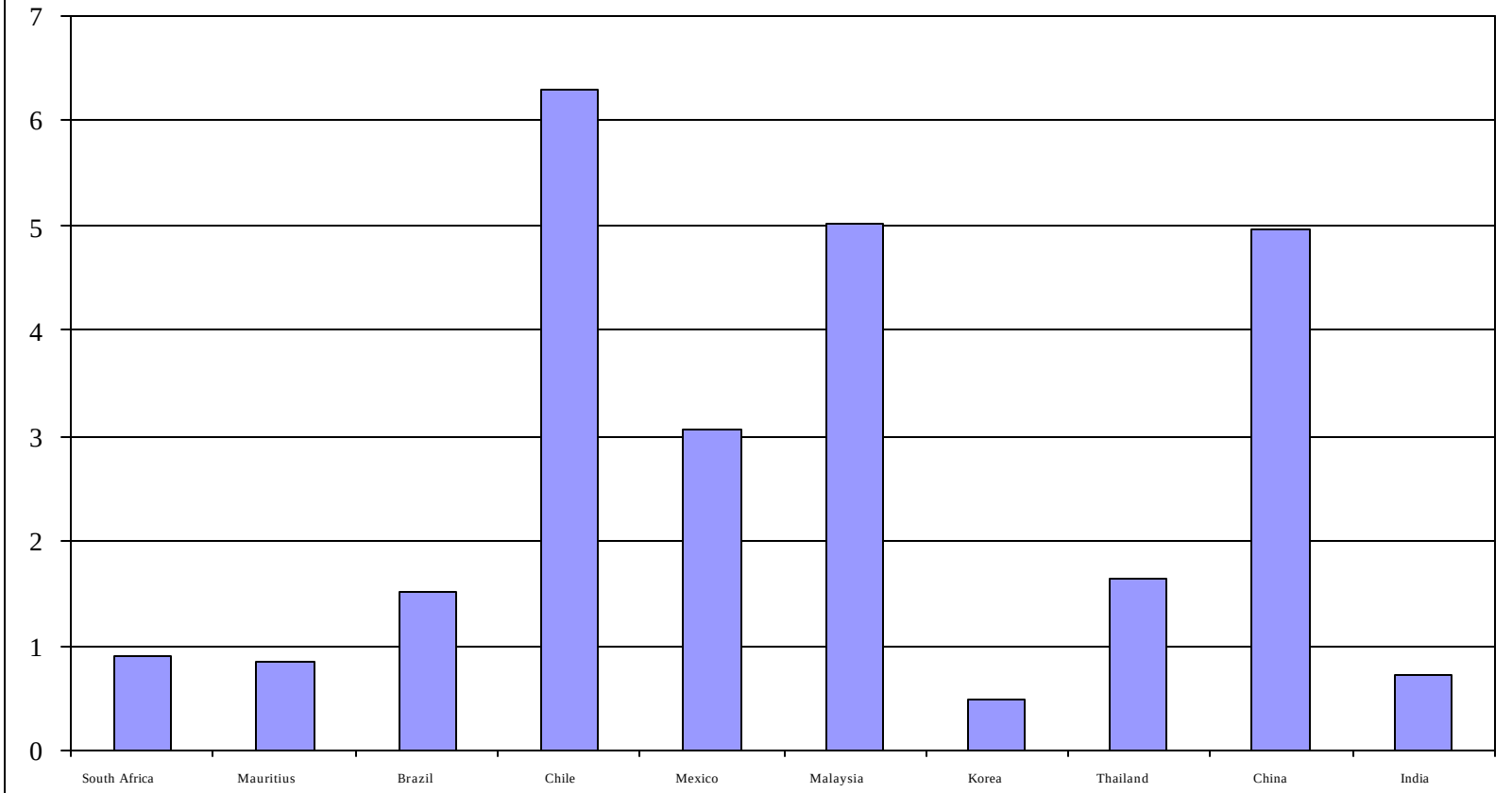


Figure 3
Foreign Direct Investment Inflows, 1995-97 average Percent of GDP



In summary, South African export and investment performance has improved markedly during the 1990s, particularly the post-1994 period, coinciding with the demise of Apartheid, the ending of sanctions, and the adoption of more liberal economic policies. However, some questions remain. Although much improved, South African overall export growth and FDI inflows still lag behind those of the most dynamic emerging economies. Moreover, the improved performance could be due to a one-time post-sanctions boom rather than a manifestation of improved long-term competitiveness. Another problem is that manufactured exports are increasingly capital-intensive, and thus fail to absorb much unemployed labor (Tsikata 1998). We approach these issues through an assessment of South African international competitiveness, particularly relating to labor costs.

## III. Review of International Competitiveness Theory

### III.1. What is Competitiveness Anyway?

"International competitiveness" is a much-used phrase whose meaning is not always clear. Krugman (1994) goes so far as to claim that competitiveness is a dangerous obsession when applied to countries, as opposed to companies. Krugman correctly points out that countries are not in direct competition with each other in the way that Coca Cola and Pepsi Cola are, and international trade is not a zero-sum game. Nevertheless, meaningful use of the term competitiveness is possible. In the larger sense, competitiveness can be defined as a favorable business climate, sometimes measured by a composite score of a series of indicators : structural and macroeconomic policies, basic infrastructure, education, labor market rigidities, etc. This is the approach of the World Economic Forum's competitiveness rankings. While these rankings are somewhat arbitrary they do often capture features of the broad business climate.

One can define competitiveness more narrowly as international cost and price competitiveness, which is measured by comparisons of prices or costs across countries in a common currency, i.e. the real exchange rate. We will focus on this narrower definition of competitiveness, particularly the real exchange rate based on relative unit labor costs, which reflects international differences in labor costs and labor productivity (Turner and Golub 1997). There are some connections between this narrow conception of competitiveness and the broader notion of the overall business climate.

### III.2. Price and Cost Competitiveness[4]

Price competitiveness may be defined as the relative price of foreign in terms of domestic tradable goods. In this usage, a country's competitiveness "improves" if the relative price of its tradable goods declines. The nominal exchange rate alone is clearly an unsatisfactory indicator of competitiveness, since movements in relative prices also matter. Instead, competitiveness is better measured by the real exchange rate $q = ep/p^*$, which adjusts the nominal exchange rate $e$ (foreign currency per unit of domestic currency) by domestic and foreign prices ($p$ and $p^*$ respectively).[5]

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[4]This section draws on Turner and Golub (1997). For more background see also Marsh and Tokerick (1994), Turner and Van't Tack (1993), Wickam (1993), Durand and Giorno (1987) and McGuirk (1987). For discussions relating to South Africa see IMF (1998), Kahn (1998) and Walters and De Beer (1999).

[5]Real exchange rates often refer to the relative price of tradeable and non-tradeable goods within a country, rather than on the relative price of domestic to foreign goods. The focus here, however, is on international competitiveness across countries, so we do not further discuss the traded / non-traded goods measures of real exchange rate in this paper. For further discussion of this issue see Turner and Van't dack (1993, section V.) and Wickam (1993), and Kahn (1998) for South Africa.

Often, $e$ and $p^*$ are weighted-average measures, with weights based on the domestic country's pattern of trade, as discussed further below.

The underlying theoretical model justifying a focus on the relative price of tradable goods across countries assumes that foreign and domestic tradable goods are imperfect substitutes and/or that adjustment of $q$ to its long-run equilibrium value takes time because of market imperfections of various sorts.[6] If traded goods were perfect substitutes and adjustment instantaneous, purchasing power parity would hold at all times, i.e., $q$ would be constant, and competitiveness indicators would show no variation over time if measured correctly.[7] This framework therefore applies to international trade in differentiated manufactured goods (and increasingly trade in services), where there are known departures from the law of one price.[8] In contrast, for most primary products, which are homogeneous and traded in well-organized markets, the law of one price holds much more closely.

International price and cost competitiveness is an important determinant of trade flows. If South African competitiveness improves, foreign demand for South African products should rise, as they become less expensive in foreign markets, while South African demand for imports would be expected to drop, as the latter become more expensive to South African buyers. In addition, in a world of high capital mobility, cost-competitiveness may be a determinant of foreign direct investment flows. Footloose industries will tend to locate where unit costs of non-tradable inputs, particularly labor, are low. Costs of tradable inputs such as raw

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[6]See McGuirk (1987) for discussion of theoretical foundations.

[7]Even if the law of one price holds for all goods separately, aggregate price indexes could still diverge due to differences in weights across countries. But such changes would not reflect movements in competitiveness.

and $p^*$

should also be exogenous with respect to the exchange rate and represent equilibrium values, rather than temporary movements associated with "pricing to market" or other short-run influences. In practice such equilibrium traded-goods price indexes are not observable. The available alternatives are consumer price indexes (CPIs), wholesale price indexes (WPIs), GDP deflators, export and import unit values, and unit labor costs. As is well recognized in the literature, each of these measures has its pros and cons.

The main problem shared by CPIs, WPIs and GDP deflators is that they include non-traded goods as well as traded goods. If traded and non-traded goods prices diverge over time, as they often do for various reasons such as differential sectoral productivity growth, aggregate price indexes could be very misleading indicators of the prices of traded goods. The CPI-based measures have some

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[8]Isard (1976) for example showed sustained departures from the law of one

advantages relative to WPIs and GDP deflators. CPIs are more similar across countries than WPIs and GDP deflators, and as the most common basis for measuring inflation, are available for more countries on a timely basis. On the other hand, CPIs may be poor measures of equilibrium traded goods prices and are endogenous to the exchange rate. First, CPIs may be distorted by price controls and excise taxes, and thus diverge from the underlying domestic cost of production. Second, CPIs may not accurately reflect the prices of intermediate goods, which represent an increasingly important part of trade in manufactures. Third, a relative decline in the CPI associated with "pricing to market" may not signify an improvement in competitiveness, but rather a temporary reduction in profit margins. Fourth, CPIs are endogenous to the exchange rate since they include import prices, and therefore understate changes in competitiveness. For example, if country j's currency depreciates, its import prices rise, pushing up its CPI and reducing the extent of j's real depreciation.

Relative export and / or import unit values have the advantage of excluding non-traded goods, but have other deficiencies. Export and import prices may be heavily influenced by short-run pricing to market and are not exogenous to the exchange rate. Also, they may be heavily weighted with prices of primary products. They may fail to reflect the endogenous effects of international competitiveness on the composition of the goods that are exported and imported, and consequently on the observed prices of exports and imports. Also, in most cases they are average values rather than actual prices and may be distorted by composition effects. In addition, data are not available on a timely basis for many countries, including South Africa.

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price across countries even for very similar manufactured products.

Unit labor costs in manufacturing (labor cost per unit of output or equivalently labor cost divided by output per worker) capture a key underlying determinant of competitiveness in an important subset of traded goods. By focusing on costs rather than prices, unit labor costs avoid some of the endogeneity problems of the CPI and export price measures. Labor costs are less directly subject to direct exchange-rate effects than traded-goods prices. Unit labor costs have several limitations, however. First, data on labor productivity and labor compensation, both of which are needed to compute unit labor costs, are not always reliable and available on a timely basis. Second, these measures are not widely available for services, which constitute a growing although still secondary component of international trade. Third, labor productivity may exhibit short-run counter-cyclical movements, as firms "hoard" labor in recessions. This problem can be partially overcome by filtering, however. Fourth, unit labor costs ignore other costs of production, notably intermediate goods, non-labor taxes, and capital costs. Similarly, movements in unit labor costs may sometimes reflect factor substitution rather than changes in efficiency. For example, an increase in the capital stock may raise the productivity of labor and reduce unit labor costs without necessarily improving competitiveness, since capital now represents a higher share of unit costs. But, as noted earlier, to the extent that capital and intermediate goods are traded in international markets whereas labor remains largely immobile internationally, labor costs are likely to diverge much more across countries than other costs of production, and therefore play a disproportionately important role in competitiveness. Moreover, especially in the advanced economies and increasingly also in emerging market countries, manufactures constitute a large part of trade. Turner and Van't dack's (1993, p. 112) comprehensive survey of competitiveness indicators concludes that for industrial countries, "relative unit labor costs in manufacturing is probably the best single indicator". Competitiveness measures based on unit labor costs are also particularly attractive if the focus is on emerging economies that are major exporters of manufactures, as South Africa is to some

extent. Also, as discussed earlier, other symptoms of labor market rigidities in South Africa suggest the salience of labor costs in the determination of competitiveness.

### III.2.2. Weighting Scheme in the Real Effective Exchange Rate

The real effective exchange rate $REER_i$ for country $i$ is normally calculated as a geometric weighted average of bilateral real exchange rates:

(1) $$REER_i = \prod_{i \neq j} \left( \frac{p_i e_{i1}}{p_j e_{j1}} \right)^{x_{ij}}$$

where $e_j$ denotes the exchange value of country j's currency against the U.S. dollar, $x_{ij}$ is country $j$'s weight in country $i$'s index, and $p_j$ is the price index of country $j$. Under this definition, a rise in REER represents a real appreciation of the domestic currency.

Much of the work in computation of real exchange rates has been done at the International Monetary Fund. The choice of weights has been the subject of extensive research at the Fund, and the current system is reviewed in detail in Zanello and Desruelle (1997). The IMF weights are based on a complex formula involving exports, imports, and domestic production in such a way as to capture both bilateral trade and competition with third countries. The IMF calculates real effective exchange rates based on unit labor costs (REER-ULCs) for industrial countries. Recently, Turner and Golub (1997) made an attempt to extend the IMF REER-ULCs to a large number of newly industrializing countries. For REER-ULCs, weights are based on manufactured goods, since the unit labor costs are for manufacturing. The IMF also calculates CPI-based real exchange rates for almost all countries (REER-CPI). For REER-CPIs, the weights are based on trade in non-oil primary products and tourism as well as manufactured goods.

The IMF weights $x_{ij}$ are themselves an average of export and import weights. The import weights are simply equal to import shares, i.e, the import weight given to the United States in South Africa's REER is the U.S. share of total South African imports. Export weights take into consideration competition in third markets. For example for South Africa, the IMF weight given to the United States is not equal to the share of South African exports going to the United States, but attempts to incorporate the effects of South African competition with the United States in Japan, Europe, etc. As we will see below, however, the IMF procedure does not seem to fully reflect the nature of competition that South Africa faces in world markets. This may be related to the problem that the IMF procedure for computing export weights is extremely laborious and consequently does not include many countries. In any event, the weighting scheme turns out to have surprisingly little impact on the computed REERs for South Africa, as shown below.

### III.2.3 Relative versus Absolute Unit Labor Costs Comparisons

The above-discussed REER measures are indexes revealing changes over time relative to a base year, rather than comparisons of absolute levels of costs or prices between countries. Some attempts to compare levels of unit labor costs across countries have been undertaken (Golub 1999). Absolute measures are more difficult to obtain and are subject to greater measurement error, but are potentially more informative.

Following the methodology of Golub (1999), this paper will assess the absolute level of South African unit labor costs relative to other countries.

The unit labor requirement of industry i in country j is

(2) $$a_{ij} = \frac{L_{ij}}{Q_{ij}}$$

where $Q$ is real value added and $L$ employment. $a_{ij}$ is the inverse of productivity ($Q/L$).

Unit labor cost for sector i in country j is by definition

(3) $$ULC_{ij} = w_{ij} \cdot a_{ij}$$

where $w_{ij}$ is the wage rate, or more precisely labor cost inclusive of fringe benefits. Alternatively stated, unit labor costs are equal to the ratio of wages to productivity.

Country j's competitiveness vis-à-vis country k in sector i depends on differences in productivity, wages across countries and the bilateral exchange rate ($e_{jk}$), which together determine the relative unit labor cost of production $c_{ijk}$ in a common currency

(4) $$c_{ijk} = \frac{a_{ij} w_{ij}}{a_{ik} w_{ik} e_{jk}} .$$

Relative unit labor cost can be transformed by multiplying and dividing by the purchasing-power parity exchange rate $ppp_{jk}$, thus yielding equation (5).

(5) $$c_{ijk} = \frac{a_{ij} w_{ij}}{a_{ik} w_{ik} e_{jk}} = \frac{a_{ij}}{a_{ik}} \cdot \frac{w_{ij}}{w_{ik} ppp_{jk}} \cdot \frac{ppp_{jk}}{e_{jk}} .$$

Equation (5) breaks down relative unit labor cost into three components: relative productivity, relative wages, and the exchange rate relative to its equilibrium or purchasing power parity level.

Sectoral or global competitiveness can be studied on the basis of equation (4) or (5). Note also that these equations can also serve as a sort of link between the broad and narrow concepts of competitiveness: the general business climate has an important effect on productivity and hence relative costs. Poor infrastructure, burdensome regulations, inadequate education will all negatively impact labor productivity, while labor-market rigidities could affect wages. Thus, cost competitiveness is an important component of competitiveness in the broader sense of the overall business climate.

## IV. South African Real Effective Exchange Rate Indexes

### IV.1 Weights

Table 1 compares South Africa's trade pattern in 1996 with the weights in the IMF CPI-based real effective exchange rate (CPI-REER) and the revised South African Reserve Bank (SARB) real effective exchange rates.[9] The first 3 columns of Table 1 show the IMF REER-CPI weights, the weights in the SARB REER index before it was revised in 1999, and the new SARB weights. The next 4 columns display South Africa's 1996 exports and imports for total merchandise trade and manufactured goods respectively. The most striking aspect of Table 1 is the low weight that both the IMF and the SARB give to developing countries, and especially Africa. The older SARB index gave no weight at all to developing countries, and the

[9] See also IMF (1998) for a discussion of the weights in South Africa's REER.

developing country weights in the IMF REER-CPI add up to less than 6 percent, with zero to Africa. The revised SARB index increases the developing-country weights to about 12 percent, including 2.3 percent for Zimbabwe, but this is still way below the actual South African trade with developing countries in general and Africa in particular. In 1996, fully 40 percent of South African exports were to developing countries with 17 per cent going to Africa and 13 percent to Asia. For manufactured exports, these shares are even higher: about 45 percent to all developing countries, 21 percent to Africa and 17 percent to Asia. Between 1988 and 1996, the share of South African exports going to developing countries expanded by about 10 percentage points. In 1997-98 this share fell back about 5 percent, as exports to Asia declined sharply in the wake of the financial crisis. For imports, the shares of developing countries are lower, but still above those of the SARB and the IMF.

Table 1

**IMF and SARB Weights Compared to South Africa 1996 Trade Pattern**[a]

| | IMF | New SARB | Old SARB | SA Total Exports | SA Total Imports | SA. Manufact Exports | SA Manufact Imports |
|---|---|---|---|---|---|---|---|
| **Developed countries** | **94.3%** | **88.2%** | **100.0%** | **59.6%** | **72.0%** | **55.4%** | **79.0%** |
| ECU | 46.4% | 35.7% | 31.6% | 20.4% | 30.8% | 18.7% | 34.4% |
| United States | 11.6% | 15.2% | 42.8% | 9.8% | 13.0% | 8.2% | 13.6% |
| United Kingdom | 11.6% | 14.9% | 16.7% | 13.3% | 11.7% | 16.0% | 13.1% |
| Japan | 14.5% | 10.3% | 8.9% | 8.7% | 8.3% | 5.3% | 9.4% |
| **Developing countries** | **5.7%** | **11.8%** | **0.0%** | **40.4%** | **28.0%** | **44.6%** | **21.0%** |
| **Africa** | **0.0%** | **2.3%** | | **17.3%** | **2.7%** | **21.3%** | **1.9%** |
| **ESSADEC** | **0.0%** | **2.3%** | | **13.5%** | **1.8%** | **16.6%** | **1.2%** |
| Zimbabwe | | 2.3% | | 5.4% | 1.0% | 7.2% | 0.9% |
| **Asia** | **4.1%** | **8.3%** | | **15.2%** | **13.5%** | **14.9%** | **16.6%** |
| China | | 3.1% | | 0.8% | 2.2% | 2.4% | 0.4% |
| Hong Kong | 2.3% | 2.6% | | 2.6% | 1.6% | 3.2% | 1.8% |
| Korea | | 2.6% | | 2.9% | 2.0% | 2.7% | 2.3% |
| Singapore | | 1.6% | | 1.7% | 1.2% | 2.3% | 1.3% |
| Taiwan | 1.9% | | | 3.2% | 3.2% | 3.5% | 3.6% |
| **Other** | **1.6%** | **1.2%** | | **7.9%** | **11.7%** | **6.8%** | **4.2%** |
| Israel | | 1.2% | | 1.2% | 2.1% | 1.6% | 0.7% |
| Brazil | 1.6% | | | 1.7% | 3.1% | 2.2% | 1.1% |

[a]The first 3 columns show the IMF REER-CPI weights, the weights in the SARB REER index before it was revised in 1999, and the new SARB weights. The next 4 columns display South Africa's 1996 trade pattern for all goods and manufactured goods.

Sources: International Monetary Fund, South African Reserve Bank, TIPS, IDC. For more details see the data Appendix.

The low weights assigned to developing countries by the IMF and the SARB may partially reflect the way competition in third markets is incorporated. For example, Europe's export weight in South Africa's IMF REER is higher than export shares indicate, to the extent that Europe has a large share of the African market, and thus is construed to be South Africa's main competitor not only in Europe itself but also in Africa. It is hard to see how this effect could be important enough to diminish the weight on developing countries as much as the IMF and SARB weights indicate, however, since the latter are even below import shares. Moreover, the way that the IMF incorporates the effects of export competition in third markets can be criticized for South Africa. It might make more sense to increase rather than lower the export weight given to medium-income developing countries relative to actual export shares, to the extent that these countries are likely to produce manufactured goods that compete with South Africa's manufactured exports. Many of the European exports to South Africa and other African countries, on the other hand, may be higher-technology goods that do not in fact compete with South African actual or potential exports. In any event, the weight assigned to developing countries in the IMF and SARB indexes seems too low. In view of the uncertainty of how to deal with competition in third markets, I elected to simply use actual 1996 trade shares, alternatively using various combinations of 1) total merchandise trade and trade in manufactured goods, and 2) exports, imports or an average of the two.

Table 2 shows the countries that are included in the REER calculations for this paper. Of the countries shown in Table 2, not all are included for any particular price series, due to missing data, but in all cases the number of developing countries included is much higher than for the IMF and SARB weighting schemes. The countries included for each separate REER series are listed in Table 3. Developing countries are still under-represented relative to actual South African trade, but by much less than in the cases of the IMF and SARB weighting schemes.

Table 2

Countries Included in the Real Effective Exchange Rate Calculation of South Africa

**Developed**

Australia
Canada
Denmark
France
Germany
Ireland
Italy
Japan
Netherlands
Norway
Spain
Switzerland
United Kingdom
United States

**Developing**

**Asia**

China
Hong Kong
India
Indonesia
Malaysia
Singapore
South Korea
Taiwan
Thailand

**Africa**

Ghana
Kenya
Madagascar
Malawi
Mauritius
Mozambique
Nigeria
Tanzania
Zambia
Zimbabwe

**Americas**

Argentina
Brazil
Mexico

**Europe, Middle East**

Iran
Israel
Saudi Arabia
Turkey

Table 3

Countries Included in Real Effective Exchange Rate Calculations

| country | CPI | Mfg VA deflator | WPI | GDP deflator | Unit Labor Cost |
|---|---|---|---|---|---|
| Argentina | Yes | Yes | Yes | Yes | |
| Australia | Yes | Yes | Yes | Yes | Yes |
| Brazil | Yes | Yes | Yes | Yes | Yes |
| Canada | Yes | Yes | Yes | Yes | Yes |
| China | Yes | Yes | | Yes | |
| Denmark | Yes | Yes | Yes | Yes | Yes |
| France | Yes | Yes | | Yes | Yes |
| Germany | Yes | Yes | Yes | Yes | Yes |
| Ghana | Yes | Yes | | Yes | Yes |
| Hong Kong | | | | Yes | Yes |
| India | Yes | Yes | Yes | Yes | Yes |
| Indonesia | Yes | Yes | Yes | Yes | Yes |
| Iran | Yes | | Yes | | |
| Ireland | Yes | | Yes | Yes | |
| Israel | Yes | | Yes | Yes | Yes |
| Italy | Yes | Yes | Yes | Yes | Yes |
| Japan | Yes | Yes | Yes | Yes | Yes |
| Kenya | Yes | Yes | | Yes | Yes |
| Korea | Yes | Yes | Yes | Yes | Yes |
| Madagascar | Yes | Yes | | Yes | |
| Malawi | Yes | Yes | | Yes | Yes |
| Malaysia | Yes | Yes | Yes | Yes | Yes |
| Mauritius | Yes | Yes | | Yes | Yes |
| Mexico | Yes | Yes | Yes | Yes | Yes |
| Mozambique | Yes | | | | |
| Netherlands | Yes | Yes | Yes | Yes | Yes |
| Nigeria | Yes | Yes | | Yes | |
| Norway | Yes | Yes | Yes | Yes | Yes |
| Saudi Arabia | Yes | Yes | Yes | Yes | |
| Singapore | Yes | Yes | Yes | Yes | Yes |
| Spain | Yes | Yes | Yes | Yes | Yes |
| Switzerland | Yes | | Yes | Yes | |
| Tanzania | Yes | | | | Yes |
| Thailand | Yes | Yes | Yes | Yes | Yes |
| Turkey | Yes | Yes | Yes | Yes | |
| UK | Yes | Yes | Yes | Yes | Yes |
| United States | Yes | Yes | Yes | Yes | Yes |
| Zambia | Yes | Yes | | Yes | |
| Zimbabwe | Yes | Yes | | Yes | Yes |

### IV.2. Price Series

I calculated REERs for South Africa using the following price indexes: Consumer Prices (CPI), Wholesale Prices (WPI), GDP deflator, manufacturing value added deflator (VA Deflator), and unit labor costs (ULC). The IMF REER for South Africa is based on CPIs. The South African Reserve Bank (SARB) REER uses wholesale price indexes. Thus we cover most of the possibilities discussed in section III.2.1, and in addition include the manufacturing value added deflator on the grounds that it is a reasonable proxy for traded-goods prices. Export prices were not considered due to lack of data and the fact that for South Africa these prices would be strongly influenced by the prices of gold and other primary commodities, whereas the focus here is on competitiveness in manufacturing. All sources and methods are described in the data Appendix.

### IV.3 Real Effective Exchange Rates, 1970-1998

Figures 4- 6 display the CPI, WPI, and ULC-based REERs for South Africa, setting 1970 = 100. The GDP deflator and value added deflator cases are not displayed, as they show results very similar to the other three (see also Figures 8-10 for the latter). In Figures 4- 6, six alternative weighting schemes are shown: total exports plus imports, manufactured exports plus imports, total exports, total imports, manufactured exports and manufactured imports. An upward movement represents a real appreciation. There is surprisingly little variation in the REERs as the weights are varied. Recall from Table 1 that exports and especially manufactured exports are more highly oriented toward developing countries than imports. In the case of unit labor costs (Figure 6), the weights make some difference in the REERS for the 1990s: the export-weighted ULC measure shows lesser real depreciation than import-weighted ULC, reflecting declines in unit labor costs in a

number of developing countries during this period. Still, even in the case of unit labor costs, the movements of the different series are very similar.

**Figure 4**
**CPI-Based Real Effective Exchange Rate**
**Alternative Weights**

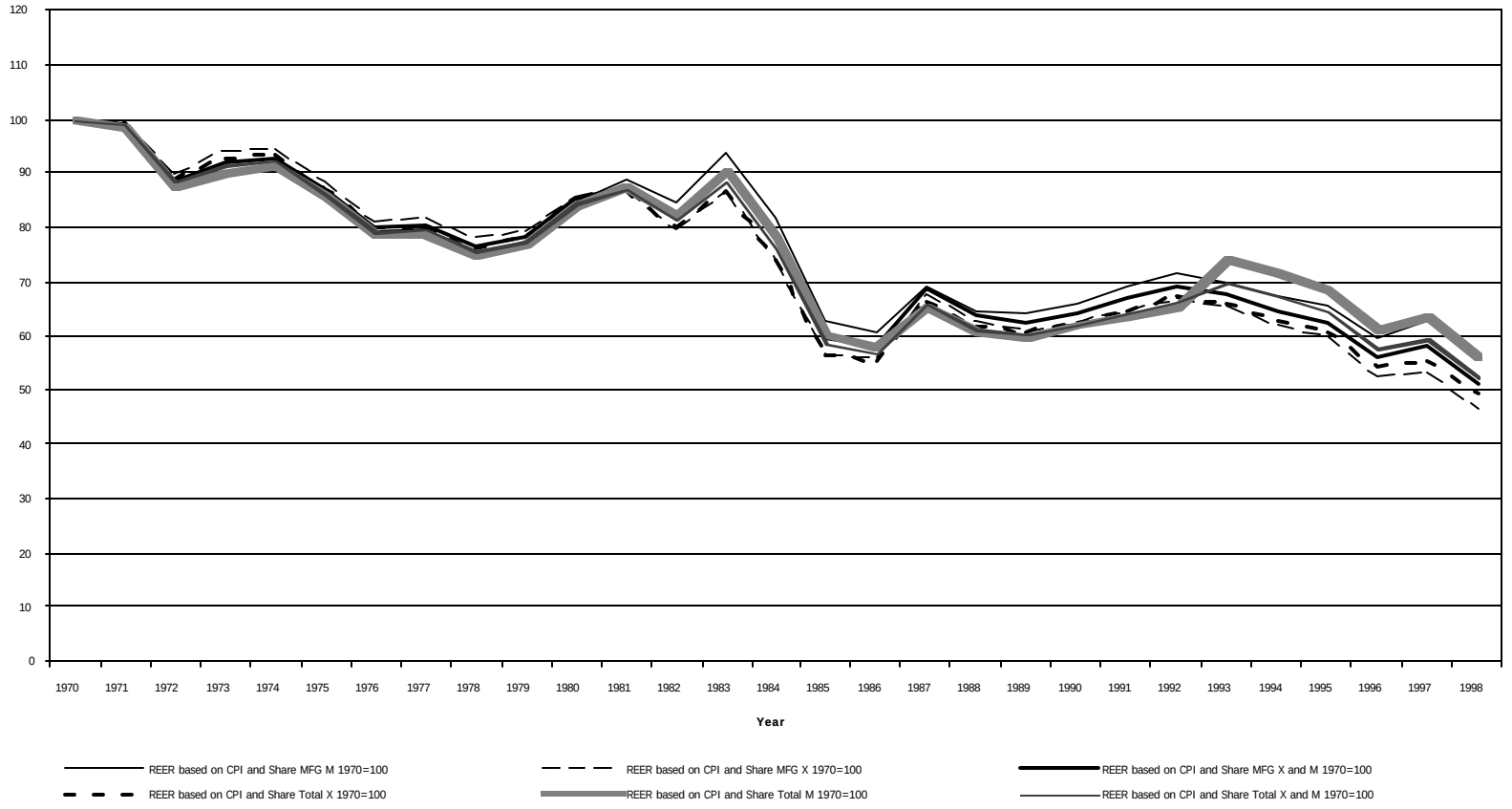


**Figure 5**
**WPI -Based Real Effective Exchange Rate**
**Alternative Weights**

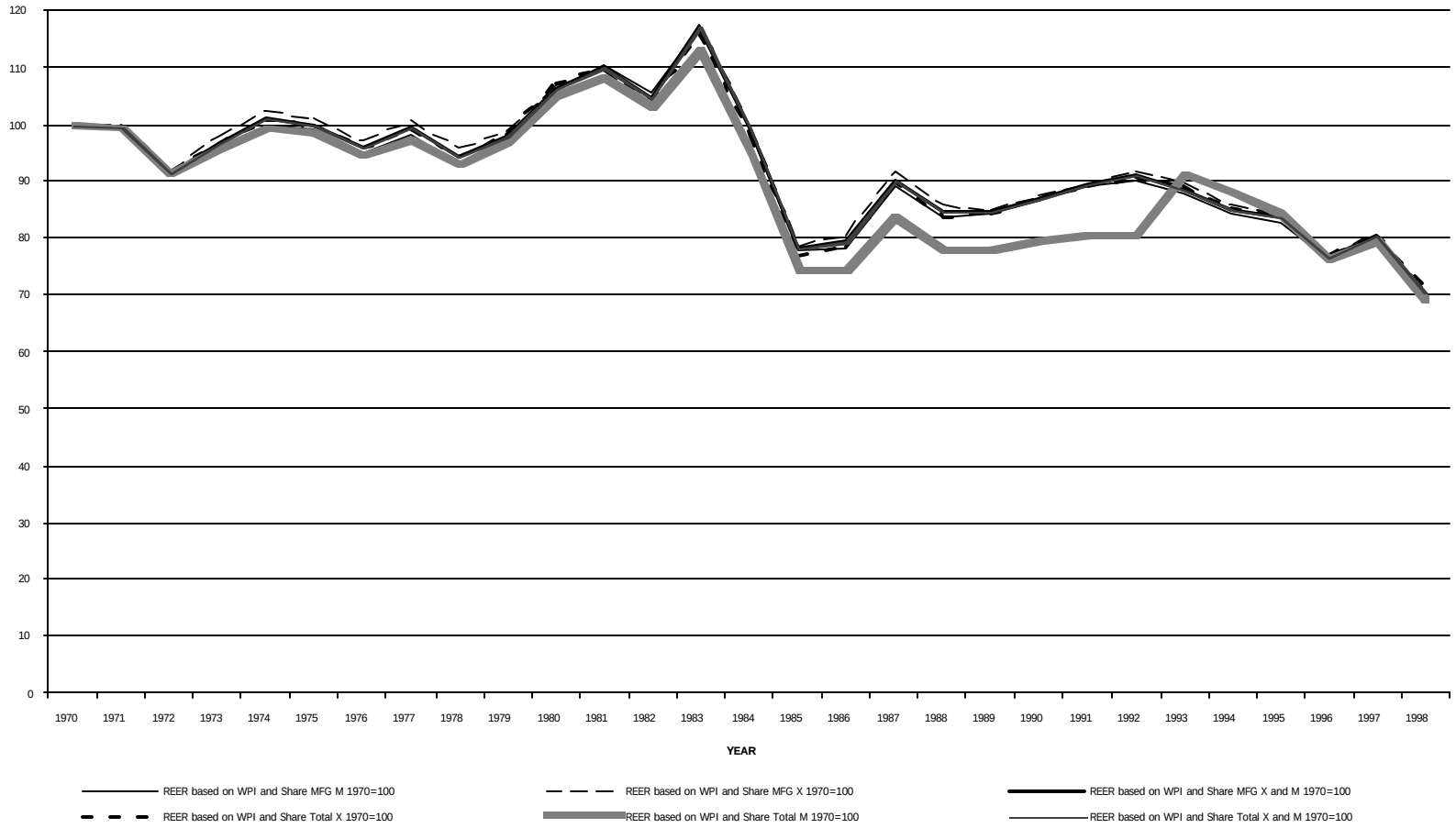


**Figure 6**
**Unit Labor Cost-Based Real Effective Exchange Rate**
**Alternative Weights**

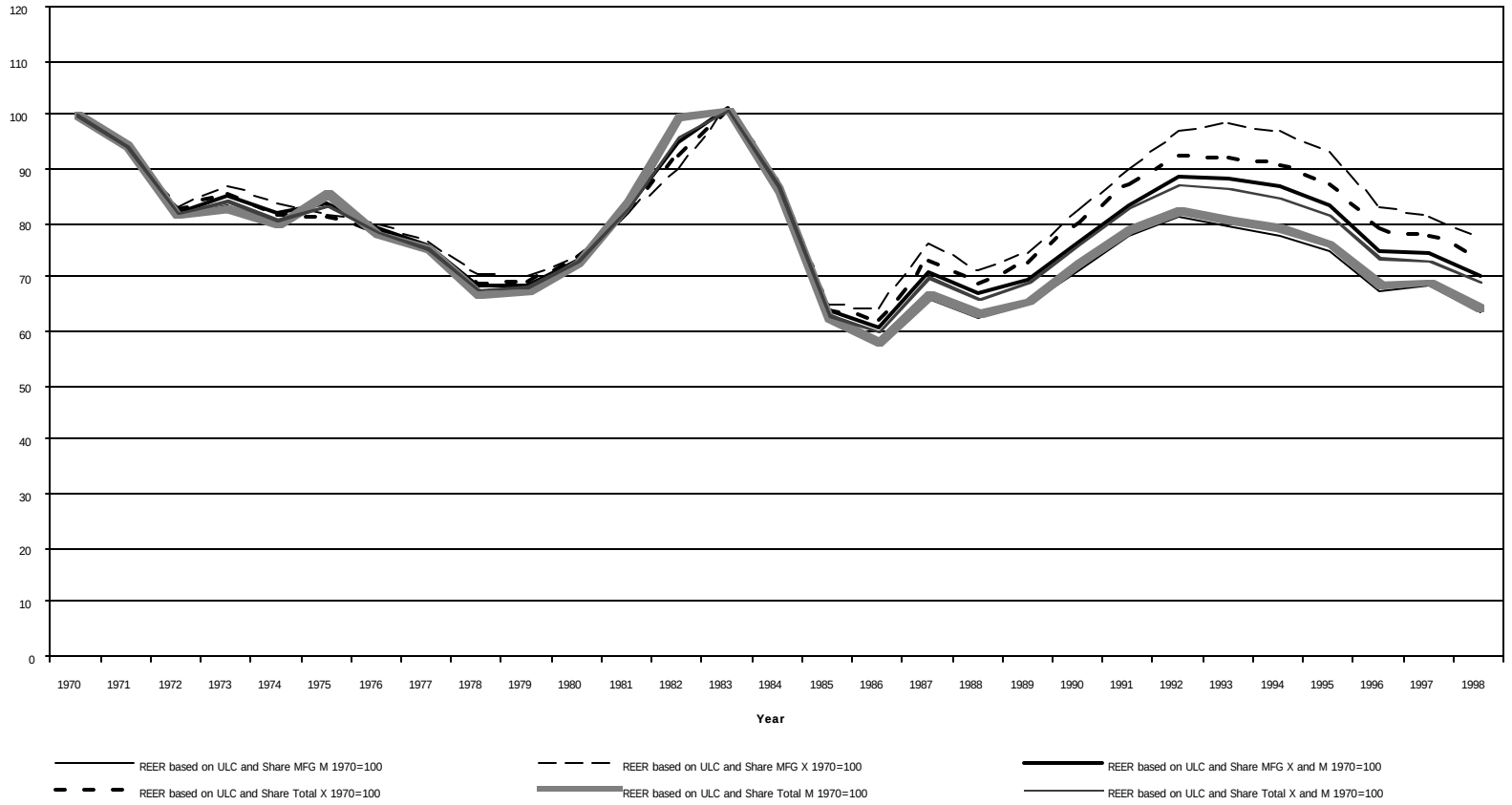
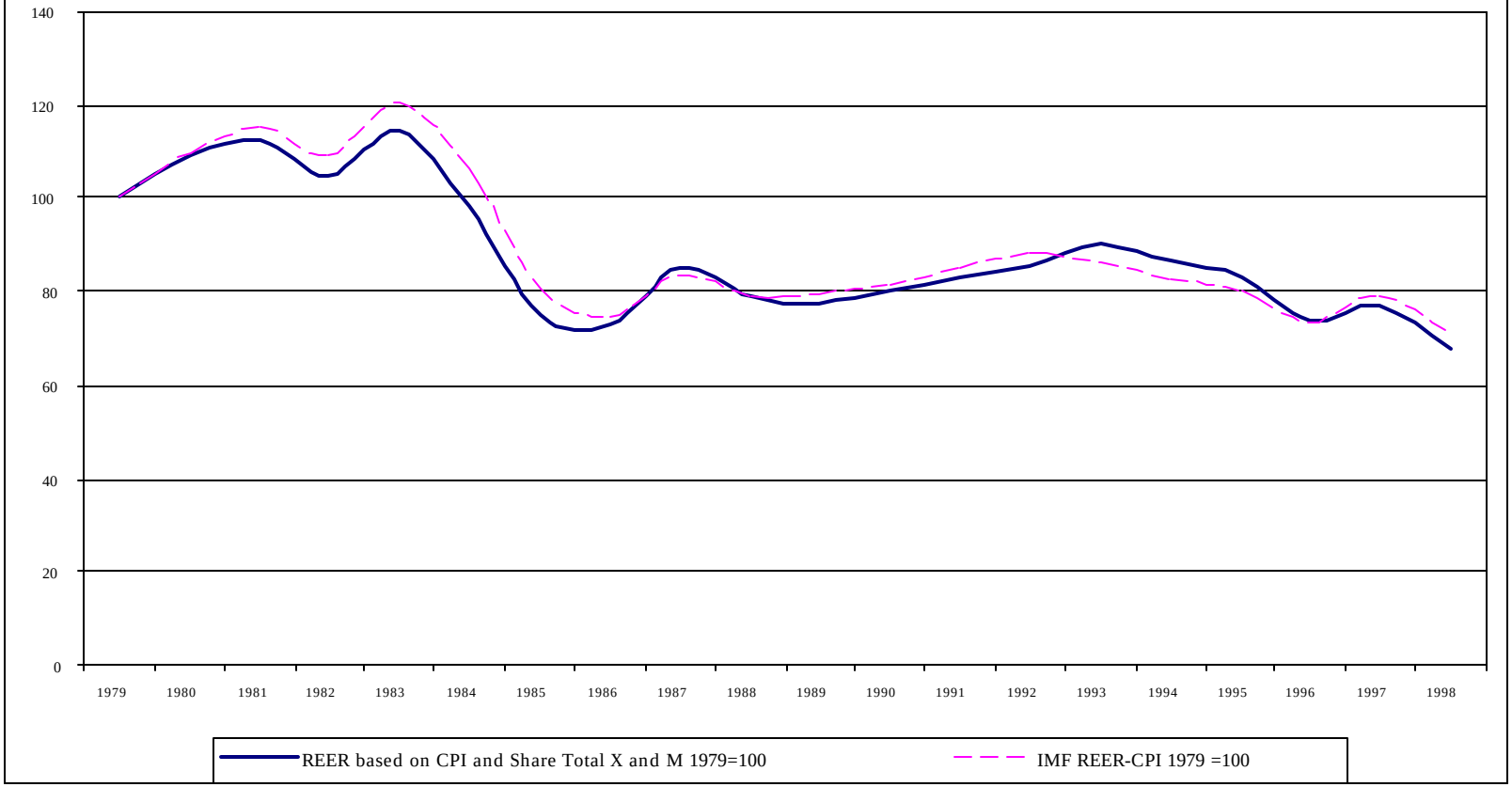


Figure 7
IMF REER-CPI Compared to REER-CPI



The relative unimportance of the weights is also brought out clearly in Figure 7, which compares the IMF REER-CPI with my calculated REER-CPI weighed by manufactured exports plus imports, setting 1979 = 100, (the first year the IMF series is available). My series includes almost all the countries in Table 2, whereas the IMF gives very little weight to developing countries (see Table 1). Despite the large difference in country weights, the two series in Figure 7 are very closely correlated.

The choice of price index, on the other hand, is somewhat more important. Figures 8-10 display the different REER measures, holding constant the weights. Figure 8 uses total exports plus imports to weight all REERs shown, Figure 9 uses manufactured trade weights, and Figure 10 uses manufactured exports weights. There is considerable divergence between the various REER measures in each of these cases. The CPI series in particular show a declining long-term trend for the real exchange rate over the 1970-1998 period that is less apparent for the other series. The GDP deflator and the manufacturing value-added deflator exhibit the smallest long-run real depreciation, with the WPI and the ULC indicators in between. There is, however, a substantial correlation in the turning points of the various REER series, especially after the late 1970s. According to the REER series as a group, South African competitiveness worsened in the early 1980s then improved dramatically in the mid-1980s. There was then another period of real appreciation through around 1992. The rest of the 1990s have witnessed a substantial real depreciation, roughly returning real exchange rates to their late 1980s levels.

**Figure 8**
**Comparison of Alternative REER Measures**
**All Series Weighted by Total Exports Plus Imports**

**Figure 9**
**Comparison of Alternative REER Measures**
**All Series Weighted by Manufactured Exports Plus Imports**

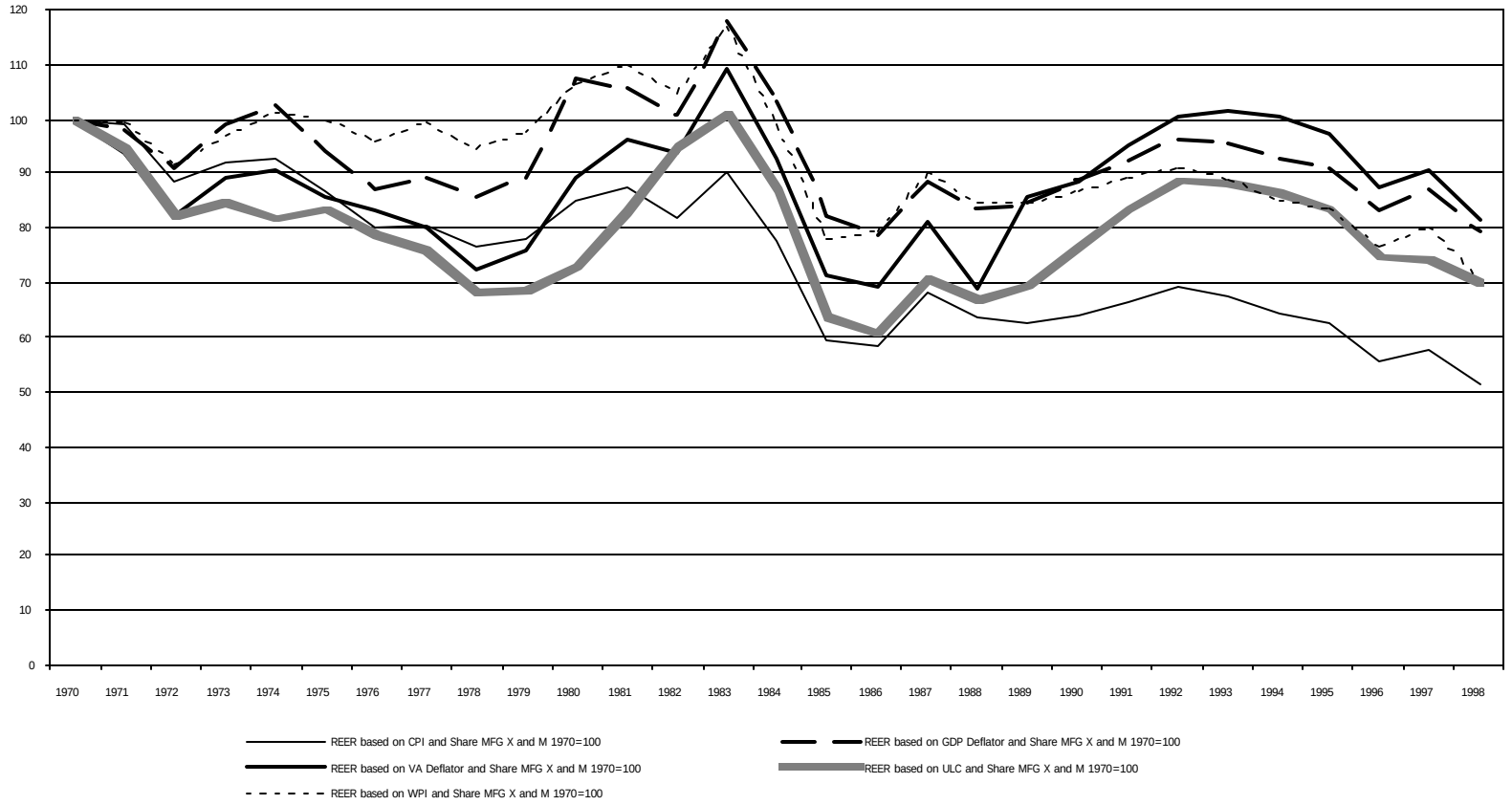


**Figure 10**
**Comparison of Alternative REER Measures**
**All Series Weighted by Manufactured Exports**

## V. **South African Wages, Productivity, and Unit Labor Costs**

Section IV presented calculations of real effective exchange rates, including some based on unit labor costs. These indicators show changes over time rather than levels of competitiveness. Thus, for example, while we can determine that competitiveness improved since the early 1990s, we cannot determine whether competitiveness is strong in absolute terms--it may simply be less bad than before. In this section, South African levels of labor cost in aggregate manufacturing are compared to other countries on a bilateral basis.

It should be remembered, as mentioned earlier, that calculations of the absolute level of competitiveness are far more difficult and subject to greater error than for rates of change. First, there are differences in the way countries measure value added and labor costs. To the extent that these measurement differences do not vary too much over time, they pose less of a problem for assessing changes in competitiveness than for levels. Second, comparisons of productivity require some estimate of the equilibrium or purchasing-power-parity exchange rate to convert output into a common currency. It is not appropriate to use market exchange rates to convert real output into a common currency, as short-run fluctuations in exchange rates do not in general reflect real productivity changes. A country's productivity does not increase simply because its currency appreciates. Estimates of purchasing-power-parity (PPP) exchange rates for manufacturing are not available for South Africa.[10] In the absence of a suitable PPP exchange rate, I used

[10]The International Comparison Project (ICP) has calculated PPP exchange rates for many countries, but these are expenditure-based and cannot readily be used for manufacturing production. In any case, no ICP study of South Africa has ever been done. The International Comparison of Output Project (ICOP) at the University of Groningen has calculated manufacturing PPPs for a limited number of countries, but not for South Africa.

the average real exchange rate over the 1970-1998 period as a proxy for the long-run equilibrium real exchange rate.

As noted above, unit labor cost is equal to the ratio of wages to labor productivity. Productivity is calculated as real value added per employee, using the manufacturing value added deflator to deflate nominal value added, which is then converted to rand using the mean real exchange rate. Wages are defined here as total remuneration of labor, inclusive of non-cash fringe benefits, divided by number of employees.[11] Wages are converted to rand using the market exchange rate. Methods and data sources are explained in the Appendix. Note then that by construction, movements in exchange rates affect relative wages, but not relative productivity, as is appropriate (see equation (4) and related discussion above).

Figure 11 compares South African wages and productivity to those of the major industrial countries in 1990 and 1998. Figure 12 presents similar data for a number of developing countries. Some clear patterns emerge.

• South African labor costs in the 1990s in manufacturing are quite competitive vis-à-vis industrial countries. South African productivity is well below that of industrial countries, but in most cases, relative South African wages are even lower. That is, South African unit labor costs, the ratio of wages to productivity, are generally below those of industrial countries both in 1990 and 1998. In the case of the United States, for example, Figure 11 shows that South African wages and productivity were both around 25 per cent the U.S. level in 1990, meaning that South African unit labor costs were almost equal to those of the United States.

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[11] For some countries, there is no data on fringe benefits. The comparisons attempt to adjust for this. See the Appendix for details.

Figure 11

South African Wages and Productivity, Relative to Industrial Countries, (SA = 1.0)

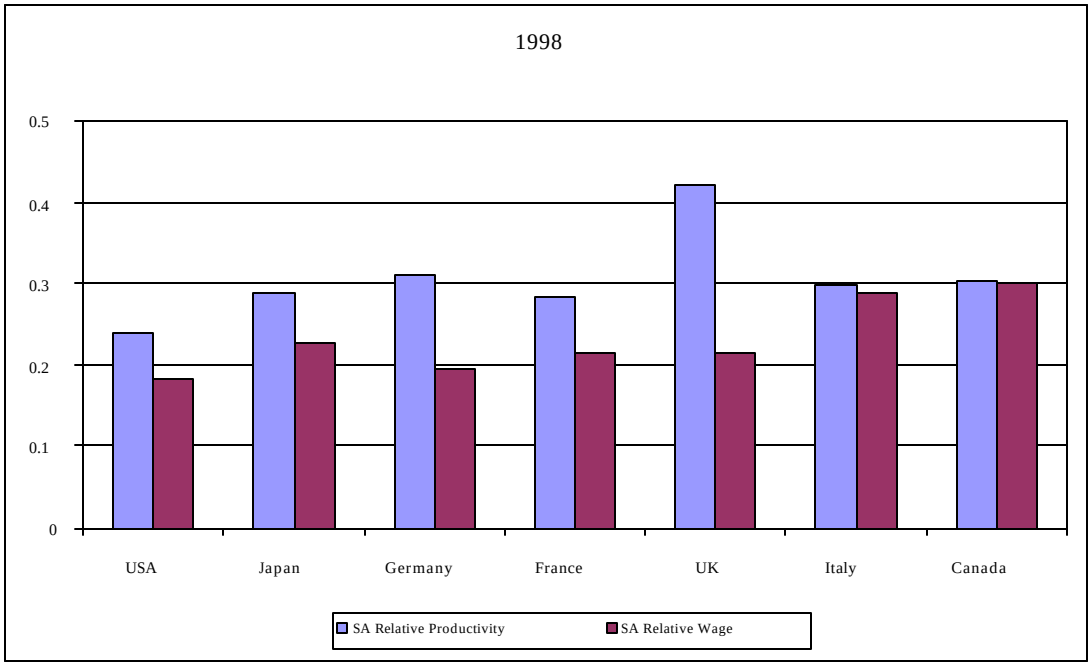
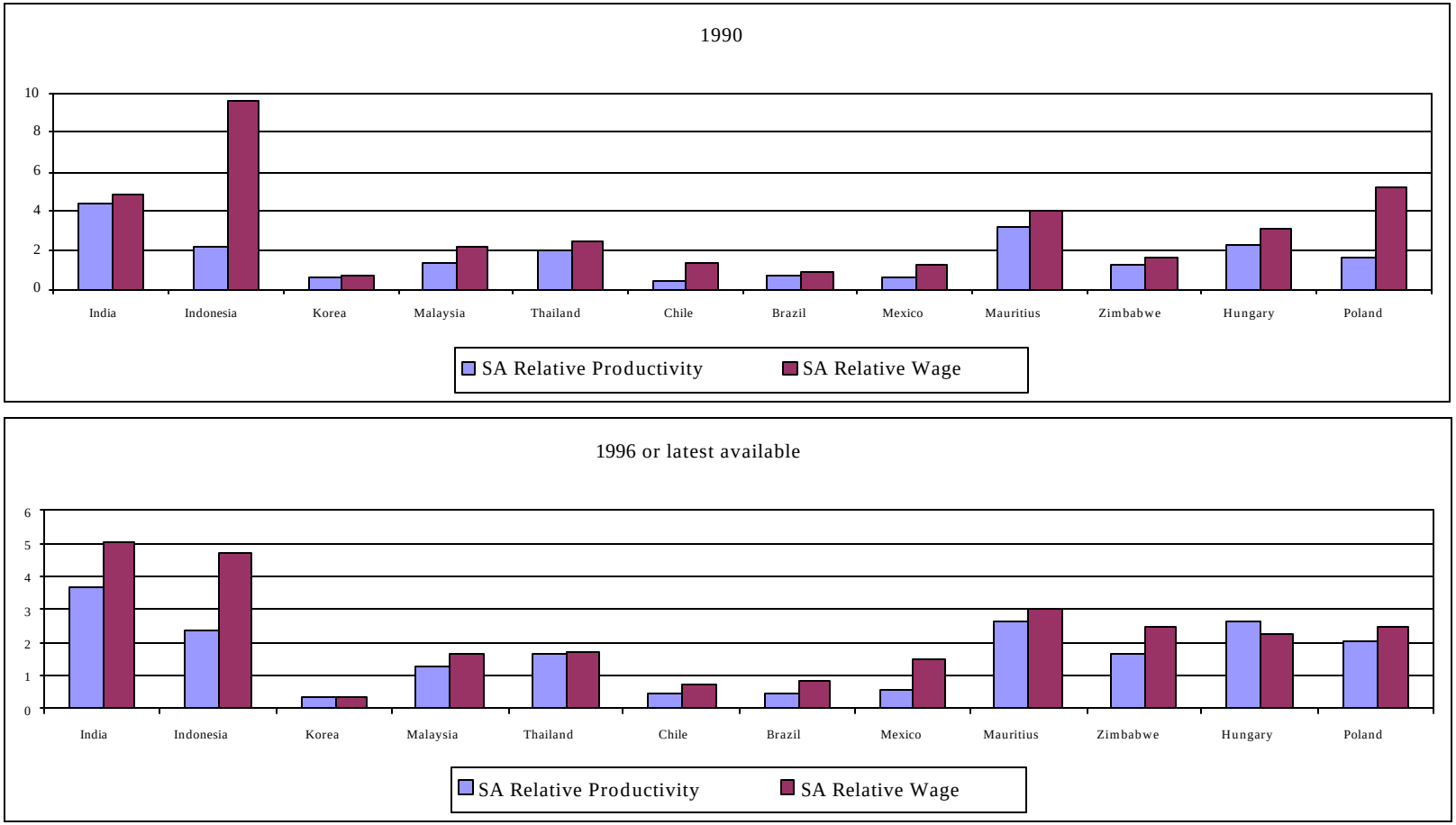



Figure 12
South African Wages and Productivity, Relative to Developing Countries, (SA=1.0)



All 1996 except Brazil 1994, Poland 1994, Thailand 1995, Mexico 1995, India 1997, Hungary 1997, Chile 1997.

• Vis-à-vis almost all developing countries that are major exporters of manufactures, however, South African unit labor costs are generally high, i.e. relative South African wages exceed South African productivity. Note that there is a very large variation in South Africa's overall level of wages and productivity vis-à-vis other developing countries in Figure 12. South African manufacturing productivity is two to four times greater than that in India, Indonesia, and Thailand, but is lower than Korean and Chilean productivity. Regardless of this variation in productivity differentials, South African relative wages exceed South African relative productivity in all cases in 1990 and all but one in 1996 (the exception is Hungary), implying that South African unit labor costs are high relative to other developing countries.

• South African labor's competitiveness improved against most countries during the 1990s as relative wages generally declined. This corresponds to the real depreciation of the rand during the 1990s observed in Figures 4-10. There are some exceptions among the developing countries, however (India, Mexico). Also, there are no data for 1998 for developing countries, but the large depreciations in Asia and Latin America in the aftermath of the 1997-98 Asian crisis undoubtedly substantially deteriorated South Africa's competitiveness.

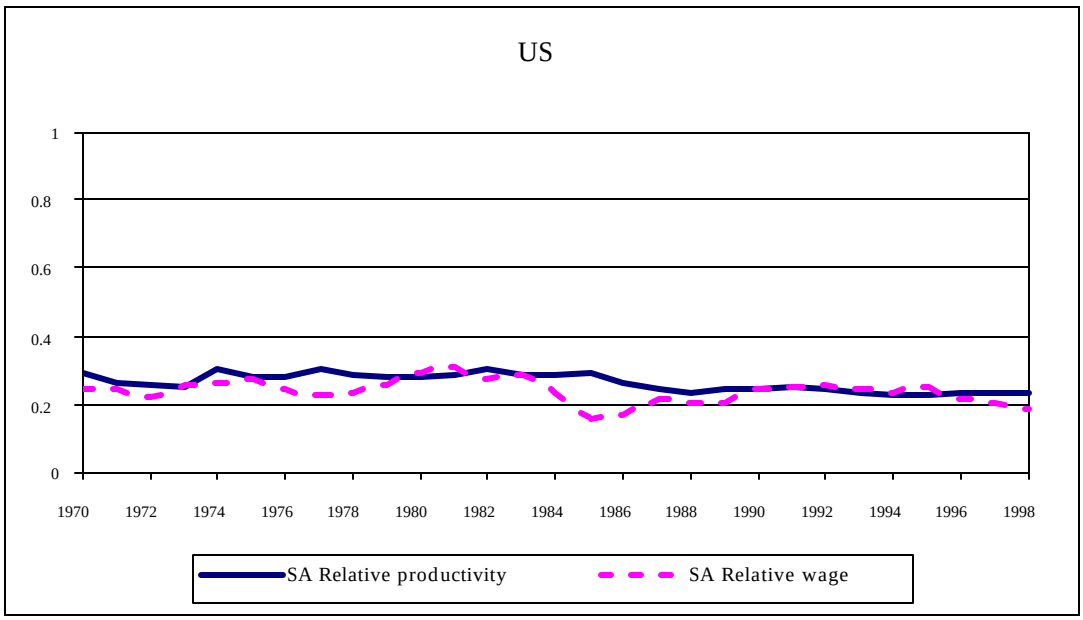
Figure 13 shows time series of South African wages and productivity relative to a number of the countries in Figures 11 and 12 : the United States, Japan, Germany, U.K., Korea, Malaysia, Chile, Mexico, Mauritius and Zimbabwe. This is to give a fuller picture of the evolution over time of South African bilateral competitiveness. Vis-a-vis the industrial countries, South African productivity and wages move together fairly closely. Some recent improvement of South African competitiveness is generally visible in these cases. There is more variation vis-à-vis developing countries and these figures defy a simple summary. In the case of Mexico, for example, South Africa suffered losses of competitiveness following the 1982 debt crisis and again in 1994-95 following the 1994 peso collapse. Against Chile,

however, South African competitiveness improved substantially between 1990 and 1997. South African labor had a competitive edge against Zimbabwe until about 1989, but in the early 1990s there was a big decline in relative Zimbabwe wages, due largely to depreciation of the Zimbabwean currency.

In summary, South African unit labor costs appear to be competitive against developed countries but much less so against developing countries. To the extent that South Africa competes primarily against other developing countries, there is a serious labor cost problem. Also, the wage / productivity comparisons reported here may understate the adverse effects of high South African labor costs on unemployment. If labor costs are high and inflexible, productivity will rise over time endogenously, as firms shed labor and adopt more capital-intensive production techniques, thus raising the marginal and average product of labor. Consequently, an *ex post* correlation of labor costs and productivity does not by itself prove that labor costs are not "too high". The productivity / wage comparisons, however, are mainly concerned with assessing international competitiveness, rather than determining the real wage that clears the labor market.

Figure 13

South African Wages and Productivity, Relative to Selected Countries



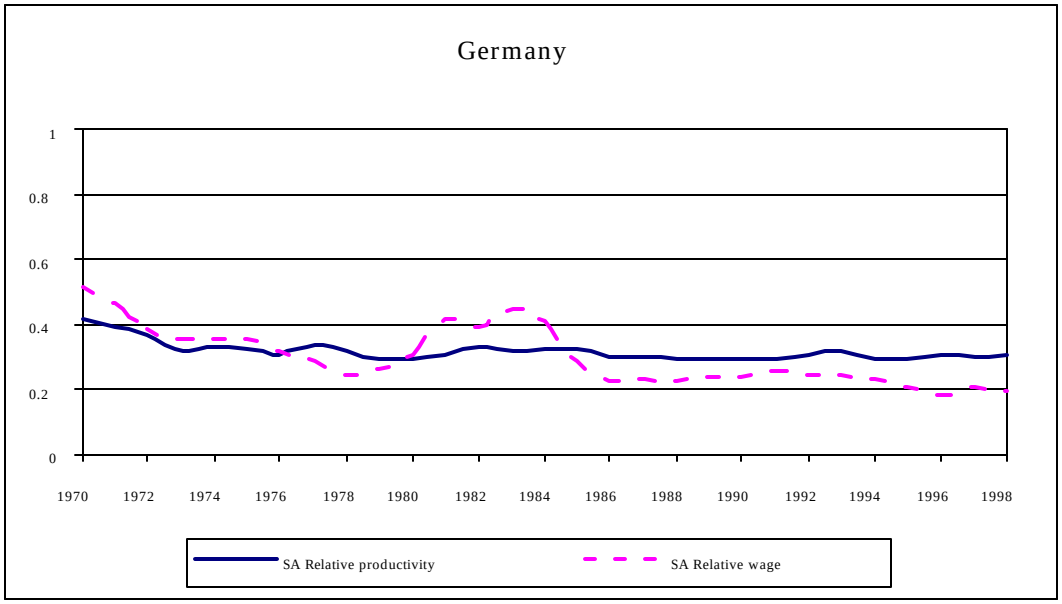
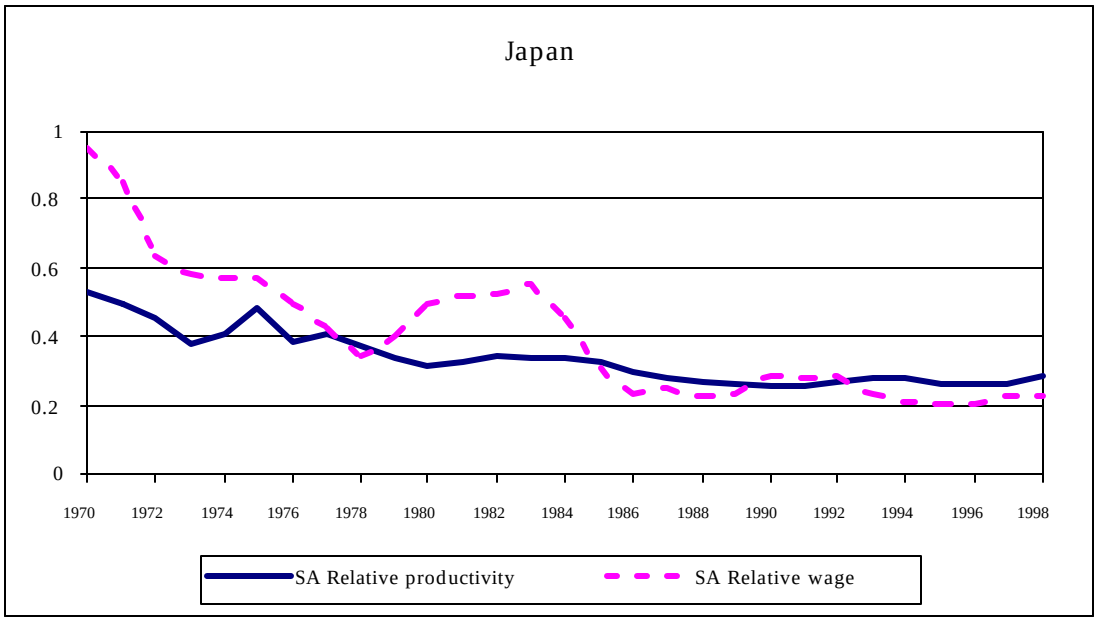



Figure 13, continued

South African Wages and Productivity, Relative to Selected Countries



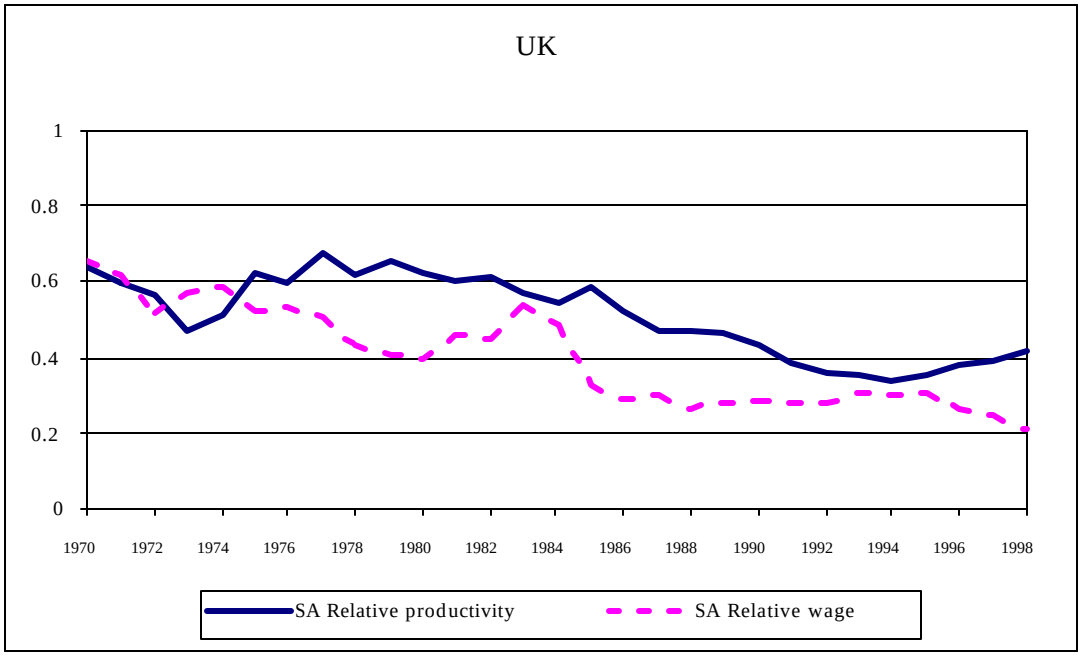
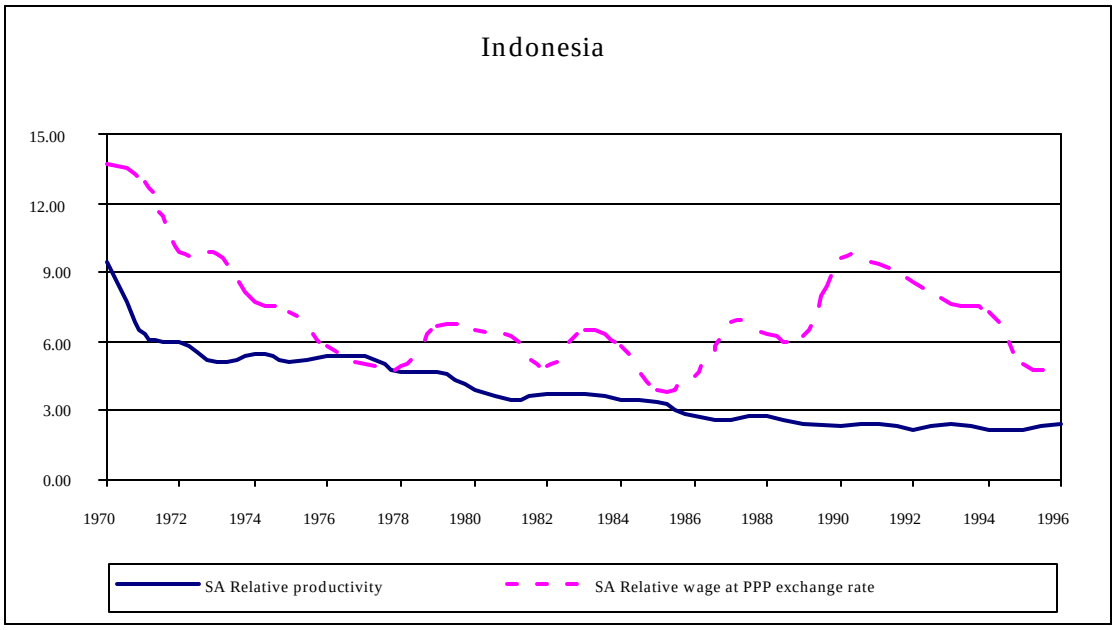



Figure 13, continued

South African Wages and Productivity, Relative to Selected Countries



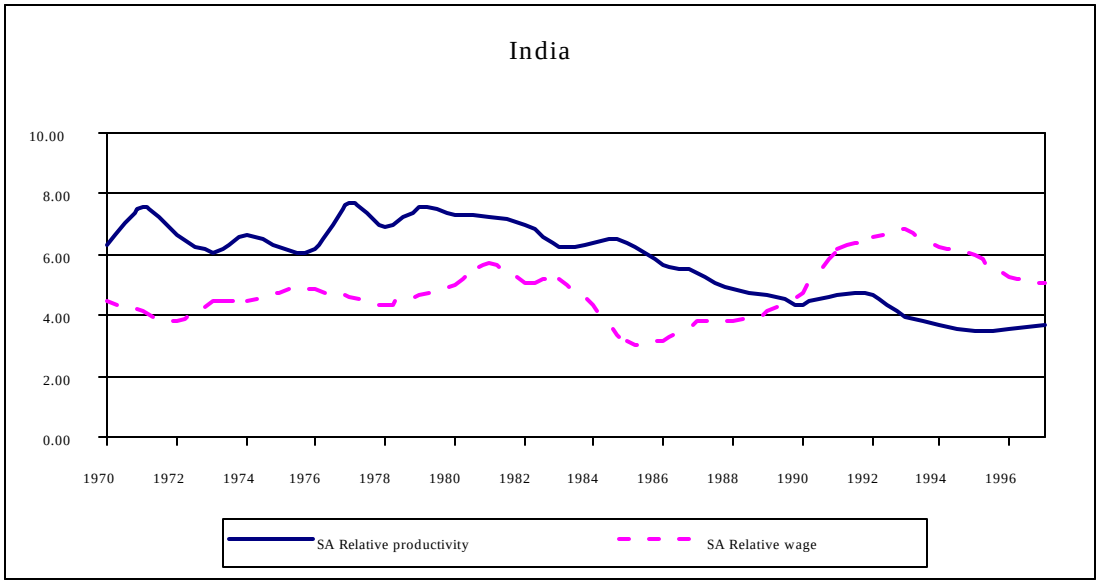
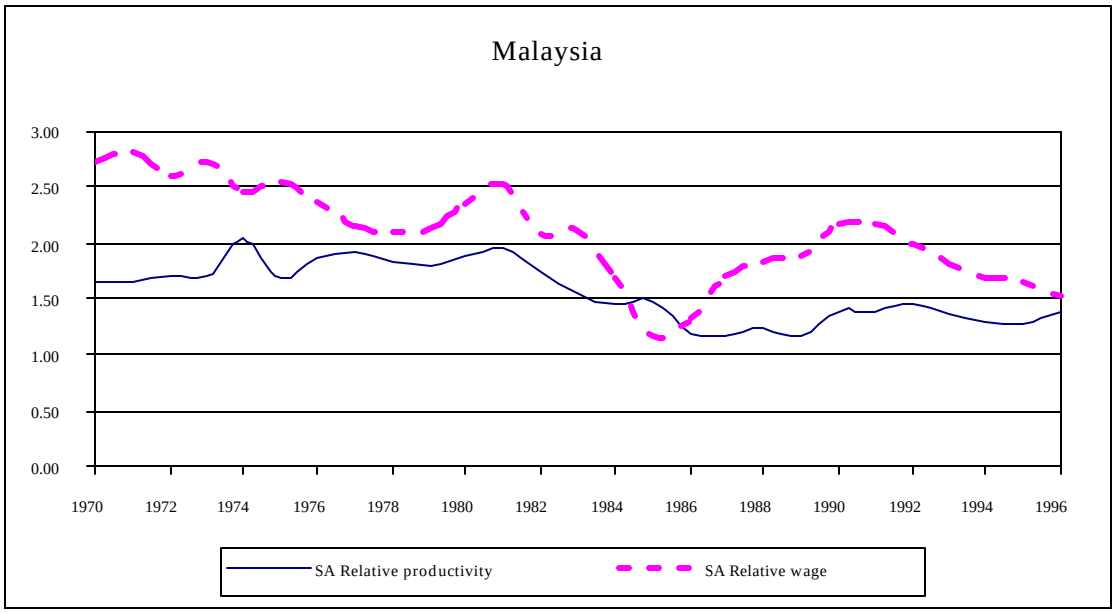



Figure 13, continued

South African Wages and Productivity, Relative to Selected Countries



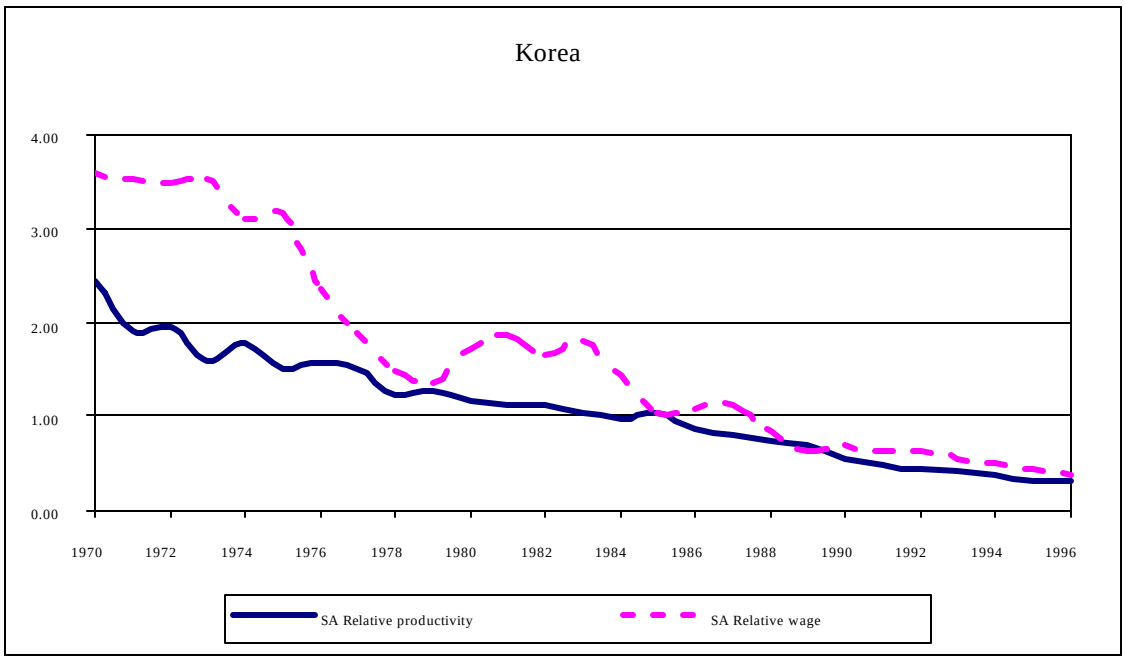
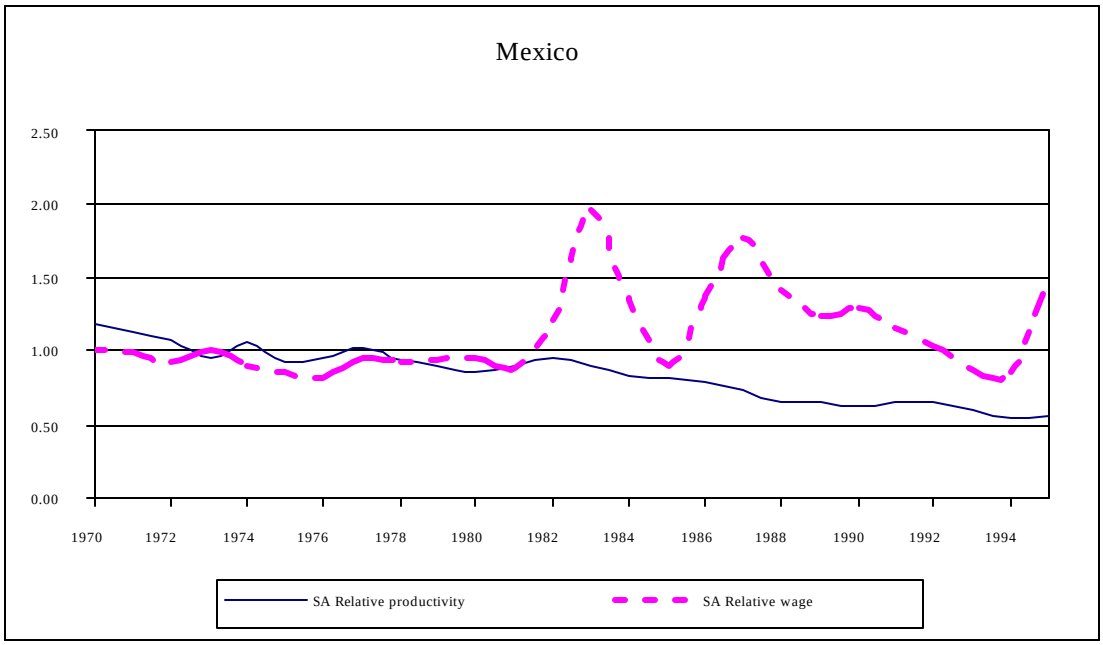



Figure 13, continued

South African Wages and Productivity, Relative to Selected Countries



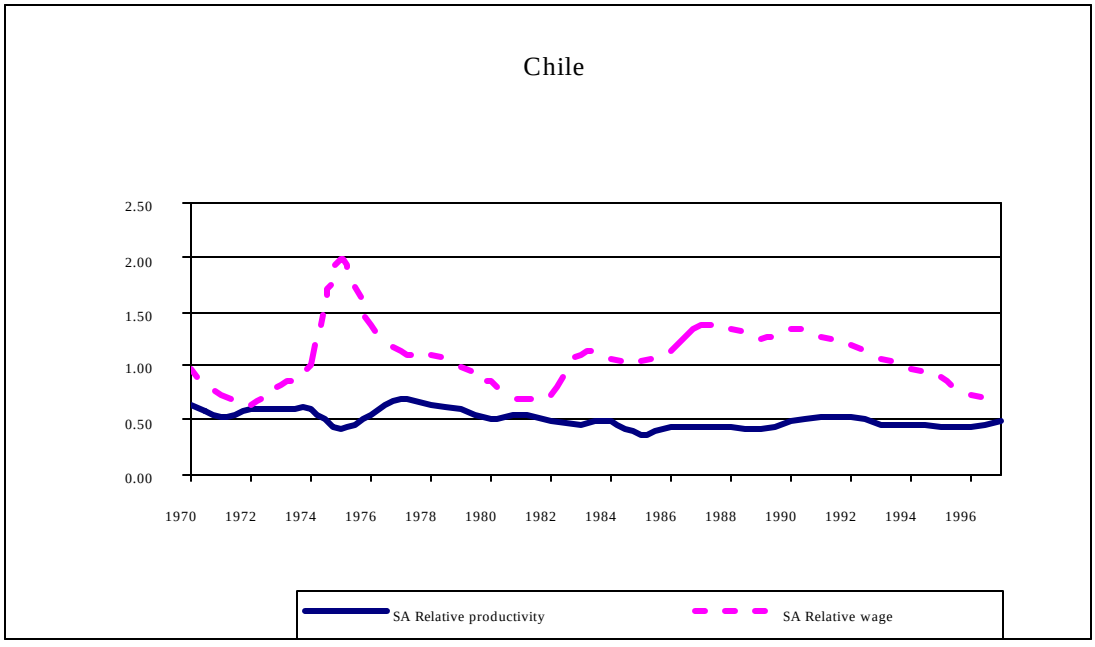
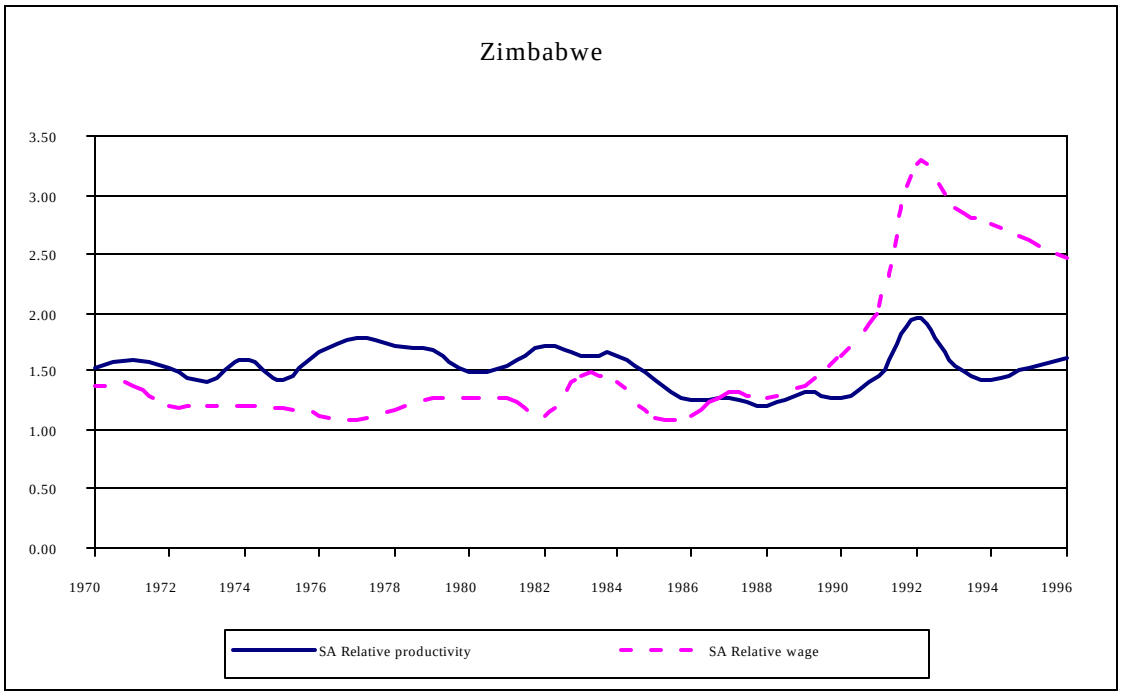
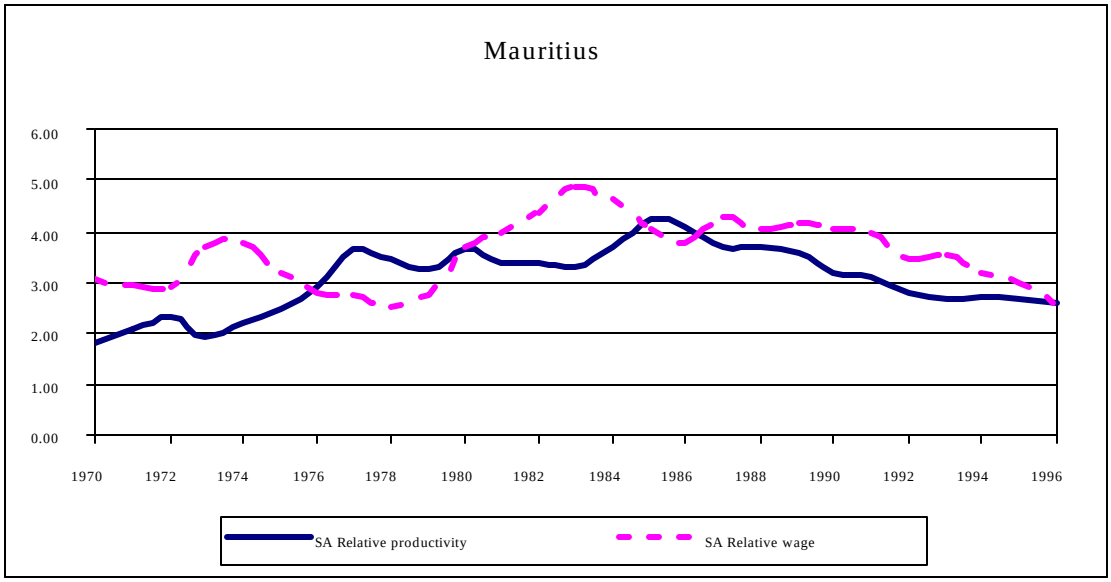



Figure 13, continued

South African Wages and Productivity, Relative to Selected Countries



# VI. Competitiveness and Trade Performance

## VI.1 Correlations between the REER and Trade and Investment Flows

In this section the relationship between trade flows and competitiveness indicators is evaluated using some simple charts. We will then turn to regressions. Figure 14 plots South African real manufactured exports[12] divided by real GDP against the real effective exchange rate based on unit labor costs, inverted for ease of visual inspection (so that an increase in the REER index now represents a depreciation, i.e. an improvement in competitiveness). There is a strikingly close correlation between the two variables. The only apparent anomaly is that manufactured exports have grown more rapidly in the 1990s than competitiveness alone would justify. This is readily explicable in terms of a combination of the ending of sanctions associated with Apartheid and the adoption of more outward oriented economic policies.

Figure 15 plots real manufactured imports divided by real GDP against competitiveness in the same way as in Figure 14. Contrary to the theoretical presumption, there appears to be a positive correlation between manufactured imports and competitiveness, although a much weaker one than for exports. This could be due to a high import-intensity of manufactured exports.

[12] Exports and imports are deflated by the manufacturing value added deflator. This is an imperfect choice, especially for imports.

**Figure 14**
**Real Manufactured Exports (as % of real GDP) v. Inverted REER-ULC**

**Figure 15**

**Real Manufactured Imports (as % of real GDP) v. Inverted REER-ULC**

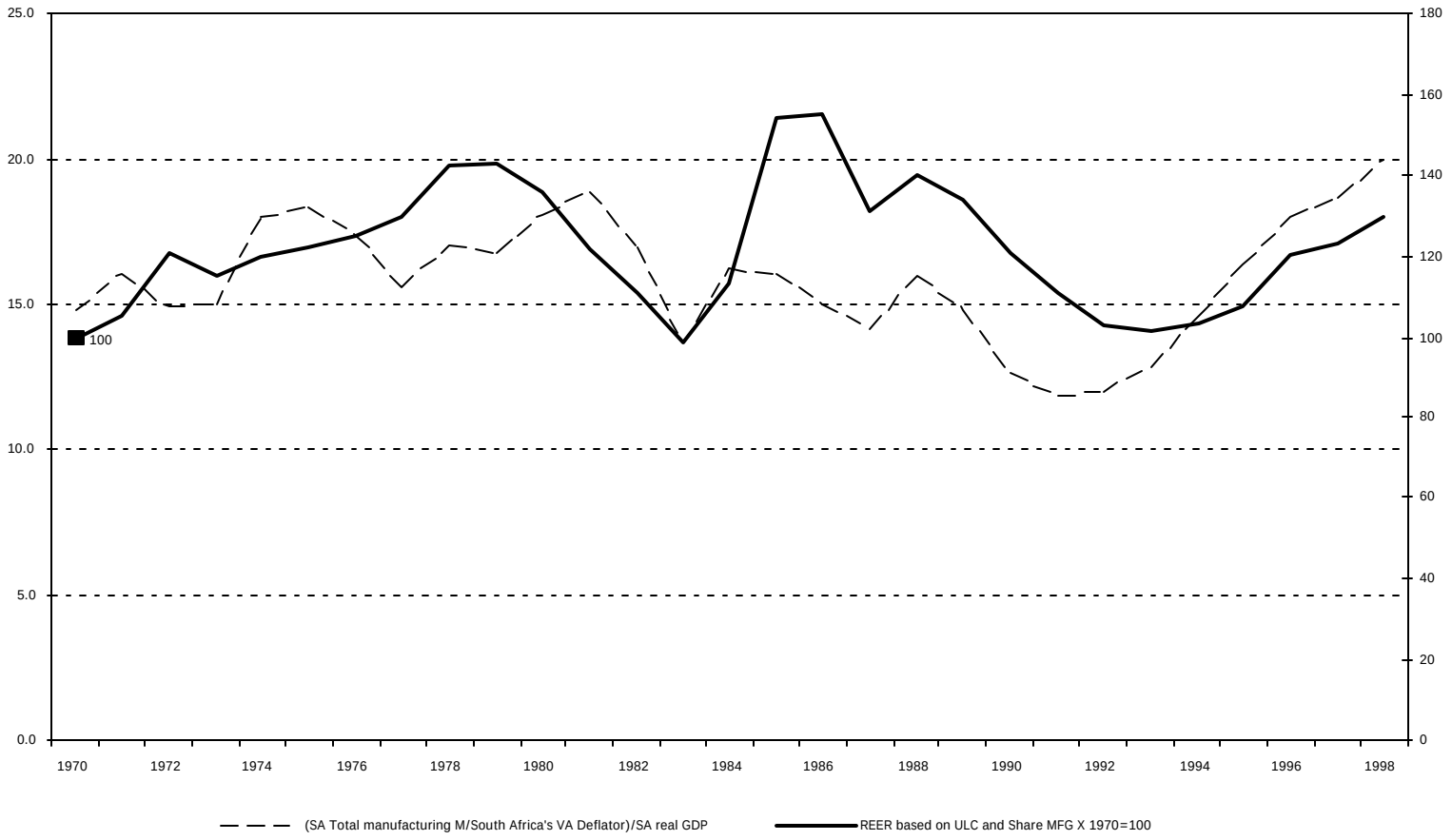


**Figure 16**
**Gross Foreign Direct Investment (as % of GDP) v. Inverted REER-ULC**

Figure 16 plots net inflows of direct foreign investment against the inverted REER. No correlation shows up in this case. Instead, the most salient feature is the big increase in FDI inflows in the late 1990s. As discussed in section II, however, the South African ratio of FDI to GDP remains well below that attained by some other developing countries and it fell sharply in 1998.

### VI.2 Econometric Specification

This section examines the statistical relationship between real exchange rates and trade flows, attempting to control for changes in domestic and world demand, and tariff rates on imports. Conventional trade equations were specified. See Goldstein and Khan (1986) for a review of the literature on modelling the price-responsiveness of trade flows, and Golub (1994) for an example of this kind of modelling. Equations (6) and (7) show the baseline specification. The same regressions were also run with the variables first-differenced to deal with possible non-stationarity problems. All variables were logged.

(6) $EXP = b_1 + b_2\,REER\text{-}xxx + b_3\,WORLDGDP$

(7) $IMP = b_1 + b_2\,REER\text{-}xxx + b_3\,SAGDP + b_4\,TARIFF$

Dependent Variables

EXP, IMP : real exports and imports, deflated by the GDP deflator.

EXMFG, IMMFG: real exports and imports of manufactures, deflated by the manufacturing deflator.

Independent Variables

REER-xxx: Real effective exchange rate of the rand, alternatively using Consumer Prices (REER-CPI), Wholesale Prices (REER-WPI), GDP deflator (REER-GDP), manufacturing value added deflator (REER-VAD), and unit labor costs (REER-ULC). Weights on the REERs are chosen to match the dependent variable. For example, when manufactured exports are the dependent variable, REER uses manufactured export weights.

WORLDGDP: World Real GDP in 1995 US $,

SAGDP: South African Real GDP, in 1995 Rand

TARIFF: Duties collected divided by total imports.

### VI.3 Results

Table 4 shows the results of equation (6) using various alternative REER measures. In this case the REER is not inverted so that the expected sign of the REER is negative (i.e., a real appreciation should reduce real manufactured exports). The strong negative effect of REER shows up in each case, with the magnitude of the elasticity varying from about 0.8 to 1.4. (Recall that all variables are logged so coefficients can be interpreted as elasticities). The income-elasticity on world GDP varies from about 1.0 to 1.4 except for the REER-CPI where it is only 0.6, undoubtedly reflecting the very different trend behavior of the REER-CPI shown in Figures 8-10. In short, Table 4 confirms the visual correlation observed in Figure 14: manufactured exports respond strongly to improved competitiveness.

Table 4

**Regressions of Real Manufactured Exports Using Alternative REERs**

**EXPMFG = $b_1$ + $b_2$ REER-xxx + $b_3$ WORLDGDP**

| Constant | REER-xxx | WORLDGDP | R-squared |
|---|---|---|---|
| | REER-ULC | | |
| 1.98 | -0.78 | 1.35 | 0.89 |
| (1.99)* | (-4.07)** | (13.68)** | |
| | REER-CPI | | |
| 6.21 | -0.94 | 0.62 | 0.87 |
| (2.38)* | (-3.03)** | (2.34)* | |
| | REER-GDP | | |
| 5.15 | -1.37 | 1.27 | 0.91 |
| (3.78) | (-5.18)** | (14.18)** | |
| | REER-WPI | | |
| 5.05 | -1.07 | 1.02 | 0.88 |
| (2.63) | (-3.56)** | (7.22)** | |
| | REER-VAD | | |
| 1.70 | -0.79 | 1.42 | 0.89 |
| (1.70) | (-3.76)** | (13.86)** | |

t-statistics in parentheses. ** denotes statistical significance at 1% level, * at 5% level.

Table 5

**Regressions of Real Manufactured plus Agricultural Exports Using Alternative REERs**

$$EXP = b_1 + b_2 \ REER\text{-}xxx + b_3 \ WORLDGDP$$

| Constant | REER-xxx | WORLDGDP | R-squared |
|---|---|---|---|
| | REER-ULC | | |
| 3.99 | -0.54 | 0.67 | 0.75 |
| (1.22) | (-2.80)** | (5.89)** | |
| | REER-CPI | | |
| 6.37 | -0.67 | 0.30 | 0.72 |
| (2.54)* | (-2.24)* | (1.19) | |

t-statistics in parentheses. ** denotes statistical significance at 1% level, * at 5% level.

Table 5 reports the same equation except that the dependent variable is non-mining exports, i.e. manufacturing plus agriculture. Agricultural exports are only about one fourth of manufactured exports, so one would not expect much change. The results again varied little with the REER choice, so only two are reported, for unit labor costs and CPI. The former is chosen because unit labor costs are preferred on the theoretical grounds discussed earlier, the latter because the CPI is the best in terms of data availability. The elasticities on the REER variable fall a bit, but the strong effect of this variable remains. The coefficient on world GDP drops considerably and is estimated with less precision. When mining is included, the REER coefficient remains negative, but the statistical significance declines. This is not surprising because gold exports are not likely to respond much to the real effective exchange rate.[13]

Table 6 turns to real imports of manufactures. Real appreciation (loss of competitiveness) should lead to a rise in imports, so a positive coefficient is expected. Instead, the signs on the REER variables in four out of five cases are negative, although they are small and statistically insignificant in all but the VAD case. For REER-WPI the sign is positive and insignificant. The elasticity on South African GDP is near 1.0 and statistically significant in all five cases. The coefficient on the tariff variable is also always negative and significant, consistent with theoretical prediction.

[13] Also, total exports are deflated by the GDP deflator which is obviously inappropriate if gold is included. This issue is not pursued further, however, since our focus here is on manufactured exports.

Table 6

**Regressions of Real Manufactured Imports using Alternative REERs**
**IMPMFG = $b_1$ + $b_2$ REER-xxx + $b_3$ SAGDP + $b_4$ TARIFF**

| Constant | REER-xxx | SAGDP | TARIFF | R-squared |
|---|---|---|---|---|
| | REER-VAD | | | |
| 2.11 | -0.32 | 1.02 | -0.37 | 0.83 |
| (2.57)* | (-2.31)* | (9.61)** | (-5.82)** | |
| | REER-CPI | | | |
| 1.15 | -0.06 | 0.97 | -0.36 | 0.79 |
| (0.67) | (-0.31) | (4.98)** | (-5.17)** | |
| | REER-GDP | | | |
| 1.29 | -0.11 | 0.99 | -0.36 | 0.79 |
| (1.03) | (-0.57) | (7.69)** | (-5.20)** | |
| | REER-ULC | | | |
| 1.96 | -0.20 | 0.93 | -0.36 | 0.81 |
| (1.86) | (-1.46) | (7.35)** | (-5.37)** | |
| | REER-WPI | | | |
| 0.31 | 0.05 | 1.04 | -0.36 | 0.79 |
| (0.22) | (0.28) | (7.45)** | (-5.15)** | |

t-statistics in parentheses. ** denotes statistical significance at 1% level, * at 5% level.

Table 7

**Regressions of Changes in Real Manufactured Exports with Alternative REERs**

**EXP = $b_1$ + $b_2$ REER-xxx + $b_3$ WORLDGDP**

| Constant | REER-xxx | WORLDGDP | R-squared |
|---|---|---|---|
| | REER-ULC | | |
| –0.01 | -0.99 | 1.62 | 0.74 |
| (–0.18) | (-7.04)** | (1.64) | |
| | REER-CPI | | |
| –0.08 | -0.84 | 3.62 | 0.58 |
| (–2.08)* | (–4.60)** | (3.11)** | |

Table 8

**Regressions of Changes in Real Manufactured Imports with Alternative REERs**

**IMPMFG = $b_1$ + $b_2$ REER-xxx + $b_3$ SAGDP + $b_4$ TARIFF**

| Constant | REER-xxx | WORLDGDP | TARIFF | R-squared |
|---|---|---|---|---|
| | REER-ULC | | | |
| –0.04 | -0.34 | 3.27 | -0.04 | 0.74 |
| (–2.67)** | (-2.77)** | (7.16)** | (0.57) | |
| | REER-CPI | | | |
| –0.05 | -0.50 | 3.35 | -0.07 | 0.77 |
| (–3.22)** | (-3.40)** | (7.72)** | (-1.09) | |

t-statistics in parentheses. ** denotes statistical significance at 1% level, * at 5% level.

As an alternative specification, equations (6) and (7) were estimated in first-difference form. Again only 2 cases are shown, as results were not too sensitive to the choice of REER. Table 7 shows the results for manufactured exports. The strong negative effect of real appreciation on exports remains. The estimated effect of world income is now higher but less precisely estimated. For manufactured imports (Table 8), the sign on REER is now always "wrong" and statistically significant, although the coefficient is always smaller in absolute value than the coefficient on exports. The coefficient on South African GDP is now much larger, but the tariff variable loses all its explanatory power. Even accepting the results of the first-difference regressions in Tables 7 and 8 instead of those in Tables 4 and 5, a real depreciation will improve the manufacturing trade balance, since exports increase more than imports in response to a depreciation of REER.

In summary, the regressions confirm a robust and powerful effect of improvements in competitiveness on manufactured exports. The effects on imports are more ambiguous.

## VII. Conclusions and Policy Implications

Under GEAR, South Africa has embarked on a policy of export-led growth. Several years into these reforms, there is some disappointment that South Africa has not grown more rapidly and that unemployment continues to worsen. But this paper suggests that South Africa should stay the course. Experience from all over the world shows that economic reform is a painful process that takes time to bear fruit. Positive results of South Africa's reforms are nonetheless already in evidence in the form of strong growth of manufactured exports and increased foreign direct investment. It remains critical to create an environment where exports and foreign

investment will continue to expand. One important component of this environment is international cost competitiveness.

A mixed picture of South Africa's competitiveness emerges from the analysis of this paper. There has been a sizeable real depreciation in the last few years, but by most measures of the real effective exchange rate, the recent depreciation has only returned the real exchange rate to the level of the mid-1980s. In absolute terms, South African wage levels appear to be reasonably competitive against developed countries when productivity differences are allowed for. It is probably more appropriate to compare South Africa to other emerging economies, however. An increasing share of South Africa's exports go to developing countries, particularly Africa and Asia. A case can also be made that South Africa's main competitors in developed country markets are other developing country exporters of manufactures. On this basis, South Africa appears to have a serious labor cost problem. South African unit labor costs (wages adjusted for productivity differences across countries), are higher than almost all developing countries, ranging form low-wage countries like India and Indonesia, to higher wage countries like Brazil and Korea. At the very least, these results suggest that there is no room to increase real wages faster than productivity. On the contrary, wage moderation and/or continued real rand depreciation are necessary to gain competitiveness vis-à-vis other emerging markets and to foster the continued growth of exports and foreign direct investment.

Indeed, manufactured exports are heavily influenced by cost competitiveness, as Figure 14 vividly shows. Formal regression analysis confirms a strikingly strong statistical effect of cost competitiveness on exports of manufactures that is robust to variations in the way the real exchange rate is calculated, and to the specification of the regression equations. The evidence is less clear on foreign direct investment. Other factors may have swamped the effect of competitiveness on FDI into South Africa in recent years, in particular, the sanctions under the Apartheid era, and the

lifting of these sanctions with the demise of Apartheid. Also, FDI inflows are likely to be very sensitive to less quantifiable aspects of the business environment. The high crime rate in South Africa in particular could have a large deterrent effect on FDI.

While macroeconomic cost competitiveness is very important, by itself it is not sufficient to resolve the unemployment problem and to create the foundations for lasting growth. Labor market rigidities, inadequate education, and crime are often-noted structural problems that must be tackled directly. These microeconomic and social reforms must complement improved international competitiveness in leading South Africa towards fulfillment of the objectives of the GEAR strategy.

**Appendix Sources and Methods**

Real Effective Exchange Rates

Nominal exchange rates, CPIs, GDP deflators, and Manufacturing Value Added Deflators 1970-1997 are taken from the World Bank World Development Indicators on CD-ROM. WPIs are from the International Monetary Fund International Financial Statistics (IFS) CD-ROM. IFS is also used to update exchange rates, CPIs, and GDP deflators to 1998. The manufacturing value added deflator was obtained by dividing nominal value added by real value added. In some cases, some price index data were unavailable for a few years at the beginning or the end of the 1970-1998 period. In such cases, the data were extrapolated from the closest available price series. For example, if Brazil is missing 1998 data for the manufacturing value added deflator but the GDP deflator data is complete, the 1998 manufacturing deflator is assumed equal to the change in the GDP deflator.

Unit labor costs are calculated as wages divided by productivity, as described in the text. The wage and productivity data are obtained from two sources. For most industrial countries, productivity and labor costs are derived from unpublished data from the United States Bureau of Labor Statistics (BLS). For developing countries, the primary data source is the United Nations Industrial Development Organization (UNIDO) INSTAT database. For purposes of developing indexes of unit labor costs rather than comparing levels between countries, the differences between the BLS and UNIDO definitions of value added and labor compensation do not matter, at least insofar as the differences are the same over time.

Productivity and Wage Levels

For level comparisons, however, several other considerations come into play. First, differences in definitions do matter. The UNIDO and BLS data differ in several respects. First, in the UNIDO database, value added is generally based on the census definition rather than the national accounts compatible definition used by the BLS. The main difference is that census value added does not deduct some service inputs from gross output in deriving value added. Second, labor compensation as reported by UNIDO includes some fringe benefits such as maternity pay and payment in kind, but excludes employer contributions to social insurance funds and is thus an incomplete measure of labor costs. The BLS definition is more inclusive. For South Africa, the data were obtained directly from South Africa sources, with the help of the Finance Department. The South African data conform to the BLS approach: value added is based on a national accounts definition and labor remuneration includes fringe benefits. Thus, South African data were deemed to be directly comparable to industrial country data obtained from the BLS. To compare South Africa to most developing countries, an adjustment to the South African data was necessary. This was done by assuming that the difference between census and national accounts variables is the same in South Africa as in the United States.

Second, international comparisons of productivity require a purchasing-power-parity or equilibrium exchange rate. South Africa has so far not been included in either the ICP or ICOP efforts to develop PPP exchange rates. I therefore resorted to proxying the PPP exchange rate by the mean real exchange rate based on value-added deflators over the sample period. The PPP exchange rate for each year is then obtained by extrapolation using value-added deflators. For further discussion of comparisons of unit labor cost levels see Hooper and Larin (1989) and Hooper and Vrankovich (1995).

Trade Flows

Exports and imports for South Africa were obtained from TIPS online (total trade) and from IDC for manufacturing trade. The latter is for SACU rather than just South Africa, but IDC reports that South Africa accounts for the overwhelming majority of SACU trade, so this should make little difference. Customs duties as a share of imports were provided by the SARB.

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