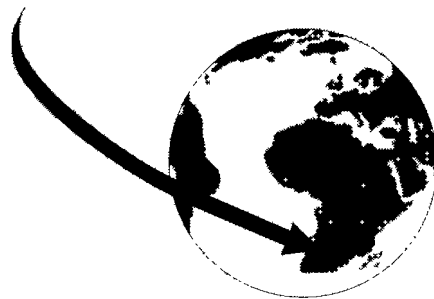No 252

REPUBLIC OF MAURITIUS

Ministry of Economic Development and Regional Co-operation
CENTRAL STATISTICAL OFFICE

PRODUCTIVITY AND COMPETITIVENESS

Indicators 1982-1996

July 1997

Price Rs 30

Productivity and Competitiveness Indicators - 1982 to 1996

This report on Productivity and Competitiveness Indicators is the product of a joint collaboration between the Central Statistical Office, the Ministry of Industry and Commerce, the Ministry of Economic Development and Regional Cooperation and the National Productivity Institute of South Africa

Note

Readers are invited to make the distinction between official data which are published in the Economic Indicators and the analysis presented for the benefit of general readers. Differences of opinion may arise regarding the analytical part but these do not in any way, undermine the quality of the data. The editors welcome constructive critical comments.

25 July, 1997

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PRODUCTIVITY AND COMPETITIVENESS INDICATORS - 1982 to 1996

1. INTRODUCTION

1.1 THE RELEVANCE OF PRODUCTIVITY MEASUREMENT

There are many definitions of productivity and quality. This is partly due to their complex nature and partly because they mean different things to different people. The core, however, is *the relation between real output (e.g. amount of sugar, clothing, textiles, accommodation and insurance) and real inputs (e.g. amount of worker effort, good management, materials, energy, plant and equipment) used in producing this output.* If output grows faster than inputs, then productivity is improving, and an increase in real income should eventually follow. In this way, productivity improvement boosts economic growth so that more and more can be produced.

Figure 1.1 - The Productivity Process
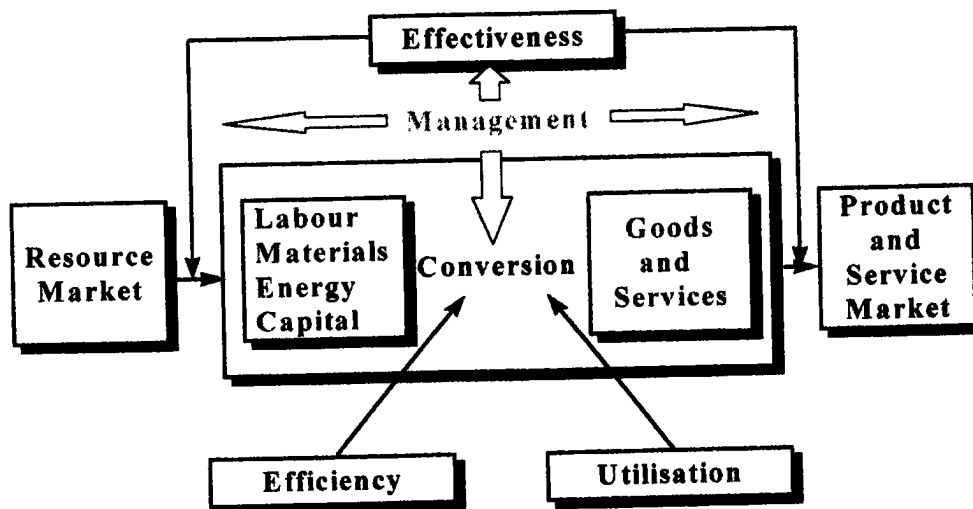
Productivity improvement is brought about in many ways. For instance, producing the "right products and services" (*effectiveness*) will lead to an increase in demand, which usually means better utilisation of capacity. Productivity may also be enhanced through more competent management or better allocation of existing resources, resulting in a higher rate of conversion (*efficiency*) or greater use (*utilisation*) of these resources.

A new series of statistics on productivity and competitiveness, using 1982 as the base year, is being released for the first time by the Central Statistical Office (CSO). Productivity measurement and analysis is vital for effective decision making and is a useful starting point in any attempt to improve productivity. These statistics will *assist decision makers, planners and the public in general,* to monitor and analyse the implications of productivity and competitiveness at the national and sectoral level.

1.2 LIVING STANDARDS

The value of all final goods and services produced by a country in a given period is called the Gross Domestic Product (GDP). This is a measure of the income generated in the economy by all the workers in Mauritius which contribute to creating wealth for all its citizens. In this sense, GDP per capita (GDP divided by the total population) measures the average amount of income available for each citizen. If GDP grows at a faster rate than the population then, on average, the material welfare or living standards of our citizens will improve.

Figure 1.2 - Real GDP per Capita
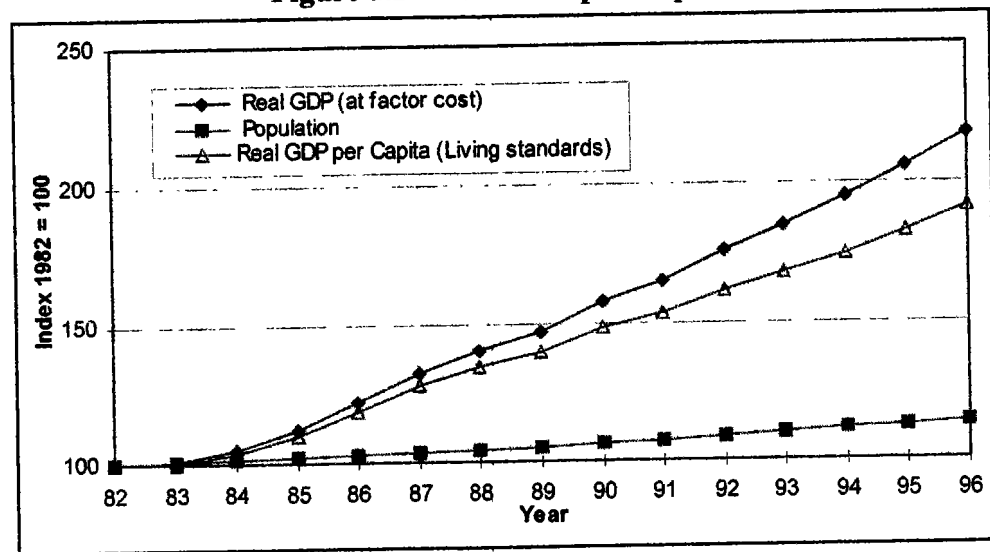
Mauritian real GDP grew, on average, by 5.7 per cent per year between 1982 and 1996. During this period the population increased at around 1 per cent each year, and therefore the average increase in GDP per capita was 4.7 per cent per annum.

1.3 OVERVIEW

During the period 1982 to 1996, the economy showed an average growth rate of 5.7 per cent. After a modest growth of only 0.4 per cent in 1983, growth accelerated to 7.6 per cent for the period 1985 to 1988. Thereafter, an average of 5.6 per cent for the period up to 1996 was maintained.

Employment increased by 6.5 per cent per annum between 1984 and 1987, before slowing to a rate of 2.9 per cent during the period 1988 to 1991 and 1.6 per cent over the last five years.

Data on the stock of fixed capital shows an average real increase of 3.9 per cent for the years 1982 to 1987 followed by a higher growth rate of 8.9 per cent between 1988 and 1994. From 1995 onwards, the average growth declined to 5.6 per cent per annum.

Figure 1.3 - GDP by Economic Activity,
Rs 67 907 million in 1996

Finance, real estate & business services 16.1%

Government and others 12.9%

Agriculture 9.3%

Manufacturing 24.1%

Transport and communication 11.1%

Restaurants and hotels 4.4%

Distributive trade 13.2%

Construction 6 5%

Electricity and water 2.4%
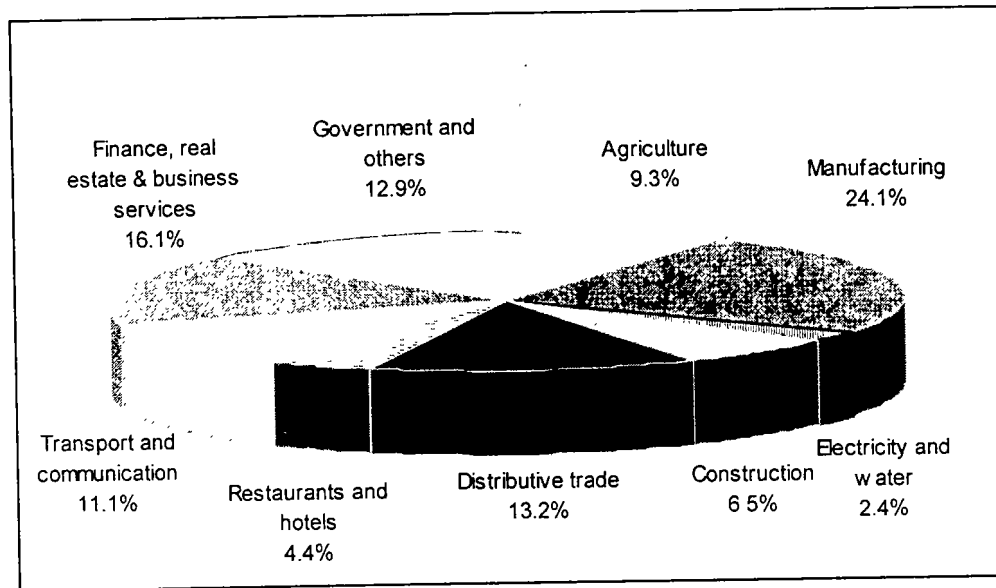
There has been a gradual shift in the contribution of the different sectors to GDP from 1982 to 1996. The contribution of Agriculture decreased from 15 per cent in 1982 to 9 per cent in 1996. Manufacturing, which accounted for 15 per cent in 1982 increased substantially to 24 per cent in 1996. The Government's share has remained constant over this period.

1.4 APPROACH TO PRODUCTIVITY MEASUREMENT

Until recently only labour productivity and unit labour cost indices have been available for total Manufacturing enterprises employing more than ten people. During the past six months, an estimate of capital stock was made. This has enabled the computation of partial capital and multifactor productivity (MFP) and other related indices.

Three sets of tables covering the period from 1982 to 1996 have been prepared for:

      (a) Total Mauritian economy
      (b) Manufacturing, and
      (c) Export Processing Zone (EPZ).

Productivity measurement makes use of ratios calculated by comparing output to one input or a combination of inputs in a particular industry, sector or for the entire economy. The ratio of output to labour or capital gives partial productivity indicators, and the ratio of output to all inputs is termed total factor productivity (TFP). However, as data is not available to estimate all inputs, a less specific term, multifactor productivity (MFP) is used.

Output is given by value added which is an important measure of the aggregate value of goods and services produced in the country. Value added in constant rupee is used as a proxy indicator of production in physical terms. Data on value added is derived from the production accounts and are readily available from National Accounts Statistics. It is customary to change weights at intervals of five years. The base years for National Accounting Index purposes are 1982, 1987 and 1992. The productivity index series are presented with base year 1982 = 100.

Value added or net output is the value of any industry's (or firm's) final output less its purchases of intermediate products. Value added is also equal to the amount available for distribution to the factors of production in the form of wages and salaries, profits, rent, allowance for depreciation, interest and dividends. It is measured at factor cost. For purposes of this report value added includes the total economy. It should be noted that in some other countries, for purposes of productivity analysis, value added is limited to the private business sector.

Labour is the total number of persons engaged, including self-employed, in any type of economic activity irrespective of the size of the establishment. Figures are mid year estimates. A more accurate measure of labour input would be total number of hours worked, however in the absence of this information, the number of workers has been used. It should be noted that labour and employment are used interchangeably in this document.

Capital is given by the net stock of investment in reproducible fixed assets, that is in residential and non-residential building excluding land, infrastructure and equipment. Capital stock figures are derived using the standard perpetual inventory method and valuations are based on constant prices with allowances for depreciation.

Method of weighting. The share of 'compensation of employees' and 'gross operating surplus' in current value added is used as weights for the calculation of the multifactor productivity

Caution to users. The productivity measures discussed at the beginning of this section are usually expressed as fractions and transformed into index numbers, which makes use of a reference base period, to facilitate analysis. These index numbers provide reliable and timely estimates of productivity change. The focus is mainly on trends as opposed to levels.

Since productivity statistics are derived from ratios, they should be used and interpreted with caution. A rise in output per unit of a single input will measure the combined effect of a change in the efficiency with which all resources have been used. For example, output per worker will rise if labour is equipped with better tools and machinery. A better measure of productivity, using all resources, is given by the measure of multifactor productivity.

2. PRODUCTIVITY OF THE ECONOMY

2.1 LABOUR PRODUCTIVITY IN MAURITIUS

Figure 2.1 - Trends in Labour Productivity in Mauritius, 1982 to 1996
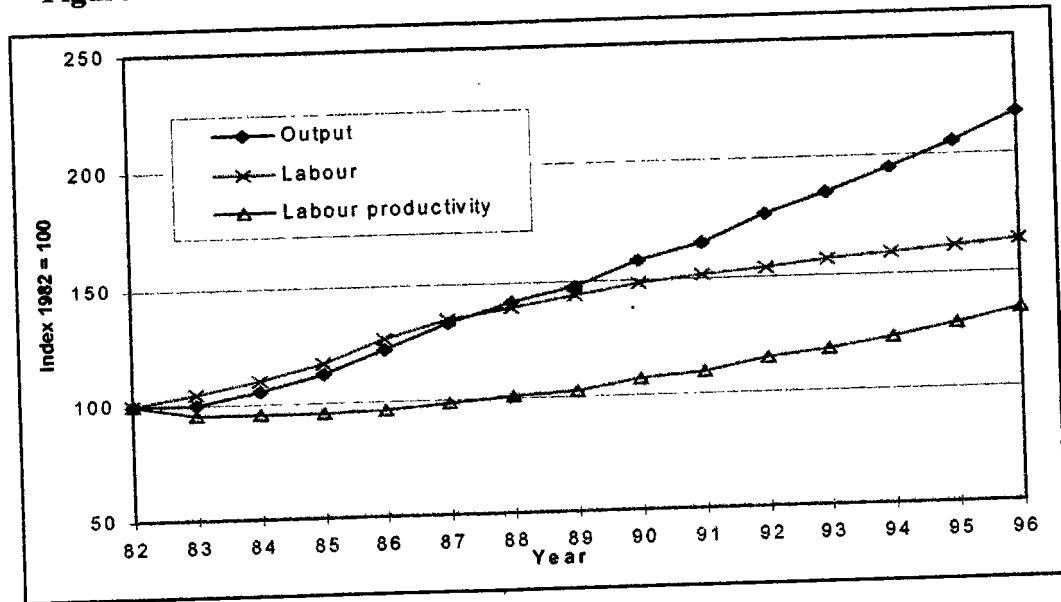
Labour productivity is defined as the average amount of output generated per worker. It is a partial measure of productivity. On a national level it is calculated by dividing Gross Domestic Product (GDP) by the number of people engaged in the whole economy. An increase in labour productivity occurs when GDP per worker rises, for instance when GDP grows faster than employment or declines more slowly than employment.

A word of caution. *At this stage no consideration has been given to the quality of labour inputs, although it is accepted that this will certainly be influenced by education, training and development. Not taking such quality improvements into account will have the effect of overstating the rate of productivity growth. However, despite this limitation, the index is internationally the most commonly used partial measure of productivity.*

After an initial period of negative productivity growth, which on average declined by 1.4 per cent from 1982 to 1985, the index showed positive growth of 1.8 per cent per annum up to 1988, 3.2 per cent from 1989 to 1992 and 3.8 per cent from 1993 to 1996. The average growth over the whole period was 2.1 per cent per annum.

2.2 CAPITAL PRODUCTIVITY IN MAURITIUS

Figure 2.2 - Trends in Capital Productivity in Mauritius, 1982 to 1996
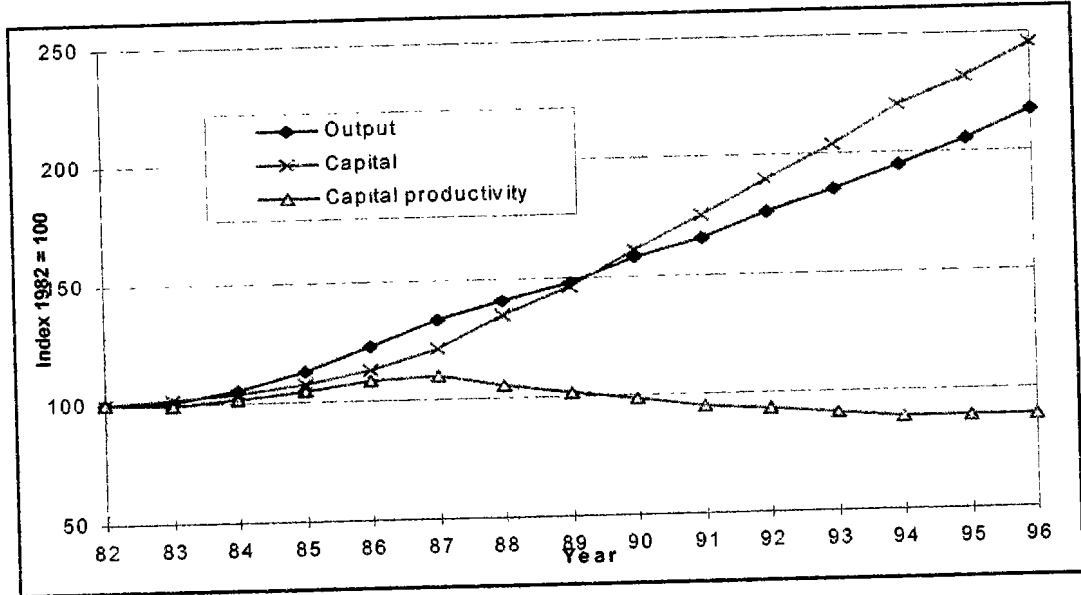
Capital productivity is defined as the amount of output created by each unit of capital. It is another partial measure of productivity. At a national level it is measured by dividing the amount of gross domestic product created by the total amount (or stock) of capital employed in the economy in a given period of time. Capital productivity gives an indication of the degree of efficiency with which assets (capital stock) are utilised.

An analysis of the trend in capital productivity over the period shows three phases. From 1982 to 1987, a capital productivity growth rate of 1.9 per cent was realised implying better utilisation of productive equipment coupled with a vigorous increase in employment. The second phase 1988 to 1994, registered decline in capital productivity with an average drop of 3.1 per cent per annum. The last two years suggest a consolidation phase with a slight 0.5 per cent growth in 1995 followed by a 0.2 per cent decline in 1996. Over the entire period there was an average decline of 0.9 per cent per annum.

The slight decline in capital productivity implies the use of more capital per worker as a result of investment in better technology. The capital/labour ratio increased from 1987 to 1996 by 5.4 per cent per annum. This has enabled workers to be more productive. The question raised is whether this trend will continue in the future, and the nature of this investment. If the investment leads to a future stream of increased outputs, then the capital investment will eventually result in increased multifactor productivity.

2.3 MULTIFACTOR PRODUCTIVITY IN MAURITIUS

Figure 2.3 - Trends in Multifactor Productivity in Mauritius, 1982 to 1996
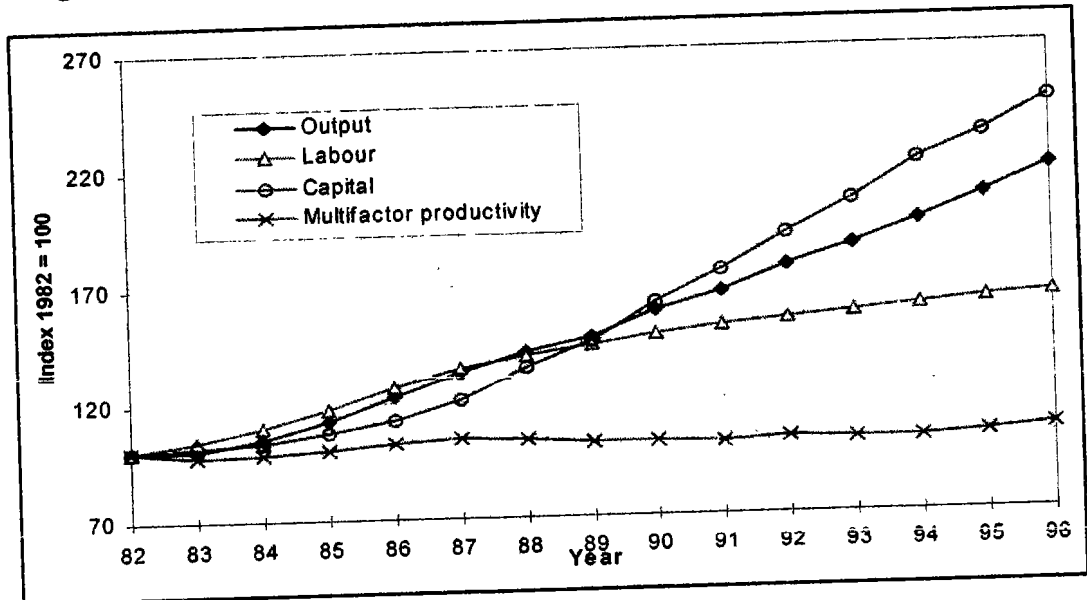
Multifactor productivity is defined as the amount of output created by both capital and labour employed in the wealth creating process. As previously mentioned, labour productivity and capital productivity are both partial measures. They compare output (GDP) against only one input (i.e. labour or capital) for any given period. MFP, on the other hand, measures output against both inputs. Growth in MFP typically flows from, inter alia, investments in human capital (e.g. training), improved technology, better management systems, optimal resource allocation, and co-operative relationships between labour and management.

From 1982 to 1983, the increase in output was less than the increase in labour and capital inputs. The effect of this was a drop of 2.6 per cent in multifactor productivity. Between 1984 and 1987, increases in output accelerated to eclipse the large increases in both capital and labour, resulting in a multifactor productivity growth of 1.7 per cent over this period. From 1988 to 1991, a small decline of 0.8 per cent was recorded in the multifactor productivity due to a large increase in capital input and a relatively smaller increase in output and labour input. However, it was not enough to offset the growth in use of capital. Between 1992 and 1996, a small multifactor productivity growth rate of 0.9 per cent was recorded reflecting a better balance between output, labour and capital inputs. Over the entire period from 1982 to 1996 multifactor productivity increased by 0.4 per cent per annum.

2.4 COMPARING PRODUCTIVITY TRENDS IN MAURITIUS

Figure 2.4 - Comparing Productivity Trends in Mauritius, 1982 to 1996
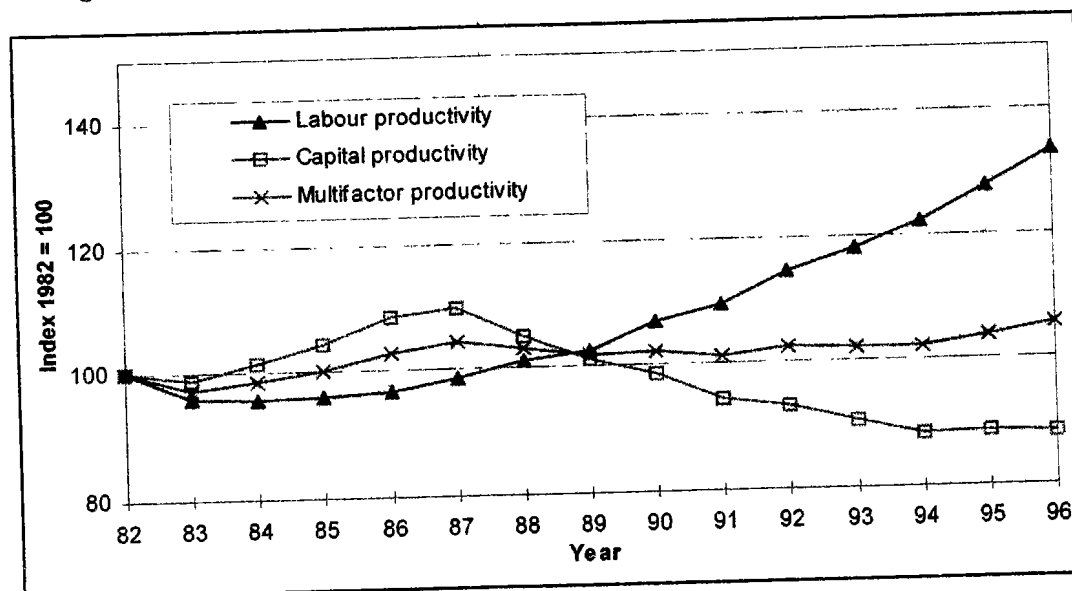
Why is multifactor productivity so important? An economy can grow in two ways - either by injecting more resources into the production process or using the existing resources more productively. Although economic growth can be driven through increasing the amount of capital or labour used, this cannot go on indefinitely. Sooner or later, one or other resource will become scarce, making productivity growth the only option. In Mauritius, it is evident that economic growth has largely been driven by employing its people more productively. In the longer term it is envisaged that the massive injections in capital equipment and new technology made over the past ten years, which has mainly been in telecommunications and transport, will provide the opportunity for future improvements in both labour and capital productivity.

As far as capital productivity is concerned, there is a distinct turning point in 1987. The first phase, from 1982 to 1987, shows sustained growth. Thereafter, capital productivity declined by an average of 2.4 per cent per annum. Labour productivity, on the other hand, has increased steadily from 1984 onwards. Multifactor productivity, which reflects the combined effects of labour and capital, grew until 1987, reflected a mixed performance between 1987 and 1994, and has grown by 1.8 per cent per annum during 1995 and 1996.

Growth Accounting determines the contribution of different factors to economic growth. The overall growth rate was 5.7 per cent per annum, while capital and labour inputs increased by 6.6 and 3.6 per cent respectively. A simple average of the weights of the input factors over the entire period was calculated and applied to arrive at weighted factor growth rates. From this it was deduced that capital contributed 61 per cent and labour 30 per cent to growth. The residual of 9 per cent, which is that part of change in output that has not been explained by corresponding changes in weighted labour and capital inputs, includes qualitative factors such as training, management and technology.

2.5 UNIT LABOUR COST - THE EFFECTS OF LABOUR COST

Figure 2.5 - Unit Labour Cost in Mauritius, 1982 to 1996
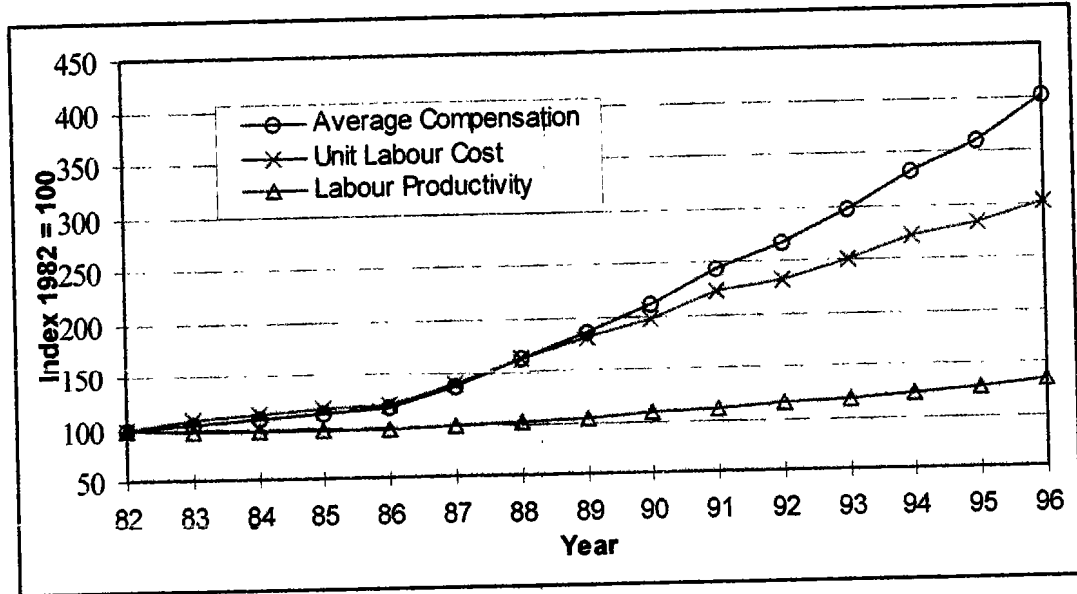
Unit labour cost is defined as the labour cost of producing a unit of output. It is measured by dividing compensation paid to labour by the total amount of output (GDP) generated in a period. Compensation to labour includes wages, salaries, contribution to pension funds and all other payments which organisations make to or on behalf of employees. Average compensation per employee measures the average remuneration per employee and is calculated by dividing total compensation by the number of employees. Changes in unit labour cost are determined by changes in labour productivity and changes in compensation per employee. Unit labour cost provides one indication of how cost competitive a nation is in producing goods and services.

During the period 1982 to 1986, the labour cost on average increased by 4.0 per cent, from 1987 to 1991 accelerated sharply to 15.7 per cent per annum, and levelled off to an average of 10.6 per cent between 1992 and 1996. The unit labour cost increased by 8.2 per cent per annum during the period 1982 to 1996. The increase in unit labour cost would have been greater had it not been for the average growth in labour productivity of 2.1 per cent per annum over this period. This must be viewed against an average inflation rate of 7.0 per cent per annum over the entire period. For purposes of international comparisons, the unit labour cost is discussed under the section dealing with competitiveness.

3. PRODUCTIVITY OF MANUFACTURING AND THE EXPORT PROCESSING ZONE

Since the early 1980's, the Manufacturing sector has made giant strides, raising its contribution to GDP from 15 per cent to around 24 per cent. It provides jobs for nearly 30 per cent of total employment and accounts for some 60 per cent of aggregate foreign earnings, including the export of services such as tourism. The lifeblood of the Manufacturing sector has been the EPZ companies which account for over 50 per cent of Manufacturing's total output and sugar milling which accounts for a further 7 per cent.

The productivity performance of the Manufacturing sector can be divided into two distinct phases. From 1982 to 1988, the Manufacturing and the EPZ sub-sector were characterised by rapid growth of labour and capital input which was not matched by the growth in real output. This led to stagnant labour productivity as well as declining capital and multifactor productivity. The period from 1989 to 1996 witnessed an average decline in labour and capital input. Corresponding real output declined but at a slower rate. The positive growth in both labour and capital productivity yielded a higher rate of multifactor productivity.

3.1 LABOUR PRODUCTIVITY

Figure 3.1 - Labour Productivity in Manufacturing, 1982 to 1996
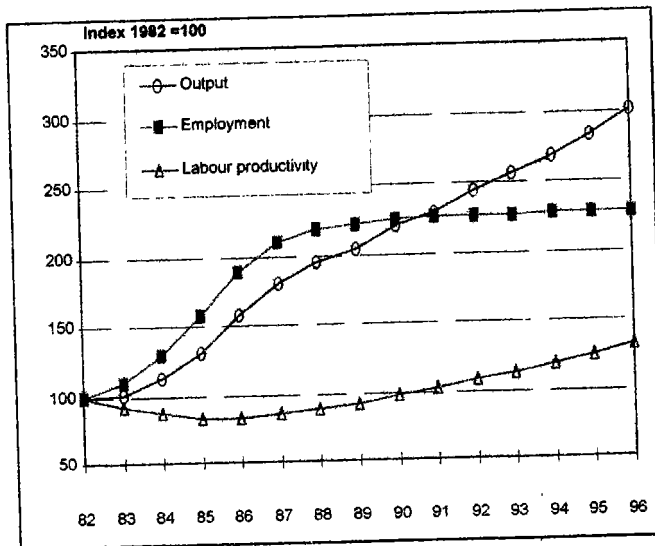
During the period 1982 to 1985, labour productivity declined at an annual rate of 6.2 per cent, as the 16.5 per cent growth rate in labour input outstripped the growth rate of real output (9.3 per cent). High labour mobility and absenteeism coupled with low level of efficiency due to the learning gap were major factors contributing to the decline in labour productivity.

Labour productivity improved at an annual rate of 2.7 per cent between 1986 and 1989, and at higher rate of 5.4 per cent from 1990 onwards. This healthy situation may be attributed to the production of higher value added products in the textile and clothing sector and the diversification process of the industrial base. The improvement of technological capabilities coupled with industrial re-engineering have certainly been beneficial to higher labour productivity.

Due to a significant learning gap and inefficiencies, the EPZ sector reflected declining labour productivity between 1983 and 1985. Since 1986, there has been a positive growth in labour productivity, as shown in figure 3.2. Some of the factors that could have contributed to this can be ascribed to longer working hours, shift work, productivity awareness and the campaign to increase productivity. The developments in manufacturing sector have been substantially influenced by growth in the EPZ.

Figure 3.2 - Labour Productivity of the Export Processing Zone, 1982 to 1996
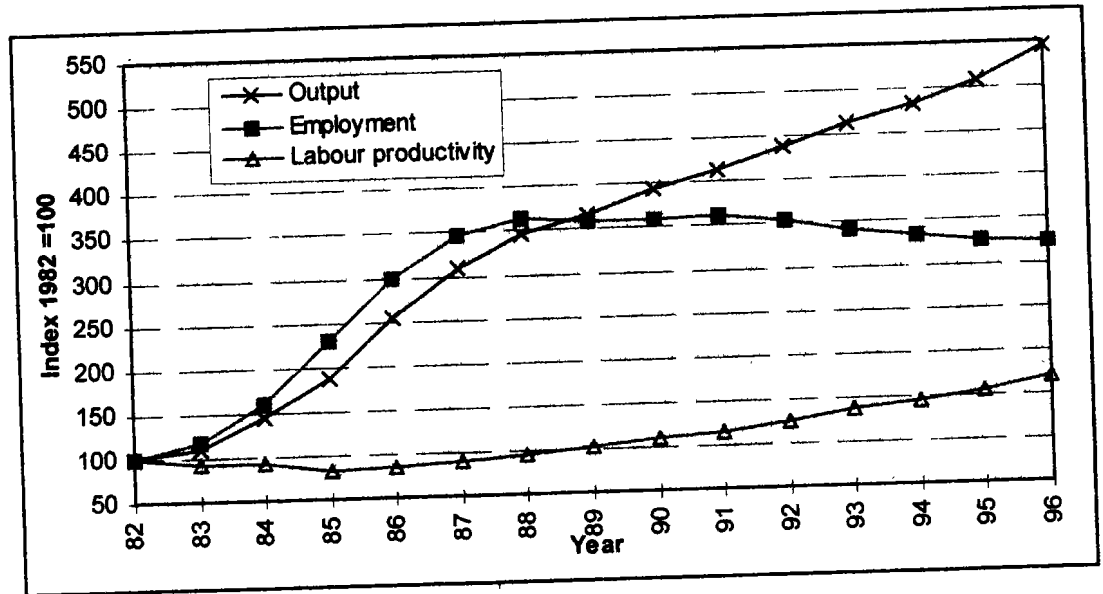
3.2 CAPITAL PRODUCTIVITY

Figure 3.3 - Capital Productivity in Manufacturing, 1982 to 1996
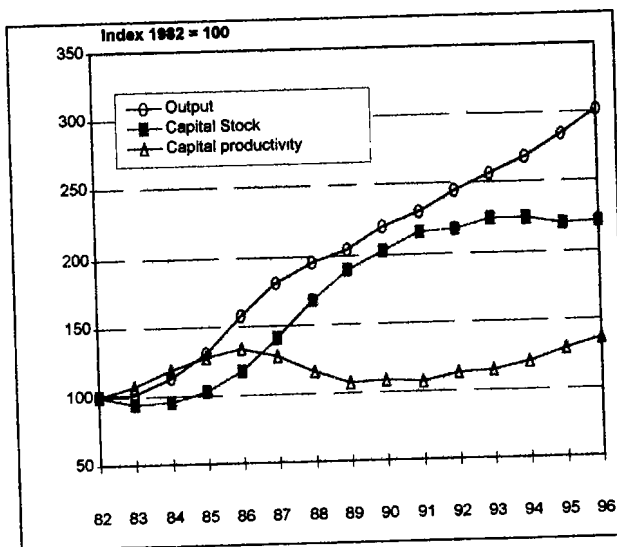
As shown in figure 3.3, the trend in capital productivity over the period under review, was somewhat erratic. After increasing by an annual average rate of 7.5 per cent during 1982 to 1986, due to better utilisation of capital, capital productivity decreased by 6.9 per cent per annum from 1987 to 1989. This followed substantial investment as capital input rose by 17.2 per cent per annum in these three years.

Capital productivity revived from 1990 onwards, reflecting greater efficiency in the use of the capacity of capital. It should be noted that capital investment usually has a lag effect.

Figure 3.4 - Capital Productivity of the Export Processing Zone, 1982 to 1996
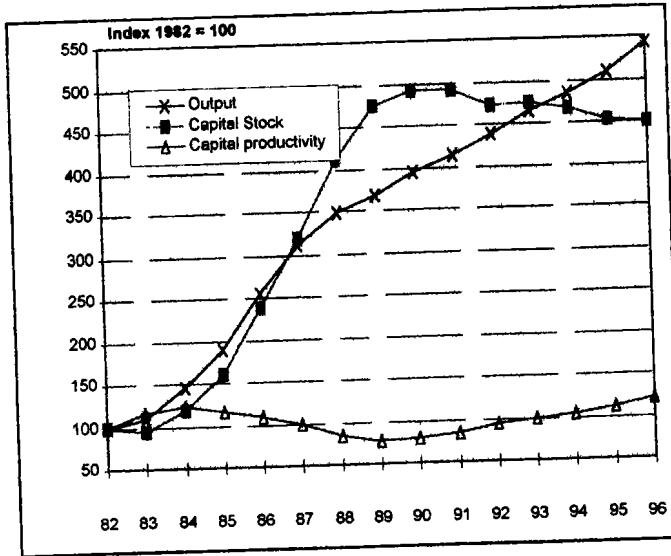
The EPZ sector reflected very little capital productivity gains between 1982 and 1989. It was only from 1990 onwards that capital productivity showed positive growth. It can be argued that the shortage of labour compelled business to use its capital more efficiently.

3.3 MULTIFACTOR PRODUCTIVITY

Figure 3.5 - Multifactor Productivity in Manufacturing, 1982 to 1996
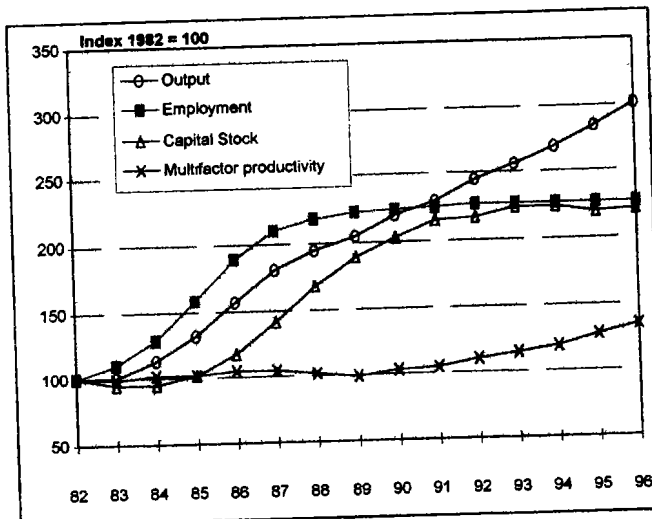
Since 1982, output has risen steadily while the increase in both employment and capital stock were high prior to 1989, thereafter tapering to current levels. It is clear from figure 3.5 that between 1982 and 1989, the rate of output increased at a higher rate than that of capital, and in this way the high growth in employment could be offset by improved efficiencies.

From 1982 to 1987, multifactor productivity increased by only 1 per cent per annum. During 1988 and 1989 the situation worsened, as the index fell by 5.4 per cent over the two years, because labour productivity did not improve enough to offset the loss in capital productivity. From 1990 onwards, a marked improvement in multifactor productivity is observed with a 4.4 per cent increase per year arising from the combined

effect of favourable increases in both labour productivity (5.4 per cent per annum) and capital productivity (3.4 per cent per annum).

These gains in multifactor productivity are a positive sign for our industrial development. It denotes maturity of the industrial structure and growth that is driven by factors such as efficiency, enhanced product quality, better management and better economic policy.

Figure 3.6 - Multifactor Productivity of the Export Processing Zone, 1982 to 1996
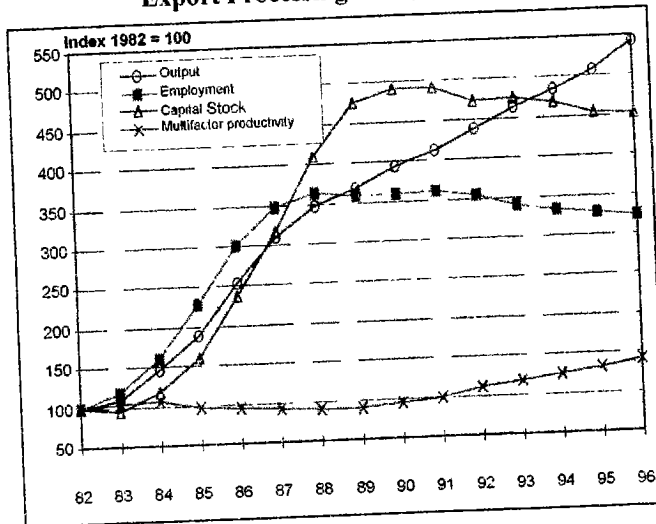
Combining labour and capital productivity into multifactor productivity in the EPZ, reflects a negative trend until 1989. The growth rate was positive from 1990 onwards. This is reflected in figure 3.6. As the cost of labour started to increase, and the EPZ faced a shortage of skilled labour, productivity improvement became a more critical issue to industrialists.

3.4 UNIT LABOUR COST

Figure 3.7 - Unit Labour Cost in Manufacturing, 1982 to 1996
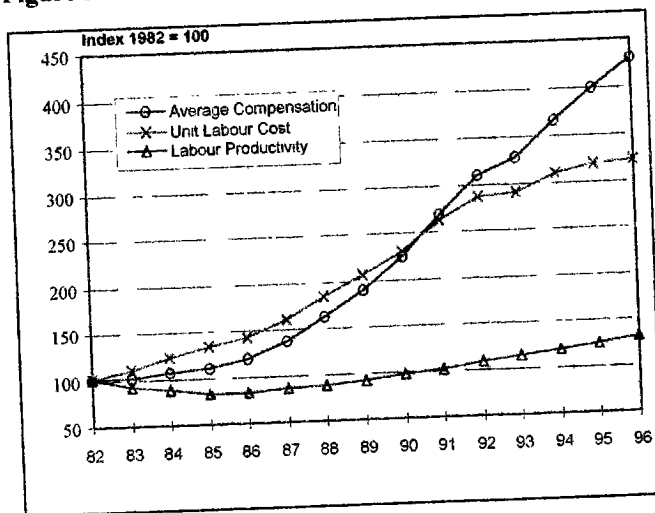
Many of the manufacturing enterprises, including the EPZ, started in Mauritius because of the relatively low labour cost and the abundance of labour. A major boost for growth in the manufacturing sector came from the introduction of the EPZ, which included generous incentives, such as duty free equipment and tax holidays.

During the early 1990's labour became scarce and the cost of labour rose sharply. Unit labour cost increased on average by 6.7 per cent per annum over this period. The increase was even more pronounced in the EPZ sub-sector, which then started to make use of imported labour. This stemmed the high increase in compensation and also had a

beneficial effect on labour productivity. In this way the unit labour cost could be contained and the competitiveness of the Manufacturing sector improved.

This trend is illustrated in figures 3.7 and 3.8, where it is clearly shown that between 1982 and 1985, unit labour cost increased by more than average compensation due to a decline in labour productivity. Thereafter, labour productivity improved resulting in the unit labour cost increasing at a slower rate than the average compensation.

Since 1992, growth in average compensation grew at a slower rate of 9.8 per cent per annum and together with the

Figure 3.8 - Unit Labour Cost of the Export Processing Zone, 1982 to 1996

continued labour productivity growth of 5.4 per cent, unit labour cost was contained at 4.2 per cent. This trend has made the industry more competitive.
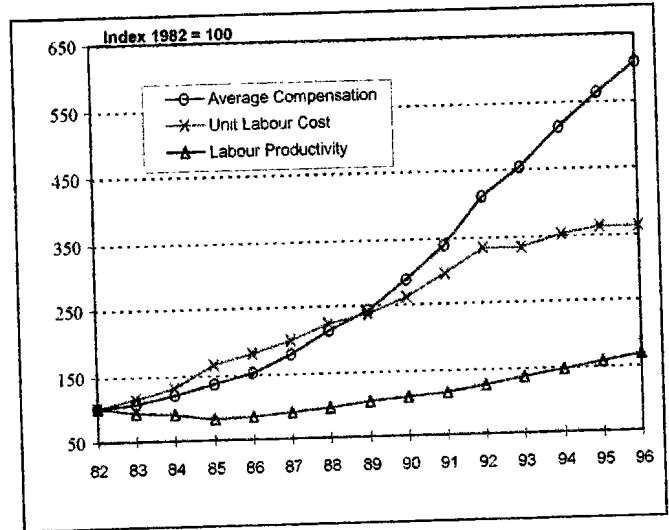
4. INTERNATIONAL COMPETITIVENESS

A number of competitiveness indicators can be used to compare a country's competitiveness internationally. These would include unit labour cost, real effective exchange rate, net export ratios, relative market shares as well as qualitative indicators such as those contained in the World Competitiveness Year Book. In this report, due to time limitations and data constraints, the emphasis will be on unit labour cost. The intention is, however, to expand the number of competitiveness indicators in subsequent editions.

In examining the trends in competitiveness, it is vital to consider changes in foreign exchange rates, because trends in competitiveness of a nation's products depend on changes in the prices of those products and also on commercial exchange rates. In US dollars, the unit labour cost grew at the rate of 3.2 per cent between 1982 and 1987, 7.2 per cent per annum between 1988 and 1991 and 1.6 per cent per annum from 1992 to 1996. Over the entire period, 1982 to 1995, this grew by an average of 5.3 per cent per annum. This declining trend was mainly attributable to the depreciation of the Mauritian currency relative to major trading partners, which in turn has made the country more competitive.

Figure 4.1 - International Comparison of Growth Rate in Unit Labour Cost Manufacturing, 1982 to 1995
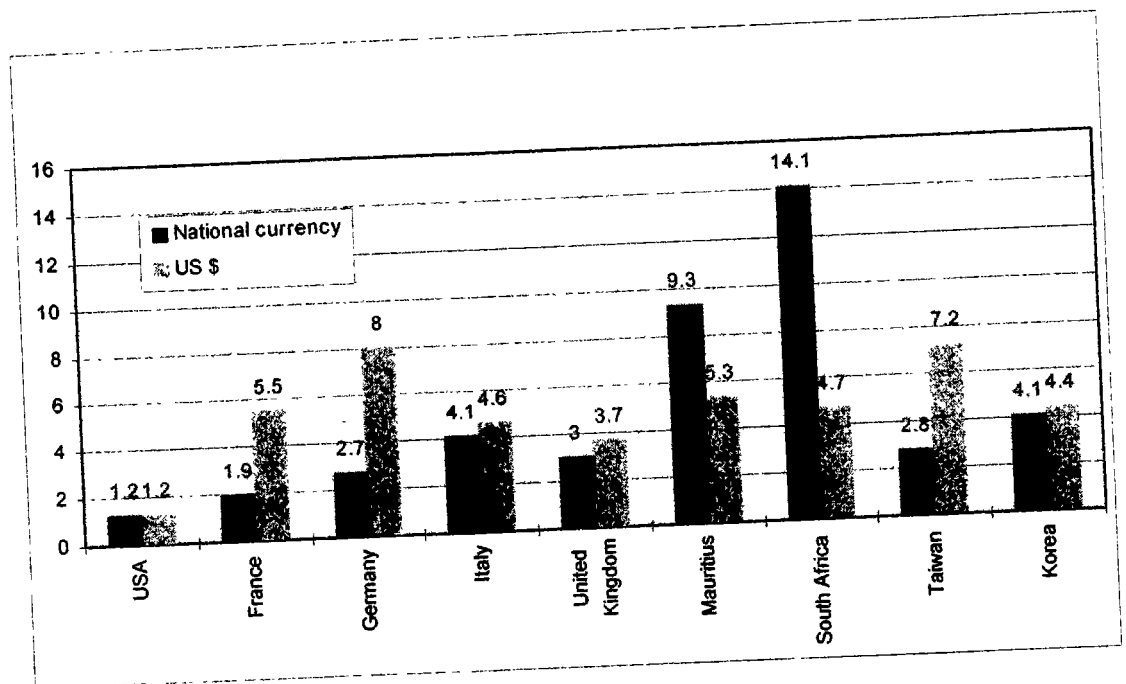
Currency appreciation and depreciation is a mixed blessing. On the one hand, appreciation of the rupee helps to contain inflation but may lead to a loss of international competitiveness. Similarly, a depreciation of the rupee, while being beneficial to the export-oriented sectors, would also have potential inflationary consequences and could

increase the prices of vital imports of raw materials and capital equipment, while it also increases the repayments and interest payments on foreign loans.

In terms of macro-economic policies, the authorities usually have to make a policy trade-off between the exchange rate adjustment and the inflation rate. The choice for many developing countries has been to adopt a "flexible" exchange rate policy as is the case for Mauritius. In the international trade environment created by the Marakesh agreement of the World Trade Organisation, the way forward for Mauritius is to become competitive through the achievements of productivity gains. Long term competitiveness depends heavily on productivity growth assisted intermittently by exchange rate changes. Short term exchange rate accommodation can only serve to postpone the need to address the real issues related to good management and productivity improvement.

Labour is the most important resource in the production process as it is the only input that can transform other resources into products and services that have value. It is therefore appropriate to concentrate on the labour cost content of output to give an indication of the competitive ability of nations. Figure 4.1 shows growth for the period from 1982 to 1995 in unit labour cost in national currency and US dollars, in the manufacturing sector. The latter indicates comparative changes in unit labour cost after the movement in exchange rates have been considered. The dollar is chosen as the currency in which most international transactions are priced.

It is interesting to note that for the period from 1982 to 1995 the unit labour cost of most of the Mauritian trading partners increased more slowly, in terms of their national currency, than in terms of the dollar. This indicates some appreciation in their own national currencies. Although to a lesser extent, this is also the case for Korea. In developing countries like Mauritius and South Africa, where comparative inflation rates have been much higher, depreciation in their currencies has been necessary to make their products more competitive in international markets.

An international comparison of the multifactor productivity for the business sector of selected countries is published by the OECD Economic Outlook (1997, A68) and the World Economic Outlook (May 1997) . The average percentage changes at annual rates are as follows:

Country	Average per cent growth per annum	Period
United States	0.5	(1979 to 1995)
Japan	1.2	(1979 to 1995)
United Kingdom	1.5	(1979 to 1995)
Mauritius (*)	0.4	(1982 to 1996)
Korea	2.1	(1984 to 1994)
Singapore	3.1	(1984 to 1994)
Taiwan	2.8	(1984 to 1994)
Indonesia	0.9	(1984 to 1994)
Malaysia	1.4	(1984 to 1994)
Phillipines	-0.9	(1984 to 1994)
Thailand	3.3	(1984 to 1994)

* Note: Mauritius is for the total economy, while other countries are for the business sector only.

A. THE TOTAL ECONOMY

Table A.1 - Trends in Labour Productivity for the Total Economy, 1982 to 1996

Year	Output		Employment		Labour productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	100.4	0.4	104.6	4.6	96.0	-4.0
1984	105.2	4.8	110.1	5.3	95.6	-0.4
1985	112.5	6.9	117.3	6.5	95.9	0.3
1986	122.5	8.9	126.7	8.0	96.7	0.8
1987	132.7	8.3	134.6	6.2	98.6	2.0
1988	140.9	6.2	139.3	3.5	101.1	2.5
1989	147.4	4.6	143.7	3.2	102.5	1.4
1990	158.1	7.3	147.8	2.9	107.0	4.4
1991	165.1	4.4	150.8	2.0	109.5	2.3
1992	176.1	6.7	153.7	1.9	114.6	4.7
1993	184.8	4.9	156.6	1.9	118.0	3.0
1994	194.6	5.3	159.1	1.6	122.3	3.6
1995	205.5	5.6	161.1	1.3	127.5	4.3
1996	217.4	5.8	163.1	1.2	133.3	4.5

Table A.2 - Trends in Capital Productivity for the Total Economy, 1982 to 1996

Year	Output		Capital Stock		Capital productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	100.4	0.4	101.6	1.6	98.8	-1.2
1984	105.2	4.8	103.7	2.1	101.4	2.6
1985	112.5	6.9	107.7	3.9	104.4	3.0
1986	122.5	8.9	113.0	4.9	108.4	3.8
1987	132.7	8.3	121.1	7.2	109.6	1.1
1988	140.9	6.2	134.2	10.8	105.0	-4.2
1989	147.4	4.6	145.7	8.6	101.2	-3.6
1990	158.1	7.3	160.8	10.4	98.4	-2.8
1991	165.1	4.4	175.0	8.8	94.3	-4.2
1992	176.1	6.7	189.3	8.2	93.0	-1.4
1993	184.8	4.9	204.1	7.8	90.5	-2.7
1994	194.6	5.3	220.6	8.1	88.2	-2.5
1995	205.5	5.6	231.9	5.1	88.6	0.5
1996	217.4	5.8	245.8	6.0	88.4	-0.2

Table A.3 - Trends in Multi-Factor Productivity for the Total Economy, 1982 to 1996

Year	Output		Employment		Capital Stock		Multifactor Productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0		100.0	
1983	100.4	0.4	104.6	4.6	101.6	1.6	97.4	-2.6
1984	105.2	4.8	110.1	5.3	103.7	2.1	98.5	1.1
1985	112.5	6.9	117.3	6.5	107.7	3.9	100.2	1.7
1986	122.5	8.9	126.7	8.0	113.0	4.9	102.8	2.6
1987	132.7	8.3	134.6	6.2	121.1	7.2	104.3	1.5
1988	140.9	6.2	139.3	3.5	134.2	10.8	103.1	-1.2
1989	147.4	4.6	143.7	3.2	145.7	8.6	101.8	-1.3
1990	158.1	7.3	147.8	2.9	160.8	10.4	102.2	0.4
1991	165.1	4.4	150.8	2.0	175.0	8.8	101.1	-1.1
1992	176.1	6.7	153.7	1.9	189.3	8.2	102.3	1.2
1993	184.8	4.9	156.6	1.9	204.1	7.8	101.9	-0.4
1994	194.6	5.3	159.1	1.6	220.6	8.1	101.9	0.0
1995	205.5	5.6	161.1	1.3	231.9	5.1	103.8	1.9
1996	217.4	5.8	163.1	1.2	245.8	6.0	105.6	1.7

Table A.4 - Comparing Productivity Trends for the Total Economy, 1982 to 1996

Year	Labour productivity		Capital productivity		Multifactor productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	96.0	-4.0	98.8	-1.2	97.4	-2.6
1984	95.6	-0.4	101.4	2.6	98.5	1.1
1985	95.9	0.3	104.4	3.0	100.2	1.7
1986	96.7	0.8	108.4	3.8	102.8	2.6
1987	98.6	2.0	109.6	1.1	104.3	1.5
1988	101.1	2.5	105.0	-4.2	103.1	-1.2
1989	102.5	1.4	101.2	-3.6	101.8	-1.3
1990	107.0	4.4	98.4	-2.8	102.2	0.4
1991	109.5	2.3	94.3	-4.2	101.1	-1.1
1992	114.6	4.7	93.0	-1.4	102.3	1.2
1993	118.0	3.0	90.5	-2.7	101.9	-0.4
1994	122.3	3.6	88.2	-2.5	101.9	0.0
1995	127.5	4.3	88.6	0.5	103.8	1.9
1996	133.3	4.5	88.4	-0.2	105.6	1.7

Table A.5 - Unit Labour Cost for the Total Economy, 1982 to 1996

Year	Average Compensation		Unit Labour Cost		Labour productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	103.7	3.7	108.1	8.1	96.0	-4.0
1984	108.0	4.1	113.0	4.5	95.6	-0.4
1985	112.6	4.3	117.4	3.9	95.9	0.3
1986	116.8	3.7	120.9	3.0	96.7	0.8
1987	136.8	17.1	139.0	15.0	98.6	2.0
1988	162.7	18.9	160.9	15.8	101.1	2.5
1989	185.9	14.3	181.3	12.7	102.5	1.4
1990	211.2	13.6	197.5	8.9	107.0	4.4
1991	242.4	14.8	221.4	12.1	109.5	2.3
1992	266.2	9.8	232.3	4.9	114.6	4.7
1993	295.7	11.1	250.6	7.9	118.0	3.0
1994	331.7	12.2	271.3	8.3	122.3	3.6
1995	360.1	8.6	282.4	4.1	127.5	4.3
1996	400.3	11.2	300.3	6.3	133.3	4.5

Table A.6 - Capital Labour Ratio for the Total Economy, 1982 to 1996

Year	Capital output ratio	Growth rate (%)	Capital labour ratio	Growth rate (%)	Labour productivity index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	101.2	1.2	97.1	-2.9	96.0	-4.0
1984	98.6	-2.6	94.2	-3.0	95.6	-0.4
1985	95.7	-2.9	91.8	-2.5	95.9	0.3
1986	92.3	-3.6	89.3	-2.7	96.7	0.8
1987	91.3	-1.1	90.0	0.8	98.6	2.0
1988	95.2	4.3	96.3	7.0	101.1	2.5
1989	98.9	3.9	101.3	5.2	102.5	1.4
1990	101.7	2.8	108.8	7.4	107.0	4.4
1991	106.0	4.2	116.1	6.7	109.5	2.3
1992	107.5	1.4	123.2	6.1	114.6	4.7
1993	110.5	2.8	130.3	5.8	118.0	3.0
1994	113.4	2.6	138.6	6.4	122.3	3.6
1995	112.9	-0.4	144.0	3.9	127.5	4.3
1996	113.1	0.2	150.7	4.7	133.3	4.5

B. THE MANUFACTURING SECTOR

Table B.1 - Trends in Labour Productivity in Manufacturing, 1982 to 1996

Year	Output		Employment		Labour productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	101.0	1.0	109.8	9.8	92.0	-8.0
1984	113.3	12.2	129.2	17.7	87.7	-4.7
1985	130.7	15.4	158.1	22.4	82.6	-5.8
1986	157.1	20.2	188.9	19.5	83.2	0.7
1987	180.0	14.6	209.7	11.0	85.8	3.1
1988	194.4	8.0	218.4	4.1	89.0	3.7
1989	203.9	4.9	221.8	1.6	91.9	3.3
1990	219.6	7.7	224.4	1.2	97.9	6.5
1991	229.7	4.6	225.6	0.5	101.8	4.0
1992	244.6	6.5	226.0	0.2	108.2	6.3
1993	256.4	4.8	226.1	0.0	113.4	4.8
1994	268.2	4.6	226.9	0.4	118.2	4.2
1995	283.5	5.7	226.9	0.0	124.9	5.7
1996	301.3	6.3	227.0	0.0	132.7	6.2

Table B.2 - Trends in Capital Productivity in Manufacturing, 1982 to 1996

Year	Output		Capital Stock		Capital productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	101.0	1.0	94.4	-5.6	107.0	7.0
1984	113.3	12.2	95.3	1.0	118.9	11.1
1985	130.7	15.4	102.5	7.6	127.4	7.1
1986	157.1	20.2	117.6	14.7	133.5	4.8
1987	180.0	14.6	140.7	19.6	127.9	-4.2
1988	194.4	8.0	167.1	18.8	116.4	-9.0
1989	203.9	4.9	189.2	13.2	107.8	-7.4
1990	219.6	7.7	202.7	7.1	108.3	0.5
1991	229.7	4.6	215.1	6.1	106.8	-1.4
1992	244.6	6.5	216.6	0.7	112.9	5.7
1993	256.4	4.8	223.6	3.2	114.7	1.6
1994	268.2	4.6	223.8	0.1	119.8	4.4
1995	283.5	5.7	220.3	-1.6	128.7	7.4
1996	301.3	6.3	220.9	0.3	136.4	6.0

Table B.3 - Trends in Multi-Factor Productivity in Manufacturing, 1982 to 1996

Year	Output		Employment		Capital Stock		Multifactor Productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0		100.0	
1983	101.0	1.0	109.8	9.8	94.4	-5.6	98.9	-1.1
1984	113.3	12.2	129.2	17.7	95.3	1.0	101.6	2.7
1985	130.7	15.4	158.1	22.4	102.5	7.6	102.0	0.4
1986	157.1	20.2	188.9	19.5	117.6	14.7	105.3	3.2
1987	180.0	14.6	209.7	11.0	140.7	19.6	105.3	0.0
1988	194.4	8.0	218.4	4.1	167.1	18.8	101.9	-3.2
1989	203.9	4.9	221.8	1.6	189.2	13.2	99.6	-2.3
1990	219.6	7.7	224.4	1.2	202.7	7.1	102.9	3.3
1991	229.7	4.6	225.6	0.5	215.1	6.1	104.2	1.3
1992	244.6	6.5	226.0	0.2	216.6	0.7	110.4	6.0
1993	256.4	4.8	226.1	0.0	223.6	3.2	114.0	3.3
1994	268.2	4.6	226.9	0.4	223.8	0.1	119.0	4.4
1995	283.5	5.7	226.9	0.0	220.3	-1.6	126.8	6.6
1996	301.3	6.3	227.0	0.0	220.9	0.3	134.7	6.2

Table B.4 - Comparing Productivity Trends in Manufacturing, 1982 to 1996

Year	Labour productivity		Capital productivity		Multifactor productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	92.0	-8.0	107.0	7.0	98.9	-1.1
1984	87.7	-4.7	118.9	11.1	101.6	2.7
1985	82.6	-5.8	127.4	7.1	102.0	0.4
1986	83.2	0.7	133.5	4.8	105.3	3.2
1987	85.8	3.1	127.9	-4.2	105.3	0.0
1988	89.0	3.7	116.4	-9.0	101.9	-3.2
1989	91.9	3.3	107.8	-7.4	99.6	-2.3
1990	97.9	6.5	108.3	0.5	102.9	3.3
1991	101.8	4.0	106.8	-1.4	104.2	1.3
1992	108.2	6.3	112.9	5.7	110.4	6.0
1993	113.4	4.8	114.7	1.6	114.0	3.3
1994	118.2	4.2	119.8	4.4	119.0	4.4
1995	124.9	5.7	128.7	7.4	126.8	6.6
1996	132.7	6.2	136.4	6.0	134.7	6.2

Table B.5 - Unit Labour Cost in Manufacturing, 1982 to 1996

Year	Average Compensation		Unit Labour Cost		Labour productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	101.5	1.5	110.4	10.4	92.0	-8.0
1984	107.2	5.6	122.2	10.7	87.7	-4.7
1985	110.8	3.4	134.0	9.7	82.6	-5.8
1986	119.1	7.5	143.2	6.9	83.2	0.7
1987	137.8	15.7	160.5	12.1	85.8	3.1
1988	163.6	18.7	183.8	14.5	89.0	3.7
1989	189.1	15.6	205.7	11.9	91.9	3.3
1990	225.2	19.1	230.2	11.9	97.9	6.5
1991	268.4	19.2	263.6	14.5	101.8	4.0
1992	309.7	15.4	286.1	8.5	108.2	6.3
1993	328.6	6.1	289.8	1.3	113.4	4.8
1994	366.9	11.7	310.4	7.1	118.2	4.2
1995	398.8	8.7	319.2	2.8	124.9	5.7
1996	429.1	7.6	323.3	1.3	132.7	6.2

Table B.6 - Capital Labour Ratio in Manufacturing, 1982 to 1996

Year	Capital output ratio	Growth rate (%)	Capital labour ratio	Growth rate (%)	Labour productivity index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	93.4	-6.6	85.9	-14.1	92.0	-8.0
1984	84.1	-10.0	73.7	-14.2	87.7	-4.7
1985	78.5	-6.7	64.8	-12.1	82.6	1.8
1986	74.9	-4.6	62.3	-3.9	83.2	0.7
1987	78.2	4.4	67.1	7.7	85.8	3.1
1988	85.9	9.8	76.5	14.0	89.0	-1.1
1989	92.8	8.0	85.3	11.5	91.9	3.3
1990	92.3	-0.5	90.3	5.9	97.9	6.5
1991	93.6	1.4	95.3	5.5	101.8	4.0
1992	88.5	-5.4	95.8	0.5	108.2	6.3
1993	87.2	-1.5	98.9	3.2	113.4	4.8
1994	83.5	-4.2	98.6	-0.3	118.2	4.2
1995	77.7	-6.9	97.1	-1.5	124.9	5.7
1996	73.3	-5.7	97.3	0.2	132.7	6.2

C. THE EXPORT PROCESSING ZONE

Table C.1 - Trends in Labour Productivity of the Export Processing Zone, 1982 to 1996

Year	Output Index	Output Growth rate (%)	Employment Index	Employment Growth rate (%)	Labour productivity Index	Labour productivity Growth rate (%)
1982	100.0		100.0		100.0	
1983	109.0	9.0	117.1	17.1	93.1	-6.9
1984	145.0	33.0	158.8	35.6	91.3	-1.9
1985	188.0	29.7	228.4	43.8	82.3	-9.9
1986	254.0	35.1	299.2	31.0	84.9	3.2
1987	309.9	22.0	347.1	16.0	89.3	5.2
1988	346.8	11.9	363.0	4.6	95.5	6.9
1989	366.9	5.8	359.0	-1.1	102.2	7.0
1990	393.0	7.1	357.5	-0.4	109.9	7.5
1991	413.0	5.1	360.0	0.7	114.7	4.4
1992	438.2	6.1	354.1	-1.6	123.7	7.8
1993	464.0	5.9	340.2	-3.9	136.4	10.3
1994	484.0	4.3	332.8	-2.2	145.4	6.6
1995	508.2	5.0	327.0	-1.7	155.4	6.9
1996	543.8	7.0	322.7	-1.3	168.5	8.4

Table C.2 - Trends in Capital Productivity of the Export Processing Zone, 1982 to 1996

Year	Output Index	Output Growth rate (%)	Capital Stock Index	Capital Stock Growth rate (%)	Capital Productivity Index	Capital Productivity Growth rate (%)
1982	100.0		100.0		100.0	
1983	109.0	9.0	93.4	-6.6	116.8	16.8
1984	145.0	33.0	117.5	25.8	123.4	5.7
1985	188.0	29.7	160.7	36.8	117.0	-5.2
1986	254.0	35.1	236.6	47.2	107.4	-8.2
1987	309.9	22.0	317.1	34.0	97.7	-9.0
1988	346.8	11.9	410.1	29.3	84.6	-13.4
1989	366.9	5.8	475.1	15.8	77.2	-8.7
1990	393.0	7.1	492.6	3.7	79.8	3.4
1991	413.0	5.1	491.6	-0.2	84.0	5.3
1992	438.2	6.1	472.1	-4.0	92.8	10.5
1993	464.0	5.9	474.7	0.6	97.8	5.4
1994	484.0	4.3	467.7	-1.5	103.5	5.8
1995	508.2	5.0	453.5	-3.0	112.1	8.3
1996	543.8	7.0	451.2	-0.5	120.5	7.5

Table C.3 - Multi-Factor Productivity of the Export Processing Zone, 1982 to 1996

Year	Output		Employment		Capital Stock		Multifactor Productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0		100.0	
1983	109.0	9.0	117.1	17.1	93.4	-6.6	104.1	4.1
1984	145.0	33.0	158.8	35.6	117.5	25.8	105.9	1.7
1985	188.0	29.7	228.4	43.8	160.7	36.8	96.8	-8.6
1986	254.0	35.1	299.2	31.0	236.6	47.2	94.5	-2.4
1987	309.9	22.0	347.1	16.0	317.1	34.0	93.2	-1.4
1988	346.8	11.9	363.0	4.6	410.1	29.3	90.0	-3.4
1989	366.9	5.8	359.0	-1.1	475.1	15.8	89.1	-1.0
1990	393.0	7.1	357.5	-0.4	492.6	3.7	94.8	6.4
1991	413.0	5.1	360.0	0.7	491.6	-0.2	99.8	5.3
1992	438.2	6.1	354.1	-1.6	472.1	-4.0	109.9	10.1
1993	464.0	5.9	340.2	-3.9	474.7	0.6	117.0	6.5
1994	484.0	4.3	332.8	-2.2	467.7	-1.5	123.8	5.8
1995	508.2	5.0	327.0	-1.7	453.5	-3.0	132.5	7.0
1996	543.8	7.0	322.7	-1.3	451.2	-0.5	141.1	6.5

Table C.4 - Comparing Productivity Trends in the Export Processing Zone, 1982 to 1996

Year	Labour productivity		Capital productivity		Multifactor productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	93.1	-6.9	116.8	16.8	104.1	4.1
1984	91.3	-1.9	123.4	5.7	105.9	1.7
1985	82.3	-9.9	117.0	-5.2	96.8	-8.6
1986	84.9	3.2	107.4	-8.2	94.5	-2.4
1987	89.3	5.2	97.7	-9.0	93.2	-1.4
1988	95.5	6.9	84.6	-13.4	90.0	-3.4
1989	102.2	7.0	77.2	-8.7	89.1	-1.0
1990	109.9	7.5	79.8	3.4	94.8	6.4
1991	114.7	4.4	84.0	5.3	99.8	5.3
1992	123.7	7.8	92.8	10.5	109.9	10.1
1993	136.4	10.3	97.8	5.4	117.0	6.5
1994	145.4	6.6	103.5	5.8	123.8	5.8
1995	155.4	6.9	112.1	8.3	132.5	7.0
1996	168.5	8.4	120.5	7.5	141.1	6.5

Table C.5 - Unit Labour Cost in the Export Processing Zone, 1982 to 1996

Year	Average Compensation		Unit Labour Cost		Labour productivity	
	Index	Growth rate (%)	Index	Growth rate (%)	Index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	105.0	5.0	112.7	12.7	93.1	-6.9
1984	119.8	14.1	131.2	16.4	91.3	-1.9
1985	135.2	12.9	164.3	25.2	82.3	-9.9
1986	152.3	12.6	179.4	9.2	84.9	3.2
1987	178.4	17.1	199.8	11.4	89.3	5.2
1988	212.4	19.1	222.3	11.3	95.5	6.9
1989	240.8	13.4	235.6	6.0	102.2	7.0
1990	287.6	19.4	261.6	11.0	109.9	7.5
1991	337.5	17.4	294.2	12.5	114.7	4.4
1992	410.6	21.7	331.8	12.8	123.7	7.8
1993	453.9	10.5	332.8	0.3	136.4	10.3
1994	510.2	12.4	350.8	5.4	145.4	6.6
1995	561.2	10.0	361.1	2.9	155.4	6.9
1996	608.2	8.4	360.9	-0.1	168.5	8.4

Table C.6 - Capital Labour Ratio of the Export Processing Zone, 1982 to 1996

Year	Capital output ratio	Growth rate (%)	Capital labour ratio	Growth rate (%)	Labour productivity index	Growth rate (%)
1982	100.0		100.0		100.0	
1983	85.6	-14.4	79.7	-20.3	93.1	-6.9
1984	81.0	-5.4	74.0	-7.2	91.3	-1.9
1985	85.5	5.6	70.4	-4.9	82.3	1.8
1986	93.1	8.9	79.1	12.4	84.9	3.2
1987	102.3	9.9	91.4	15.5	89.3	5.2
1988	118.3	15.6	113.0	23.6	95.5	-1.1
1989	129.5	9.5	132.4	17.2	102.2	7.0
1990	125.4	-3.2	137.8	4.1	109.9	7.5
1991	119.0	-5.1	136.6	-0.9	114.7	4.4
1992	107.7	-9.5	133.3	-2.4	123.7	7.8
1993	102.3	-5.0	139.5	4.7	136.4	10.3
1994	96.6	-5.6	140.5	0.7	145.4	6.6
1995	89.2	-7.7	138.7	-1.3	155.4	6.9
1996	83.0	-7.0	139.8	0.8	168.5	8.4

Note: All 1996 figures are provisional at the time of this release.