

# Globalisation and its effect on the South African labour market: evidence from the manufacturing sector

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This article investigates the impact of globalisation on employment and wages in the South African manufacturing sector for the period 1993 to 2001. Globalisation has led to a more open economy. Export volumes have increased and manufactured goods have gained ground in relation to mining products. Within the manufacturing basket, labour-intensive goods have become more important. Productivity has increased, but there has been no nett job creation or increase in unskilled wages. Regression results indicate that exports have a positive effect on employment, but only for highly skilled workers, not for semi-skilled or unskilled employees.

## Die effek van globalisering op die Suid-Afrikaanse arbeidsmark: bewyse uit die vervaardigingsektor

Hierdie artikel ondersoek die impak van globalisering op indiensname en lone in die Suid-Afrikaanse vervaardigingsektor vir die periode 1993 tot 2001. Globalisering het tot 'n oper ekonomie gelei. Uitvoervolumes het gestyg en vervaardigde goedere het relatief tot mynbouprodukte in belangrikheid toegeneem. Binne die vervaardigingsmandjie het arbeidsintensiewe goedere ook belangriker geword. Produktiwiteit het toegeneem, maar daar was geen netto toename in werkskepping nie en ongeskoolde lone het nie gestyg nie. Regressie-analise toon dat uitvoere 'n positiewe uitwerking op indiensname het, maar slegs vir hoogs geskoolde werkers en nie vir semi- en ongeskoolde werkers nie.

*Mrs A M Pretorius, Dept of Economics, University of South Africa, P O Box 392, Unisa 0003; E-mail: pretoam1@unisa.ac.za; Mr P F Blaauw, Dept of Economics, University of Johannesburg, P O Box 524, Auckland Park 2006; E-mail: pfb@rau.ac.za*

The normalisation of South Africa's international political and economic relations in the early 1990s made the country a late-comer to the globalisation game.<sup>1</sup> It is hard to date the actual start of South Africa's economic globalisation, but it occurred only after the country's economic and political performance had deteriorated since the early 1980s. South Africa thus re-entered the international economy in the early 1990s at a time when the process of globalisation was gathering momentum (Loots 2002: 47). There are a number of prominent features or landmarks in the country's globalisation process.

The commitment to trade liberalisation began in 1990 under the previous regime and gathered momentum in January 1994 with the signing of an agreement with the World Trade Organisation (WTO) to reduce the general level of tariff protection from a trade weighted average of 30% to 15% (Dept of Trade and Industry 2001: 7). The tariff structure was rationalised and import quotas in respect of agricultural imports were replaced by tariff measures. Liberalising the external trade regime has been one of the central and most visible elements of South Africa's drive to achieve accelerated economic growth. This liberalisation is symbolic of the country's break with past economic policies, and ensures the integration of domestic markets with those of the rest of world (Dept of Trade and Industry 2001: 7).

In March 1995 the financial rand was abolished and the restrictions applicable to the repatriation of non-resident-owned funds were removed (Ministry of Finance 1997). These actions initiated a process of external financial liberalisation which is still underway but which has already removed all exchange control on foreigners. It was preceded and subsequently complemented by domestic financial liberalisation, including the restructuring of the Johannesburg Stock Exchange, the development of a eurorand bond market and the diversification of financial instruments (Mboweni 2000).

- 1 Previous versions of this paper were presented at the workshop on Globalisation, Production and Poverty in South Africa, Trade and Industry Policy Secretariat, Johannesburg, on June 24 2002, as well as at the international conference on Globalisation and Entrepreneurship: fears, challenges and opportunities, hosted by the Faculty of Economics and Tourism, University of Rijeka in Pula, Croatia, from 24-26 April 2003.

The above-mentioned measures had a major effect on the domestic economy. The production side underwent a streamlining process as the quest for competitiveness in the global market resulted in significant job losses over almost the whole spectrum of the manufacturing industries.

### 1.1 Aim

The aim of this article is to measure the impact of globalisation on employment and wages in the manufacturing sector. This will be investigated in two ways. The manufacturing sectors will be classified according to factor intensity and capital/labour ratios. Possible trends in employment and wage levels for these categories will then be identified by comparing the levels of 1993 to those of 2001.

In addition, cross-sectional regressions will be run to explain the changes in employment and salary levels between 1993 and 2001. The explanatory variables include tariff levels, net exports, the employment skills ratio and a dummy variable distinguishing categories of trading partners.

The article starts by defining globalisation before identifying the possible impact of globalisation on employment and wages from the literature, evaluating the empirical evidence, and finally offering some policy considerations.

## 2. Defining globalisation

There are almost as many descriptions of globalisation as there are studies on the topic. James Mittelman sees globalisation as a syndrome of processes and activities rather than a single unified phenomenon (Loots 2002: 48). Richard Harris provides a more specific definition, referring to economic globalisation as “the increasing internationalisation of the production, distribution and marketing of goods and services” (Harris 1993: 755). The International Monetary Fund (IMF 1997: 45) describes globalisation as

[...] the growing interdependence of countries world-wide through the increasing volume and variety of cross-border transactions in goods and services and of international capital flows, and also through the more rapid and widespread diffusion of technology.

A more comprehensive and detailed description comes from Duncan (2000: 3), who defines globalisation as the process of closer economic integration between countries in terms of trade in goods and services, investment (both fixed and portfolio investment), free movement of labour (in some cases such as the European Union), adoption of common currencies, and joint international action on cross-border issues such as pollution. Perhaps the different descriptions can be summarised as the global circulation of goods, services and capital, but also of information, ideas and people (cf World Bank 2000b).

Even without a precise, widely accepted definition, globalisation is regarded by many economists as one of the most powerful forces to have shaped the world economy during the past fifty years (Loots 2002: 46). The impact of this process on employment and wages will be discussed in the next section.

### 3. The impact of globalisation on employment and wages

Much has been written about the international economic impact of globalisation. According to the World Bank (2000a) the aspects of globalisation that enjoyed global attention in the 1990s included capital flow, migration and environmental issues. The expansion of trade remains the driving force behind globalisation, however. The share of trade (imports or exports or both) in output provides a ready measure of the extent of globalisation in product markets (IMF 1997: 79). In this regard, trade in goods and services grew twice as fast as global GDP during the 1990s.

Data on the prices of tradable goods, rather than on quantities, can provide an alternative measure of the extent of globalisation. In fact, international trade theory suggests that trade affects labour markets through the prices at which trade takes place and not through the quantities involved. Even a small import share can have a major effect on wages if the competitive structure of the domestic market is significantly changed. But data in this regard is much more difficult to obtain than data on international trade flows (IMF 1997: 80).

Many authors consider the effect of globalisation on financial flows or capital movements, trade, growth and wages (cf Wade 2001; O'Rourke

& Williamson 2000; Wolf 1997; Cornia & Court 2001). Its impact on income distribution (equality) is measured through the effect on employment and wage levels, which also form the focus of this article. The next section will summarise some of the main arguments and empirical findings.

### 3.1 Effect on employment, wages and income distribution

Many proponents of free trade and capital movements say that world income distribution is becoming more equal as globalisation continues. The neo-liberal paradigm generates a strong expectation that as national economies become more densely interconnected through trade and investment, world income distribution tends to become more equal (cf Wade 2001). However, the evidence suggests that none of the possible measures shows incontrovertibly that world income distribution has become more equal over the past twenty years (cf Bourguignon & Morrisson 1999; Pritchett 1997).

As the degree of globalisation has increased, labour demand in many advanced economies has shifted away from less highly-skilled workers in favour of more highly-skilled employees. This trend has widened the wage gap between these categories of workers, producing increased income inequality and unemployment, primarily among the less highly skilled (IMF 1997: 78). The following section will provide an overview of the findings of various international studies in this regard.

#### 3.1.1 International studies

O'Rourke & Williamson (2000: 4) introduce their explanation with two conditions. Trade-creating forces must change domestic commodity prices, which in turn must induce a reshuffling of resources between economic activities in order for trade to influence what really matters, like the scale of output, the distribution of income (land returns relative to wages), absolute living standards or the quality of life. The possible impact on resources is explained by the Heckscher-Ohlin theory, which states that trade patterns reflect differences in the distribution of endowments across countries. Countries export goods embodying those factors of production with which they are well endowed. Commodity market integration therefore leads to an increase in the demand for abundant (and cheap) factors of production, thus raising their prices,

and in the same way leads to a decrease in the demand for scarce (and expensive) factors of production, thus lowering their prices (O'Rourke 2001: 2).

In practical terms, imports from countries that have a relative abundance of unskilled labour should lower the prices of products that use such labour relatively intensely. This will shift production in advanced countries towards products that are intensive in skilled labour, increasing the demand for skilled labour and lowering the demand for unskilled labour. This shift will manifest itself either in a growing wage gap between skilled and unskilled workers, or in rising unemployment of the latter in advanced economies (cf Wolf 1997; IMF 1997: 80). Various studies in the United States show that since the late 1970s the labour demand has shifted steadily and markedly away from less skilled workers toward skilled workers (cf IMF 1997: 79-80).

On the other hand, in exporting countries, the demand for goods produced by intensive unskilled labour should increase, leading to higher wages for unskilled workers and a more equal distribution of income. The standard Stolper-Samuelson prediction is that free trade increases income for the abundant factor and reduces income for the scarce factor (cf Lindert & Williamson 2001). Freer trade allows those countries abundant in unskilled labour to shift towards unskilled labour-intensive production, raising unskilled wages in relation to skilled wages.

In many developing countries the relative supply of skilled labour has increased at the same time as trade liberalisation in these countries' export markets has increased the demand for unskilled labour. Globalisation and the resulting trade liberalisation were expected to lower skilled wages and increase unskilled wages. The fact that the opposite has transpired shows that the shift towards the demand for skilled labour was not restricted to the advanced economies (IMF 1997: 82).

Labour economists looking at the effect of trade on wages have applied a methodology quite different from that of Stolper-Samuelson. They focus on the volume of trade and on the factors embodied in such flows rather than on the prices of imports. Despite the differences in methodology, nearly all research finds that international trade exerts only a modest influence on wages (IMF 1997: 83-5).

The outcome may be different if other factors influencing inequality in income are considered. Movements of labour across countries can also affect wages. The main issue in advanced economies is whether immigration of less skilled workers from developing countries depresses the relative earnings of less skilled native workers (IMF 1997: 89). According to O'Rourke (2001: 16) the impact of migration on within-country inequality depends largely on the skill mix. In the late nineteenth century, migration predominantly involved young, unskilled adults, with very high labour force participation rates. It had a large potential impact on inequality, lowering it in Europe and raising it in the New World. As the twentieth century progressed, the picture became increasingly similar, at least for the US: the skills profile of immigrants, in relation to the native born, has worsened dramatically since the mid-1960s. In situations where policy measures have encouraged more skilled immigration, greater inequality can occur in emigrant economies and greater equality in immigrant countries: the opposite of the case in the late nineteenth century (O'Rourke 2001: 16).

Has inequality in wages and income declined or worsened within individual countries? The empirical evidence is mixed. Some agreement exists on the situation in high-income countries as a group compared to developing economies as a group.

Cornia & Court (2001) found that new technology leads to rising wage inequality in developing countries. Duncan (2000) reports that in high-income countries, there appears to have been increasing inequality in some cases, for instance the Netherlands, Norway, Britain and the USA but not in Canada and France. Wolf (1997: 5) quotes a study by Slaughter and Swagel concluding that increased trade accounts for only about 10 to 20% of the changes in wages in advanced economies. Although the effect is relatively small, it thus does exist. O'Rourke (2001: 30) reports empirical findings consistent with other studies and the Heckscher-Ohlin theory, *i e* sharply rising wage inequality in Britain and the USA, varying results in other countries. Between the mid-1980s and the mid-1990s, wage inequality in advanced countries fell in exactly as many cases as it rose.

According to Cornia & Court (2001: 16) there is an increasing consensus of opinion that trade has only a limited impact on wages and income inequality. O'Rourke (2001: 30) shares this view and concludes

that cross-country studies leave many questions regarding the links between openness and inequality unanswered. Further research is needed before any conclusions can be drawn.

### 3.1.2 Previous studies regarding South Africa

Various studies on the impact of globalisation on the South African economy have appeared recently.

An ILO (1999) study covering the social impact of globalisation from 1993 to 1997 found that since the start of liberalisation export-oriented sectors performed better in terms of output, productivity gains and wage increases than import-competing sectors. Capital-intensive manufacturing sectors and those based on natural resources showed the same trend as export-orientated sectors. However, employment losses in these two manufacturing sectors were relatively larger. Formerly highly protected sectors and those with important decreases in tariffs experienced lower relative employment losses than other sectors. This suggests that the direct impact of import liberalisation is not the main factor behind employment losses.

Tsikata (1999) found that manufacturing sub-sectors reacted differently to changes in trade-weighted protection. Some of the sectors facing the largest declines in nominal protection increased both output and employment, while others showed the opposite trend. Regarding the factor intensity of exports, she found that between 1992 and 1996 South Africa had a declining share of the exports that used unskilled labour and a relatively high share of those using more skilled labour and technology.

Fedderke *et al* (1999) used dynamic heterogeneous panel estimation for the period 1970-1997 to investigate the effect of trade liberalisation on labour markets. They concluded that liberalisation stimulated the demand for labour in South Africa. Trade also led to positive growth in labour-earnings, which exceeded that of capital. On the other hand, technological progress led to negative growth in labour earnings.

Edwards (2001) followed a factor content approach to analyse the impact of trade on employment and observed a shift towards capital-intensive exports and ultra labour-intensive imports. Changes in occupational employment are translated into four demand-side factors: domestic final demand, export expansion, import substitution and

technological change. The study concludes that final demand and technology are the primary sources of change in employment. The impact of exports was favourable, but import penetration shed many job opportunities.

The findings of Jenkins (2002) correlate with those of Edwards. Between 1994 and 2001 import penetration affected employment in the manufacturing sector, but was more than offset by the additional employment associated with growing exports. Compared to export growth, domestic demand had a relatively small positive effect on employment. Productivity changes exerted the dominant influence and contributed to an overall decline in employment. In terms of the skills level of employment Jenkins confirms a skills bias in the changing pattern of trade in South Africa between 1994 and 2001. During this period greater openness increased the employment of semi-skilled and unskilled workers by 5.5%, skilled workers by 7.2% and highly skilled workers by 8.2%. Jenkins further estimated the demand for labour by regressing employment on output, remuneration per head, the import penetration ratio and the share of exports in total output. He found that output had a significant positive effect on employment, and wages a negative impact. Import penetration had the expected negative impact, but exports did not have any significant impact.

The empirical part of this article will comment on the factor intensity of South African exports as well as the impact of globalisation and the resultant trade liberalisation on employment and salaries.

## 4. The South African experience: some empirical evidence

### 4.1 Globalisation and openness

The effect of the trade liberalisation, resulting from the globalisation process, on the South African economy is evident in increasing openness (exports and imports as a percentage of GDP) and the changing composition of exports. Table 1 indicates that both exports and imports expressed as a percentage of GDP have increased since the early 1990s, resulting in an openness value of 58.07% in 2001 compared to 33.98% in 1990.

Table 1: Indicators of openness

|      | Exports<br>as % of GDP | Imports<br>as % of GDP | Exports plus imports<br>as % of GDP |
|------|------------------------|------------------------|-------------------------------------|
| 1985 | 18.93                  | 13.64                  | 32.58                               |
| 1986 | 18.21                  | 13.31                  | 31.52                               |
| 1987 | 17.51                  | 12.49                  | 31.00                               |
| 1988 | 18.45                  | 15.78                  | 34.24                               |
| 1989 | 18.99                  | 15.46                  | 34.45                               |
| 1990 | 19.38                  | 14.61                  | 33.98                               |
| 1991 | 19.57                  | 15.07                  | 34.64                               |
| 1992 | 20.50                  | 16.22                  | 36.73                               |
| 1993 | 21.49                  | 17.82                  | 39.31                               |
| 1994 | 22.16                  | 19.86                  | 42.02                               |
| 1995 | 22.96                  | 22.09                  | 45.06                               |
| 1996 | 24.56                  | 23.20                  | 47.76                               |
| 1997 | 24.56                  | 23.44                  | 48.00                               |
| 1998 | 25.72                  | 24.56                  | 50.28                               |
| 1999 | 25.64                  | 22.92                  | 48.57                               |
| 2000 | 28.59                  | 25.67                  | 54.26                               |
| 2001 | 30.95                  | 27.12                  | 58.07                               |

Source: *SARB Quarterly Bulletin* June 2002: S-109

Apart from the changes in the level and the relative importance of exports (Table 1), the composition of exports also changed significantly (Table 2). Since 1992 (as well as before) manufacturing goods have played a more important role in total exports. The mining share has been declining constantly, while that of agricultural products has remained relatively stable.

Table 2: Composition of South African trade.

|      | Agriculture<br>as % of exports | Mining<br>as % of exports | Manufacturing<br>as % of exports |
|------|--------------------------------|---------------------------|----------------------------------|
| 1992 | 3.63                           | 54.01                     | 40.24                            |
| 1993 | 3.65                           | 54.37                     | 40.50                            |
| 1994 | 4.90                           | 50.14                     | 43.45                            |
| 1995 | 3.83                           | 44.06                     | 50.57                            |
| 1996 | 4.60                           | 40.99                     | 53.66                            |
| 1997 | 4.10                           | 39.61                     | 55.72                            |
| 1998 | 4.29                           | 39.92                     | 55.23                            |
| 1999 | 4.39                           | 37.90                     | 57.11                            |
| 2000 | 3.24                           | 37.98                     | 58.34                            |
| 2001 | 3.47                           | 37.89                     | 58.34                            |

Source: Dept of Trade and Industry 2002

The effect of globalisation and the resultant increased openness on the manufacturing sector will now be discussed.

#### 4.2 Effect on the manufacturing sector

The manufacturing sector accounted for 58.34% of South Africa's total exports in 2001 and seems to have benefited from increased openness. A closer inspection of trends within this sector will answer some of the questions raised earlier regarding the impact of globalisation on the utilisation of production factors. The data used in this analysis is taken from the Manufacturing Review published on the website of the Dept of Trade and Industry (2002).

##### 4.2.1 Trade by factor intensity

Table 3 reflects on some trends in South Africa's manufacturing exports by factor intensity for the period 1993-2001. In an earlier study, Tsikata (1999) found a decline in the relative importance of unskilled labour-intensive manufacturing goods from 55.3% in 1992 to 20.8% in 1996. Table 3 demonstrates that this trend has been reversed, with the 2001 percentage of 27.29 representing an improvement on the

22.69 of 1993. Trade liberalisation seems to have been successful in increasing the relative share of unskilled labour intensive manufacturing goods in the South African export basket. On the other side of the coin, agricultural and human capital-intensive sectors lost part of their share. This could reflect a shortage of skilled labour, especially in the human capital category.

Table 3: South African manufacture exports by factor intensity.

|                                 | Percentage of manufacturing exports |       | Percentage change between 1993 and 2001 |                |         |                            |                     |
|---------------------------------|-------------------------------------|-------|---|----------------|---------|----------------------------|---------------------|
|                                 | 1993                                | 2001  | Total employment                        | Highly skilled | Skilled | Semi-skilled and unskilled | Salary per employee |
| Agricultural resource intensive | 15.83                               | 12.40 | -17.61                                  | -8.58          | -6.90   | -24.42                     | 25.96               |
| Mineral resource intensive      | 12.14                               | 12.86 | -47.58                                  | -32.12         | -43.81  | -50.49                     | 28.76               |
| Unskilled labour intensive      | 22.69                               | 27.29 | -2.61                                   | 14.54          | 5.16    | -6.20                      | 11.20               |
| Technology intensive            | 10.19                               | 10.46 | -1.24                                   | -1.22          | -14.93  | -19.89                     | 37.96               |
| Human capital intensive         | 39.17                               | 37.00 | -8.68                                   | 6.23           | -1.62   | -16.56                     | 21.21               |

Source: Author's calculations on the basis of Dept of Trade and Industry (2002) data

However, while the composition of South Africa's manufacturing exports has changed, globalisation and the resultant trade liberalisation did not succeed in creating jobs. Total employment in the manufacturing sector declined by 11.12% between 1993 and 2001. The unskilled and technology-intensive sectors are the best off with declines of only 2.61% and 1.24%. The other striking trend from Table 3 is that it was the semi-skilled and unskilled workers in all categories who experienced the highest percentage of job losses, while the number of highly skilled workers increased in two cases and had the lowest

decline in the other categories. This is in contrast to what was expected from the theory, as discussed earlier.

With an official unemployment rate of 42.8%, using the expanded definition of unemployment (Statistics South Africa 2003: 19), the expectation was that trade liberalisation would help to create jobs, especially in the manufacturing sector. Table 3 clearly confirms the “jobless growth” phenomenon in the South African manufacturing industry. While the volume of production increased by 1.53% between 1995 and 2001, employment decreased by 2.48%. This could only be attained through increased productivity. Over this period labour productivity, measured by unit production per employee, increased by 21.65% in real terms.

On the import side, import penetration has risen in almost every sector of manufacturing. It increased from 24% of total domestic consumption in 1995 to 33% in 2001 (Dept of Trade and Industry 2002). No noticeable change has occurred in the relative importance of the different importing sectors since 1993 (measured as the individual sector’s imports as a percentage of total manufacturing imports) (cf Annexure 1). There was no clear pattern in the individual sectors’ responses to declines in nominal protection, either. Some of the sectors facing the largest decline increased both their output and their employment over the period 1993-2001, while others had an opposite trend.

The last column in Table 3 indicates the percentage change in real gross salary per employee between 1993 and 2001. For the total manufacturing industry the value is 19.65%. It is striking that the increase in the unskilled labour-intensive category is below average and the lowest of all four categories — despite the fact that this category supplies an increasing share of manufactured exports.

#### 4.2.2 Trade by capital/labour intensity

The classification used in Table 3 above has been criticised because it was not developed specifically for South African conditions and can be misleading (cf Alleyne & Subramanian 2001). In Table 4 an alternative classification (on the grounds of capital/labour ratios), as used by Edwards (2001) is followed. The change in the South African export basket is even more evident from this. Since 1993 the relative import-

ance of capital-intensive goods has declined, while labour-intensive and intermediate capital-intensive goods have gained ground.

Table 4: South African manufacturing exports by capital/ labour intensity

|                                | Percentage of manufacturing exports |       | Percentage change between 1993 and 2001 |                |         |                            |                     |
|--------------------------------|-------------------------------------|-------|---|----------------|---------|----------------------------|---------------------|
|                                | 1993                                | 2001  | Total employment                        | Highly skilled | Skilled | Semi-skilled and unskilled | Salary per employee |
| Capital-intensive              | 52.36                               | 43.38 | -16.48                                  | -4.05          | -7.34   | -26.29                     | 21.36               |
| Intermediate capital-intensive | 19.58                               | 22.05 | -22.39                                  | -4.59          | -13.43  | -29.24                     | 25.56               |
| Labour-intensive               | 14.10                               | 22.51 | -4.40                                   | 9.40           | -3.29   | -13.39                     | 25.45               |
| Ultra labour-intensive         | 10.19                               | 10.46 | -1.24                                   | -1.22          | -14.93  | -19.89                     | 37.96               |

Source: Author's calculations from Dept of Trade and Industry (2002) data

This was to be expected since the major share of our exports goes to high-income countries which are regarded as capital-rich, while South Africa is better endowed with labour. Again, it is the labour-intensive and ultra labour-intensive sectors that have shown the lowest percentage decline in employment, with job losses being relatively higher for semi-skilled and unskilled workers, and job increases favouring the highly skilled in all categories.

In terms of the change in salary per employee, Table 4 indicates the same trend as was observed in Table 3. Again, the increase in real gross salary per employee is considerably lower in the ultra labour-intensive category. On average, real wages increased relatively more in capital-intensive sectors than in labour-intensive ones. However, it is dangerous to draw conclusions about a possible change in relative salaries between skilled and unskilled workers purely from the trends demonstrated by Tables 3 and 4. All sectors employ workers with various skill levels.

#### 4.2.3 Cross-sectional regression analysis

This section employs regression analysis to explain the changes in manufacturing employment levels and salaries between 1993 and 2001. The main question is whether or how globalisation, observed in tariff changes and trade patterns, has impacted on these two variables. Ordinary Least Squares (OLS) regressions are run on a cross-sectional sample of 27 manufacturing sectors. The dependent variable and some of the explanatory variables are measured in the percentage change over the period 1993-2001. This method has also been employed in a recent study explaining the impact of globalisation on social spending and immigration for a sample of 18 countries during the period 1970-1998 (Soroka *et al* 2004). As mentioned before, the rationale for running these regressions is to try to explain the changes in employment and salaries over this period by means of indicators of globalisation. There is no attempt, for instance, to estimate the output and/or wage elasticities of employment as was done by Jenkins (2002). Following the discussion in section 3.1.1, the overall expectation is that increasing openness will result in South Africa's increasingly exporting unskilled labour-intensive goods. More such exports should increase the demand for unskilled labour as well as the wage rate. In order to test whether this is the case in South Africa, three regressions are specified here.

In Table 5, DEmpl (the percentage change in employment from 1993-2001) is modeled as a function of Tariff94 (the import tariff per sector in 1994), DTariff (the change in the tariff from 1994-2001), AvNCperEmpl (average spending on new capital goods per employee for the period 1993-2001), AvNetEx (the average net exports for the period 1993-2001), AvNetExperSales (the average of net exports as ratio of total sales for the period 1993-2001), DSales (the percentage change in sales 1993-2001), DumHi (the dummy variable with a value of 1 if the main destination of exports is a high-income country) and DXofSales (the percentage change in the ratio of exports to sales for the period 1993-2001).

Both the level and the change in tariffs are included, with the expectation that sectors with high initial tariffs and/or large reductions thereof would suffer job losses as the tariffs are reduced and imports increase. If lower tariffs do impact negatively on employment levels, the estimated coefficients of the two tariff variables should be negative.

Three variables test for the possible effect of net exports on employment. Average nett exports and the ratio of average nett exports to total sales consider the possibility that sectors with high levels of nett exports employ relative more workers. DXofSales is included to determine whether sectors producing increasingly for the export market employ more workers. Positive estimated coefficients for these three variables would confirm the positive impact of exports on employment levels. Change in real sales is included in the model to account for possible increases in employment because of higher overall sales, indicative of a positive relationship.

Average spending on new capital goods per employee is included as a proxy for the capital intensity of each sector. A positive coefficient would indicate that those sectors spending relatively more on new capital goods tend to employ more workers, and *vice versa*.

DumHi tests whether employment levels show different trends when exporting to different categories of countries, considering the possibility that South Africa has relatively more unskilled labour than its high-income trading partners and relatively more skilled labour than the low-income countries. A positive coefficient would confirm that exporting to high-income countries leads to relatively more job creation than exporting to low-income countries.

The second column of Table 5 gives a summary of the regression results. Both the indicators of tariffs indicate the expected negative relationship. Therefore they are both economically significant and, with the low probabilities, also statistically significant at a 1% level. The coefficients of all the other explanatory variables also display the expected signs and are economically meaningful. Estimated with a probability of 2.47%, the negative coefficient AvNCperEmpl is a possible sign of people losing their jobs because of higher spending on capital goods or new technology. The other two variables that proved to be marginally statistically significant, at levels of 8.08% and 15.51%, concern exports and could explain the effect of trade liberalisation on employment. The sectors with the highest ratio of nett exports to total sales seem to be the ones in which employment levels have increased. Apart from the actual level of trade, the change in the ratio of exports to sales also seems to influence employment. In sectors where exports made up a larger portion of total sales in 2001 than in 1993, employ-

ment levels increased. The adjusted  $R^2$  of 0.38 may initially seem low, but explaining the change in a variable always renders lower  $R^2$ 's than explaining the levels.

Table 5: Results of cross-sectional regressions

|                 | Dependent variable |               |               |
|-----------------|--------------------|---------------|---------------|
|                 | DEmpl              | DSalperEmpl   | DHStoUratio   |
| Tariff94        | -1.579             |               |               |
|                 | <i>0.68%</i>       |               |               |
| DTariff         | -3.458             |               |               |
|                 | <i>0.23%</i>       |               |               |
| AvNCperEmpl     | -1.021             |               | 0.665         |
|                 | <i>2.47%</i>       |               | <i>59%</i>    |
| AvNetEx         |                    |               | 0.001         |
|                 |                    |               | <i>61.86%</i> |
| AvNetExperSales | 0.094              |               | -0.016        |
|                 | <i>8.08%</i>       |               | <i>52.04%</i> |
| DSales          | 0.008              | 0.225         |               |
|                 | <i>93.73%</i>      | <i>3.67%</i>  |               |
| DumHi           | 5.147              | -0.523        | 2.303         |
|                 | <i>64.74%</i>      | <i>94.25%</i> | <i>65.58%</i> |
| DXofSales       | 0.030              | -0.006        | 0.029         |
|                 | <i>15.51%</i>      | <i>82.65%</i> | <i>16.73%</i> |
| DHStoUratio     |                    | -0.357        |               |
|                 |                    | <i>5.70%</i>  |               |
| Adjusted $R^2$  | 0.38               | 0.06          | 0.08          |

- Estimated with White heteroskedasticity-consistent standard errors and covariance
- Probabilities of estimated coefficients are reported in italics

The second regression has the percentage change in salary per employee (DSalperEmpl) as the dependant variable. The explanatory variables are DSales (the percentage change in real sales), DumHi (a dummy variable with a value of 1 if the main destination of exports is a high-income country), DXofSales (the percentage change in the ratio of

exports to sales) and DHStoUratio (the percentage change in the ratio of highly skilled to semi-skilled and unskilled workers). The coefficient of DSales is expected to be positive, with higher sales resulting in higher salaries. DumHi is included to test whether salaries increase relatively more in those sectors that export to high-income countries. A positive sign would confirm this hypothesis. DXofSales is also expected to be positively related to DSalperEmpl, indicating that sectors producing increasingly for the export market pay higher salaries. DHStoUratio tests whether a changing skills ratio affects salaries. A positive (negative) coefficient would indicate that salaries increase (decrease) when relatively more skilled workers are employed. Column three of Table 5 reports the results. Only two explanatory variables draw attention. The percentage change in real sales is statistically the most significant, at a level of 3.67%, and indicates that the sectors experiencing the highest increase in total sales were those increasing their salaries per employee. It is worth noting that the change in sales is not significant in explaining the change in employment, but is significant in explaining the change in salaries. This may indicate that higher sales do not necessarily lead to more people being employed, but rather to better salaries being paid to the existing workforce. DumHi and DXofSales have coefficients with wrong signs and are nowhere near statistically significant. The coefficient of DHStoUratio indicates that salaries increase as the ratio of highly skilled to semi-skilled and unskilled workers declines. With a probability of 5.70%, it is only marginally statistically significant.

In the last regression, only DXofSales is close to being statistically significant. With a probability of 16.73% only the ratio of exports to sales seems to impact on the skills level of employees. In the sectors where exports made up a larger share of sales in 2001 than in 1993, the ratio of highly skilled workers to semi-skilled and unskilled workers increased. This finding is consistent to that of the IMF (1997: 82) quoted in section 3.1.1. The IMF also reported an increasing demand for skilled workers in developing countries as a result of globalisation. The last two regressions are not significant overall. Even in explaining the change in variables, one would expect higher  $R^2$ 's.

The effect of globalisation and trade liberalisation on the South African manufacturing industry for the period 1993-2001 can be sum-

marised by considering the explanatory power of three variables: tariffs, net exports and trading partners. Exports' share of total sales has an impact on employment levels and on the skills ratio. The larger the share of exports relative to domestic sales, the higher the employment level and the more highly-skilled workers are employed, in relation to semi-skilled and unskilled workers. Neither the level of tariffs in 1994, nor the change since then, is significant in explaining the observed loss of jobs in the manufacturing sector.<sup>2</sup> The hypothesis that the destination of exports matters does not seem to be relevant either. The dummy variable, with a value of 1 if the main destination of exports is a high-income country, is not significant, although one might have expected it to affect the skills level of employment and perhaps wages as well. This may be because South Africa's main trading partners are predominantly high-income countries, and the low-income group is poorly represented in the sample.

## 5. Concluding policy considerations

Globalisation and the resultant trade liberalisation have led to a more open economy. South African exports have increased and manufacturing goods have gained ground. The composition of exports has changed, and within the manufacturing basket, labour-intensive goods have become more important. This is entirely consistent with the standard Stolper-Samuelson prediction. This is, however, where the similarity ends. Productivity has increased, but without leading to job creation, or significantly increasing unskilled wages. On top of the possible relatively lower salaries for unskilled workers, the change in the composition of employment did not favour unskilled workers either. Considering the job losses between 1993 and 2001, semi-skilled and unskilled workers have been worst hit by retrenchments in all the manufacturing sectors. Other developing countries have experienced the same trend. In order to have a visible impact on the South African labour market, globalisation and trade liberalisation need to address employment and wage levels, especially those of unskilled workers.

2 This agrees with the findings of the ILO and Tsikata studies mentioned in section 3.1.2.

In terms of trade liberalisation, the way forward for South Africa is one of adjusting to the requirements of the international arena. The empirical evidence of this study shows that lower tariffs have had an impact on employment levels.<sup>3</sup> This finding corresponds with the conclusions drawn by Edwards (2001) and Jenkins (2002) on the impact of import penetration on job losses. Therefore the true challenge is to be (become) competitive in export markets. This study suggests that exports have a positive impact on employment. However, the demand in all sectors of manufacturing is for highly skilled workers. Therefore education and training should be a priority. South Africa's unemployment rate can only be addressed if the skills level of the workforce meets the conditions of the market.

To be fair, however, the time period under consideration is relatively short. Perhaps credit should be given for the fact that the composition of exports has changed and labour productivity is increasing with openness. This period can be seen as one of much-needed restructuring in the quest for international competitiveness. It is to be hoped that in future these positive spin-offs will be converted into significant economic growth rates and much-needed job creation.

3 Individual manufacturing sectors, however, will experience this differently. Annexure 1 indicates this difference in reaction.

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Annexure 1: Trends in manufacturing industry 1993-2001

| Total manufacturing                     | XS93 | XS01 | MS93 | MS01 | Cempl | CHSkil | CSkil  | CsemiU | CSperE |
|---|------|------|------|------|-------|--------|--------|--------|--------|
| Food                                    | 9.47 | 6.34 | 3.87 | 3.76 | -22.3 | -7.61  | -11.85 | -29.66 | 25.0   |
| Beverages                               | 1.68 | 2.26 | 0.78 | 0.50 | -24.7 | -15.51 | -21.5  | -28.59 | 45.8   |
| Textiles                                | 2.21 | 1.56 | 3.34 | 2.24 | -17.9 | 3.12   | -1.9   | -21.55 | 19.4   |
| Wearing apparel                         | 2.13 | 1.44 | 1.12 | 1.12 | 6.0   | 21.27  | 0.98   | 6.21   | -6.4   |
| Leather and leather products            | 0.99 | 0.76 | 0.61 | 0.5  | -17.5 | -36.43 | -8.99  | -18.1  | 38.1   |
| Footwear                                | 0.17 | 0.08 | 0.80 | 0.91 | -50.5 | -42.74 | -54.65 | -50.38 | -9.7   |
| Wood and wood products                  | 1.03 | 1.60 | 0.94 | 0.65 | 17.9  | 41.63  | 42.62  | 3.42   | 22.9   |
| Paper and paper products                | 6.34 | 4.48 | 2.69 | 1.58 | -15.3 | -15.43 | -0.75  | -20.92 | 29.8   |
| Printing, publishing and recorded media | 0.38 | 0.27 | 2.30 | 1.24 | 13.7  | 26.78  | 13.92  | 5.13   | 6.3    |
| Coke and refined petroleum products     | 2.01 | 6.39 | 0.56 | 2.05 | -35.6 | -15.79 | -37.97 | -40.91 | -3.8   |
| Basic chemicals                         | 7.87 | 7.77 | 7.20 | 6.02 | -13.3 | -9.18  | -7.02  | -17.53 | 41.1   |
| Other chemicals and man-made fibres     | 3.11 | 3.68 | 8.37 | 7.65 | -1.6  | 1.11   | 8.69   | -14.44 | 21.9   |
| Rubber products                         | 0.59 | 0.79 | 1.09 | 1.06 | -21.5 | -16.96 | -10.36 | -25.07 | 18.8   |
| Plastic products                        | 0.66 | 0.75 | 1.54 | 1.5  | 22.4  | 29.41  | 39.69  | 16.78  | 50.2   |
| Glass and glass products                | 0.48 | 0.34 | 0.48 | 0.41 | -29.4 | -21.88 | -28.07 | -30.42 | 25.9   |

Annexure 1: Trends in manufacturing industry 1993-2001 (continued)

| Total manufacturing                           | XS93  | XS01  | MS93  | MS01  | Cempl | CHSkil | CSkil  | CsemiU | CSperE |
|---|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| Non-metallic minerals                         | 1.05  | 0.86  | 1.32  | 1.40  | -52.8 | -47.75 | -51.89 | -53.46 | 41.4   |
| Basic iron and steel products                 | 21.89 | 12.92 | 1.73  | 1.51  | -41.0 | -25.35 | -35.06 | -46.09 | 28.8   |
| Basic non-ferrous metals                      | 9.08  | 5.61  | 1.22  | 1.76  | -41.2 | -23.05 | -33.05 | -44.42 | 33.0   |
| Metal products excluding machinery            | 2.20  | 2.33  | 2.36  | 2.30  | -13.0 | 4.15   | -9.16  | -16.23 | 19.0   |
| Machinery and equipment                       | 4.96  | 12.17 | 20.22 | 19.71 | 4.1   | 30.21  | 5.61   | -2.84  | 5.1    |
| Electrical machinery and apparatus            | 1.47  | 1.81  | 4.39  | 3.52  | 4.6   | 0.52   | -18.52 | -20.96 | 41.2   |
| Television, radio and communication equipment | 0.68  | 1.88  | 4.18  | 9.40  | -7.3  | 12.67  | -8.67  | -11.41 | 27.8   |
| Professional and scientific equipment         | 0.85  | 0.88  | 6.00  | 4.32  | -10.4 | 8.85   | -11.76 | -14.42 | 5.5    |
| Motor vehicles, parts and accessories         | 7.15  | 12.89 | 15.61 | 17.65 | 10.1  | 20.81  | 8.96   | 7.62   | 15.5   |
| Other transport equipment                     | 1.91  | 1.96  | 4.07  | 5.06  | -28.1 | -21.09 | -28.82 | -29.7  | -1.0   |
| Furniture                                     | 0.77  | 2.47  | 0.25  | 0.59  | -2.0  | 11.51  | 7.36   | -5.83  | 4.7    |
| Other manufacturing                           | 8.88  | 5.72  | 2.96  | 1.59  | -21.1 | -12.58 | -18.52 | -20.09 | 24.8   |

\* Source: Authors' calculations from Dept of Trade and Industry (2002) data

Annexure 1: Trends in manufacturing industry 1993-2001 (continued)

Legend (description of column headings)

- XS93 Sector's share of total manufacturing exports in 1993.
- XS01 Sector's share of total manufacturing exports in 2001.
- MS93 Sector's share of total manufacturing imports in 1993.
- MS01 Sector's share of total manufacturing imports in 2001.
- Cempl % change in employment from 1993 to 2001.
- CHSkil % change in employment of highly skilled workers from 1993 to 2001.
- CSkil % change in employment of skilled workers from 1993 to 2001.
- SSemiU % change in employment of semi- and unskilled workers from 1993 to 2001.
- CSperE % change in salary paid per employee from 1993 to 2001.