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Is the growth of labour productivity in manufacturing a good thing?

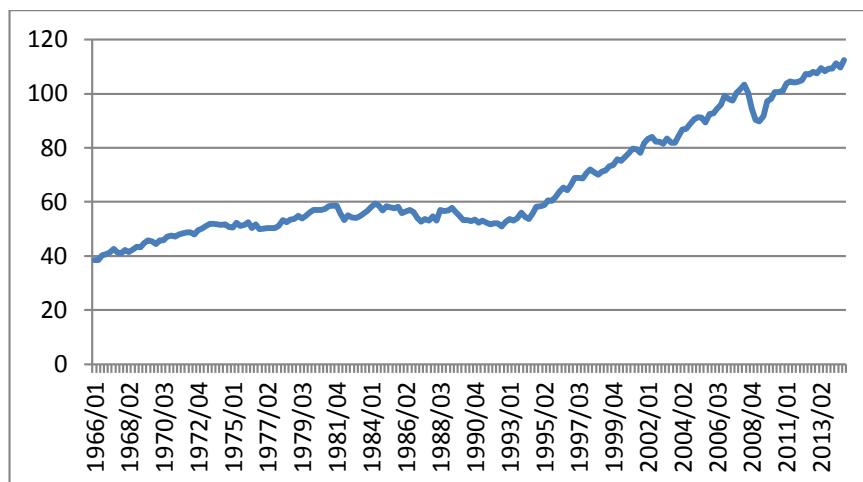
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Labour productivity grew substantially in the first twenty years of democracy, but is this unequivocally good? Much of the increase has been driven by changes at the firm level. Smaller firms' average labour productivity increased more than that of larger firms. This seems to reflect changes in the composition of firms and jobs – smaller firms and low-productivity jobs appear to be vanishing. This is worrying because these are the type of jobs we need to reduce unemployment.

Introduction

Countries get richer by becoming more productive – in other words, by producing more output with the same or fewer inputs. Individuals get richer if this higher productivity is translated into higher incomes. Figure 1 shows the growth in labour productivity in manufacturing since 1966 (where labour productivity is measured as the amount of gross output per unit of labour input). It is evident that South African labour productivity grew substantially in the first twenty years of democracy. But is this unequivocally good?

Figure 1. Labour productivity in South African manufacturing since 1966



Source: South African Reserve Bank series KBP7079L

It is worth understanding what has driven this growth in labour productivity, particularly given high unemployment during this same period of predominantly low-skilled and thus less productive individuals.

Labour productivity is a relatively crude way to measure overall productivity since it does not take into account other inputs like machines or raw materials, or other factors that may affect productivity. Labour productivity at country level can increase by means of three main mechanisms:

1. Through the expansion of high labour-productivity sectors relative to low labour-productivity sectors. The economy would then comprise more sectors that are highly productive, thus raising the average level of productivity.
2. Through compositional changes within sectors or firms. If firms with high labour-productivity expand more than firms with low labour productivity – either because there are more of these firms or because existing higher-productivity firms produce more – the average labour productivity would rise. A similar process can happen for jobs: the number of jobs with high labour productivity – which generally are higher-skilled jobs – may expand relative to jobs with low labour-productivity, leading to a rise in average labour productivity.
3. Through using relatively more of other inputs, like better machines. This would imply that, on average, each worker produces more output (via the use of these machines in manufacturing processes).

Understanding which of these mechanisms is driving the growth of labour productivity is important since they are not all equally desirable; therefore, appropriate policy responses will differ accordingly. For example, labour productivity growth that is driven by the loss of lower-productivity jobs is less desirable than productivity growth driven by the growth of more productive firms, particularly in the context of high unemployment amongst the least skilled.

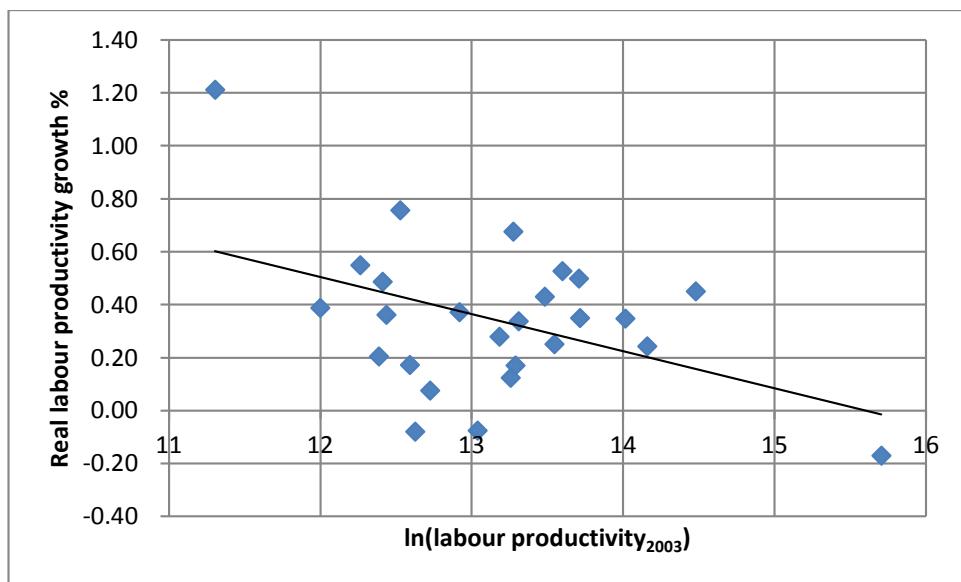
A recent REDI3x3 working paper ([Rankin 2016](#)) examines the relative importance of each of these three explanations for the doubling of labour productivity in manufacturing in the 20 years since 1994. The results are summarised here.

Possible explanations for the high growth in labour productivity

The paper starts by using industry-level data from Statistics SA on average labour productivity and wages across the different industries in the manufacturing sector. For the period since 2003, this data (see Figure 2) shows that, in industries with lower initial levels

of labour productivity, labour productivity grew more quickly than in those with higher initial levels. These low labour-productivity industries also initially had the lowest average wages.

Figure 2. Real labour productivity growth and initial labour productivity for various manufacturing industries



Source: StatsSA's Compendium of Industrial Statistics

Despite these changes *across* industries, research finds that much higher labour productivity is largely explained by changes *within* industries.¹ This suggests that there has been an expansion of high-productivity firms and/or high-productivity jobs (mechanism 2 above).

Such changes occur within firms. To investigate changes at firm level, the research aggregates 11 firm-level surveys and investigates changes between firms of different sizes.

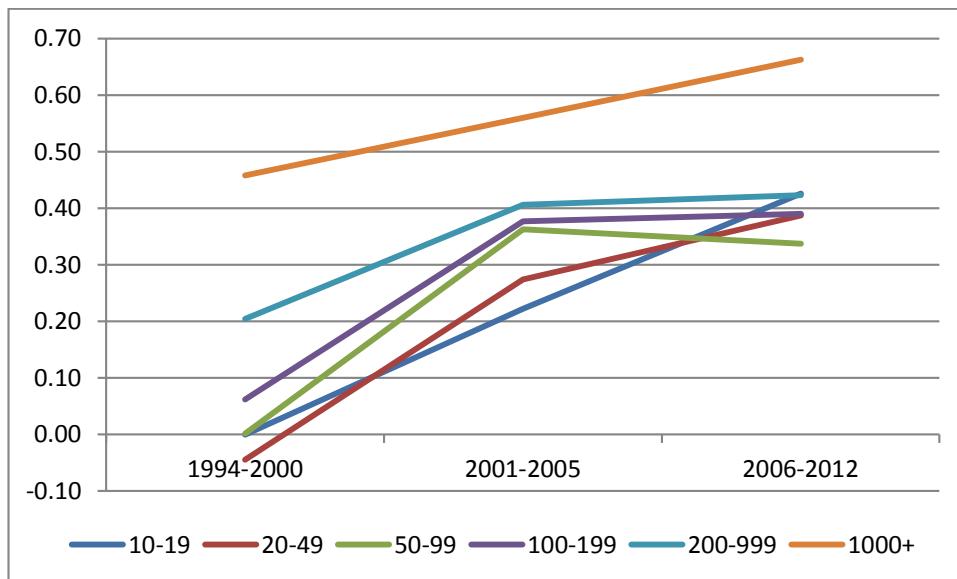
Changes in labour productivity amongst firms of different sizes

Figure 3 shows that, over the period between 1994 and 2012, smaller firms (with fewer than 50 employees) *increased* their labour productivity relative to that of larger firms (those with 50 to 1 000 employees). In the late 1990s, firms with 10-50 employees had labour productivity which was approximately 20% lower than those with 200-999 employees. However, ten to twenty years later, the average labour-productivity levels were the same for these two groups. At the end of the period under consideration, South Africa had a very unusual pattern in terms of its firm size and labour productivity – labour productivity was highest in the largest *and* in the smallest firms. This contrasts with almost all other

¹ This analysis involved the decomposition of the growth of labour productivity. For more detail, see Rankin (2016).

countries, where labour productivity typically is low for small firms and increases as firm size increases.

**Figure 3. Real labour productivity of different sized firms
(relative to firms with 10–19 employees in 1994–2000)**



Notes: Based on the coefficient estimates of an OLS regression of $\ln(\text{real output}/\text{employee})$ on period, firm size and industry (3-digit) dummies.

The research explores what might have been driving these changes. One obvious explanation could be that these smaller firms were becoming more capital intensive – replacing workers with machines. But this is not the case. Instead, it seems like average real wages in smaller firms were rising. Two types of mechanism could cause this: low-skilled workers were being retrenched or being replaced by higher-skilled workers; or small firms with many low-skill workers were closing.

What might be driving the exit of small firms and low-productivity jobs?

Unfortunately the available data does not allow one to investigate whether low-skilled workers were being replaced by high-skilled workers within firms. However, the data does allow some analysis of firm exit. The paper suggests two possible factors.

- First, it seems that there is a link between the industrial bargaining structure within an industry and the continued survival of small firms. In the sectors where they have been established, bargaining councils are mandated by law to set wages for all workers and companies in a particular sector. The analysis suggests that, in industries with active bargaining councils, smaller firms are more likely to exit than the bigger firms. This confirms research by Magruder (2012) that indicates that bargaining councils cause lower employment in small firms in South Africa. Due to the way in which the

membership of bargaining councils is constituted, they are likely to set wage rates that more closely reflect the preferences of larger firms (and their workers) than those of smaller firms. While smaller firms are legally able to apply for exemptions from the wage rates if they are too high, these are temporary and usually only granted if a firm is struggling financially. As a result, actual wage levels often are not suited to the operating position of smaller firms in an industry.

- A second possible explanation is that, when faced with increased import competition, smaller firms have less room to adjust low-skilled wages (due to the constraints placed on wages by bargaining councils). Consequently they have only two options: change the composition of their workforce by employing more higher-skilled individuals, or close down (exit the industry) if they cannot.

Conclusion

Labour productivity in the South African manufacturing sector rose substantially in the first twenty years of democracy. At the aggregate level this may seem like a good thing. But the mechanisms driving this growth are less desirable. This growth appears to be the result of fewer work opportunities for low-skilled and low-productivity workers, particularly in smaller firms. This is worrying since South Africa needs to create more of this type of job to substantially reduce the unemployment rate – it is predominantly the low-skilled who are unemployed.

References

- Magruder JR. 2012. High Unemployment Yet Few Small Firms: The Role of Centralized Bargaining in South Africa. *American Economic Journal: Applied Economics* 4 (3): 138–66. doi:10.1257/app.4.3.138
- Rankin N. 2016. *Labour productivity, factor intensity and labour costs in South African manufacturing*. REDI3x3 [Working paper 21](#).