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Mining productivity: The case of the missing input?

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Summary

The presentation starts with four observations about the period since 2000-01: mining commodity prices have risen sharply by 40 per cent (relative to general producer prices); productivity in the mining sector, which is based on the volume—not value—of output produced, has fallen substantially (a 24 per cent drop in MFP); the decline in mining productivity has taken 3.6 percentage points off growth in aggregate productivity; but higher commodity prices have also contributed to a favourable shift in the terms of trade, which has meant that Gross Domestic Income per person has risen by 8.2 percentage points more than Gross Domestic Product per person. That is, while developments in mining have subdued overall productivity growth, they have also sustained growth in prosperity through a shift in the terms of trade.

Why has productivity in mining declined so markedly? In proximate terms, the use of capital and, especially, labour inputs has grown very strongly, while the volume of output has declined. There appear to be three main underlying factors: capital and infrastructure bottlenecks; the installation of additional capacity that is yet to deliver increased output; and the depletion of reserves.

Productivity has fallen strongly in recent years because of depletion of oil and gas reserves and, with capacity constrained for the time being in other areas, usage of labour and intermediates has grown substantially. Even in mining industries in which gross output has risen, the apparent increased use of intermediates has severely dampened any positive effect on value added.

In the longer-term, the sector will not be subject to the same capacity and infrastructure constraints. Productivity is likely to turn around. But it is unlikely to return to levels seen before the turn of the century. Unless there are substantial new discoveries, the negative effect of depletion and declining average ore grades on measured productivity will still be evident. When reserves are depleted and the quality of ore declines, more ‘effort’ in terms of input of capital labour and intermediates is required to produce a unit of output. That is, measured productivity declines.

Higher output prices makes it worthwhile to commit more inputs to extract from more-marginal deposits. Consequently, there is a strong negative correlation between real output prices and mining MFP.

Such declines in measured MFP do not represent a decline in technical efficiency in mining. Rather they reflect the influence of a missing or ‘lurking’ variable—the decline in reserves and in the average quality of ore.