



How useful are our productivity measures?

Key points

- MBIE should maintain its focus on lifting productivity because:
 - productivity growth is central to lifting incomes
 - mismeasurement is estimated to have played a fairly minor role in the global productivity slowdown; the slowdown cannot simply be written off as measurement error
 - the measurement challenges are unlikely to explain New Zealand’s consistently poor productivity performance.

What is happening with productivity?

-  Productivity growth has slowed worldwide. One possible explanation is that productivity is increasingly being **mismeasured**, ie ‘true’ productivity growth may be higher than measured growth.
-  New Zealand has seen this slowdown too. New Zealand has comparatively low incomes, driven by our **poor productivity performance**.

What is productivity?

- Productivity is a measure of efficiency.
- Productivity is defined as: ‘a ratio of a volume measure of output to a volume measure of input’.

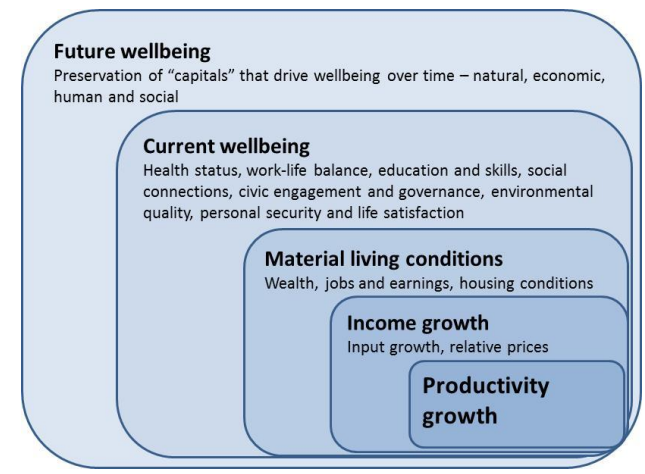
$$\text{Productivity} = \frac{\text{Volume of output}}{\text{Volume of input}}$$

- Productivity is about production.** Outputs (goods and services) are produced using inputs (like workers’ time, effort and skills, and machines). **Prices** provide a way of adding up and weighting different outputs and different inputs.
- Productivity is a volume measure.** Volume has a quantity and a **quality** component.

Why is productivity important?

- Lifting productivity means that New Zealand is making more of its limited resources. This increases society’s **choices**.
- Productivity growth is linked to **wage growth**.
- Productivity growth is a key driver of long-term per capita **income growth**. This improves material living conditions and contributes to overall wellbeing.

Productivity growth contributes to wellbeing



Source: Author, drawn from OECD (2015) *How's life? Measuring well-being*.

How is productivity measured?

- Measuring productivity involves dividing some measure of the volume of output by some measure of the volume of input.
- In practice, data on output tend to be available as dollar values rather than volumes. Adjusting for **price** and **quality** changes therefore plays a key role in measurement. An increase in the **quality** of output represents an increase in output volume, but pure **price** increases (inflation) do not.
- Consumers are willing to pay for higher **quality** goods and services, so **prices** and **quality** tend to move together. But this is not always the case. For example, the **quality** of computers has risen dramatically in recent years, while **prices** have fallen.

A stylised example of how productivity works

Inputs	Outputs	Productivity change
Current situation: 3 workers + 2 gears = 2 telephones (\$200 each)	2 telephones (\$200 each)	
Quantity of inputs goes down: 2 workers + 2 gears = 2 telephones (\$200 each)	2 telephones (\$200 each)	↑
Quantity of outputs goes up: 3 workers + 2 gears = 3 telephones (\$200 each)	3 telephones (\$200 each)	↑
Price of outputs goes up: 3 workers + 2 gears = 2 telephones (\$400 each)	2 telephones (\$400 each)	↔
Quality of inputs goes up ¹ : 3 graduates + 2 gears = 2 telephones (\$200 each)	2 telephones (\$200 each)	↓
Quality of outputs goes up: 3 workers + 2 gears = 2 smartphones (\$200 each)	2 smartphones (\$200 each)	↑

Note: In practice, productivity measures are not adjusted for labour quality
Source: Author

What are the measurement concerns?

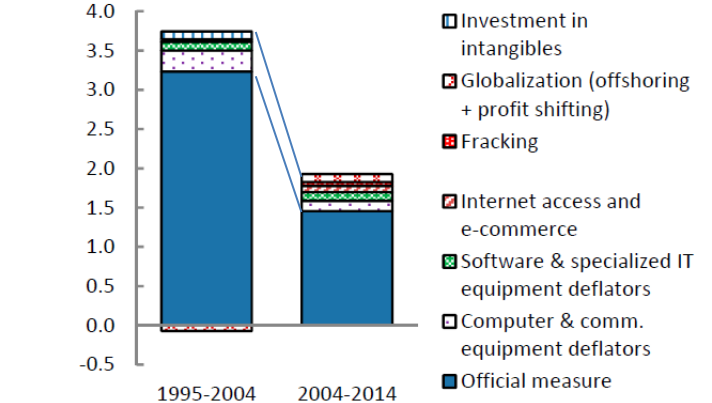
- Measurement concerns can be grouped into two broad areas.
- 1. Disentangling price and quality changes is becoming trickier**
 - It is hard for measurement to keep pace with rapid changes in the **quality** of ICT and other digital products. The **quality** of services is also hard to assess.
 - The digital economy and services sector are a growing share of the overall economy. This means that the measurement challenges may be growing too. If so, analysing productivity trends will become more difficult.
 - Improving **price** and **quality** adjustment methods will therefore improve productivity measurement.
 - 2. Productivity covers less and less of what matters**
 - Productivity measures generally only cover things that are produced and consumers pay for. They exclude the unpaid-for benefits from the digital economy like free apps, Google and Facebook.
 - It is therefore important to recognise what productivity is and isn’t, and to improve methods of measuring the benefits from the digital economy.

What is the scale of mismeasurement?

- Mismeasurement is estimated to play a limited role in explaining the global productivity slowdown.

Accounting for mismeasurement doesn’t change the story much

US labour productivity growth: official and adjusted (annual average percent)



Sources: Byrne, Fernald, and Reinsdorf (2016); IMF staff calculations.

Conclusions

- Productivity measures *are* still useful. They tell us something unique about how efficiently resources are being used.
- Mismeasurement appears to have played a fairly minor role in the global productivity slowdown.
- Many of the benefits of the digital economy fall outside conventional productivity measurement.