



What is productivity?

Productivity is essentially a measure of the effectiveness and efficiency of an organisation in generating output with the resources available. It is commonly defined as a ratio of a volume measure of output to a measure of input use¹.

Improving productivity is not about working longer or harder, but about working smarter. It means finding more efficient and effective ways² to produce goods and services so that more can be produced with the same amount of effort. It is also about producing higher value-added products and services that are worth more in the marketplace.

Why does productivity matter to businesses?

Productivity is critical for long-term competitiveness and profitability of organisations.

For countries experiencing ageing population, employers urgently need to enhance productivity since it is no longer possible to rely on increasing manpower in order to sustain business growth. For countries with still large workforces to tap into, enhancing productivity is nonetheless urgently needed to ensure that these companies move up the value chain and stay competitive to maintain profitability, especially since competition based on low labour cost will not be sustainable in this open global economy. Indeed, the only viable way to increasing profits in a sustainable manner is to increase the economic pie or value added through higher productivity. This can be done with closer involvement of employees, higher investment in capital and optimal use of capital.

Why understanding productivity measurement is fundamental

Productivity measurement is a prerequisite for improving productivity. It is essentially the identification and estimation of the appropriate output and input measures. Measurement is crucial for productivity management as it helps to determine whether an organisation is progressing well and it also provides information on how effectively and efficiently an organisation manages its resources. Peter Drucker, the pioneer of modern management theory, said “without productivity objectives, a business does not have direction. Without productivity measurement, a business does not have control”.

Some stakeholders and reports, such as the Global Wage Report published by the International Labour Office, are referring to a widening gap between productivity and wages, based on the methodologies they use for measuring productivity and real wage. It has thus been inferred by some that the wage-productivity gap shows that workers are not being rewarded fairly for their contributions to economic outputs. Understanding productivity and its measurement are hence crucial for employers to assess how to best integrate productivity into wage policies and to assist them in their dialogues with employees to instil motivation and cultivate a workplace with healthy labour-management relations.

¹ OECD Research, 2001

² Being efficient is about performing in the best possible manner with the least waste of time and effort; being effective is about being able to produce the intended objectives/results.

Some of the most common productivity measures are multi-factor productivity³, capital productivity and labour productivity. Within each, there are diverse ways of measuring them. For example, labour productivity can be measured using either number of working hours or the number of employees as the input measure. The outcomes of the different ways used to measure the respective productivity undoubtedly vary depending on the measures deployed. It is hence important for businesses to understand how productivity can be measured so that the measures are catered to their needs and operations, and accurately reflect what they are doing.

Common drivers of productivity

Productivity is enhanced in an environment with supportive policies, a culture of business innovation and where healthy competition is fostered. Five important drivers of productivity are:

#1: Innovation

A 1% increase in domestic business R&D is estimated to increase multifactor⁴ productivity growth by 0.13 percentage points (Guellec and van Pottelsberghe de la Potterie, 2001).

#2: Institutions and policies

Institutions and policies are likely to have an impact on labour productivity either by influencing investment in physical capital and human capital, or by directly affecting efficiency and technological change. For example, anti-competitive product market regulation appears to hinder multifactor productivity growth (Nicoletti and Scarpetta, 2003).

#3: Investment in physical capital i.e. Capital deepening

Technological progress and capital deepening have also been cited as key drivers of productivity. For instance, capital deepening is one of the major determinants of labour productivity growth. About half of aggregate output growth in the last 40 years of the 20th century was attributed to physical capital accumulation (de la Fuente and Ciccone, 2002).

#4: Management practices

Nevertheless, according to Erickson (Harvard Business Review, 2012), technology adoption only improves productivity if it is accompanied by concurrent changes in the way work is done. Hence, enhancing productivity also goes beyond capital deepening and technological progress. It includes changing management practices. Research has shown that management practices impact productivity significantly – a single point improvement in management practices is associated with the same increase in output as a 25% increase in labour force or 65% increase in invested capital.

#5: Human capital improvement

Despite relatively few studies on the productive effects of training, available studies typically estimate production functions using industry- or firm-level data and find that a 10% increase

³ Multifactor productivity measures the changes in output per unit of combined inputs such as capital, labour, intermediate inputs.

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in the stock of human capital due to job-related training leads to an increase in multifactor productivity of between 0.5% and 1.5%⁵.

Certainly, training programmes are not the only way to improving human capital, which can also be achieved through employees learning and observing on the job to acquire soft competencies such as communication skills.

Measuring labour productivity

As productivity is defined as the ratio of output to input, it is important to determine what data should be used to proxy the output and the input measures.

At the country and global level

The common volume measure of output at the country level is the Gross Domestic Product (GDP) or Gross Value Added⁶ (GVA). There is a strong correlation between the two, though GVA is preferred as taxes are excluded (OECD, 2001).

For the input measure, OECD (2001) cites the ideal measure as total number of hours worked broken down by type of labour input. However, most analysis uses the number of persons employed as the input measure due to the lack of available data on hours worked as well as the difficulty in doing cross-country comparisons. Nevertheless, using number of persons employed can generate biased measures of productivity if hours per person change, or if there are multiple job holdings. A simple headcount of employed persons can hide changes in average hours worked caused by evolution of part-time work or the effect of variations in overtime, absence from work or shift in normal hours. The distortion can be significant in the modern world of work where a person can have multiple employers.

It is hence important for employers to establish productivity measurements that can better reflect the reality lest the imposition of a measurement that is irrelevant or inaccurately reflecting actual circumstances. It is also important for businesses to have accurate assessment of their productivity as it will inform their work plan and strategies for improving competitiveness.

At the enterprise level

For the output measure, SPRING Singapore⁷ recommends using value-added (VA). VA can be calculated using either the subtraction or the addition method. As creation and distribution of value added are two sides of the same equation, both methods should generate the same results.

- A. Subtraction method: difference between sales and the cost of goods and services purchased to generate the sales. It excludes miscellaneous and other non-operating income. In manufacturing industries, since not all goods sold are produced in the

⁵ OECD 2007.

⁶ A productivity metric that measures the difference between output and intermediate consumption. It provides a dollar value for the amount of goods and services that have been produced, less the cost of all inputs and raw materials that are directly attributable to that production. The difference between GVA and GDP is that $GDP = GVA + \text{taxes on products} - \text{subsidies on products}$.

⁷ http://www.spring.gov.sg/resources/documents/guidebook_productivity_measurement.pdf

same period, the change in inventory level should be subtracted from sales for a better reflection of the value of output produced during that period.

- B. Addition method: sum of labour cost to employees, interest to lenders of money, depreciation for reinvestment in machinery and equipment, profits retained by the organisation and other distributed costs such as taxes. To clarify, VA does not result from paying out wages, interest charges etc. but it is the creation of VA that allows such amounts to be paid or set aside.

For the input measure, it is similar to the way inputs are proxied on the national level. Labour productivity can be measured in three ways: number of hours worked, number of workers engaged (part-timers are converted into their full-time equivalent) and cost of labour. Note that the workers include working directors, proprietors, partners, unpaid family workers and part-time workers.

General criteria for integrated productivity measurement

Measurement for productivity goes beyond a single indicator given that various dimensions of an organisation's operations come together to affect overall performance. Enterprises should hence identify a set of productivity measures relevant to their objectives and operations.

Productivity measures should be flexible and catered to different organisations, businesses, industries and countries. As such, enterprises should identify their own suitable productivity measures, referencing to the industry and economy-wide measures wherever useful.

The measurements used should enable long-term measurement in order to mitigate short-term fluctuations of business cycles due to productivity being highly cyclical.

Overall, some general guidelines in choosing productivity measures at the enterprise level:

- I. Measure only elements that have significant impact on the specific organisation's performance and its key productivity levers.

For example, in a labour-intensive manufacturing company, labour productivity is key in affecting the company's performance. Labour productivity is essentially the value added per employee. Here, two elements will have significant impacts: sales per employee; and on the cost side, value added-to-sales ratio.

- II. Measures should be relevant to specific organisations' objectives and operations and able to explain the pattern of performance and signal a course of action.

For example, a company that is labour-intensive will need to look at its labour productivity and a company that is capital-intensive will need to look at its capital productivity. Otherwise, it might face difficulty in establishing the relationship between what it measures and the outcomes, which will not contribute to strategic planning. Also, to be more action-oriented, companies can specify a particular figure to achieve, such as setting a goal to increase sales volume by 1%, so that the objectives are clear for actions to be taken.

- III. Measures should be easily understood by employees.

- IV. Measures can emulate the ones used by the industry or benchmarked organisations to facilitate the company in performing peer comparisons in order to assess improvements needed.

- V. Measures should demand only data that are practical to obtain, reliable and consistent in order to provide an accurate reflection of what they are supposed to measure.

Some questions for discussion

1. Besides measuring productivity to enhance performance, have employers linked productivity measurements to employees' wages? If yes, how? If not, what are the challenges to linking productivity to wages?
2. Do you have practical experience/knowledge of how productivity is measured by companies, including for companies that rely more on using technology or knowledge as their inputs, to share?
3. Bearing in mind the presentation from the expert and our background note, do you have inputs to share on what challenges employers typically face in their attempts to measure productivity?

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