



# growth

## living standards and economic

Improvement in living standards is the direct result of economic growth. Our per capita consumption of goods and services has increased because our per capita production (or output) of goods and services has increased. When we produce more, we can consume more.

The following section helps to explain why labor productivity is the key factor in determining our material standard of living. It is excerpted from *Living Standards and Economic Growth: A Primer*, which you can read in its entirety on the New England Economic Adventure web site <http://www.economicadventure.org/teachers/primer.pdf>

### Living Standards

For economists, a good measure of living standards would be the “value of all goods and services consumed per capita” (per capita = per person). Ideally, goods and services would be defined broadly and would include not only

goods and services that are purchased (such as a loaf of Wonder Bread), but also goods and services produced at home (such as a loaf of home-baked bread). Goods and services provided by the government (such as public parks and fire protection) would be included, as would the value of leisure time. The ideal measure would also include the enjoyment of environmental amenities (such as clean air and water) and good health, and it would incorporate adjustments for demographics, such as the differing consumption needs of children and adults.

Such a comprehensive measure does not exist; so we turn to approximations. The most commonly used measure of standard of living is national output per capita, usually measured as GDP or GNP per capita. This has a number of weaknesses. It *does not include* the value of home production, nor does it capture the quality of the environment or public health. It does include something we do not consume — investments in equipment and factories; these are not consumption goods but instead have value for us because they increase our ability to produce more, and ultimately to consume more, in the future. . . .

### Produce More, Consume More

The improvement in living standards is the direct result of economic growth. Our per capita *consumption* of goods and services has increased because our per capita *production* (or output) of goods and services has increased. When we produce more, we can consume more.

The key to producing more per capita is higher labor productivity. Productivity is how much one worker can produce in one hour. . . . [I]f the output of goods and services produced will rise relative to the population, GNP or GDP per capita will rise. Labor productivity is, thus, the key factor in determining our standard of living.

## Economic Growth Theory

To understand labor productivity and how it increases over time, it is necessary to have a rudimentary understanding of economic growth theory and accounting.

Goods and services are produced by people working with machines, equipment, structures and the like. Economists refer to the people, regardless of the nature of their work, as *labor*; and they refer to the machines, equipment, and structures as *capital*. Land is sometimes included with capital, but it is also sometimes identified as a separate economic input. Improvements to land, such as buildings, are considered capital. Economic growth, or the growth in the *quantity* and *quality* of the goods and services produced, occurs when there are (1) increases in the quantity or quality of economic inputs, or (2) improvements in how the economic inputs are combined to produce output.

More machines and more worker-hours are examples of increases in the *quantity* of economic inputs; better machines and higher-skilled workers are examples of increases in the *quality* of economic inputs. Sometimes there is no measurable increase in the quantity or quality of the inputs, but the way in which economic inputs are combined is improved so that more goods and services are produced. Economists refer to this improvement as technological change.

While most people associate the term “technological change” with major new inventions and innovations, technological change in growth theory is a residual category. It is that part of growth that is not due to measurable changes in the quality and quantities of the inputs. It includes the effects of major changes in technology, such as the advent of electricity or the invention of the steam engine. But it also includes growth that comes from more mundane changes. Improved efficiency associated with learning-by-doing, gradual improvements in how machinery and workers are organized and utilized, and increased specialization made possible by the expansion of markets all fall into the “technological change” category.

A key measure in economic growth theory is the *ratio of capital to labor*, or *capital-labor ratio*. Labor productivity increases as the capital-labor ratio increases. As workers have more, and higher quality, equipment to use, they can produce more per hour of their time. For example, an auto mechanic can perform repairs faster if he has a full set of hand tools available than if he has to share tools with another mechanic. And he can work faster still if he has some power tools available (and faster yet if he has a diagnostic computer, a lift, etc.). When the capital-labor ratio increases, economists call this *capital deepening*.

Investing in capital does not always increase the capital-labor ratio (and labor productivity). As the number of workers increases, new investment is needed just to equip each additional worker with the same capital as each worker had before. And some investment is needed to replace equipment and buildings as they wear out. Economists use the term *capital depreciation* to describe the wearing out of equipment and other capital. . . .

Improvements in labor “quality” have consistently accounted for about one-sixth of the growth in labor productivity. Workers who are better trained and better educated tend to be more productive. In many cases, more advanced or more capital-intensive production techniques require more educated or more highly trained workers to use them effectively. For example, earth moving at a construction site can be performed by workers with little education or training using hand shovels and wheelbarrows, or it can be performed by trained workers operating heavy construction equipment. Economists often speak of improvements in labor quality as investments in *human capital*. Increases in human capital typically require that people devote time to education and otherwise building their store of knowledge. This knowledge will enable them to be more productive in the future, but acquiring this knowledge requires postponing work that would permit higher consumption in the



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present. . . . Most people have little control over the current state of technology or the pace of capital investment, but they are able to influence their own economic future through the education and training options they choose.