

**EC1103 Economics Workshop #3**  
**Friday 18, October**

**Learning Outcomes:** At the end of this lecture you should understand the importance of long-term economic growth and how economic historians have explained the causes of sustained, long-term growth.

## **1. Introduction to Economic History**

There is much more heterogeneity among economic historians than other types of economists. Economic historians differentiate themselves according to issues covered, time periods, and methodologies. Whereas macroeconomics, microeconomics, and international economics are relatively self-contained disciplines, there are economic historians working in each of these areas. In Europe, economic history, as it is both practised and taught, has evolved largely out of the more analytical side of history schools; whereas in the United States it has evolved more out of the applied side of economics schools. Today's lecture lies within the economics tradition of the discipline.

Although economic historians have analysed a wide range of subject areas, one of the unifying themes of the discipline has been long-run economic growth. The importance of the issue can not be understated. In 1651, Thomas Hobbs described life as "solitary, poore, nasty, brutish, and short". Things have got much better since that time. Compared with even 100 years ago the level of total consumption, the range of available goods, the typical level of nutrition, the adult literacy rate, the rate of survival past childhood, and life expectancy have all increased considerably. Ultimately, the engine of this increase in living standards has been economic growth.

To give you an idea of the impact of sustained economic growth, even at a low level, on the living standards consider the following example. Suppose two countries had the same per capita income in 1700 (for example England and China). If one country (China) remained stagnant and the other (England) was able to sustain a paltry 1% annual increase in per capita income, by 1940 the growing country would have 11 times the per capita income as the stagnant country.

Given the importance of long-term economic growth, one of the most important tasks facing the economics profession is to understand its causes. The previous lectures have centred on two of the most important causes, international trade and well-functioning labour markets. We will return to this later. In addition we will discuss the importance of factor endowments, human capital, market size, good government, and technological change.

## **2. A Short History of Long-Run Economic Growth**

As mentioned earlier, 350 years ago life for most people was characterised by economic deprivation. This was true everywhere in the world. Studies have shown that the quality of life for the peasant in civilised England in 1750 or civilised China

as late as 1950 was in many ways worse than for traditional people in Amazonia, the Papuan highlands, or the Australian outback. This is not to say that earlier civilisations accomplished nothing, after all Pythagoras, Homer, and Virgil are taught to this day, rather that the accomplishments of ancient civilisations did little to improve the lives of most people. Classical civilisation invented a number of ingenious technologies; however, these tended to be used for warfare or the exclusive consumption of the elite.

Although the Middle Ages have been much maligned in terms of science and culture, it marked a watershed in the history of technological change. Whereas the Romans had put their energies to improving bathing technology, early mediaeval society developed the wheeled plough; efficient horse collars, harnesses, and shoes; and mills to harness the power of water and wind. Unfortunately, by the Middle Ages they had forgotten Roman bathing technology, so while the medieval peasant was more productive than his Roman counterpart, he also smelled very bad. Over the next millennium Europeans developed the mechanical clock, better sailing technology, moveable type, and revolutionary new agricultural technologies. Around 1780, steam power became the driving force behind the Industrial Revolution, which ushered in the first era of sustained economic growth.

Since the early 19<sup>th</sup> century, the developed world has undergone unprecedented levels of economic growth and, as a result, enjoyed an unprecedented improvement in quality of life. However, much of the world still has per capita real incomes similar to that of Great Britain 150 years ago. In the developing world today, most people have no more income and only slightly better education and health care than the English peasant on the eve of the Industrial Revolution. Although it may be accurate to say that technology has driven Western growth over the past 200 years, this can not be the entire story of growth or South Asia and Sub-Saharan Africa would have become much richer simply by copying Western technology.

### 3. Accounting for Growth

Those of you who have previously taken economics will be familiar with the national income identity:

$$Y = C + I + G + (X - M)$$

This identity which forms the core of macroeconomics is virtually useless in analysing growth. Since income means stuff, by definition more income means more stuff. To analyse growth we can write another expression for income using inputs rather than expenditures:

$$Y = f(L, K, N)$$

Where:

Y is National Income

L is Labour

K is Capital

N is Natural Resources

One analytically useful way of writing this down is the Cobb-Douglas production function:

$$Y = AL^{\alpha}K^{\beta}N^{\gamma}$$

We can rewrite this, so that:

$$y = a + \alpha l + \beta k + \gamma n$$

where the lower case letters denote log growth rates of Y, L, K, and N.

To understand long-term economic growth we can now look at these separate components.

#### **4. Extensive Economic Growth (Increased Factor Endowments)**

Perhaps the most obvious form of growth is increases in the factors of production (labour, capital, and natural resources). This form of growth has clear costs and does not necessarily lead to sustained increases in the quality of life. For example, increases in the labour force through population growth lead to higher incomes but also to more mouths to feed. The net effect on per capita income depends on the relationship between labour growth and labour productivity. The labour force can also be increased in other ways such as longer hours of work and higher participation rates, both of which increase per capita income but at a human cost.

Increases in natural resources have historically been important in increasing per capita income. In the early Middle Ages much of Europe was not under plough. The discovery of new worlds across the Atlantic and in the Antipodes also increased the availability of natural resources. However, such discoveries could only lead to one-off increases in income, not sustained growth. Invariably, new lands were subject to diminishing returns. Economic historians have conclusively shown that increased availability of natural resources accounts for a minuscule proportion of GDP growth for Great Britain after 1750 and the United States after 1880.

Increases in the capital stock have had a far larger effect on historical economic growth. In the United States between 1840 and 1980 increases in the capital stock accounted for nearly as high a proportion of total growth as did productivity growth. However, increases in the capital stock has a direct cost inasmuch as investment implies foregone consumption. Moreover, like the other factors of production, capital is subject to diminishing marginal returns. Since the Second World War, the share of American growth due to increases in the capital stock has fallen by 50%.

#### **5. Intensive Growth (Productivity Increases)**

Economic growth in the developed world has increasingly come to depend on productivity growth. Productivity growth has been occurring for a long time – the

invention of the wheeled plough, for example, brought about enormous productivity increases in the heavy clay soils of northern Europe. However, sustained productivity increases across most or all segments of the economy are a phenomenon unique to the developed world over the last 150 years. Economic historians have analysed four different sources of productivity growth – human capital, widening markets, institutional changes, and technological change. Below we analyse these sources individually; however, there are complex interactions between them.

Human capital is the term used to describe the education and skills of the workforce. Increasing human capital creates economic growth by making the labour force more productive. Historically, the bulk of the population had a very limited level of education. Even things we think of today as basic skills such as literacy, were lacking 200 years ago. Universal secondary schooling only arose around 1920 in the United States and after World War II in much of the rest of the developed world. Like labour, capital, and natural resources, human capital is subject to diminishing marginal returns.

More than 200 years ago Adam Smith identified widening markets as an important engine of growth. His explanation was quite simple. A small economy limits the extent of specialisation possible. In the extreme case, subsistence implies that individuals must all be jacks of all trade. Such individuals can do little more than master basic techniques and will rarely improve on those techniques. As economies become larger economies of scale drive down production costs and the extent of specialisation and exchange increases. Specialists tend to be more productive than generalists and, moreover, are better innovators. A number of factors have contributed to increasing specialisation over the past 1500 years: among them lower transportation costs (due to new technologies, elimination of piracy, and larger networks of canals and roads) and the rise of the nation-state. The current wave of globalisation represents another example of widening markets. However, like the factors listed above, widening markets may suffer from diminishing returns.

Institutions are an often-overlooked source of economic growth. Well-designed and well-functioning institutions are conducive to hard work, specialisation, and innovation whereas poorly designed or functioning institutions typically lead to stagnation. Institutions can be either formal (legal system and accountable government) or informal (religion and culture). A number of economic historians, led by Nobel laureate Douglass North, have argued that the fundamental advantage possessed by the West was institutional. These scholars have argued that the fundamental conservatism and resistance to change of the Chinese and Indian political and cultural environments ultimately led to a lack of innovation and stagnation. Scholars have also pointed to the relatively non-restrictive legal and political systems adopted by English North America as the ultimate source of its superior economic performance compared with Spanish and Portuguese South America. Finally, scholars have pointed to growth spurts following major institutional reforms in Napoleonic France and Meiji Japan as evidence of the importance of institutions.

Technological change may be our best hope for continued economic growth. Unlike the other sources of economic growth, technology does not necessarily suffer from diminishing returns. One can imagine (at least hypothetically) ploughing all available

land, everyone attaining a PhD, or a perfectly functioning legal system; however, society will never lose its capacity to discover new ideas. I mentioned earlier a number of important inventions made between 500 and 1800. Since 1800 the rate of technological change has increased dramatically. This is evident even within your lifetime. Twenty years ago computers were too large and too expensive to be widely available and mobile phones existed only in Star Trek, the original series. Because of the importance of technological change to economic growth a number of economic historians have devoted their entire professional careers to the analysis of the determinates of technological change. Among the factors that impact upon technological change are the existence of intellectual property rights (patent, copyright, and trademark law), culture and religion, and the extent of markets.

### **Additional Readings:**

Joel Mokyr, The Lever of Riches, New York: Oxford University Press, 1990.

Douglass C. North and Robert Paul Thomas, The Rise of the Western World, New York: Cambridge University Press, 1973.

Nathan Rosenberg and Louis Birdzell Jr., How the West Grew Rich, New York: Basic Books, 1986.

### **Suggested Essay Questions**

1. What features of English law facilitated the agricultural and industrial revolutions?
2. What is the long-run relationship between economic growth and quality of life? In what ways have living standards changed over the last 150 years other than through economic growth?
3. Describe the British system of intellectual property rights law. How has intellectual property rights law facilitated economic growth?
4. What was the "financial revolution"? How did it contribute to the industrial revolution?