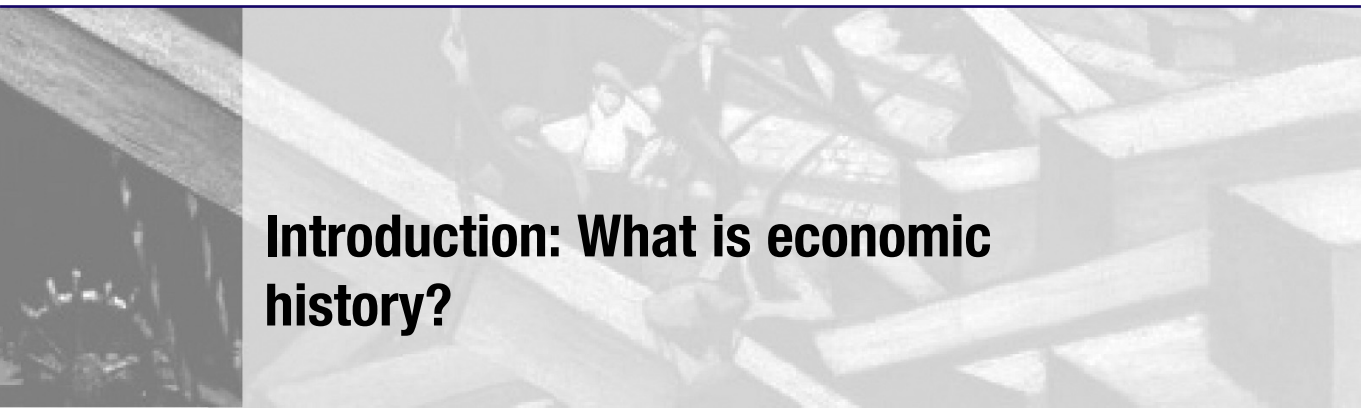

Introduction: What is economic history?

Efficiency in the use of resources shapes the wealth of nations

Economic history is concerned with how well mankind, over time, has used resources to create wealth, food and shelter, bread and roses. Nature provides resources and man transforms these resources into goods and services to meet human needs. Some resources remain in fixed supply, such as land, but the fertility of land can and must be restored after harvest. Over thousands of years of agriculture, mankind learned how animal dung, rotation of crops and the introduction of nitrogen-fixing crops could increase the yearly harvest. Natural resources such as coal, oil and iron ore are, however, non-renewable. Other resources are made by mankind. Capital, for example factory buildings and machinery and tools, is therefore renewable. Labour, finally, is a resource whose supply relies on how well mankind uses the other resources at hand. But labour has been in increasing supply since the transition from hunter-gatherer technology to agriculture about ten thousand years ago. The skills of labour, so-called human capital, were primarily based on learning by doing, and it is only since the nineteenth century that formal education has played an important role.

Efficiency is determined by the technology of production and by the institutions that give access to the use of resources. A convenient way of measuring efficiency is **total factor productivity**. The more output you get from a given amount of resources the higher the level of total factor productivity in an economy. You can measure the growth of total factor productivity by the growth in output which is not caused by an increase in inputs in production. Total factor productivity growth is caused by better use of resources due to new technological knowledge and better organization of production.

Institutions can be understood as the rules of the game for economic life. Institutions or principles such as the Rights of Man matter because if labour is not free to move it is unlikely that labour will find its most productive employment. Workers who are not properly rewarded will have every reason to shirk, that is, not to offer sufficient effort. Owners of capital need assurances from ruling elites that their property will not be arbitrarily expropriated before they will be willing to invest. Inequalities in the distribution of income and wealth tend to trigger off

distributional conflicts in nations, which hamper growth because political conflicts create uncertainty about the rules of the game in the future.

Economic history traces the efficiency characteristics of institutions by studying the development of commodity and labour markets, financial intermediaries (banks), the legal framework of contract enforcement, property rights, openness to trade and international capital flows. Property rights over resources can be more or less well defined and they impact on the use and distribution of resources. Markets can be more or less efficient depending on their competitive nature and the speed at which new information about supply and demand conditions is spread. Markets can be thin, that is trade can be infrequent and engage few participants at a time; or thick, which means that markets are almost continuous and involve a large number of traders. In history, markets have tended to become thicker and more efficient over time. Money facilitates trade and exchange and banks can help savers with incomplete knowledge to find good investment opportunities. High risks can deter people from trade, but insurance can reduce these risks. Openness to trade and factor flows has varied dramatically throughout history. Even though there is evidence that openness tends to increase efficiency in the use of resources, there are losers as well as winners within any nations from the practice of international trade. Although the long-run historical trend has been one of increasing openness, there are significant setbacks in this process driven by those who fear to or actually do lose from free trade. Openness can increase risk because open economies are more exposed to shocks originating in the world economy. It is possible that openness is therefore linked to the evolution of specific institutions, such as the Welfare State, that alleviate these effects of openness. Government sets the rules of the game, and tries to uphold law and order. But since governments have a monopoly of force, good and accountable government is far from the rule. Corruption and bad government is a major reason why economies fail.

Technology is knowledge about how to use resources in the production of goods and services. The ability to make iron out of iron ore is based on knowledge originally derived from trial and error. Without that knowledge iron ore would be useless, as it was throughout most of the history of mankind. Modern technologies differ from pre-nineteenth-century technologies mainly by the fact that they are developed from theoretical and scientific inquiry about the world, which over the span of just 200 years has expanded the knowledge base at an ever-increasing rate.

Often such knowledge will be 'embedded' in particular pieces of production equipment and tools. Think of a modern PC. It is a useful tool in a wide variety of operations, and a large amount of prior knowledge is embedded in it in the sense that the operations you can perform with the computer rely on the prior knowledge needed to construct the computer and its software.

Although some natural resources may have been depleted over time, such as oil and minerals, there has been an increase in the efficiency of their use. The general technological trend in history has been that the amount of resources you need to produce a given amount of output has declined. Late-nineteenth-century economists all agreed that coal deposits would be exhausted in the near future, which would put an end to prosperity. It did not happen because another non-renewable resource, oil, and renewable energy sources such as hydroelectricity, replaced coal as a major source of energy. In the long run oil resources will be exhausted if no alternative energy resources, renewable or non-renewable, are exploited.

Material resources, such as capital equipment, land and natural resources, are what we can call *rival* goods. You cannot both use the coal and keep it. Your use of a particular machine hinders others from its use. However, the factors that generate efficiency, that is technology and institutions, are **non-rival**. *Your* use of common knowledge to construct a new efficient tool does not preclude *others* from using the same knowledge. It is true that some knowledge is not immediately and freely accessible to all because of patent protection. Such protection is an institutional mechanism to stimulate research spending, but patents expire, after which private knowledge becomes common knowledge. Knowledge of a new institutional mechanism – say a change in corporate **taxation**, which gives investors incentives to invest in sophisticated production technology – can be imitated in any nation. The non-rival nature of knowledge about technologies and institutions gives it an almost limitless potential to change the efficiency of production.

Box 0.1 The surprising effect of technological progress

Technological progress saves resources and is measured by **total factor productivity (tfp)**. Total factor productivity is an indicator of the level of technological know-how in a society. We will later substantiate the claim that there has been a slow but increasing rate of total factor productivity growth over time. In this example we quantify the impact.

Imagine a typical economy in Europe around the year 1000. The yearly income per head was close to subsistence level, say 500 constant so-called international dollars of 1990, which simply means the value of the basket of goods this sum of money would buy in 1990 prices.

Over the next 500 years a conservative estimate of total factor productivity growth would suggest 0.1 per cent per year. From 1500 to 1800 we estimate it to be 0.2 per cent, from 1800 to 1900 to be 0.5 percent and 1 per cent between 1900 and the present (2014).

The question is now the following: How much resources do we need to use *today* to produce that subsistence basket of the year 1000. The answer is: only 7 per cent of the resources used in the year 1000!

Do we really need to worry about the environmental effects of growth when it seems to be associated with better use of resources? Yes we do, because over the same period income per head has increased about 50 times, meaning that per capita use of resources has increased by about 3.5 times, of which about a quarter of resources are non-renewable.

In recent years, climate change has come to the forefront in the political and economic debate. What role, if any, has climate in the framework sketched here? Climate is best seen as a factor, along with technology and institutions, which determines the degree of efficiency with which resources can be used. Climate change is certainly not new to economic historians, but neither the extent of these changes nor their effects have been sufficiently explored. The so-called Little Ice Age, in the Early Modern period (1450–1650), is according to one line of research responsible for a decline in output produced by given resources and technology. As a contrast, the contemporary discussion focuses on the potential increasing costs of production from global warming, although the impact may differ significantly among regions and sectors in the world.

Resource endowments of nations as far as land and mineral deposits are concerned have not changed over time. The dramatic changes that economic historians focus on are how human capital, technologies and institutions develop over time to facilitate the access to and efficient use of resources that permit income and wealth to grow. Initial resource endowments matter, but it is increased efficiency in their use which has permitted economies to enjoy increasing wealth throughout the course of history. At this stage we can formulate a strong proposition which will be corroborated in the subsequent chapters:

Proposition 1: Economies that are richly endowed with resources are not necessarily rich but economies which use resources efficiently are almost always rich irrespective of their resource endowment.

Outline of the chapters

Our story begins at a time when the first European civilization, the Roman Empire, had declined. Chapter 1 examines the surprising geo-political continuity of Europe despite the endemic political and territorial conflicts. One question asked is what shapes regional entities such as Europe. The gravity theory of trade notes that trade is stimulated by proximity and similarity and stresses the gravitational attraction of large core economies. The chapter advances the idea that trade has been a major force of integration, not only economic but also cultural and political. Initial barriers to trade tend to develop into trade-inhibiting **border effects** which define the limits of regional entities.

Proposition 2: Europe trades, therefore it is!

Before the nineteenth century technological progress was very slow and rested on a thin base of knowledge which was mainly derived from experience acquired from learning by doing and the division of labour. Division of labour was the

primary source of efficiency gains in production and triggered the development of institutions, markets, money and contract enforcement rules, which facilitated exchange. Without the exchange of services and goods there was no scope for people to specialize in separate skills. In Chapter 2 we develop a simple explanation of the rise and fall of economies stressing the ups and downs of orderly markets, urban settlements and trade nodes and division of labour. The positive effects of population growth are stressed when the declining trend in the aftermath of the decline of the Roman Empire is reversed. The decline of the Roman Empire is a story of institutional and political breakdown with severe consequences for economic welfare. An interesting question arises here: are modern economies immune to institutional failures? As we will see in subsequent chapters, the answer is no!

Proposition 3: The forces that stimulate division of labour (specialization), that is political order, population growth, money supply and exchange, were essential for the revival of the European economy in the early Middle Ages and started a process of slow growth of welfare based on skill perfection and learning by doing.

Economics and economic history tell us, first, that more resources per producer generally increase output and income. Second, and more interestingly, even within the constraints of resources which are in fixed supply, such as land, output and income per person will increase if a person learns how to increase *efficiency* in her use of resources. For example, the yield of wheat per year from a hectare of land has increased continuously and dramatically in the course of history. In Chapter 3 we focus on how the fixed supply of land can constrain growth, but only insofar as technology is stagnating.

Proposition 4: Technological progress is essentially resource saving, which makes explanations relying on binding resource constraints insufficient and often inappropriate for historical analysis except with regard to economies that are characterized by technological stagnation.

The lesson from history is that technological change can relieve the economy of the constraints of a resource in fixed supply. More paradoxically, we find that an increase in population can stimulate both technological change and division of labour, thereby counteracting the impact of **diminishing returns** when land resources per producer fall. In Chapter 4 we explore this finding further. The pre-industrial economies differed in their capacity to balance negative and positive effects from population increase. The outcome is not deterministic: some regions and nations experience slow economic growth while others have periods of growth followed by stagnation.

Proposition 5: Population growth tends to increase demand and hence division of labour as well as technological progress (Pepys' rule).

We often take institutions as given, but in a historical analysis, we cannot and should not do so. Institutions develop spontaneously or by design; they regulate use of and access to resources and the conditions for exchange. It is useful to look for efficiency characteristics in institutions. In the absence of contract enforcement mechanisms, exchange which involves future delivery will be severely restricted, for example. However, institutions which regulate the access to resources, that is property rights, have an impact on the distribution of welfare, and persistent institutions may survive only because they serve powerful elites. In Chapter 5 we discuss the interpretation and impact of institutions and note that there is often a bewildering variety of institutional solutions to the same economic problem. We ask questions like the following: why are farms generally small and managed by those who work there, whereas industrial firms are large and managed by those who own the firm rather than those who provide labour services? It turns out that in some cases institutions fail because they are inefficient, but history also tells us that inefficient institutions may survive because they serve vested interests and powerful elites.

Proposition 6: Institutions leading to efficient outcomes are often stable, but stable institutions do not necessarily promote growth and welfare.

The industrial revolution in the eighteenth and nineteenth centuries was founded on a set of modern institutions as well as new mechanisms serving the growth of science. Chapter 6 explores the foundations of modern economic growth and the conditions for technology transfer. During most of the history of mankind technology has been based on knowledge derived from experience in production, which is learning by doing. Such knowledge can develop by chance or by deliberate trial and error. However, these technologies are not based on theoretical or scientific understanding. The great leap forward in technological development is associated with the breakthrough in the nineteenth century of knowledge gained through theoretical and scientific inquiry. This industrial enlightenment, as it has been called, has its roots in preceding centuries but becomes a decisive force only in the second half of the nineteenth century. From being slow, technological progress became the prime mover of economic growth by the end of the nineteenth century. It turns out that the vast majority of products and production processes that came to dominate the twentieth century were invented in the nineteenth century. Since technology is essentially the useful application of knowledge and ideas, which are non-rival in nature (i.e. your use of knowledge does not reduce the availability of it), we would expect transfer of best-practice technology among nations to lead to convergence in the levels of technology and income across nations. We do indeed observe this convergence, but it is not *universal*. This is a paradox since we are arguing that what matters is a factor – ideas and knowledge – which is non-rival. However, being in the public domain does not imply being easily accessible or easily applied. We need to know *why* some nations

were not able to use available knowledge of superior technologies and develop institutions which helped the efficient use of resources. It turns out that technology transfer is dependent on institutional and educational pre-conditions which, if absent, will make transfer imperfect.

*Proposition 7: Science and R&D (**Research and Development**) are recent phenomena in technological development. Fast technology transfer after 1850 led to convergence based on catch-up among economies that had an appropriate educational and institutional infrastructure.*

Over thousands of years money developed into an increasingly efficient instrument of credit and payment. Banks are a more recent phenomenon, emerging only in the late medieval period and not reaching maturity until the nineteenth century. Banks are intermediaries between savers and investors (spenders). They reconcile the savers' desire to hold liquid assets with the investors' need for long-term finance, and they reduce risks by holding diversified asset portfolios beyond the reach of individual savers. Despite the inherently risky nature of banking and finance, it is possible to show how banks over time reduced risk and costs in transactions. Furthermore, the development of banks increased savings and investment. The breakdown of a financial system in twelfth-century Europe would have effects on trade, but in the present world it threatens all economic activities. The evolution of money, credit and banking is explored in Chapter 7.

Proposition 8: Banks have developed as intermediaries between savers and investors by reducing risk in saving, by solving informational asymmetries and by monitoring borrowers more efficiently than savers would be able to on their own.

Before the Industrial Revolution, international capital flows and international trade were limited; the first wave of globalization occurred in the nineteenth century. The institutional foundations of a functioning international trading system and monetary regime are explored in Chapters 8 and 9. Although there are net gains for nations that trade, there are winners and losers within each nation. Sometimes the losers dictate trade policy and the result will be trade restrictions and a globalization backlash, as in the interwar period (1920–40). While it is easy to understand that a majority of losers can dictate protectionist policies, like landowners in Europe in the closing decades of the nineteenth century, we also face the paradox that small minority groups, such as farmers, can lobby successfully for tariff protection 100 years later. Explain that!

*Proposition 9: Net gains from trade do not preclude winners and losers. The protectionist paradox is that both large and small groups can successfully lobby for **protectionism** and win, but for different reasons. Bad times foster protectionism, but good times help free trade forces.*

International monetary regimes, discussed in Chapter 9, have varied significantly throughout history. The relative merits of fixed **exchange rates** vs floating exchange rates cannot be determined in a straightforward way. The advantages of fixed exchange rates in stimulating trade and capital mobility were noted in the nineteenth century, but these phenomena have also been present in the floating exchange rate regimes emerging since the mid 1970s. Fixed exchange rates tend to restrict the ability of policymakers to impact on domestic economies, and floating exchange rates are therefore favoured when there is a demand for an activist domestic economic policy, as emerged after the breakthrough of democracy in Europe in the early twentieth century. Although economic orthodoxy led Europe back to the Gold Standard, a fixed exchange rate regime, it had neither the equilibrating mechanisms nor the longevity of the classical Gold Standard of the period before the First World War. The lessons from the interwar period were applied in the exchange rate regime introduced after the Second World War, giving nations more say over domestic monetary policy at the expense of free capital mobility. But a system with fixed exchange rates in the short run and adjustable exchange rates in the long run fell victim to its own contradictions. The twentieth century was not made for fixed exchange rates.

Proposition 10: The historical record suggests that widespread democracy seems to be difficult to reconcile with a fixed exchange rate policy because such a policy constrains domestic economic policy options.

Chapter 10 explores economic growth and economic policy in the twentieth century. That century can be described as the era of political economy because it witnessed the transformation of the minimal state to the activist state. The balance between politics and markets differed and the 'over-politicized' economies of the Socialist bloc ultimately failed because they did not deliver the goods promised. The mixed approach favoured in the rest of Europe was more successful in the combination of competitive markets and extensive insurance schemes provided by the Welfare State. We interpret Welfare State provisions as a response to **market failures** in insurance and the need for life-cycle smoothing of income.

The book illustrates the fragility of free trade policies and fixed exchange rates under pressure from an international crisis. But we also demonstrate the power of economic policies in reviving growth in a depression, and the tragedy of erroneous policy responses, as in Germany leading to the ascent of Adolf Hitler. The interwar period paved the way for a new economic policy regime characterized by more active fiscal and monetary policies of Keynesian persuasion. We shall chronicle its birth, near-death and resurrection.

Proposition 11: The idea that the economy was a self-regulating and equilibrating process was killed by the Great Depression, and after the Second World War Europe

worked out a new balance between politics and economics, paving the way for activist fiscal and monetary policies. The Welfare State is primarily an inter-temporal redistribution institution which is explained by market failures and human lack of self-control.

Chapter 11 discusses inequality, past and present. While Europe converged, the income gap between the rich industrialized countries and the rest of the world increased dramatically from around 1800 and has gone on increasing up to the present. The developing nations are poor mainly because they are not capable of creating the institutional and educational conditions for technology transfer. The spectacular growth in recent decades of economies in South East Asia indicates the power of institutional change. Industrialization and modernization usually increase inequality within nations because of bottlenecks in the supply of skilled people. But by expanding human capital investment and easing access to higher education inequality will be reduced, as in Europe in the twentieth century. However, there are persistent wage differences between men and women that are based on discrimination.

Proposition 12: World income inequality has probably peaked after 200 years of increased income gaps. More equality ahead need not be just wishful thinking but will be the result of an increasing number of nations getting the institutional infrastructure needed for technology transfer.

Chapter 12 deals with the challenge and opportunities of globalization. We argue that, on balance, globalization brings net benefits to the world economy. But there are losers and winners. A number of questions will be addressed. Will globalization put downward pressure on (unskilled) wages in the rich countries? Will wages in poor and rich countries converge? Will there be a 'race to the bottom' as regards 'labour standards', that is hours and conditions of work? The preliminary answer to the first two questions is yes, but it is no to the last question – if we are allowed to judge from the experience of the first era of globalization.

Proposition 13: The world economy just before the First World War was as globalized as the world economy today. There was convergence of wages in the first era but not a race to the bottom in 'labour standards'.

1 The making of Europe

1.1 The geo-economic continuity of Europe

The formation of Europe was a long historical process which involved political, cultural and economic forces. The most striking fact is the geo-economic persistence and continuity of Europe during the last two millennia. We will deal with the integrative impact of trade as well as its border-maintaining effect in shaping and maintaining Europe. Trade was the cohesive force when political, religious and military conflicts threatened to tear Europe apart.

If we let the core of Europe be defined by the borders of the European Union, we can trace back the origins of that geographical entity to the Roman and Carolingian empires, the latter emerging in the ninth century, several centuries after the collapse of the Roman Empire. (See Maps 1.1–1.3.) About 80 per cent of the total population of the Roman Empire around the year 100 AD lived within the present (2010) borders of the European Union. It stretched from the Atlantic coast to the Black Sea. Ireland, the northern periphery of Europe, Scandinavia and Russia were touched by neither the Roman nor the Carolingian rulers. Russia's relationship to Europe has remained ambivalent throughout its history, with periods of self-imposed isolation as well as enthusiastic embracing of European ideals, and Scandinavia was late in joining the European Union; in fact Norway is still making up its mind whether to join or not.

The Carolingian Empire represented the revival of political order after the disintegration of the Roman Empire, and also the emergence on the political scene of Germanic peoples, who amalgamated their own traditions with the adopted culture, law and language of their Roman predecessors in their south and westward push. Germanic tribes also advanced towards the east, but kept their own language and pushed the Slavic languages back eastward when they subjected the indigenous peoples and their land. It took centuries, in fact a millennium of conflicts, for the present map of nation states forming the European Union to emerge, and it is worth noting that the heartland of the Roman Empire, that is Italy, was not again a nation state until the late nineteenth century. After Rome and after the partition of the Carolingian Empire the new nations remained smaller. At one extreme we have the prosperous merchant city states of Italy, for example