1 Introduction

This book examines the British economy's growth performance over the last 250 years. The focal point is to offer an interpretation – informed by ideas from growth economics, and firmly grounded in empirical evidence – of the relative economic decline that characterized the period from the mid-nineteenth century, when Britain had the highest per capita income of any major economy, to the early 1980s, when this had fallen below the West-European average. This will entail an analysis of the experience of economic growth from the Industrial Revolution to the eve of the financial crisis which erupted in 2007.

The concept of 'relative economic decline' relates to international comparisons of the level of real Gross Domestic Product (GDP) per person. As applied to Britain, it means that over many decades economic growth was slower than in a peer group of other countries, with the result that they first caught up, and then overtook, British income levels. As is reported in Table 1.1, this describes the economic history of the post-Industrial Revolution period through the 1970s. Relative economic decline was most apparent vis-à-vis the United States, from the American Civil War to 1950 and, compared with European countries, during the 1950s to the 1970s.

Relative economic decline did not mean that British economic growth slowed down. On the contrary, as is shown in Table 1.2, the long-run tendency was for the rate of growth of real GDP per person to increase over time. The acceleration in economic growth which Britain experienced as result of the Industrial Revolution represents the transition to 'modern economic growth' (Kuznets, 1966) where technological progress took centre stage. From the Industrial Revolution to the First World War, growth averaged a little under

Table 1.1 *Real GDP/person (UK = 100 in each year)*

	USA	Germany	France
1820	65.6	51.9	54.7
1870	76.6	57.6	58.8
1913	107.7	74.1	70.8
1929	125.3	73.6	85.6
1937	103.4	75.3	72.2
1950	137.8	61.7	74.7
1979	142.7	115.9	111.1
2007	132.9	107.0	98.6

Notes: Estimates refer to West Germany in 1950 and 1979. Purchasing power parity estimates in $1990GK for 1870–1979 and in $2015EKS for 2007.
Sources: Maddison (2010) and The Conference Board (2016).

Table 1.2 *Growth rates of real GDP, population and real GDP/person (% per year)*

	GDP	Population	Real GDP /person
1500–1650	0.59	0.60	–0.01
1650–1780	0.71	0.24	0.47
1780–1820	1.43	1.22	0.21
1820–1870	2.12	1.24	0.88
1870–1913	1.90	0.89	1.01
1929–1937	1.99	0.44	1.55
1950–1979	2.63	0.40	2.23
1979–2007	2.54	0.32	2.22

Note: Estimates based on England up to 1700, Britain 1700–1870, United Kingdom 1870–2007.
Sources: Broadberry et al. (2015) and The Maddison Project database.

1 per cent per year, roughly double the rate from 1650 to 1780 – itself well above the 0.2 per cent average over the previous 400 years – but less than half that achieved since the Second World War. The problem

was rather that growth in other countries increased by more than in Britain as faster technological advance became possible.

Evidently, growth comparisons, whether inter-temporal or international, need to be handled with care. It is important to take into account what is feasible, and to recognize that relative economic decline does not always connote 'failure'. It seems clear that the accumulation of knowledge and human capital characteristic of the last 100 years has been conducive to faster technological progress in the advanced economies, as is reflected in their capacity to exploit major new technologies increasingly quickly (Crafts, 2012). Growth of real GDP per person of around 2 per cent per year was not feasible in 1800 but quite normal 200 years later. Similarly, growth possibilities may vary across countries at a point in time because of different scope for catch-up or the 'inappropriateness' of technological change.

The former is widely recognized and with the availability of purchasing power parity adjusted series for relative income levels can now be taken properly into account. Countries grow faster when they embark on catch-up from an initially low income and productivity level. No Western European country could expect to grow at a double-digit pace as China has in the recent past. Equally, Britain as the first industrial nation, could expect to be caught up as modern economic growth spread – reflected in relative economic decline compared with European countries in the nineteenth century. On the other hand, being overtaken by its European peer group, as happened to Britain in the 1960s and 1970s, surely is a diagnostic of a growth failure since there is no reason to think that other countries had access to superior technology or a more favourable geography.

Adoption of a new technology is not always appropriate – it may be profitable in some countries but not others because cost or demand conditions differ. It follows that different technological choices may be rational and the technological playing field may not be level. The appropriateness of technology may be affected by relative factor prices perhaps differing on account of geography or the level of development. It is widely remarked that this is an important issue in the

viability of technologies developed by advanced economies for adoption in poor developing countries (Allen, 2012). But, in past times, appropriateness was relevant to the diffusion of technology between leading economies both with regard to other countries' ability to emulate Britain at the time of the Industrial Revolution, and in terms of American technology's suitability for adoption in Europe at the time of the 'second Industrial Revolution' a hundred years later.

Growth economics now offers valuable analytical tools with which to develop an explanation for relative economic decline which was not really the case when the traditional neoclassical economic growth model ruled the roost. This viewed the sources of economic growth as growth in the capital stock and the labour force, and improvements in technology which raised the productivity of these inputs. This model has two key assumptions, namely, that capital accumulation is subject to diminishing returns and that technological progress is exogenous and universally available. These assumptions are fundamental to two well-known predictions of the model about the long run, namely, that increasing the rate of investment has no effect on the steady-state rate of economic growth and that all countries converge to the same income level as initially backward countries automatically enjoy rapid catch-up growth.[1]

Although some insights from this model have found favour (and an empirical technique derived from it, growth accounting, has been widely used in economic history) it is fair to say that the pure neoclassical model has been regarded by most economic historians, as unhelpful much of the time. In particular, the notions of universal technology and long-run income convergence have seemed far-fetched to scholars accustomed to thinking in terms of, say, the new institutional economic history with its emphasis on the importance of institutions and political economy considerations to growth outcomes. Moreover, this model cannot really cope with the leading economy being overtaken and, after all, this is at the heart of Britain's relative economic decline.

[1] The model can easily be adapted to allow for improvements in labour quality from better education without changing these basic predictions.

The so-called 'new' growth economics offers models with more attractive features. These include acceptance that institutions and policy can affect the growth rate, and can promote divergence in growth outcomes and, associated with this, the recognition that catching-up is not automatic. The most useful of these new models embody the idea of endogenous innovation; they consider that technological advance, whether through invention or diffusion, is influenced by economic incentives, in particular, expected profitability and they drop the assumption that technology is universal. Technologies are developed to address market demands in particular locations and may not be appropriate elsewhere (Acemoglu, 1998). Carefully deployed, these ideas can inform an appraisal of controversies surrounding British growth performance.

Broadly speaking, new growth economics suggests that there are two important aspects of the incentive structures that influence the decisions to invest and to innovate which matter for growth outcomes, namely, their impact on expected returns and on agency problems (Aghion and Howitt, 1998). Thus, institutions and policies that reduce the supply price of capital or research inputs, or reduce fears of expropriation, can increase innovative effort, speed up technology transfer and enhance the chances of rapid catch-up growth. Innovative effort is also positively affected by greater market size, which makes it easier to cover the fixed costs of innovating. Since effective and timely adoption of new technologies tends to be costly to the management of firms in terms of the effort required, it is also important that managers are incentivized to work hard on behalf of the owners – when this is not the case we speak of performance being jeopardized by principal–agent problems. Unless there are large external shareholders who can internalize the benefits of effective control of management, strong (though less than perfect) competition tends to be important in underpinning TFP growth (Nickell, 1996).

These ideas also resonate with economic historians' discussions of the international diffusion of technology. In particular, there is an

obvious connection with the idea of 'social capability' used by Abramovitz and David (1996). But it should also be noted that these authors also stress the importance of 'technological congruence' in catching up or falling behind. Here the point is that the cost-effectiveness of a technology may vary across countries where demand or cost conditions are different. An interesting aspect of this, as pointed out by Abramovitz (1986) is that social capability is not an absolute but may vary according to the technology in question – for example, institutions and policies which were excellent for the diffusion of Fordist production techniques in manufacturing in the 1950s, may not be ideal to facilitate rapid uptake of ICT in services in the 1990s.

The key ideas are captured in Figure 1.1, which is adapted from Carlin and Soskice (2006). In this figure x is the rate of (labour-augmenting) technological progress and $\check{k}$ is the capital to effective labour ratio. The upward-sloping (Schumpeter) line reflects the endogeneity of technological progress based on the assumption a larger market increases innovative effort because it is potentially more profitable, since success will be rewarded by greater sales. With more

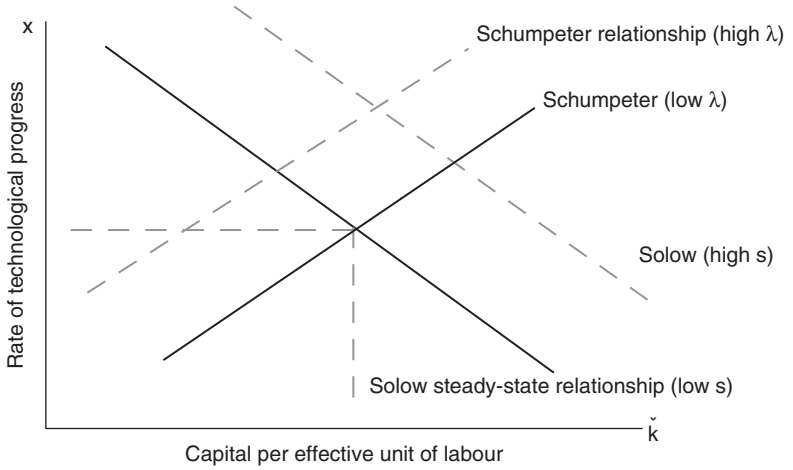

FIGURE 1.1: Endogenous growth

capital per unit of effective labour there will be higher income per person so the Schumpeter line is upward-sloping. The downward-sloping (Solow) line represents points which are consistent with the steady-state relationship between technological progress and capital per effective unit of labour. The steady-state is characterized by balanced growth in which the capital stock grows at the same rate as the sum of labour force growth and the rate of technological progress. When this is the case the capital to output ratio is constant and so is the ratio of capital to an effective unit of labour. For a given savings rate, the growth of the capital stock is faster the lower the capital to output ratio. With a 'well-behaved' production function, lower capital per effective unit of labour means a lower capital to output ratio. Thus, the Solow line will be downward sloping. The equilibrium rate of technological progress is established by the intersection of these two lines.

Figure 1.1 implies that the rate of innovation increases when either the Solow and/or the Schumpeter line shifts upward. An upward shift of the Solow line will be the result of an increased rate of savings (and investment) which will lead to faster technological progress and, thus, a faster rate of economic growth. In turn, investment will respond to changes in the economic environment which affect its expected profitability. An upward shift of the Schumpeter line associated with a 'higher λ', i.e., an increase in innovative effort for any given market size, will reflect such changes as greater technological opportunity, lower R & D costs, more appropriable returns from R & D and intensified competitive pressure on managers. Improvements in social capability and/or technological congruence can also be thought of as equivalent to a higher λ. The key implication of Figure 1.1 is that the growth rate will be affected by institutions and policies both through their impact on technological progress and on investment.

It is important to remember that as the twentieth century progressed, the United Kingdom increasingly obtained its new

technology from abroad. The key to growth performance became prompt and effective diffusion of foreign technology rather than domestic invention. Technological opportunity from advances in other leading countries, and the social capability to exploit them, is what mattered most. In an open economy, greater success in technology transfer will raise λ.

Key points in the chapters that follow can be situated within the framework of Figure 1.1. Thus, the discussion of the Industrial Revolution in Chapter 2 highlights that there was a much lower rate of technological progress than was traditionally believed, and provides reasons why λ and s were still quite low in an economy where institutions and economic policies left a good deal to be desired. Conversely, in Chapter 3 where American overtaking is discussed, a number of reasons why the United States had become a relatively high-λ economy are discussed. These include market size, investments in human capital and technological opportunities not available to European countries. In Chapter 4, it is noted that these advantages persisted as the United States continued to heavily outperform Britain during the interwar period.

Figure 1.1 is particularly helpful in Chapter 5's analysis of the Golden Age of catch-up growth after the Second World War when both the Schumpeter and Solow lines were subject to favourable shifts in many countries. Technological progress in Europe was boosted by increased opportunities for technology transfer, while in coordinated market economies saving and investment were increased by cooperative agreements between firms and workers. On the other hand, Britain found that λ was reduced by institutional legacies and policy errors. In the later twentieth century, as discussed in Chapter 6, the scope for catch-up growth had declined and there were downward shifts in both the Schumpeter and Solow lines. Britain's relative performance improved somewhat, however, as institutional and policy reforms had a positive impact on λ.

Economic historians might want to add something quite distinctive to ideas from conventional growth economics so as to

emphasize that 'history matters' in the sense that the past constrains and shapes the present, and that 'path dependence' is a relevant idea (David, 1994).[2] North (2005) stressed path dependence in the context of institutional change and failures of reform in which inefficient institutions persist, and 'status-quo bias' can also inhibit policy reform (Fernandez and Rodrik, 1991). This is potentially an important issue as countries pass from the early to later stages of development, or as the world moves from one technological epoch to another and reform is desirable. Aghion and Howitt (2006) emphasized that the policies appropriate for a 'far-from-frontier' and a 'close-to-frontier' economy may differ greatly, echoing the insights of Gerschenkron (1962). In the British context, these ideas can be explored in the context of making sense of the long-standing claim in the literature that the 'early start' impaired subsequent growth performance.

The legacy of the past can cast its shadow over economic performance in a number of other ways. In an open economy, the structure of production depends on relative productivity compared with trading partners. This may be influenced by the development of large agglomerations which have surprising staying power – cotton textiles in Lancashire at the turn of the twentieth century come immediately to mind. The strength of successful sectors 'crowds out' other activities and inhibits the development of new, ultimately more dynamic, sectors as with so-called 'Dutch disease'. Policy choices may not only be constrained by the vested interests inherited from, or the 'inescapable experience' of the past, but there are also interaction effects between institutional legacies and policy changes – for example the 'British system of industrial relations' had important implications for the impact on productivity of the weakening of competition, which resulted from the difficulties of the 1930s.

[2] Path dependence is a property of non-ergodic stochastic processes whose asymptotic distributions evolve as a history of the process itself. So the vision of history is that in a multiple-equilibrium world it is possible to get locked into a locally stable equilibrium (which may be inferior) by historical accident.

With these ideas in mind, the rest of the book reviews Britain's growth performance over the long run, starting with the experience of the Industrial Revolution. The aim is not so much to provide a textbook account, but to develop an analytic perspective. This will entail providing description, explanation and evaluation of the growth record in successive periods. The analysis will be firmly grounded in economics, but will recognize the importance of historical context and the ways in which economic performance is conditioned by what went before. I shall feel free to engage with major debates in the historiography and bold enough to draw some 'lessons from history'.