



# **The Global Economy in the 1990s**

## **A Long-run Perspective**

Edited by **Paul W. Rhode** and **Gianni Toniolo**

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## **The Global Economy in the 1990s**

The 1990s were an extraordinary, contradictory, fascinating period of economic development, one evoking numerous historical parallels. But the 1990s are far from being well understood, and their meaning for the future remains open to debate. In this volume, world-class economic historians analyze a series of key issues: the growth of the world economy; globalization and its implications for domestic and international policy; the sources and sustainability of productivity growth in the United States; the causes of sluggish growth in Europe and Japan; comparisons of the information technologies (IT) revolution with previous innovation waves; the bubble and burst in asset prices and their impacts on the real economy; the effects of trade and factor mobility on the global distribution of income; and the changes in the welfare state, regulation, and macro-policy making. Leading scholars place the 1990s in a fuller long-run global context, offering insights into what lies ahead for the world economy in the twenty-first century.

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PAUL W. RHODE AND  
GIANNI TONIOLO



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# Contents

<i>List of figures</i>	page vii
<i>List of tables</i>	x
<i>List of contributors</i>	xiii
<i>Preface</i>	xiv
1 Understanding the 1990s: a long-run perspective <i>Paul W. Rhode and Gianni Toniolo</i>	1
2 The world economy in the 1990s: a long-run perspective <i>Nicholas Crafts</i>	21
3 Managing the world economy in the 1990s <i>Barry Eichengreen</i>	43
4 Europe: a continent in decline? <i>Riccardo Faini</i>	69
5 Technical change and US economic growth: the interwar period and the 1990s <i>Alexander J. Field</i>	89
6 General-purpose technologies: then and now <i>Peter L. Rousseau</i>	118
7 Productivity growth and the American labor market: the 1990s in historical perspective <i>Gavin Wright</i>	139
8 The 1920s and the 1990s in mutual reflection <i>Robert J. Gordon</i>	161
9 Bubbles and busts: the 1990s in the mirror of the 1920s <i>Eugene N. White</i>	193

10	The 1990s as a postwar decade <i>Peter Temin</i>	218
11	What is happening to the welfare state? <i>Peter H. Lindert</i>	234
12	The American economic policy environment of the 1990s: origins, consequences, and legacies <i>Michael A. Bernstein</i>	263
	<i>References</i>	280
	<i>Author index</i>	305
	<i>Subject index</i>	310



# Figures

1.1	Global Gini coefficients, 1900–2000	<i>page 6</i>
4.1	Decomposing the income gap between the euro area and the United States	79
4.2	Italy’s share of non-oil world exports and the dollar/euro exchange rate	82
4.3	Germany’s share of non-oil world exports and the dollar/euro exchange rate	82
4.4	Converging with the United States? Relative income per capita	85
4.5	Productivity growth	85
4.6	Annual hours worked	86
6.1	Annual growth in output per man-hour in the United States, 1874–2001	119
6.2	Shares of total horsepower generated by the main sources in US manufacturing, 1869–1954	121
6.3	Shares of computer equipment and software in the US aggregate capital stock, 1960–2001	122
6.4	Shares of electrified horsepower by US manufacturing sector in percentiles, 1890–1954	123
6.5	Shares of IT equipment and software in the US capital stock by sector in percentiles, 1960–2001	125
6.6	Percentage of US households with electric service and personal computers during the two technological epochs	126
6.7	The relative price of equipment with respect to consumption goods in the United States	127
6.8	US price indices for the products of two technological revolutions	127
6.9	Patents issued on inventions in the United States per million persons, 1890–2000	129

6.10	Annual IPOs in the United States as a percentage of stock market value, 1890–2001	130
6.11	Investment in the United States by new firms relative to incumbents, 1890–2001	131
6.12	Waiting times to exchange listing in the United States, 1890–2001	132
6.13	Average age (in years) of the largest US firms with market values that sum to 10 percent of GDP, 1885–2001	133
6.14	The ratio of consumption to income in the United States, 1870–2001	134
6.15	The <i>ex post</i> real interest rate on commercial paper in the United States, 1870–2001	135
7.1	Real hourly wages in US manufacturing, 1890–1928	144
7.2	Real hourly US manufacturing wages, 1909–1940	146
7.3	US college enrollment as a percentage of the population aged eighteen to twenty-four, 1880–2002	148
7.4	Real hourly wages in the United States in 1982 dollars, 1950–2002	150
7.5	Real federal minimum wage in the United States, 1950–2000	152
7.6	Employment ratios in the United States, 1948–2004	156
8.1	Real US GDP growth, 1913:1984 to 1932:2003 alignment	167
8.2	US productivity growth, 1913:1984 to 1932:2003 alignment	168
8.3	US unemployment rate, 1913:1984 to 1932:2003 alignment	169
8.4	US consumer price inflation, 1913:1984 to 1932:2003 alignment	169
8.5	Standard and Poor's 500 stock market index, 1913:1984 to 1932:2003 alignment	170
8.6	The share in real US GDP of consumer durables plus total investment, 1919:1990 and 1932:2003 alignment	175
8.7	The shares in real US GDP of producer durable equipment and consumer durables, 1919:1990 to 1932:2003 alignment	176
8.8	The shares in real US GDP of residential and non-residential structures investment, 1919:1990 to 1932:2003 alignment	177
8.9	The share in real US GDP of inventory change, 1919:1990 to 1932:2003 alignment	178

9.1	Real S&P 500 returns 1871–2003 and twentieth-century crashes	194
9.2	Boom and bust, 1920–1933	196
9.3	Boom and bust, 1990–2003	196
9.4	The stock yield and equity premium in the United States, 1871–2003	206
10.1	Dow-Jones Industrial Average returns, 1920:1946:1990 to 1933:1959:2003 alignment	221
11.1	Support ratios for the elderly in selected countries since 1980	243
11.2	How population aging affected pensions and other social transfers in the OECD, 1978–1995	246
11.3	Age and total social transfers around the world in the 1990s, versus historical paths 1880–1995	252
11.4	Income and total social transfers around the world in the 1990s, versus historical paths 1880–1995	253

# Tables

1.1	Average annual growth rates in per capita GDP: the world economy and United States	<i>page 4</i>
1.2	Productivity in the US nonfarm business sector, 1974–2001	10
2.1	International trade and foreign investment compared with world GDP	22
2.2	The diffusion of information and communications technology	22
2.3	Shares of world manufactured production and exports	23
2.4	Growth rates of real GDP per capita	24
2.5	Sources of labor productivity growth	26
2.6	Levels of GDP per capita in 1990 dollars Geary–Khamis	27
2.7	Population living on \$1 and \$2 per day	28
2.8	Human Development Index averages	29
2.9	The growth of real GDP per capita	30
2.10	Distance, economic interactions, and world market access	32
2.11	The relationship between real GDP and labor productivity in the European Union and the United States	34
2.12	Supply-side policy stances	37
2.13	The rule of law governance indicator	39
2.14	Projections for the long-run growth of real GDP per capita in the transition economies	40
3.1	Merchandise exports as a percentage of GDP in 1990 prices, 1870–1998	45
3.2	Analysis of the migrant stock by region, 1965, 1975, 1985 and 1990	47

3.3	Selected indicators of FDI and international production, 1982–1999	48
3.4	National regulatory changes affecting FDI, 1991–1999	50
3.5	Percentage shares of world exports	53
3.6	Net capital flows to developing countries, 1989–2003	56
3.7	Net official aid to developing countries, by type and source, 1990–2001	61
4.1	GDP growth in the United States, Japan, and the euro area	71
4.2	Per capita GDP growth in the United States, Japan, and the euro area	72
4.3	Productivity growth in the United States and the euro area	75
4.4	Employment growth in the United States and the euro area	75
4.5	The sources of growth	77
4.6	Determinants of countries' shares of world exports	83
4.7	The United States' and Europe's growth in historical perspective	84
5.1	Compound annual growth rates of MFP, labor, and capital productivity in the US private non-farm economy, 1901–2000	90
5.2	The growth of MFP, labor, and capital productivity in manufacturing in the United States, 1919–2000	94
5.3	The employment of scientists and engineers in US manufacturing, 1927–1940	95
5.4	Changes in the uses and sources of saving in the United States, 1995–2000	101
5.5	The MFP contribution to labor productivity growth and acceleration in the United States, 1995–2000	106
5.6	Contributions to labor productivity acceleration in the United States	106
5.7	Sectoral contributions to MFP growth in the United States, 1995–2000	110
6.1	Rank correlations of electricity shares in total horsepower by manufacturing sector in the United States, 1889–1954	123
6.2	Rank correlations of IT shares in capital stocks by sector in the United States, 1961–2001	125
7.1	Growth rates of US GDP per capita and GDP per hour worked, 1870–2004	143

7.2	Measures of wage inequality for weekly wages in the United States: full-time, full-year workers	151
8.1	Growth rates of selected macroeconomic variables in the United States, 1919–1929 and 1990–2000	163
8.2	Levels of selected macroeconomic variables in the United States, 1919–1929 and 1990–2000	165
9.1	Characteristics of booms and busts in the United States (end-of-month indices)	197
9.2	The dividend yield, earnings/price ratio and pay-out ratio in two booms in the United States	201
10.1	Military expenditure as a percentage of NNP or GDP	220
10.2	Capital flows of the largest lenders and borrowers, 1924–1930	225
10.3	Capital flows of the largest lenders and borrowers, 1990–1999	226
10.4	Percentage income shares of the top 1 percent of the population	227
10.5	Agricultural supports by the United States and European Union	230
11.1	How social transfers have changed in the OECD since the 1980s	236
11.2	Old-age tensions in OECD countries: projecting pension support and social transfers to 2020, using the aging effect alone	241
11.3	Heading the wrong way: employment rates since 1980, for men of ages fifty-five to sixty-four	248
11.4	Developing countries: projecting pension support and total social transfers to 2020 or the sample's age boundary, using the aging effect alone	257

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# Preface

In the process of producing this volume the editors incurred numerous debts, which we can only partially repay with an expression of our gratitude here. The original versions of these papers were presented at the joint Duke–University of North Carolina conference on “Understanding the 1990s: the long-run perspective” held at the Terry Sanford Center on the Duke University campus in Durham, North Carolina, from 26–27 March 2004. This conference would not have been possible without the untiring efforts of Peggy East at Duke University. We would also like to thank Nancy Kocher at the University of North Carolina, and members of the program committee Peter Coclanis, Robert Keohane, Thomas Mroz, and Thomas Nechyba. Generous funding was provided by the Dickson Fund for the Study of Economics in History at the University of North Carolina Economics and History Departments, the Kenan Fund of the University of North Carolina Department of History, the Duke University Economics Department, the Duke Center for International Studies, and the European Studies Center. These contributions are greatly appreciated. We would also like to thank the discussants and participants for their valuable remarks, which led to lively discussion and debate at the conference and – ultimately – to better chapters in this volume. Among those deserving special thanks are Andrea Boltho, Michael Bordo, Paul David, Thomas Geraghty, Christopher Hanes, Richard Sylla, Ignazio Visco, John Wallis, and Barrie Wigmore. Finally, we would like to thank Andriy Gubachiov at Duke University and Lynn Dunlop and Chris Harrison at Cambridge University Press for their work in making this volume possible.



# 1 Understanding the 1990s: a long-run perspective

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*Paul W. Rhode and Gianni Toniolo*

## 1.1 Introduction

The twentieth century both opened and closed with a bang: the *belle époque* before 1914 and the “roaring nineties” (Stiglitz, 2003) just past. It was only after the First World War that people looked back at the 1895–1914 period with nostalgia as a “beautiful era” of spreading prosperity, peaceful technical progress, low inflation, and modest financial instability. The 1990s, on the contrary, were seen as the “best of times” (Johnson, 2001) by many of those who lived through the decade – at least, those in the United States.<sup>1</sup> Will future historians confirm this view? If the twentieth century is any guide, much will depend on how the twenty-first century unfolds. If peace again prevails, if productivity growth continues apace at the economic center and spreads to the periphery, if means are found to govern the international economy in ways that make the costs of globalization socially acceptable, then the 1990s may well be remembered as a moment in human history when the foundations were laid for a long period of sustainable growth. If, on the other hand, social, political, and economic instability prevails, as it did after the First World War, then people may indeed look back at the 1990s as “the best of times,” creating the myth of another *belle époque*. Posterity will magnify the virtues of the last decade in the twentieth century and ignore its shortcomings.

While we cannot anticipate the future verdicts of either public opinion or historians on the 1990s, there can be little doubt that, from a number of political, social, and economic viewpoints, the decade was an exceptional, significant, and defining period in human history. But how exceptional, and how significant? And what was the nature of the new epoch being defined? These are questions that can be answered only from a long-term perspective. As we do not possess the hindsight of future generations, we can only look at the 1990s through the prism of the past. By taking a long-term perspective, often covering the entire twentieth century, the chapters in this book offer a better understanding of the “novelties” of the 1990s that so impressed contemporary observers.

Some may quibble with treating the 1990s as a unit of analysis because decades are not natural economic or historical concepts. Developing periodizations using great wars or revolutions as breakpoints is much more common when taking the long view. Accidents of the calendar make it sensible to treat certain decades, such as the 1920s and 1930s, as meaningful historical periods. Watershed events – the end of the First World War, the onset of the Great Depression in 1929, and the beginning of the Second World War – broke the flow of history. But, in general, the use of decades is an artifice. Nonetheless, the 1990s do possess a greater claim than most decades to possessing an economic unity. The period was indeed full of events for which the words “new” and “path-breaking” can hardly be avoided. The most important events, all taking place in the late 1980s and early 1990s, were the end of the Cold War, Europe’s move to closer integration, and the start of the meteoric rise of China and India.

The end of the so-called Cold War was undoubtedly the most important event in global history since 1945. The fall of the Berlin Wall in 1989 and the events that followed in rapid sequence throughout Eastern Europe marked such a sharp break with the past that we now speak of a “short twentieth century,” encompassing only 1914–1991 (Hobsbawm, 1994), much as we refer to a “long nineteenth century” (1789–1914). It was soon clear that history did not end with the Cold War, and that – if anything – its path would become more complex, uncertain, and challenging as people and leaders ventured into uncharted territory. Historians and political scientists are just beginning to take stock of the implications of the end of the Cold War, while – as mentioned by Peter Temin in chapter 10 – its impacts on the world economy remain to be assessed by economic historians.

A second trend-setting event took place almost unnoticed. In February 1986 the representatives of the (then) twelve European Union member states signed the Single European Act in Luxembourg. This led to the creation of a truly Single European Market, beginning on 1 January 1993. While the relevance of Europe’s quiet revolution – which also entailed the creation of the single currency – is little understood outside the “old continent,” it is nevertheless likely to be one of the most innovative events for which the 1990s will be remembered.

Two other changes in the early 1990s also have the potential to be epoch-making. In the mid-1980s China’s economic reforms, initiated in 1978, threatened to stall. On the one hand, these reform policies were challenged by power-brokers associated with the previous system and, on the other hand, they were deemed inadequate by intellectuals, students, and members of the slowly emerging middle class. The course that would ultimately be followed remained unclear, leading to instability that potentially threatened China’s economic growth. In 1989 the situation came to a head with the tragic events of

Tiananmen Square. Following the resurgence of conservative members of the Communist Party, it seemed that economic reforms had suffered a permanent blow. In 1992, however, the fourteenth Party Congress gave its official approval to Deng Xiaoping's policies promoting a market-oriented economy. Since then, Chinese GDP growth has averaged about 8 percent annually.

In India, at roughly the same time (July 1991), Manmohan Singh, finance minister in the Narasimha Rao government, responded to a twin fiscal and foreign deficit crisis by pushing through a thoroughgoing liberalization package. Long-standing trade barriers and regulatory/licensing restraints were removed, foreign investment encouraged, and public assets privatized. Since 1992 India has experienced sustained GDP growth in the range of 5–6 percent annually, and the English-speaking and highly educated segments of its population have begun to participate in and enjoy some of the prosperity of the high-technology boom.<sup>2</sup> Whereas China has emerged onto the world stage as a manufacturing powerhouse, India has adopted the role of specialization in services and advanced technology.

If, from a global perspective, many of the most defining events of the 1990s took place in Europe and Asia, it was in the United States that the decade took on the feeling of an exciting, even inebriating, second *belle époque*. As in the 1920s and 1960s, the popular imagination in the 1990s was enthralled by the dream of a “new economy,” promising a cornucopia of high income and productivity growth, low inflation and unemployment, and soaring returns on financial assets.

Early in the 1990s the mood in the United States was tinged with pessimism, out of concern about industrial decline, Asian competition, rising unemployment, and economic inequality. Rising populist sentiments in response to de-industrialization mixed with social disharmony resulting from the so-called “cultural wars” and racial/ethnic strife, and with widespread frustration about political gridlock and an apparent future of unending fiscal deficits. If the United States had triumphed in the Cold War and stunned the world with its military might in the First Gulf War, the Americans seemed to be losing out to foreigners, especially to the Japanese, in terms of economic welfare and competitiveness. The “American Century” appeared destined to an early end.

A few years later, those who returned to the United States after spending some time away were surprised by the U-turn in the country's prevailing mood. Open optimism about the future of the economy had replaced the creeping pessimism. Japan and the “Asian Tigers” were no longer perceived as threats. Innovations in IT were progressing at a breathtaking pace. Spending six months out of the country meant that, on return, one needed to exert a non-trivial effort in updating one's hardware technology and learning to use the new software. By the mid-1990s foreign observers were impressed by the renewed optimism and vitality that characterized large segments of American society. Statistical

Table 1.1 *Average annual growth rates in per capita GDP: the world economy and the United States*

	1820– 1870	1870– 1913	1913– 1950	1950– 1960	1960– 1970	1970– 1980	1980– 1990	1990– 2000
World	0.53	1.30	0.91	2.78	3.03	1.89	1.29	1.55
United States	1.34	1.82	1.61	1.71	2.87	2.12	2.25	1.94

Source: Maddison (2001, 2003).

evidence for healthy economic performance by the United States and, particularly, a remarkable productivity surge soon confirmed that these impressions were not unfounded. The media announced the birth of a “new economy,” based on the internet and the World Wide Web. The “fabulous decade” of growth in the United States highlights how one historical period in a particular economy can have a unique feel, one different from that prevailing in the same economy just a half-dozen years before or after or in other economies at the same instant.

For reasons both geopolitical and economic, therefore, the 1990s were an extraordinary, contradictory, fascinating period of economic development. It is a period, however, that is far from being well understood. Prominent voices, such as that of Joseph Stiglitz, have called for the “economic history of the 1990s to be rewritten.” The jury is still out on a number of key issues, including: the causes and sustainability of productivity growth in the United States; the sluggish growth in Europe and stagnation in Japan; how the IT revolution compares with past waves of innovation; the bubble in financial prices and its impact on the real sector; the financial instability in the “periphery”; the effects of trade and factory mobility on the global distribution of income; and the impact of changes in the welfare state, regulation, and macro-policymaking. By taking a long-run perspective on these issues, this book hopes to make the task of the jury easier. We hope that, by providing a better understanding of the features of the world economy in the 1990s that are particularly meaningful or distinctive from a historical perspective, we shall be able to frame the questions most relevant for our economic future more meaningfully.

## 1.2 The international economy

Thanks to the heroic quantification efforts of scholars such as Angus Maddison (2001), we can now roughly compare the growth rates in GDP *per capita* for the whole of the world economy in the 1990s with past periods. Table 1.1 shows that neither the world nor the United States witnessed exceptional economic

performances in the 1990s. It was far from being the best economic decade on record. In fact, growth rates in the 1990s were below the 1950–2000 average both for the world and the United States. As we noted above, any periodization is quite arbitrary and decades should not be taken too seriously as units of observation. The 1990s opened with a fairly long (1989–1992) period of virtual stagnation (zero growth) both worldwide and in the United States. If we take a shorter definition of the 1990s (1992–2000) then the GDP per capita rate of growth was 2.45 and 1.95 percent per annum respectively for the United States and the world. Of course, the ad hoc choice of other starting and ending dates for previous periods would also show different performances. We shall return to this briefly at the end of the chapter.

It is not surprising given this record for per capita GDP growth that Nicholas Crafts (chapter 2) finds that “for the industrial countries as a whole there was no resurgence in total factor productivity (TFP) growth.” He concludes that, “despite the excitement of the ‘new economy’ in the United States and the international take-up of new electronic age technologies, there was no return to the TFP growth of the (1950–70) Golden Age.”

Crafts does find that, from other vantage points, the 1990s appear rich in novelties. The most notable potential breakthrough, both from a historical perspective and for its implications for the future of the international economy, is the rise of China to the rank of a world economic power. Between 1990 and 2000 the Chinese economy more than doubled its size in real terms (Maddison, 2003), its share in the world economy growing from 7.8 to 12.5 percent (from 2.7 to 7.0 percent in manufacturing production). Growth acceleration in India was also outstanding by historical standards. As these two countries together accounted in the year 2000 for about 38 percent of the world’s population, it may be argued that their recent growth performance brought about probably the biggest single improvement in human welfare anywhere, at any time.

The rapid growth of China and India brought about the second important change in the 1990s, already under way in the previous decade: the end, perhaps the reversal, of the increase in worldwide income inequality that characterized “modern economic growth” (as defined by Kuznets, 1966) since it began in the early nineteenth century. If, as noted by Crafts, “divergence big time” was a key feature of the last century, then the 1990s highlight a true structural break in the economic history of the world. Figure 1.1 shows a measure of inequality (Gini coefficient) for the world economy: the unit of observation is the per capita GDP of individual countries weighted with the share of each country’s population in the total world population. The graph measures both the big twentieth-century divergence and the convergence process that began in the 1980s and continued in the following decade. This finding by Boltho and Gianni Toniolo (1999) has subsequently been refined by Bourguignon and Morrison (2002) and Sala-i-Martin (2002). In chapter 2, however, Crafts argues that welfare indicators



Figure 1.1 Global Gini coefficients, 1900–2000

such as the Human Development Index (HDI), which, in addition to income, takes into account education and mortality, have converged worldwide since the 1950s.

Crafts points out that the whole African continent, and in particular its sub-Saharan part, did not share in the world's output surge of the 1990s. The continent's per capita GDP remained stagnant throughout the decade in real terms, declining from 28 to 24 percent of the world average between 1990 and 2000. At the end of the twentieth century Africa's poverty remained the world's most intractable development issue, underlying the failure of policies thus far undertaken and consigning to the twenty-first century what will probably turn out to be its most relevant economic challenge.

If Africa's economic problems dated back decades, two economic failures were specific to the 1990s: Japan and Russia. The two experiences differ greatly. Japan's performance was disappointing mostly in the light of its previous outstanding growth, which led many to predict in the 1980s that it would pass the United States in the "race for global economic leadership." Between 1990 and 2000 Japanese per capita GDP grew on average only by 0.8 percent per year, as against almost 6 percent over the previous four decades (see tables 4.1 and 4.2 in chapter 4). Although scholars and policymakers disagree sharply over reasons for the "lost decade" in Japan, its beginning is inevitably linked in the popular mind to the bursting of the stock market bubble in December 1989 and the real estate bubble a year later. The asset market deflation hit the core financial

sector hard, with the major banks proving unwilling or unable to write down their non-performing loans. The long recession even led the country's consumer price index (CPI) to fall persistently after 1998, a rare event indeed in the postwar world. Studying the shift in Japan's economic performance from "miracle" to "malaise" has spawned a veritable cottage industry. Useful points of entry are Saxonhouse and Stern (2003), which explores wide-ranging debates about the macro-policy responses, and Gao (2001), which traces the institutional/structural roots of stagnation to the strong coordination weak monitoring regime that evolved between banks and large corporations during the high-growth epoch. Among the other important forces depressing growth were: (i) the nation's demographic structure, with low birth rates and a rapidly aging population (see Peter Lindert's discussion in chapter 11); and (ii) the rise of rival manufacturing powers in East Asia during an era of global de-industrialization.<sup>3</sup> (See also Sato, 2002; Hayashi and Prescott, 2002.)

The case of the Russian Federation was one of the most serious economic failures in the 1990s, particularly in the light of the performance of the formerly centrally planned Eastern European economies and of Russia's claim to being a political and military superpower. In 2000 the per capita GDP of Russia was only two-thirds of that of Soviet Russia in 1990. Moreover, welfare indicators such as life expectancy had also dramatically declined and income distribution became vastly unequal. Such a dismal performance came as a surprise to some economists and policymakers, who in the early 1990s had bet on growth acceleration in Russia once market institutions replaced central planning. Economic historians, whose main professional assumptions are that "time matters" and "institutions matter," were much less surprised. "Transition" was not easy for any country. It was, however, easier for those Eastern European countries that had enjoyed before 1939 a relatively modern market economy, with the attendant institutions and entrepreneurial middle class. There was, on the other hand, no heritage of social, economic, and political institutions that the Russians could draw upon in building a free-market economy. These changes will take much longer to take root in Russia than they did in the Eastern European countries that have recently gained access to the European Union.

The economic development of the European Union was also quite disappointing, to those who had pinned hopes on the Single Market and Currency. "Or was it?" asks Riccardo Faini in chapter 4. It was a common perception, on both sides of the Atlantic, during the 1990s that the European economy performed poorly when compared to that of the United States. While the latter's GDP grew at an average annual rate of 3.2 percent, the European Union's managed only an annual average increase of 2.1 percent. Moreover, the world's export share of the large Continental economies sharply declined, while the United States was able to achieve a slight increase in its share of total world trade. More importantly still, labor productivity growth in Europe remained higher

than in the United States until the mid-1990s, after which time, however, productivity growth in the United States was more than twice as fast as that of the European Union. It is likely, therefore, that the 1990s witnessed a break in the long-established postwar trends that saw Western Europe and Japan catching up with the United States after losing ground for over a century prior to 1950.

In the long-term perspective, the end – and perhaps the reversal – of Europe’s convergence with the United States represents one of the relevant economic changes of the 1990s, with potentially far-reaching implications for the twenty-first century. While acknowledging that Europe’s long productivity catch-up came to an end in the second half of the 1990s, Faini warns against viewing these trends with undue pessimism (from Europe’s point of view). First of all, demographic trends on the two sides of the Atlantic are very different, and if per capita rather than total GDP is taken into consideration then Europe’s relative performance looks distinctly better. During the 1990s population growth was 1.15 percent per annum in the United States and only 0.3 percent per annum in the European Union. If this is taken into account, it remains true that over the 1990s the United States grew more rapidly than Europe on per capita terms, but only by the narrow margin of 0.1 to 0.2 percentage points per annum. In the second half of the decade, the rate of growth in GDP per capita was about the same in the two areas. Moreover, Faini notes, differences in accounting practices and definitions result in a reduction of some 0.2 to 0.3 percentage points in growth differential between Europe and the United States, so that the latter’s per capita growth in the second half of the 1990s would again be slower than Europe’s. While convergence has by and large come to an end, we are not – or not yet – witnessing the beginning of a great new divergence.

### 1.3 The productivity surge and the “new economy” in the United States

Even before the purported advent of a “new economy” in the United States, the 1990s saw a revival of intellectual interest in “long waves” of technological progress, particularly in the role of general-purpose technologies (GPTs) as the engines of growth. The GPT concept, formulated by Bresnahan and Trajtenberg (1995) in a highly influential article (written in 1991), captured many of the features of semiconductors. An innovation qualified as a GPT if it was pervasive, spreading to many sectors of the economy; if it was a breakthrough that had the inherent potential for continuous improvement; and if it fostered complementary innovations in downstream sectors. The concept was in some sense an updating of Joseph Schumpeter’s idea of the “great innovation.”

This updating proved timely. During the “golden age” of productivity growth, in the 1950s and 1960s, scholars had come to downplay the role of individual great inventions. Edward Denison’s pioneering work (1962) on growth accounting had established that in a large, robustly expanding economy no single invention, and indeed no single factor, explains more than a small fraction of



total growth. This conclusion was reinforced by the path-breaking work of “new economic” historians Robert Fogel (1964) and Albert Fishlow (1965) on the social savings of the railroad in nineteenth-century America. This transportation innovation, which for many historians had virtually defined the century’s progress, could, in Fogel’s estimation, account for only two years of economic growth. The idea of a long boom driven by a single epoch-making innovation was on its deathbed.

Even the onset of the “great productivity slowdown” of the 1970s and 1980s, which revived scholarly interest in the long waves, seemed to confirm the lesser role for single great technologies in the growth progress. The stagnation of measured productivity was occurring in the period when new information technologies were rapidly entering offices, factories, and homes. This puzzling phenomenon was well captured in Robert Solow’s famous paradox: “We see computers everywhere but in the productivity numbers (Solow, 1987).” The IT sector might well satisfy Moore’s (1965) law, which promised a doubling of computing capacity for a given cost every 18–24 months, but it wasn’t generating measured increases in output per unit of input.

A number of arguments addressed the puzzling statistical unimportance of this technology, which appeared revolutionary to most who used computers and certainly to all who produced them. One common argument was that the shift of the economy from commodity production to services muted the impact of productivity advances, leading to what is known as Baumol’s Disease (Baumol, 1967). Some argued this was due to measurement problems. In many services such as the government sector, output is very hard to measure and is, essentially, proxied by inputs. A second, related argument was that much of the modern productivity advances, even in the commodity-producing sector, took the forms of quality improvements that were poorly measured by existing prices series. A now classic article by William Nordhaus (1997b) on the price of light and the careful empirical work of Zvi Giliches and his associates highlighted such measurement issues.<sup>4</sup> Others argued, more negatively, that the computer did not actually contribute to greater creativity or to more judicious decisions. Instead, the computer just reduced the cost of making revised drafts, leading to more work being produced, not a better final product. Others contended that portable computers and mobile phones increased the number of hours worked rather than output per hour.

In contrast to these pessimistic assessments, a highly influential article by Paul David argued that productivity gains from computers were just over the horizon; it was only a matter of time. David (1990) drew a historical parallel between the impact of the computer and that of the electrical dynamo in the early twentieth century. Although visionaries could see the revolutionary implications of electrical power from the mid-1890s on, the effects would not be realized in meaningful ways until the 1920s. Building on the prior work of Richard Du Boff (1964) and Warren Devine (1983), David noted that the first uses of electricity

Table 1.2 *Productivity in the US nonfarm business sector, 1974–2001*

	1974–1900	1991–1995	1996–2001	Post-1995 change
Growth of labor productivity	1.36	1.54	2.43	0.89
Contribution from capital deepening	0.77	0.52	1.19	0.67
IT capital	0.41	0.46	1.02	0.56
Computer hardware	0.23	0.19	0.54	0.35
Software	0.09	0.21	0.35	0.14
Communication equipment	0.09	0.05	0.13	0.08
Other capital	0.37	0.06	0.17	0.11
Labor quality	0.22	0.45	0.25	–0.20
Multifactor productivity	0.37	0.58	0.99	0.41
Semiconductors	0.08	0.13	0.42	0.29
Computer hardware	0.11	0.13	0.19	0.06
Software	0.04	0.09	0.11	0.02
Communication equipment	0.04	0.06	0.05	–0.01
Other sectors	0.11	0.17	0.23	0.06
Total IT contribution	0.68	0.87	1.79	0.92

NB: Growth in percent per annum.

Source: Oliner and Sichel (2002).

in manufacturing involved plugging the new power source into the shaft-and-belt factory designed around steam engines. Only over time did the new system of production with straight-line product flows, small-horsepower motors, and material handling devices evolve, allowing the full realization of the potential of electrical power. David argued that, in a similar way, the first decades of the diffusion of the computer would be spent in redesigning production to make use of the new technologies. Outweighing the initial benefits of using new hardware or software were the investment costs in updating to version 2 of better hardware or software. Eventually, though, the net gains would be realized.

In the United States, the recent past has borne out David's prediction of an acceleration of productivity growth based on the application of the new computer technologies. Table 1.2 illustrates this acceleration and indicates its proximate causes, using data gathered by Stephen Oliner and Daniel Sichel

(2002). Comparable analyses by Jorgenson and Stiroh (2000) and Jorgenson, Ho and Stiroh (2003) led to roughly similar results. All these studies date the US productivity surge to 1995/96.

The analysis highlights IT's contribution to changes in labor productivity through two channels: (i) capital deepening by investments in computer hardware, software, and communication equipment; and (ii) increases in multifactor productivity within the sectors producing semiconductors, computer hardware, software, and communication equipment. Using Oliner and Sichel's (2002) calculations and the 1995/96 breakpoint, labor productivity increased by about 0.9 percentage points per year between the 1991–1995 and 1996–2001 periods.<sup>5</sup> IT accounted for all of this change (and, indeed, a little more). Multifactor productivity increased from about 0.6 percent per year to 1.0 percent, and again virtually all the acceleration was due to IT. The resolution of the Solow puzzle was accompanied by the widespread celebration of a new technological age.

In chapter 5, Alexander Field places the acceleration of US productivity growth in the second half of the 1990s into a century-long perspective. He finds that the labor productivity advance in the recent period was well below that achieved in the “golden age” of 1947–1973 and was roughly the same as that occurring during the interwar period. Notably, he finds that the 1995–2000 “multifactor productivity growth was less than half what it was during the Depression years” of the 1930s, a period that Field has dubbed the “most technologically progressive decade” in a major recent article (Field, 2003). In this sense, the 1990s experience was far better than that of the 1970s and 1980s, but not truly exceptional in the long-run perspective. His careful sectoral decomposition of growth further indicates that the advance in the 1990s was on a narrower front, concentrated primarily in the computer-producing and intensive computer-using sectors, than productivity growth in earlier periods. Further, Field takes issue with the practice of attributing the labor productivity advance associated with capital-deepening investments in computers to the IT sector, arguing that such productivity-enhancing investments would have occurred in other sectors in any case. He concludes: “We should give the IT revolution its due, but not more than its due.”

Adopting the analytical framework of Bresnahan and Trajtenberg, Peter Rousseau's contribution in chapter 6 offers a sweeping comparison of electrification and IT as general-purpose technologies. He finds that electricity and IT both meet the standard criteria as GPTs: they are pervasive, improving, and innovation-spawning. Rousseau dates the introduction of electricity to 1894 and IT to 1971, and notes that productivity growth was lower at the onset of the new GPT eras than in the decades preceding them. After the introduction of each technology, economic innovation – as measured by initial public offerings (IPOs), patents, and investment by new firms relative to incumbents – began to rise. In a head-to-head comparison of the GPTs, Rousseau concludes, on

the one hand, that electricity was more pervasive and diffused more rapidly and more evenly through the economy than information technologies. IT, on the other hand, saw more dramatic improvements, with its price falling over a hundred times more quickly than that of electricity. (The power of Moore's law exceeded that of the economies of scale and improvements in fuel economy that contributed to falling electricity prices before the 1970s.) In terms of patents, IPOs, and investments in start-ups, IT also seems to have generated more innovation. The slowdown during the birth phase of the IT GPT was also deeper. Thus, Rousseau regards IT as more "revolutionary." Whereas Field preaches caution about the much-hyped IT revolution, Rousseau appears more optimistic, saying that "continuing price declines and the widespread increases in computer literacy . . . suggest . . . the most productive period of the IT revolution still lies ahead."

Gavin Wright, in chapter 7, widens our focus to link the invention and diffusion of new technologies with labor market conditions. He argues that, throughout the twentieth century, periods of rapid productivity growth have also been periods of strong upward pressure on real hourly wages. The 1920s represent one of the clearest examples. Most accounts, Wright argues, stress the causal link from exogenous productivity advance to higher wages. They neglect the causal link operating in the opposite direction, as the processes of induced innovation and diffusion respond to the high-pressure labor market conditions such as those prevailing from the mid-1990s onwards. Many of the computer-based technologies, for example the inventory-control technologies employed by cutting-edge retailers, had been available in the 1970s and 1980s, but were not fully exploited until the 1990s. Wright argues that "*both* blades of the scissors are required to account for the productivity surge" of the period. This chapter also raises an important caution against equating "technological progress" with changes in total factor productivity. The commonly used measures of TFP suffered not only because they are calculated as residuals – and thus, in Moses Abramovitz's formulation, are really "measures of our ignorance" – but also because they assume that technological change is neutral. Technological change that fundamentally changes the production function or redefines inputs or output is poorly captured by such measures.

## 1.4 Financial bubbles, policy, and the real economy

American observers living through the "roaring nineties" naturally made comparisons with the "roaring twenties." As in the 1920s (and 1960s), "new economy thinking" led even intelligent observers to conclude that the business cycle was dead and a new age of endless growth was possible. Prosperous times such as the 1990s seemed to give the lie to the textbook macro-economics prescriptions that potential output is best captured by the average of what is actually

achieved and that NAIRU (the non-accelerating inflation rate of unemployment) is permanently fixed at roughly 6 percent. The 1990s experience induced even Federal Reserve Bank chairman Alan Greenspan, after a period of initial caution, to believe that more aggressive policies could achieve faster growth without reigniting inflation. In the United States, economic prosperity became the core topic of everyday conversation, just as the “war on terrorism” became in the early 2000s. Venture capitalists touting their most recent IPO as the “next new thing” became the centers of media attention, near-celebrities. In contrast to the 1970s and 1980s, when talk about financial matters focused on how to preserve wealth from erosion by inflation and taxes, in the 1990s (or at least the second half) attention was paid to earning wealth through clever investing and risk-taking.

In his chapter exploring the real side of the economy, Robert Gordon details the striking similarities between the 1920s and the 1990s. Placing the series for the two decades on the same graphs, Gordon observes that the growth paths of income, productivity, and employment were almost identical. Inflation remained low in both periods, calling into question the existence of a Phillips Curve trade-off. Over each decade, new GPTs drove the boom. Gordon’s analysis seeks to link the appearance and utilization of the new technology with investment behavior. The core question (inspired by the desire to understand better the economic disaster of the 1929–1933 period and avoid its repetition) is to compare investment in the 1920s and the 1990s. Did a technology-inspired “wave of optimism” lead to “overinvestment” in the 1920s and to the subsequent collapse? Are there signs of similar problems in the 1990s? Gordon concludes that, due to better public policies (including, but not limited to, monetary behavior) and to an economic structure emphasizing the service sector, the modern US economy is much “more stable and less fragile than in the 1920s.” In this case, the experience of the 1990s provides valuable lessons for how we can understand the past, how we should interpret the causes of the Great Depression.

To the public mind, the most notable analogy between the 1990s and 1920s was soaring stock prices. And one of the greatest sources of concern was whether the “bubble” and the subsequent “bust” would lead to widespread financial disturbances and, ultimately, to severe economic difficulties. In his chapter examining the financial markets in the 1990s in the mirror of the 1920s, Eugene White asks whether it is possible to distinguish between stock prices changes due to improved fundamentals and those due to what Alan Greenspan famously called “irrational exuberance.” He further inquires how, given these difficulties, the Federal Reserves should respond to asset market booms and crashes. White argues convincingly that there are enormous difficulties in identifying the role of fundamentals in forward-looking assets, and yet one can’t attribute the rise in equity prices solely, or even primarily, to unfounded optimism. The positive

signs of a “new economy” promising a prosperous future were real, both in the 1920s and the 1990s. Thus, a Federal Reserve policy of “benign neglect” towards stock market booms was an adequate response. White does suggest that the contrast between the disastrous aftermath of the boom of the 1920s and the much softer landing after the boom of the 1990s highlights the wiser application of monetary policy today. One of the most striking and telling features of the “bubble” of the 1990s is that no major bank or financial institution failed when it finally burst.

Peter Temin (chapter 10) helps to broaden our perspective by placing the 1990s in a comparison with the 1950s as well as the 1920s. He argues that the common feature that each of these periods shared was a “postwar decade.” After the ends of the three great wars of the twentieth century – the First World War, the Second World War, and the Cold War – the world economy was shocked by declines in military expenditures and by dramatic changes in government in the losing countries. Even for the winners, postwar decades were special. In Temin’s comparison, the experience in the United States following the end of the Cold War appears closer to that after the First World War than after the Second World War. Both the rise and fall of military spending as a share of GDP was greater in the 1940s than in either of the other episodes. Temin observes that “the 1990s recapitulate the 1920s in the United States: the unsustainable boom in stock prices, international capital flows, and income distribution inequality.” In contrast with the Second World War and its aftermath, when income and wage distribution in the United States experienced what Claudia Goldin and Robert Margo (1992) call the “great compression,” wage and income inequality was high and rising after the ends of the First World War and the Cold War. In addition, the renegotiation of the social contract that commonly occurs after a war was not so apparent in the 1990s. The peace dividend did not lead to an expansion of the welfare state. One key difference Temin notes with the 1920s and 1950s is that, in the 1990s, the United States was the great borrower, not the great lender. Temin’s emphasis on the end of the Cold War is welcome, because, the economics of this conflict has heretofore received little attention (with the exception of Edelstein, 1990). The victorious end of the Cold War and the reduction in the threat of nuclear destruction undoubtedly contributed to the optimism for which the 1990s became known in America.

## 1.5 Globalization and international policymaking

The word “globalization” was found in the pre-1990 editions of good dictionaries but it became a fashionable quasi-neologism only in the 1990s. Whether describing the world economy or the birth of a universal culture, globalization became the catchword of the last decade of the twentieth century. It is now commonplace to say that human life has become global and that only by “thinking

global” we can understand reality at the onset of the twenty-first century. But – asks Barry Eichengreen in chapter 3 – how different was globalization in the 1990s from that of previous periods?

International economic integration is driven by two major forces: transportation and communication costs on the one hand, and institutions on the other. Long-distance transportation and communication costs have shown a secular tendency to fall since the early decades of the nineteenth century. Together with the decline of mercantilism and the introduction of market-friendly policies, the steam-engine-driven transport revolution progressively built up the “first globalization” of the last decades of the nineteenth century. After 1914, even as technical progress continued in the transport industry, wars, depression and strained international relations produced a “globalization backlash” (O’Rourke and Williamson, 1999) that began to be slowly reversed only in the 1950s.

Both the first and the second globalization were the result of the long-term decline in transportation and information costs and of an institutional environment that favored the development of domestic and international markets. Thus, Eichengreen notes: “The expansion of international transactions in the 1990s was the continuation of trends that had been under way for as long as half a century, and their growth pace did not significantly exceed that of the preceding twenty-five to fifty years.” Nevertheless globalization in the 1990s was more extensive than it was before 1913. In particular: (i) the ratio of world exports to world GDP was considerably higher in 1990 than it had been in 1913 and rose considerably in the following decade (table 3.1); (ii) whereas in 1913 gross world asset and liability positions were very close to net, in the 1990s the former were much higher than the latter, indicating a large multidirectional flow of capital funds not seen in the first globalization (Obstfeld and Taylor, 2003, p. 145). One area where pre-1913 globalization remains unrivalled is labor mobility. Today’s somewhat smaller ratios of migrants to the total population, in spite of much higher wage differentials between countries of emigration and immigration, indicate that today’s restrictions on labor mobility are much more binding than they were before the First World War.

If the 1990s were not marked by discontinuities (trend breaks) in the pace of international market unification – a process that, according to Eichengreen, is far from full realization – then why has recent public opinion been so impressed by “globalization”? The reason may be found in the level, rather than the rate of change, of integration in the international economy. By the 1990s the level of integration had crossed the threshold where it affected the daily lives of a large number of people in many countries and altered the distributions of income and wealth. This led, among other things, to political clashes about global markets of an intensity not seen since the first globalization of the nineteenth century. One ironic difference was that, this time round, information technology and cheap travel have globalized even anti-globalization protests.



The new political awareness that international developments matter for the “man in the street” in every corner of the world prompted increasing demands, both in developed and developing nations, for active international policymaking. Three developments, Eichengreen argues, had significant implications for the management of the world economy in the 1990s: growth in emerging markets, capital mobility, and the rise of regionalism.

Eichengreen believes that, in some cases, the challenges to international policymaking were addressed quite successfully, as in the case of the completion of the Uruguay Round (1994) and the creation of the World Trade Organization (WTO). A number of countries pursued policies friendly to foreign direct investment (FDI), which held up well in the face of the financial turbulence of the 1990s. Regionalism developed in ways that proved to be complements to rather than substitutes for the growth of global markets and institutions.

Other problems persist however, notably those deriving from short-term capital mobility and from the need to create an international financial architecture better able to prevent financial crises and to mitigate the impact on the real economy of those that inevitably take place (e.g. the crises in Mexico (1994/95), the Far East (1997/98), Russia (1998) and Brazil (1998/99)). Most problematic of all, international policymaking has so far failed to tackle poverty in the lowest-income countries and significantly reduce the long-term impact of economic activity on the natural environment on a global scale.

As with globalization, deregulation also became a key economic policy catchword of the 1990s. In chapter 12, Michael Bernstein argues that the deregulation movement yielded mixed or negative results, at least in the United States. Changes in the telecommunications sector, which – together with banking and aviation – experienced the greatest deregulation in the 1980s and 1990s, lie close to the heart of the IT revolution. Many observers relate the more rapid adoption of information technology in the United States than in Europe to the break-up of AT&T (1982) in the United States and the continued sway of state-run monopolies in Europe. (The faster diffusion of mobile phones in Europe supports rather than refutes this claim.) But the deregulated telecommunications industry was also closely tied to the American bubble and the bust. In the late 1990s rival firms in this sector built vast fiber optic networks in a competition to win first-mover status in this market of the future. Between 1998 and 2001 global investments in fiber optics totaled over \$1 trillion. Yet only 5 percent of this capacity was “lit” by the end of the period, as the demand needed to justify the infrastructure build-up never appeared (see Matheison, 2002a, 2000b; Brenner, 2002, 2003). Faced with this over-investment and accounting/underwriting scandals associated with its financing, many industry leaders, including Worldcom/MCI, Global Crossing, and AT&T, were brought low in the early 2000s. But this was not the only reckoning with telecom deregulation. Bernstein observes that in the United States, even as long-distance rates fell,



charges for local service have risen sharply, reducing access for low-income customers.

In the popular view deregulation was often linked with globalization as was another major policy issue in the 1990s: the future of social security and, more generally, of the welfare state. The welfare state was seen as endangered by a competitive global “race to the bottom” and by the revival of classical *laissez-faire* economics, with its advocacy of providing the “right” incentives and reducing effective marginal tax rates. As President Bill Clinton announced in 1996, “The era of big government is over.” Such announcements were the epilogue of the long, slow death of the Cold-War-era Keynesian consensus that Bernstein traces in chapter 12.

Contrary to much of the received wisdom, Peter Lindert (chapter 11) comes to the conclusion that the welfare state is not an endangered species among the industrialized OECD (Organisation for Economic Co-operation and Development) countries. Indeed, it is likely to spread to middle-income developing countries. His statistics show that, while the growth of the welfare state clearly slackened after 1980, social transfers continued to comprise a slowly rising share of GDP throughout the 1990s. If population aging is certainly a threat to the welfare state in the developed countries, Lindert shows that the countries with the very oldest populations have already begun to cut the relative generosity of their transfers to the elderly *per elderly person*. They have not, however, cut the average shares of public pensions or other transfers with respect to GDP, suggesting that welfare policies respond to demographic trends in democratic countries by adjusting rather than slashing social public expenditure. Lindert sees two further reasons for optimism about the continuation and diffusion of the welfare state: (i) there is almost no statistical evidence of a long-run trade-off between GDP growth and social expenditure; and (ii) rich modern democracies adjust their tax structure to minimize allocative distortions (Lindert, 2004).

## 1.6 Summing up: the 1990s in long-run perspective

The addition to our understanding of the 1990s contained in the individual chapters in this book – all contributed by leading economic historians – is substantial. The interested reader will find a wealth of detailed facts as well as overall interpretations that are quite consistent, though not identical, with each other. (Some of the differences in interpretation may be due to the time-frames – the entire decade or chiefly its second half – that the authors consider.) The overall picture of the 1990s and of their relevance as “initial conditions” for the twenty-first century has been outlined in the previous pages, and can be summarized in the following seven points.

(i) From a global perspective, the most revolutionary events of the decade were the consolidation of China’s rapid economic growth and the beginning of

India's catch-up. Given that these two nations combined make up about two-fifths of the world's population, these trends portend the most extraordinary change in economic welfare in human history. Chinese and Indian growth, which was under-appreciated at the beginning of the 1990s, achieved such high, sustained rates by the end of the decade that these developments have become focal concerns for policymakers, the media, and scholars. These changes will probably remain in the limelight for the foreseeable future, as China and India strive to sustain growth in the face of the predictable social and political stresses that – history shows – go with high-speed economic development, and as the so-called advanced economies adapt to the presence of the two giants. A mirror image to the rapid Chinese and Indian growth, at the beginning of the twenty-first century, is the stubbornly intractable problem of African poverty. This will be one of the major challenges confronting future international policymakers, and tackling it will be one of the main duties of both the “old” and the “new” rich in the global community in the new century.

(ii) Globalization, one of the catchwords of the decade, continued to spread but was not a “new” phenomenon. The integration of the world economy started in the 1960s, particularly as far as trade was concerned, and received a major boost in the 1980s with the liberalization of capital movement. Yet, in some areas such as international labor movements, globalization in the 1990s did not go as deep as in 1913. Globalization remains an ongoing process, with a long road ahead before the world becomes a fully integrated market for products and factors of production. And, as the history of the first half of the twentieth century reveals, this road may yet be blocked by any backlash against globalization, if policymakers overlook the social impact of the changes in income distribution that accompany freer trade.

(iii) The US productivity surge – heralded as the “new economy” – was certainly a strong departure from the low growth that set in after 1973. While a genuine development of potentially revolutionary importance, the IT-led surge did not match productivity growth in earlier periods of similar length, or even the long wave of 1919–1973, in magnitude or breadth. Even if the “golden age” levels of productivity growth are unlikely to return soon to the US economy, the scope for exploiting the new information technologies remains wide; unless major macroeconomic policy mistakes are made, the United States will remain for the foreseeable future on a higher productivity growth path than the sluggish years, 1973 to 1993.

(iv) The postwar productivity catch-up of the European Union and Japan with the United States came to an end in the 1990s, but there was no clear evidence that a new divergence had set in. Neither the European Union nor Japan seems so far to have exploited fully the potential for productivity gains deriving from the spread of the IT general-purpose technology. This is one of the major economic challenges they are facing at the beginning of the new century.